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

USAID
FROM THE AMERICAN PEOPLE

PRESIDENT'S MALARIA INITIATIVE

PRESIDENT'S MALARIA INITIATIVE

Liberia

Malaria Operational Plan FY 2013

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Malaria prevention and control is a major foreign assistance objective of the U.S. Government (USG). In May 2009, President Barack Obama announced the Global Health Initiative (GHI), a 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, tuberculosis, maternal and child health, family planning and reproductive health, nutrition and neglected tropical diseases.

PMI was launched in June 2005 as a 5-year, $1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through Fiscal Year (FY) 2014 and, as part of the GHI, the goal of PMI has been adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. 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 (M&E); and promoting research and innovation.

Liberia launched PMI-supported activities in 2008. Liberia's health infrastructure was severely damaged during the long civil war, leaving only about 45% of the population with access to essential health services. The entire population of approximately 3.5 million is at risk for malaria. The 2011 Malaria Indicator Survey (MIS) showed malaria prevalence by microscopy at 28% (CI: 24.6% - 31.0%) and at 45% using rapid diagnostic tests (RDTs). The National Malaria Control Program (NMCP) has produced a National Malaria Control Strategy for the years 2010-2015.

Liberia is in the fourth year of a 5-year, $37 million malaria grant from the Global Fund to Fight Aids, Tuberculosis and Malaria (Global Fund) and in the first year of a 5-year, $60 million malaria Global Fund grant. Several other international and local non-governmental organizations also provide major support to malaria prevention and control efforts through importation and distribution of insecticide-treated nets (ITNs) and antimalarial drugs, together with training of healthcare facility workers and community health volunteers.

Based on progress and experiences over five years of PMI implementation, this FY 2013 Malaria Operational Plan (MOP) for Liberia was drafted during a planning exercise carried out in March 2012 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 (MOHSW)'s 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 FY 2013 PMI funding of $12 million will support the following activities:

Insecticide-treated nets (ITNs): The NMCP's National Strategic Plan for 2010-2015 aims to increase usage of ITNs among the whole population, especially pregnant women and children under five, to 85% by December 31, 2010 and sustain this usage through 2015. The malaria strategic plan also set a target of one ITN for each sleeping space, or approximately three nets per household. There are an estimated 712,163 households in Liberia and approximately 3 million ITNs have been distributed in Liberia between 2008 and January 2012, via door-to-door campaigns, and through antenatal clinics. PMI has contributed 57% of the total ITNs received in Liberia since 2008.

The planned activities with FY 2013 funding include procurement and distribution of 250,000 ITNs through mass campaigns and antenatal clinics. PMI will also continue to support strengthening the management of the national net program, improving logistics, forecasting, storage, distribution, training, and associated behavior change and communication for improved net usage.

Indoor residual spraying (IRS): PMI-supported IRS coverage expanded from approximately 22,000 structures (160,000 people) in 2009 to 89,710 structures (834,671 people) in 2011. In 2011, resistance assays were conducted and used to inform insecticide selection for the 2012 spray round. Emerging focal resistance was detected, dictating a switch from a pyrethroid to a carbamate insecticide in two counties. The NMCP has requested PMI assistance in setting up a comprehensive mosquito surveillance program that includes IRS-targeted counties. This is being facilitated in part through collaboration with the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) from Cairo, Egypt and the Liberian Institute of Biomedical Research (LIBR).

With FY 2013 funding, PMI will support spraying of at least 25,000 structures and will continue to engage in public-private partnerships with the Liberian Agriculture Cooperative rubber plantation and ArcelorMittal. The NMCP, in coordination with PMI, will determine sites to be treated. Additionally, PMI will help support the development of entomology capacity by providing technical assistance to two newly-hired insectary technicians, by providing training on WHO and CDC insecticide susceptibility tests, and by helping the NMCP to survey for malaria mosquitoes monthly in five counties.

Intermittent Preventive Treatment of Pregnant Women (IPTp): According to the 2011 MIS, 50% of pregnant women received two or more doses of IPTp during their last pregnancy. PMI continues to support the training of health workers and students in pre-service institutions. As part of this effort, in 2011 pre-service training materials for malaria in pregnancy (MIP) were finalized and printed. Furthermore, 432 general community health volunteers (gCHVs) were provided with comprehensive community health education materials that stress early antenatal care and prevention of MIP. With FY 2013 funding, PMI will maintain support for capacity building of health staff for MIP and will support the distribution of MIP commodities, i.e., ITNs and sulfadoxine-pyrimethamine, through antenatal clinics.

Case Management & Pharmaceutical Systems: Laboratory diagnostic capacity in Liberia has been showing progress amid continuing challenges. A total of 1.8 million malaria cases were diagnosed in 2011, representing approximately 61% of all consultations in Liberia. In addition, a transitional plan has been developed that will ensure that the National Diagnostics Unit (NDU) of the MOHSW will assume responsibility for managing diagnostics in Liberia. With FY 2013 funding, PMI will procure laboratory supplies, including reagents for microscopy and rapid diagnostic tests (RDTs) for malaria diagnosis. PMI will also continue to provide technical assistance to the NMCP to strengthen the National Public Health Reference Laboratory (NPHRL) and will support the NMCP's efforts to conduct refresher training for laboratory technicians.

Increasing private sector availability of artemisinin-based combination therapies (ACTs) is a high priority of the NMCP and the MOHSW. In 2011, as part of a pilot activity, 400,000 ACT treatments were delivered to private medicine shops, pharmacies, and drug outlets in Montserrado County, and data are being gathered to monitor ACT consumption.

At the community level, the number of gCHVs to community dwellers has been reduced to one gCHV for every 500 people. This has contributed to progress in diagnosing and treating uncomplicated malaria at the community level and to increased referrals of persistent febrile cases to health facilities.

In FY 2013 PMI will procure 1,117,000 ACTs to help fill Liberia's ACT needs. Quinine for severe malaria for treating an estimated 150,000 severe malaria cases will also be procured. In addition, PMI will continue to support the extension of malaria case management to the community level and private sector case management through refresher training. PMI will also support the Liberia Medicine and Health Product Regulatory Authority (LMHRA) to provide quality assurance of antimalarials.

During the past year, the Logistics Management Information System (LMIS) tools that have been rolled out in Montserrado County have shown significant progress. Although issues of quality still pose a challenge, reporting rates from health facilities in the county have climbed to 70%. With FY 2013 funds, PMI will continue to support strengthening of the drug and laboratory supply chain system at the central and county levels.

Monitoring & Evaluation: The NMCP has finalized and costed its M&E strategy and work plan. The Global Fund and PMI provide the bulk of the costs, while WHO provides technical support. During 2011, the NMCP implemented its fourth Malaria Indicator Survey (MIS) and the report was finalized in 2012. Although the MOHSW completed training for the national Health Management Information System (HMIS), significant problems with reporting are still encountered in several counties. With FY 2013 funds, PMI will support continued implementation of the End Use Verification (EUV) tool with emphasis on follow up actions, will provide resources for supportive supervision of M&E activities, will enhance reporting and use of data in Montserrado County, and will support the 2014 MIS.

ACRONYMS

ACT	Artemisinin-based combination therapy
ANC	Antenatal care
BCC	Behavior change and communication
CDC	Centers for Disease Control and Prevention
CHT	County health team
CY	Calendar Year
DHS	Demographic and Health Survey
EPHS	Essential Package of Health Services
EPI	Expanded Program on Immunizations
EQA	External Quality Assurance
EUV	End Use Verification
FARA	Fixed Amount Reimbursement Agreement
FY	Fiscal year
gCHV	General community health volunteer
GHI	Global Health Initiative
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GOL	Government of Liberia
HCW	Health care worker
HFS	Health facility survey
HMIS	Health Management Information System
iCCM	Integrated community case management
IEC	Information, education and communication
IMaD	Improving Malaria Diagnostics
IMCI	Integrated Management of Childhood Illnesses
IPTp	Intermittent preventive treatment during pregnancy
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
LMHRA	Liberia Medicines and Health Products Regulatory Authority
LMIS	Logistics Management Information System
M&E	Monitoring and evaluation
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MOHSW	Ministry of Health & Social Welfare
MOP	Malaria Operational Plan
NDS	National Drug Service
NDU	National Diagnostics unit
NGO	Non-governmental organization
NHSWPP	National Health and Social Welfare Policy and Plan
NMCP	National Malaria Control Program
NPHRL	National Public Health Reference Laboratory
PEPFAR	President's Emergency Plan for AIDS Relief

PMI	President's Malaria Initiative
PQM	Promoting Quality Medicines
QA/QC	Quality assurance/quality control
RBHS	Rebuilding Basic Health Services
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
SCMU	Supply Chain Management Unit
SP	Sulfadoxine-pyrimethamine
TA	Technical assistance
TTM	Trained traditional midwife
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

STRATEGY

1. Introduction

The President's Malaria Initiative (PMI) is a major component of the United States Government's (USG's) effort to prevent and control malaria in sub-Saharan Africa. PMI was launched in June 2005 as a 5-year program with funding of $1.2 billion and a goal to reduce malaria-related mortality by 50%. The strategy for achieving this goal was to reach 85% coverage of the most vulnerable groups – children under five years of age and pregnant women – with evidence-based preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), insecticide-treated bed nets (ITNs), intermittent preventive treatment during pregnancy (IPTp), and indoor residual spraying (IRS). Owing to PMI's progress, in 2008 the Lantos-Hyde Act extended funding for PMI through FY 2014 with the revised goal of a 70% reduction in malaria-related mortality in the original 15 countries by 2015. In 2008, Liberia became PMI's eighth focus country. Funding for PMI activities in Liberia has been:

- FY 2008, $12.5 million
- FY 2009, $11.8 million
- FY 2010, $18 million
- FY 2011, $15.3 million
- FY 2012 and 2013, $12 million

In implementing PMI, the USG commits to working closely with host governments and within existing national malaria control plans. Efforts are also coordinated with other national and international partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), Roll Back Malaria (RBM), and the World Bank's Malaria Booster Program, as well as non-governmental organizations and the private sector, to ensure that investments are complementary and that RBM and Millennium Development goals are achieved. PMI aims to ensure that all country assessment, evaluation, and planning sessions are inclusive and collaborative. Over the past three years in Liberia, PMI has strengthened coordination and collaboration among donors, particularly with the Global Fund.

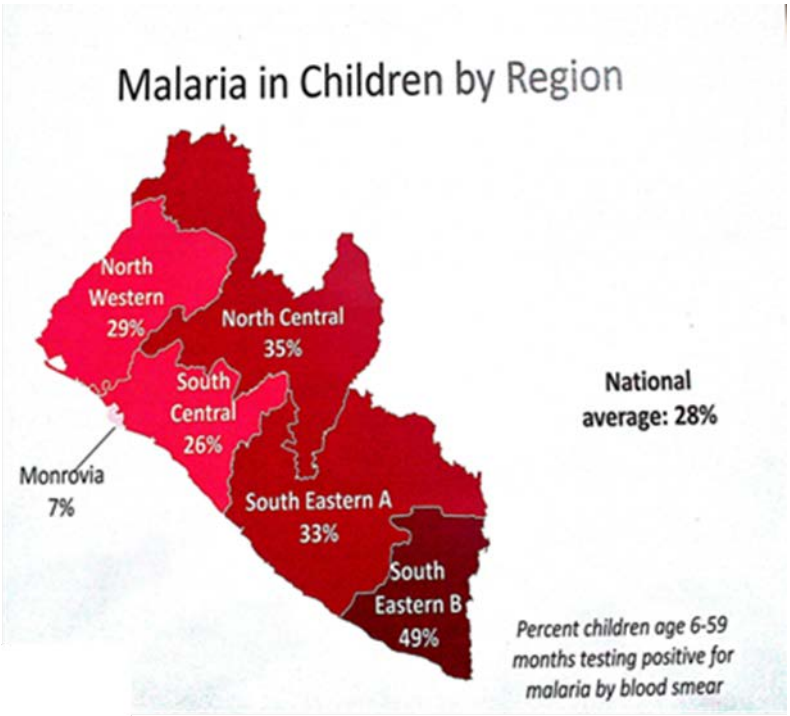
The Liberian Ministry of Health and Social Welfare's (MOHSW) National Malaria Control Program (NMCP) has made progress in decreasing malaria-related mortality. However, challenges remain. This strategy section of Liberia's Malaria Operational Plan (MOP) FY 2013: 1) briefly reviews the current status of interventions; 2) identifies challenges, opportunities and threats that pose barriers to the progress of activities under PMI; and 3) lays out a strategic plan to achieve high impact results within an environment of shrinking financial resources.

2. Malaria Situation in Liberia

Liberia covers 43,000 square miles in West Africa and is bounded by nearly 350 miles of Atlantic Ocean off the southwest and by the neighboring countries of Sierra Leone (northwest), Guinea (north) and Côte d'Ivoire (east and southeast). Most of the country lies at altitudes 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 to malaria transmission. Liberia has hyper-/holoendemic malaria. The major vectors for malaria are *Anopheles gambiae* s.s, *An. funestus*, and *An. melas*. The major parasite species are *Plasmodium falciparum* (>90%), *P. ovale*, and *P. malariae.*[1]

According to results from the 2005 Malaria Indicator Survey (MIS), the prevalence of malaria parasitemia in children under five was 66%. The prevalence rate fell to 32%[2] (CI: 27.9% - 35.4%) in 2009, and was 28% (CI: 24.6% - 31.0%) according to the 2011 MIS. The geographical prevalence of malaria according to the 2011 MIS is shown in the map below.

Figure 1: Prevalence of Malaria in Children in Liberia by Region[3]



The entire population of approximately 3.48 million[4] is at risk of the disease; children under five and pregnant women are the most affected groups. According to data from the 2009 Health

[1] Roll Back Malaria-National Desk Analysis-Liberia- 2001
[2] By RDT testing, the prevalence was slightly higher at 37%
[3] Liberia Malaria Indicator Survey, 2011

Facility Survey (HFS), malaria accounts for 35% of outpatient department attendance and 33% of in-patient deaths.

Since August 2005, as part of the previous National Malaria Strategic Plan, Liberia has made progress in malaria control and prevention. The achievements from August 2005 to 2011 documented in the 2011 MIS include:

- 50% of households have at least one ITN, up from 18% in 2005
- 37% of children under five slept under an ITN the previous night, up from 2.6% in 2005
- 39% of pregnant women slept under an ITN the previous night; in 2005 31% of women slept under any type of net
- 50% of women received two or more IPTp doses during their most recent pregnancy, up from 4.5% in 2005
- 25% of children under five received an ACT treatment for malaria within 24 hours from the onset of fever, up from 5% in 2005.

3. National Malaria Control Strategy

The GOL/MOHSW's Liberian Malaria Control Strategy for 2010-2015 aims to sustain progress in decreasing malaria-related mortality, to scale-up the most effective malaria control and prevention activities from the health facility to the community level, and to involve all partners (including the private sector) in supporting health care delivery.

Under the 2010-2015 Liberia Malaria Control Strategy, the NMCP assumes the lead coordination role and takes responsibility for the decentralization of malaria control and prevention activities throughout the country. This coordination role includes all health partners, donors, and private sector stakeholders.

Malaria control and prevention activities in Liberia follow the principle of the "three ones":

- One national malaria control coordinating authority where implementation is a country-led process;
- One comprehensive plan for malaria control including costed work plans;
- One country level monitoring and evaluation framework.

The four basic technical pillars or strategic interventions are:

1. ***Case management through improved malaria treatment and the scale up of ACTs***. Resources are to be directed towards increasing the availability and use of artemisinin-

[4] National Population and Housing Census, 2008

based combination therapies (ACTs) as first-line treatment in all public health facilities, at the community level, and in the private sector. To ensure quality of care, training will focus on strengthening key providers' skills. Malaria treatment guidelines will be revised to ensure coordinated implementation at all levels. National targets include:

- At least 80% of patients with uncomplicated malaria receive early diagnosis and prompt and effective treatment according to MOHSW guidelines
- At least 65% of patients with complicated or severe malaria are diagnosed in a timely manner and receive correct treatment according to MOHSW guidelines

2. ***Integrated Vector Management (IVM) to prevent mosquito-to-human contact, to reduce vector abundance, and to improve environmental sanitation and control of potential breeding sites.*** IVM in Liberia includes the provision of long-lasting insecticide treated nets (LLINs) through mass distribution to all households and targeted distribution to pregnant women and children under five. The strategy also includes targeted indoor residual spraying (IRS) for sleeping structures and targeted larviciding. National targets include:

- At least 90% of families have received at least one LLIN
- At least 85% of children and pregnant women sleep under LLINs
- At least 85% of the general population sleep under LLINs
- At least 85% of the population in targeted districts in protected by IRS

3. ***Malaria prevention and control during pregnancy.*** Since the introduction of intermittent preventive treatment during pregnancy (IPTp) in Liberia, the use of sulfadoxine-pyrimethamine (SP) for malaria during pregnancy has been gradually increasing, paralleling the gradual increase in access to health care. Trained traditional midwives (TTMs) are expected to refer pregnant women to ANC clinics rather than supply IPTp at the community level. This approach aims to encourage early and repeated ANC clinic attendance. National targets include:

- At least 80% of pregnant women attending antenatal consultation receive IPT according to the national MIP protocol
- 80% of all pregnant women diagnosed with malaria at health facilities (public or private) receive prompt and effective treatment according to national treatment protocol
- All pregnant women with suspected malaria at the community level are referred to the nearest health facility and receive prompt and effective treatment
- At least 80% of pregnant women attending antenatal consultation receive an LLIN

4. ***Support for advocacy, social mobilization and behavior change communication (BCC).*** This component will focus on the role of health providers and the community in malaria control and prevention activities, using a multichannel approach for health education with emphasis on radio messages, community health volunteers, and child-to-child communication. Key change agents for dissemination of malaria messages will include peer educators, trained care-givers, and other locally respected authorities. National targets include:

- All health facilities (public and private) provide updated malaria health education
- 90% of the population has heard a malaria message through multimedia channels

The above four technical pillars in turn rest on a foundation of support functions designed to facilitate their effective rollout and implementation in a cross-cutting manner.

- **M&E and Research**: Monitoring and evaluation is a major focus of both the MOHSW and the NMCP. The NMCP has developed a comprehensive M&E plan in collaboration with the M&E unit of the Department of Planning at the MOHSW and with other technical partners. This plan will be integrated with the health management and information system (HMIS) of the MOHSW. More detailed operational M&E plans will be prepared on an annual basis and revised when necessary. Malaria-specific indicators will be selected from the RBM core indicators, as well as program-specific indicators to measure performance. All data collected (routine and surveys) will be analyzed, and reports will be produced and shared with stakeholders.
- **Supply Chain Management**: Supply chain management continues to be one of the biggest challenges facing health care programs in Liberia. Inadequate storage, inventory and warehouse management practices, and limited information sharing continue to contribute to stock outs of commodities and uncertain drug quality. This activity is seen as a key priority by the NMCP and the public health community.
- **Program Management and Administration**: In order to ensure that the NMCP is able to provide expert advice on malaria prevention and control activities in Liberia, additional capacity building, particularly in program management and M&E are required. This capacity building will be a continuous process that will provide the NMCP with the necessary technical capability, resources, and information needed to carry out its responsibilities, including fostering effective partnerships among stakeholders.

The election of President Ellen Johnson Sirleaf as the chairperson of the African Leaders Malaria Alliance (ALMA) brings additional political support to the fight against malaria in Liberia.

4. PMI Goals and Objectives

The goal of PMI is to reduce malaria-associated mortality by 70% compared to pre-initiative levels in the 15 original PMI countries. By the end of 2014, PMI will assist Liberia to achieve the following targets in populations at risk for malaria:

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

5. Progress on Indicators to Date

The most up-to-date information on the status of malaria prevention and control interventions in Liberia comes from Malaria Indicators Surveys (MIS) funded by PMI. The table below shows progress since the 2005 MIS and preliminary results from the 2011 MIS.

Progress on Indicators to Date

CORE INDICATORS	RBM Targets 2010	PMI Targets 2014	MIS 2005	MIS 2009	MIS 2011
Proportion of households with a pregnant woman and/or a child <5 that own at least one ITN	85%	90%	18%	47%	50%
Proportion of children <5 who slept under an ITN the previous night	80%	85%	2.6%	27%	37%
Proportion of pregnant women who slept under an ITN the previous night	80%	85%	n/a	33%	39%
Proportion of pregnant women and children <5 who slept under an ITN the previous night or in a house that has been sprayed with IRS in the last 6 months	n/a	85%	n/a	n/a	W=45% <5=43%
Proportion of women who have completed a pregnancy in the last two years and received two or more doses of IPTp during their pregnancy	80%	85%	4.5%	45%	50%
Proportion of children <5 suspected with malaria who received ACTs within 24h of onset of their symptoms.	80%	85%	5.3%	17%	24.5%
Proportion of children under 5 with any kind of anemia (severe anemia)			87%	63% (5%)	n/a (8%)
Proportion of children with positive parasitemia among children under 5			66%	32%	28%

6. Other Relevant Evidence on Progress

The 2009 Health Facility Survey also provides useful information on the progress of malaria facility-based activities. A total of 418 health facilities, representing 79% of all health facilities in Liberia, were visited, and the survey included record review, assessment of commodities, and observation of malaria case management. Results from the Health Facility Survey are encouraging, as 86% of health workers were prescribing antimalarial drugs according to national guidelines and 85% of health workers had access to essential malaria drugs.

Key Indicators of the Liberia Health Facility Surveys

	INDICATORS	HFS 2005	HFS 2009
1	% of GOL health facilities that have ACTs available for treatment of uncomplicated malaria	58	71
2	% of health workers who search for danger signs	11	20
3	% of health workers who prescribe antimalarial drug according to national guidelines	75	86
4	% of health workers who counsel of patients/caretakers on malaria	26	45
5	% of health workers with access to essential malaria drugs	48	85
6	% of out-patient department attendance due to malaria among children under five years	59*	38
7	% of pregnant women with confirmed malaria	31	18
8	% of patients receiving appropriate malaria treatment within 24 hours	21	35
9	% of overall deaths with laboratory-confirmed malaria (Rapid Diagnostic Test (RDT) or blood smear)	44	33

* Clinical malaria

7. Integration, Collaboration, Coordination

The Global Health Initiative (GHI) is the USG vehicle for ensuring all USG global health investments are efficiently coordinated with recipient countries' health priorities in order to achieve maximum ownership and results. Thus, the guiding principle of the USG's GHI strategy for Liberia is to ensure all USG health investments align with Liberia's 2011-2021 National Health and Social Welfare Policy and Plan (NHSWPP), which is designed to expand access to basic health services and to establish the building blocks of equitable, effective, responsive, and sustainable health service delivery. The USG complements the Liberian MOHSW's efforts by concentrating its resources on two key focus areas: 1) improving service delivery through the Essential Package of Health Services (EPHS) and 2) strengthening health systems to increase institutional capacity and sustainability.

Through GHI the USG will invest in capacity building and technical assistance for policy formulation, strategy development, health systems strengthening, and countrywide BCC initiatives. Additionally, the USG is using MOHSW systems to provide both facility-based and community-based support under performance-based contracting with NGOs for specific health facilities and their catchment communities. The USG is also providing complementary technical assistance for quality assurance, in-service training, and supportive supervision.

Performance-based contracting is a service agreement entered into between the MOHSW and NGOs to carry out service delivery at health facilities and catchment communities. These NGOs are expected to ensure health care services are in consonance with the essential package of health services (EPHS), which is a standard government-approved package for primary health care

services in Liberia. These contracts include a performance bonus for reaching targets on quantity and quality indicators after verification of submitted data at the county level and counter-verification by the Central Level Committee comprised of the MOHSW and third party stakeholders.

From 2005 until 2007, the Global Fund constituted the majority of external funding for the implementation of malaria control and prevention activities in Liberia. A $37 million Global Fund Round 7 grant was signed in April 2008, with the United Nations Development Program as the Principal Recipient, and in 2011 a $60 million Round 10 grant was signed.

In 2010, PMI helped create a Donors' Forum to coordinate donors' efforts and prevent duplication. The forum included the WHO, UNICEF, and the Global Fund. A key achievement of the forum was the formulation of a joint 2011 annual work plan developed by the NMCP to monitor the activities of partners and provide a platform for further collaboration. This has resulted in increased collaboration, coordination, and integration among partners supporting the NMCP.

In Liberia, PMI prioritizes the scale-up of integrated community case management (iCCM) to increase access to health services at the community level, and in collaboration with UNICEF, PMI supports the Community Health Services Division of the MOHSW to implement iCCM. This program provides treatment for malaria, diarrhea and acute respiratory infection (ARI) for children under five at the community level. The Global Fund, under its Round 10 grant, has committed support to the expansion of the iCCM program nationwide.

The MOHSW has prioritized the integration of diagnostic capacity at the central and regional levels. The MOHSW established a National Diagnostics Unit (NDU) to coordinate the support of partners to maintain achievements and continue progress. PMI and other USAID programs are coordinating with the NDU, the Global Fund, and other partners to operationalize an integrated diagnostics strategy that will provide comprehensive diagnostic policies, standard operational guidelines, and a national diagnostic program for Liberia.

PMI is supporting a pilot in the greater Monrovia area of Montserrado County to provide ACTs to the private sector (i.e., wholesalers and retailers) for increased access to malaria treatment. This initiative will provide access to 57% of the population that seek treatment for malaria from private pharmacies, medicine shops, and health facilities. In FY 2013, based on results and lessons learned, the Global Fund will support the scale-up of this activity to the rest of the country through a Round 10 grant.

Additionally, PMI, in collaboration with the NMCP, has initiated a partnership with private companies to support the continued implementation of IRS. Under this initiative, the Arcelo-Mittal Steel Company has conducted two rounds of spraying in its concession areas in Nimba and Grand Bassa Counties. The Liberia Agriculture Company has also been engaged in this public-private partnership and has supported one round of spraying in its concessional area located in Grand Bassa County. PMI has provided insecticides and technical support, including training and mentoring, to these companies to build capacity to conduct IRS. As these companies increase their financial support to conduct IRS, PMI will decrease its support and shift resources

towards strengthening the vector control and entomological capacity of the NMCP in collaboration with the U.S. Naval Medical Research Unit No. 3 (NAMRU-3).

8. PMI Support Strategy

The overall PMI support strategy for Liberia is nested within the GHI strategy for Liberia, which seeks to align, complement, and support Liberia's 2011-2021 NHSWPP. To improve the overall health status of the population, strategic investments need to be made that take the best advantage of resources from government, development partners, and technical agencies.

PMI's national level support includes health system strengthening, bolstering the Health Management Information System (HMIS), improving pharmaceutical and commodity supply chain management, and enhancing BCC activities. Diagnostics, promoting quality medicines, ITN distribution through ANC clinics, and the provision of antimalarial commodities in health facilities, are among specific interventions that PMI will continue to support under its nationwide investment approach. In many cases, PMI is one partner among several others, enabling PMI to expand its activities beyond what could have been possible otherwise.

Support at the county level consists of the implementation of Liberia's Essential Package of Health Services at the facility and community levels. This is the principal delivery mechanism for preventive and curative malaria activities. Up to six counties will initially be targeted for service delivery. These counties were prioritized based on their population concentration (the six counties account for 75% of the total population of Liberia) and their potential to fuel nationwide development. Several USAID funding streams including HIV/AIDS, maternal and child health, and family planning, will be combined with PMI resources. Accountability of PMI resources at the county level will be through MOHSW performance-based contracting of NGOs. Scale-up to nationwide coverage for all activities, except IRS, will be achieved through coordination with the Global Fund, the Pool Fund, and the European Union.

9. Challenges, Opportunities, and Threats

Significant strides remain to be made to reduce malaria-related morbidity and mortality in Liberia. The main challenges include: 1) inefficient supply chain management; 2) inadequate Logistics Management Information System (LMIS) reporting and use; 3) need for greater capacity at the NMCP for managerial and supervisory functions; and 4) budget constraints.

Since its inception in 2008, PMI has allocated an average 40% of its annual budget to the procurement of antimalarial commodities. The supply chain for these commodities, particularly for ACTs and RDTs, remains critical for diagnosis and treatment of malaria. Although the MOHSW developed a Supply Chain Master Plan in 2010 (with technical assistance from PEPFAR), the implementation of the plan continues to stall due to limited and inadequate financial, human, and material resources. This delay has resulted in persistent stock outs of antimalarial commodities in health facilities. Through the Donor's Forum, PMI continues to coordinate with the Global Fund to harness the required funding and human capacity necessary to implement the Supply Chain Master Plan.

The LMIS data emanating from health facilities should feed into the database of the Supply Chain Management Unit (SCMU) of the MOHSW to inform forecasting, quantification, and procurement planning of health commodities. However, data quality remains unreliable and continues to make forecasting and quantification difficult. The NMCP has recognized these problems and has increased its coordination with PMI to remedy the situation. Additionally, the Global Fund has committed resources to the rollout of the LMIS forms to eleven counties, complementing the effort of PMI in the four largest counties. Currently, the NMCP is engaged in an independent assessment of the situation surrounding stock-outs of antimalarial commodities in collaboration with the National Drug Service (NDS), the county depots, and selected health facilities.

The NMCP has the opportunity moving forward to track performance and implementation through its newly revised and costed M&E Strategic Plan, but the managerial and supervisory capacity at the NMCP should be bolstered in order to ensure the long-term sustainability of malaria activities. Two of the NMCP's most effective personnel were recently promoted to higher level positions within the MOHSW; replacement of these individuals will require managerial training to meet the increasing demands for program oversight and efficiency from the NMCP.

Since 2007, the GOL has gradually increased its national budget allocation for health. However, there is still a heavy reliance on donor support for health services delivery, and budget constraints threaten the level of support that will be provided in the future. It is incumbent upon the GOL to absorb more of the country's health expenditures.

OPERATIONAL PLAN

1. Insecticide-Treated Nets

NMCP/PMI Objectives

Liberia's ITN policy is "universal coverage" defined as one LLIN for each sleeping space or three LLINs per household.[5] Distribution approaches are regular mass campaigns and distribution through antenatal services and EPI clinics. Mass campaigns are held each year, targeting different counties, with the goal of replacing LLINs that have been in the field for three years. As per Liberia's LLIN Strategic Plan, distribution campaigns are "door-to-door" and incorporate net "hang-up" and educational messaging to encourage net "keep-up." Additionally, the NMCP seeks to increase use of LLINs to 85% among the entire population through intense BCC at the community level.

Progress during last 12 months

During 2012, the NMCP continued LLIN mass campaign distribution with an aim to replace LLINs distributed in 2009 – 300,000 LLINs purchased by PMI were distributed in Montserrado, Margibi, Gbarpolu, and Grand Cape Mount counties through local NGOs during door-to-door distribution campaigns. PMI trained a total of 500 general community health volunteers (gCHVs). Intense BCC was conducted through mass media, including radio spots, and leaflet distribution.

More than 3 million LLINs have been distributed in Liberia since 2008, including 1.7 million LLINs purchased by PMI. Currently, 1.6 million LLINs are considered viable (less than 3 years old). However, there is a significant disparity between the administrative distribution data from the mass campaigns and the LLIN coverage found in household surveys. By the end of 2010, operational coverage of LLINs (number of ITNs distributed/population), based on the NMCP objective of three LLINs per household with an average size of five, was 114%.[6] However, data from the 2011 MIS documented only a small increase in household ownership of mosquito nets over previous surveys. Overall 49% of households have one or more ITNs, up from 47% in the 2009 MIS. While this is a significant improvement over the household net ownership of 18% recorded in 2005, and an increase from the figure of 30% ownership recorded in the 2007 Demographic and Health Survey (DHS), a larger increase in household ownership was expected. Anecdotal evidence suggests that some homeowners hide nets when a surveyor comes in the hopes of receiving additional nets. Moreover, other surveys have demonstrated higher ITN ownership. A 2009 EPI coverage survey conducted by UNICEF after the 2009 MIS documented the proportion of households owning an ITN at 62.6%, and a post-distribution survey conducted from November-December 2010 in Montserrado County showed that LLIN ownership reached 84%.[7] It will be important to determine why there are discrepancies in reported coverage levels.

[5] Liberia LLINs Strategic Plan and Operational Guidelines 2011-2015
[6] Ibid
[7] Ibid

Encouragingly, data from the 2011 MIS showed that among children under five and pregnant women living in households owning an ITN, 68% and 77% respectively slept under an ITN the previous night, up from 51% and 60% in 2009.

Challenges, opportunities, and threats

The 2011 MIS indicated only moderate coverage in spite of ample numbers of ITNs being distributed. This could be due to the fact that nets have been distributed mostly through campaigns. The literature shows that mass distribution is not sufficient to sustain net ownership. It could also be due to survey flaws or flaws in the distribution methodologies being used. Steps to correct this situation include conducting a qualitative survey with input from CDC using reprogrammed FY 2012 funds, and implementation of the Supply and Logistics Inventory Control Evaluation (SLICE) tool to help determine where the problem lies. Furthermore, post-distribution surveys, which have been done to date by implementing NGOs, could be conducted by a third party. Lastly, a DHS will be conducted in 2013 that should provide additional information.

Gap Analysis

Gap Analysis for ITNs CY 2011-2014

Need and Funding Source	**2011**	**2012**	**2013**	**2014**
Campaign Replacement	991,787	812,708	883,400	1,176,959
Routine ANC/EPI	185,172	213,400	193,030	197,084
Total need	1,176,959	1,026,108	1,076,430	1,374,043
Already committed/distributed				
Malaria No More/UNICEF	80,000			
PMI-MOP FY10-11	350,000	300,000		
GF-Round 7	400,000			
GF-Round 10		1,098,000	300,000	
PMI-MOP 2012				
PMI-MOP 2013				250,000
Total already distributed or committed	830,000	1,398,000	300,000	250,000
Annual LLIN Gap	346,959	-371,892	776,430	1,124,043

Plans and Justification

PMI will procure LLINs for replacement campaigns and for routine distribution through ANCs. These nets, along with nets procured by Global Fund, will go toward filling the expected ITN gap, but the gap will not be fully met. Additional donor support will be needed.

Proposed activities with FY 2013 funding ($1,775,000)

- PMI will procure 250,000 LLINs for distribution through mass replacement campaigns and routine health facility services (EPI and ANC) in selected counties. PMI counties that received new LLINs in 2010 will be targeted for replacement in 2013. ($1,125,000)

- Funding will provide money for LLIN distribution, including warehousing and transportation, by local NGOs. In addition, PMI will conduct training of supervisors for campaigns. IEC/BCC and community mobilization pre-distribution and during campaigns will be conducted by the NGOs to promote continued net use. Additionally, the NGOs will conduct follow-up supervisory visits and a third party will conduct ITN ownership and use surveys. ($650,500)

2. Indoor Residual Spraying

NMCP/PMI Objectives

The 2010-2015 revised NMCP strategy includes increased use of IRS in rural districts of high malaria prevalence, covering approximately 50% of the population, in order to quickly reduce malaria transmission. IRS will complement the use of LLINs to reduce malaria prevalence, morbidity, and mortality. The NMCP IRS strategy recognizes the use of IRS within the context of integrated vector management and sustainable gains.[8]

Progress during the last 12 months

In 2011, IRS covered 89,710 structures protecting 834,671 people in 5 counties, encompassing 14 districts.[9] Additionally, resistance assays were conducted to inform insecticide selection for the 2012 IRS campaign. The initial round of 2012 IRS spraying was conducted in March 2012 in the same 5 counties as 2011 with the goal of treating at least 80,000 structures to protect over 720,000 people from malaria. This target was exceeded by more than 16,000 structures with a spray coverage rate of over 97%. Furthermore, IRS public-private partnerships with Liberia Agriculture Company and ArcelorMittal were continued. See the table below for a summary of IRS activities in Liberia to date.

[8] National IRS Strategy for Liberia 2011-2015 (draft)
[9] Liberia End-of-Spray Round Report 2011

Liberia IRS Activities, Counties and Insecticide Class

Year	Counties					Statistics	
	Montserrado	Margibi	Bong	Nimba	Grand Bassa	Number of structures	Population protected
2009	X	pyrethroid	X	X	pyrethroid	22,000	160,000
2010	pyrethroid	pyrethroid	X	X	pyrethroid	48,000	160,000+
2011	carbamate	pyrethroid	carbamate	pyrethroid	pyrethroid	89,710	834,671
2012	carbamate	carbamate	pyrethroid	pyrethroid	pyrethroid	96,901	869,707

The NMCP has stated their desire to develop a strong program based on focal IRS, as part of their IVM strategy. However, they have very limited malaria vector surveillance data or mosquito control capacity. The NMCP has requested PMI assistance in setting up a comprehensive mosquito surveillance program that includes IRS-targeted counties. This is being facilitated in collaboration with the U.S. Naval Medical Research Unit No. 3 (NAMRU-3) from Cairo, Egypt. During the past year, anopheline mosquito density and malaria infection rates were monitored by NAMRU-3. Ten sites in three counties (Montserrado, Margibi, Lofa) were surveyed using three different adult traps with surveillance occurring every other month. Species identification and density tallies are being compiled by NAMRU-3 and Liberian Institute of Biomedical Research (LIBR) personnel. Results are pending and will be shared with the NMCP once sample processing is complete. A new round of NAMRU-3 driven surveillance began in January 2012 to monitor ten sites in five counties (Lofa, Bong, Margibi, Montserrado, and Bomi) to determine arbovirus infection rates in trapped mosquitoes; malaria infection rates will also be determined as anopheline mosquitoes are collected during the arbovirus survey.

Challenges, opportunities, and threats

The entomology capacity in Liberia remains a challenge. In 2010 four NMCP entomology technicians received training at Naguchi Memorial Institute for Medical Research in Accra, Ghana. Since then, two of these people have left the NMCP. Additionally, the LIBR insectary, which is needed for production of insecticide-susceptible malaria mosquitoes as a baseline against which to compare field mosquito populations for determining resistance ratios, is not functioning. Insecticide-susceptible mosquitoes are also used for bioassay testing of aging ITNs and insecticide longevity testing of IRS-sprayed structure surfaces. A technical assist visit was made to the LIBR insectary by a CDC entomologist in February and by three CDC/PMI entomologists in March 2012. Discussions are underway around either improving the LIBR insectary or purchasing a large metal shipping container and structurally modifying it for use as a mobile mosquito insectary.

Budget constraints are a threat to the IRS program in Liberia. Although the NMCP strategy is to cover over 50% of the population with IRS, the current funding climate means that IRS activities will need to be scaled back in the coming year, not expanded. However, the situation also presents an opportunity to refocus efforts on IRS capacity building and to engage more heavily with the private sector.

Plans and Justification

PMI will deploy well-targeted and cost-effective IRS based on sound local evidence on disease eco-epidemiology and operation feasibility, with an eye toward capacity building and sustainability. Additionally, PMI will work with the NMCP to establish a robust scheme to manage the development of insecticide resistance among local malaria vectors, and to ensure the continued utility of WHOPES-approved insecticides.

Proposed activities with FY 2013 funding ($2,639,200)

- Support spraying of a minimum of 25,000 structures (protecting at least 232,500 people) with carbamate or pyrethroid insecticides. The maximum number of houses to be sprayed will be determined by costs associated with economy of scale and class of insecticide. Funding should allow for continued IRS activities through calendar year 2013 and the first nine months of 2014. Funding includes support for the procurement of insecticides and personal protective equipment, training, M&E, environmental compliance, and entomological activities. Entomological surveillance activities will include adult and larval mosquito surveillance before and during IRS implementation to assess the impact of IRS activities in targeted counties. In addition, insecticide susceptibility assays will be performed and bioassays will be conducted to determine IRS longevity in treated structures. Areas for IRS will be selected based on 2011 MIS and entomological surveillance results, and will take into account accessibility of the spray area and population density, in order to provide the greatest protection to the most people. ($2,470,000)

- Increase entomology capacity by providing equipment, supplies, and mentoring for NMCP entomology technicians. Mosquito surveillance equipment (CDC light traps, dissecting microscopes, larval surveillance gear) will be provided to the NMCP to enable them to begin mosquito density and species identification activities in three counties. Training (and supply of equipment) for the use of WHO and CDC bottle bioassay tests by NMCP technicians will be provided in order for NMCP personnel to begin mosquito resistance surveillance in non-IRS areas. The insectary at LIBR will be improved with the necessary equipment to make it functional, and/or a standard shipping container will be modified with insulation, electrical wiring, and air conditioning for rearing mosquitoes. ($75,000)

- Increased malaria vector surveillance, bed net monitoring, and BCC in those districts where IRS is withdrawn. Additionally, health facility and/or anemia and parasitemia surveys will be done to monitor for any increases in malaria in former IRS districts. ($70,000)

- Technical assistance for vector control activities. CDC staff will conduct two TA visits to assist with training and to monitor planning and implementation of vector control activities. Training will include use of WHO and CDC bottle assays for insecticide resistance monitoring, colorimetric testing for carbamate residues on sprayed structure surfaces (for IRS monitoring), and review implementation of mosquito surveillance activities. ($24,200)

3. Intermittent Preventive Treatment during Pregnancy

NMCP/PMI Objectives

More than 170,000 pregnancies occur each year in Liberia and all pregnant women are at risk of malaria infection and its consequences. The NMCP's strategic plan has the following objectives:

- To increase access to prompt and effective treatment of malaria in pregnant women to at least 80%
- To increase the use of at least two doses of IPT among pregnant women to at least 80%
- To increase the use of ITNs among pregnant women to at least 80%

Progress during last 12 months

PMI contributed to the development and testing of pre-service training materials for malaria in pregnancy. These materials were finalized and 150 copies were produced in 2011. These are expected to be sufficient for all the pre-service training institutions nationwide.

In 2010, a curriculum to train general community health volunteers (gCHVs) was developed and training manuals produced. The manuals were used to train 390 gCHVs and trained traditional midwives (TTMs) on danger signs of pregnancy, malaria in pregnancy and referral to health facilities. In 2011, 432 gCHVs were provided with comprehensive community health education materials (CHEST kits) that stress early antenatal care and prevention of malaria in pregnancy. These are supported by nationwide radio campaigns and printed posters.

Through the RBHS project, PMI has supported performance-based financing initiatives to improve IPTp coverage (and other indicators) at 110 health facilities in Lofa, Nimba, Bong, Grand Cape Mount, and River Gee Counties. RBHS accomplishes this through sub-grants to nongovernmental organizations in these counties. There are indications that the performance-based financing initiatives have indeed translated to sustained tracking of pregnant women to adhere to IPTp compliance, and the MOHSW is replicating this model in seven other counties supported through the Pool Fund. Discussions are underway to cover the remaining three counties with funding from the Global Fund and other partners.

During 2011, the HMIS reported that 78,760 women had received the second IPTp dose as part of their antenatal care—just under half of the estimated number of pregnancies annually. This number is considered a poor estimate of coverage because of systematic deficiencies in recording IPTp at health facilities, facility-switching behavior on the part of pregnant women (i.e., women

do not go to the same facility for each of their ANC visits), and incomplete reporting from facilities and county health departments. Nationally representative data from the 2011 MIS indicate that 50% of women received two doses of IPTp during their last pregnancy. This figure, too, is considered an underestimate of current coverage because it relies on recall over the past two years. Other estimates of coverage are available from the 110 facilities supported through performance-based financing, where 42,520—or 81% of women who had reached term in the final quarter of 2011—received two doses of IPTp.

Data from community surveys conducted in five counties in the first quarter of 2011 estimated that 60% (CI: 21%-99%) of pregnant women who owned an ITN slept under it the previous evening.[10] Additionally, the 2011 MIS measured use among pregnant women who owned an ITN at 77%.

Challenges, opportunities, and threats

Stockouts of SP, late presentation at ANC facilities, facility-switching behavior, and health worker performance are considered the most important modifiable barriers to improving IPTp coverage nationwide. The MOHSW has initiated the process of including SP in the list of tracer drugs for performance-based contracts to ensure stockouts are averted in health facilities, and the performance-based contracts, which provide bonuses to health facilities for reaching targets on IPTp, are incentivizing health facility staff to work closely with traditional birth attendants and community health workers to ensure women attend ANC clinics early and get their second dose of SP. Additionally, deficiencies in recording IPTp are being addressed. A Performance of Routine Information System Management (PRISM) assessment has recently been conducted to identify technical, behavioral, and organizational factors affecting routine health data to guide the design of interventions to improve performance, quality, and use of data.

Plans and Justification

PMI will help to support the NMCP's policy on MIP, which includes the following:

- All health facilities in the country (public and private) should provide IPTp according to the national MIP guidelines
- The drug of choice for IPTp is SP
- gCHVs and TTMs should encourage MIP interventions by identifying pregnant women at the community level and referring them for early ANC attendance
- ITNs will be provided to all pregnant women

PMI and the NMCP support TTMs to refer pregnant women to ANC clinics rather than supply IPTp at the community level. This approach aims to encourage early and repeated ANC attendance. This role is recommended by the Family Health Division to ensure pregnant women comply with routine ANC visits. All health facilities with ANC services are charged with providing IPTp with SP for at least two doses.

[10] Exposure to anti-malaria BCC messages: Fifth RBHS ITN survey, April 2011

Proposed activities with FY 2013 funding ($650,000)

- Monitor and evaluate adherence to new curriculum and clinical standards at six clinical training sites on a monthly basis, in collaboration with training institutions; and conduct quarterly joint monitoring and supervisory visits to training institutions implementing the updated curricula and standards, with the Liberian Board of Nursing and Midwifery. This will be completed through a new mechanism as RBHS comes to an end in 2013. ($50,000)

- Continued in-service training and supervision of health care workers at ANC facilities and in the community through performance-based incentives. In 2013, this activity will be shifted to the Fixed Amount Reimbursement Agreement (FARA) mechanism, a direct channel to the Liberian Government including the National Malaria Control Program and Family Health Division. ($450,000)

- Support distribution of MIP commodities—LLINs and SP—through ANC delivery points. These resources will also be routed to the Ministry of Health through the expanded FARA mechanism. Activities and deliverables will be achieved through MOHSW performance-based contracts with NGOs. ($150,000)

4. Case Management

Diagnosis

NMCP/PMI Objectives

The National Malaria Strategic Plan stresses parasitological diagnosis for all suspected malaria cases at both the facility and community level in Liberia with the aim that at least 80% of patients with uncomplicated malaria receive early diagnosis. RDTs are used in all health facilities, and microscopy is conducted for confirmatory purposes where available. In addition, the MOHSW promotes the use of RDTs by gCHVs as part of iCCM. The long-term strategy of the MOHSW is to have RDTs used at the community and clinic levels and microscopy at health centers and hospitals levels.

Progress during last 12 months

[11] Ministry of Health and Social Welfare 2011 Annual Report

due to malaria was recorded as 42% with the highest mortalities occurring in Lofa and Nimba Counties, which are two of the areas of highest malaria prevalence in Liberia.[12]

With PMI support, the MOHSW recently launched revised National Therapeutic Guidelines that further support the National Malaria Strategic Plan for confirmatory diagnosis of all uncomplicated cases of malaria. All public health facilities in Liberia have been instructed by the MOHSW to ensure compliance with these guidelines for managing malaria cases.

PMI support has led to the development of a transitional plan that will ensure that the National Diagnostics Unit (NDU) of the MOHSW assumes major responsibilities for managing diagnostics in Liberia. PMI is finalizing the installation of laboratory equipment in selected regional laboratories earmarked by the NDU. PMI continues to procure reagents and other supplies for the National Public Health Reference Laboratory (NPHRL), which is overseen by the NDU, to improve laboratory services. A technical working group is in place and provides a forum for the coordination of diagnostics among partners. PMI also continues to support the NDU to develop its capacity for procurement planning and forecasting of diagnostics equipment and supplies.

Challenges, opportunities, and threats

The treatment of suspected cases of malaria continues to pose a challenge to malaria diagnosis. While Liberia has a policy of confirmatory diagnosis before treatment, the integrated management of childhood illness (IMCI) protocol states that all febrile cases should be treated as malaria, particularly among children under five. The problem is further compounded by limited microscopy capacity, resulting from a limited pool of laboratory technicians coupled with high numbers of consultations at health facilities. The Ministry of Health, in an effort to tackle this situation, has issued a policy instrument directing all health workers to adhere to the WHO guideline recommending treatment of confirmed malaria cases at all levels of the health system. Community health workers have largely adhered to this policy directive, treating or referring malaria cases to health facilities after diagnosis, but maintaining a regular supply of RDTs at the community level is critical to sustaining this high level of adherence. The NMCP will have to continue advocacy efforts to ensure clinicians conform to the treatment guidelines. This effort will require the cooperation of professional groupings including the Liberia Medical and Dental Council, the Liberia Nursing Association, and the Pharmacy Association of Liberia, along with other affiliate groups.

[12] Ibid

Gap Analysis

Gap Analysis for RDTs 2012-2015[13]

	2012	2013	2014	2015
RDT National Needs	5,117,321	5,000,000	3,000,000	3,000,000
Global Fund R7 &10	3,787,467			
Global Fund R10		1,430,167*	3,285,493*	2,592,601*
PMI	1,900,000	1,750,000	1,750,000	1,750,000
Annual RDT gap	(570,146)	-1,819,833	(2,035,493)	(1,342,601)

* Projections submitted by the NMCP to the Global Fund

PMI supported the NMCP to develop a revised gap analysis for the national needs for RDTs. The table above shows the revised needs based on a more realistic forecast derived from revised assumptions for fever episodes. Previously, the NMCP had assumed that 90% of the population would experience malaria with four fever episodes per year in infants, four episodes in adolescents, and two episodes in adults. Under the revised assumptions, two episodes of fever are expected for infants, two episodes for adolescents, and one episode for adults. The gap analysis provided by the NMCP shows that Liberia would need 5,000,000 RDT kits in 2013; this figure is expected to fall gradually in subsequent years due to scale up of microscopy.

Plans and Justification

The NDU, established in 2010, seeks to develop an integrated national laboratory system. The NDU has the mandate to oversee and supervise all diagnostic activities in clinical laboratories in the country, including the NPHRL, which routinely conducts quality assurance for the accurate preparation of slides. There are five regional laboratories of the NDU that support the external quality assurance (EQA) program of the NPHRL. PMI will provide support for these laboratories, and in collaboration with the Global Fund, will work to strengthen the diagnostic capacity of the MOHSW.

Proposed Activities with FY 2013 funding ($1,601,700)

- Support procurement of RDTs. The total need for RDTs is based on service delivery requirements, including iCCM needs. PMI will procure 1,750,000 RDTs for CY 2014 to help fill the gap. ($1,277,500)

- The procurement of laboratory supplies, including reagents for health facilities and the NPHRL, will further strengthen the conduct of external quality assurance for malaria diagnosis. Four regional laboratories will continue to supply slides stained in the field to the NPHRL where they will be re-examined by expert microscopists for accuracy and completeness. ($70,000)

[13] The gap analysis is based on consumption figures and does not include buffers at various levels amounting to an additional need of seven months worth of RDTs.

- The NDU Strategic Plan provides for an integrated approach to diagnostics in Liberia. Under the Strategic Plan, the NDU will be expected to assume a greater role in ensuring proper malaria diagnosis through increased mentoring and validation. As microscopy becomes more widely used to diagnose malaria at health centers and referral hospitals, the NMCP and NDU will work with an implementing partner, in conjunction with the NPHRL, to conduct refresher training for laboratory technicians to upgrade skills in malaria diagnostics. This will involve mentoring and validation through routine supportive supervision from the NMCP and NDU, and external quality assurance from the NPHRL. Additional support for these activities will be provided by non-PMI funding via the Global Fund and USAID. ($80,000)

- The MOHSW has directed that all treated malaria cases be based on confirmatory diagnosis. To ensure compliance with this policy change, the NMCP and NDU will continue support to health facilities to develop diagnostic capacity for early and accurate diagnosis of malaria. PMI will provide contracted NGOs support to conduct refresher training for 100 health workers and to support monitoring for upgrading microscopy in select counties at 112 health facilities. ($150,000)

- The CDC will continue to provide technical assistance to the NMCP through two dedicated diagnostic visits to support further efforts of the NMCP to rationalize treatment guidelines and improve the rollout of malaria diagnostics. ($24,200)

Treatment and Pharmaceutical Management

Treatment

NMCP/PMI Objectives

The first line drug for treating uncomplicated malaria in infants, adolescents and adults is AS-AQ, fixed-dose artesunate/amodiaquine. For complicated malaria, the preferred treatment has been intravenous quinine or intramuscular arthemeter, and a shift is being made to artesunate, including for pre-referral treatment. Oral quinine is recommended for malaria in children less than 5 kg and in pregnant women in their first trimester.

Access to treatment of malaria with ACTs has remained largely through public health facilities and a limited number of private health facilities. The NMCP is trying to improve access to appropriate case management to 80% of the population by expanding access to case management through iCCM of malaria and through the private sector.

Progress during last 12 months

The revised 2010-2015 Malaria Policy and Strategic Plan focuses on increasing access to prompt and effective treatment with ACTs for 80% of the population. In 2011, 1.8 million cases of malaria were diagnosed out of a total of 2.9 million consultations from all health facilities in

Liberia.[14] An estimated 70% of all diagnosed malaria cases were treated with ACTs. In its continuing effort to increase access to treatment of malaria with ACTs, the NMCP, with support from PMI, has initiated a private sector pilot whereby ACTs are to be made available to private medicine shops, pharmacies, and drug outlets in Montserrado County. Through this pilot, 400,000 ACT treatments have been delivered to the private sector. Data are being gathered to monitor the consumption of ACTs by care-seekers, and an assessment is planned semi-annually to evaluate the level of progress made in the private sector to increase access to ACTs as the preferred treatment for malaria.

At the community level, gCHVs are adhering to the MOHSW guidance to only treat diagnosed cases of malaria and to refer persistent febrile cases to community clinics and health facilities. The revised ration of 500 community dwellers to a gCHV, down from 1,000 community dwellers to a gCHV initially, continues to contribute to sustained progress. The Community Health Services Division of the MOHSW has also assigned community services supervisors to monitor the gCHVs and ensure that data is accurately and completely recorded and transferred to the HMIS. Moreover, the NMCP has developed indicators to be reported on through the HMIS. PMI is collaborating with the Global Fund in the implementation of the iCCM program.

Challenges, opportunities, and threats

The Liberia Medicines and Health Products Regulatory Authority (LMHRA), established with support from PMI in 2010, has attempted to address the problem of drug quality. PMI has provided training for personnel of the quality control laboratory of the LMHRA and has procured equipment and supplies to ensure the continued function of the laboratory. The Global Fund also supported the renovation of the quality control laboratory and procured additional equipment. PMI has provided technical support to the LMHRA through training and mentoring, and is currently assisting the LMHRA in setting up a registry for manufacturers of pharmaceuticals globally that will serve as a repository for initiating the detection of counterfeited antimalarials being imported into Liberia.

Gap Analysis

Gap Analysis for ACTs 2011-2015

	2012	**2013**	**2014**	**2015**
National Needs	5,751,827	4,759,000	4,120,000	3,665,945
PMI	2,350,000	2,350,000	1,117,619	1,117,619
Global Fund: R10/Public	1,122,976	715,084*	957,982*	784,356*
Global Fund: R10/Private		464,235*	816,009*	668,114*
Annual ACT gap	2,278,851	1,229,681	1,228,390	1,095,856

* Projections made by the NMCP for the Global Fund

[14] Ministry of Health and Social Welfare 2011 Annual Report

Plans and Justification

PMI will continue to support the NMCP's efforts to expand access to malaria case management through iCCM. Additionally, in collaboration with the MENTOR Initiative and the Global Fund, PMI will support a private sector initiative to increase access to ACTs. RDTs will be included in the initiative in order to prevent an unintended endorsement of clinical diagnosis.

Proposed Activities with FY 2013 funding ($2,423,500)

- PMI will procure 1.117 million ACT treatments for the public sector, community case management, and the private sector to help fill Liberia's ACT needs. PMI will have discussions with the NMCP regarding how to make up for the shortfall. ($1,173,500)

- PMI provides arthemeter, quinine, and artesunate injectibles to treat severe malaria. In 2013, PMI will procure a mix of the above treatments for severe malaria. ($200,000)

- The MOHSW has adopted an integrated approach to community-level treatment of three major childhood illnesses, i.e., malaria, diarrhea, and acute respiratory infections, which complements IMCI at the facility level. PMI will continue support for IMCI and iCCM for appropriate and prompt treatment of uncomplicated malaria and for referrals for severe malaria. Specifically, PMI will support the training, equipping, supply and supervision of 2,134 gCHVs at a ratio of one gCHV per 500 people and refresher training and follow-up of trainers and underperforming gCHVs. Facility-based training will also be supported. ($850,000)

- The NMCP has acknowledged the low quality of antimalarials available in Liberia, particularly in the private sector Liberia established the LMHRA in 2010 with support from PMI, and PMI continues to provide technical assistance to this entity. A QA/QC laboratory has also been established, with initial support from the Global Fund, to ensure the quality of antimalarials meets minimum standards. PMI will continue support for quality control and quality assurance of antimalarials through training and procurement of supplies, reagents and equipment. This activity is geared towards strengthening the QC laboratory to continue testing of randomly selected antimalarials from the private sector to ensure that these drugs are efficacious and meet treatment standards. ($150,000)

- PMI has initiated collaboration with the private sector to increase access to ACTs since 54% of the population receives treatment for malaria from private medicine shops, private pharmacies, and private clinics. PMI will complement work being done by the MENTOR Initiative to strengthen the NMCP's monitoring of this activity to ensure that caregivers are compliant with guidelines mandating treatment for confirmed cases of malaria. PMI will support private sector case management of malaria through refresher training for dispensers, supervision, and monitoring of private sector healthcare providers. Under a Round 10 grant, the Global Fund will scale-up this activity nationwide. ($50,000)

Pharmaceutical Management

NMCP/PMI Objectives

Under the leadership of the MOHSW and in collaboration with partners, including PMI, a ten-year Supply Chain Master Plan was developed in 2010. The Master Plan integrates all pharmaceutical logistics into a single system to ensure transparency and responsiveness. The Supply Chain Management Unit (SCMU) has been re-established and is responsible for all supply chain operations.

Progress during last 12 months

During the past 12 months, the LMIS tools being implemented in Montserrado County with technical assistance from PMI have shown significant progress. Reporting rates from health facilities in Montserrado have increased to about 70%. PMI is supporting roll out in the other three largest counties while the Global Fund is supporting the rollout of the LMIS tools to the rest of the country for routine collection and transfer of data to the HMIS. The NMCP, with technical assistance from PMI, has installed the pipeline software that enables the program to monitor the stock balances of malaria products at the National Drug Service (NDS). These reports, coupled with the increase in reporting rates from health facilities in Montserrado County, have significantly improved the capacity of the NMCP to detect potential stock-outs of antimalarials and contributed to the revised formulae used by the NMCP to make forecasts for national needs of malaria commodities.

Challenges, opportunities, and threats

The supply chain system remains a lingering challenge to the effective implementation of the Essential Package of Health Services (EPHS), the bedrock of Liberia's ten-year National Health Plan. Central to this problem is the unreliability of data emanating from health facilities to adequately inform quantification and forecasting of malaria commodities, particularly ACTs. Distribution of malaria commodities are also hampered by limited storage at the NDS, poor procurement planning due to unreliable data from health facilities, and the lack of reliable means of transportation. These problems continue to contribute to intermittent stockouts of ACTs and RDTs.

The SCMU of the MOHSW continues to receive technical assistance through PMI to resolve these problems. PMI is supporting the Montserrado County Health Team with the implementation of LMIS tools to improve its supply chain system and will replicate this support in three other counties: Lofa, Nimba, and Bong. PMI is also strengthening collaboration with other partners, including the Global Fund and the Clinton Health Access Initiative, to increase the logistic capacity of the SCMU to rollout the LMIS tools nationwide and to assist the NDS in developing a national procurement plan and establishing a central warehouse.

Plans and Justification

PMI has initiated a customized supply chain system in Montserrado County to provide the NMCP and the MOHSW a practical supply chain model that forecasts, quantifies, procures, and distributes based on reliable and accurate data. In 2013, PMI will continue to support the supply chain system at both the central and county levels.

Proposed activities with FY 2013 funding ($678,500)

- In 2013 PMI will support strengthening the drug and laboratory supply chain system, including development of drug financing, registration, logistics, information systems, supervision, forecasting, and warehousing plans at the central level. Specifically, PMI will support development of data collection and analyses for adequate forecasting and quantification; development of a community-based supply chain management system for the iCCM program; and development of national procurement planning for commodities, equipment and supplies. In addition, PMI will ensure that the LMIS supports the HMIS. ($553,500)

- PMI will also support the supply chain at the county level in four counties (Montserrado, Lofa, Nimba, and Bong), complementing Global Fund support in the remaining 11 counties. At the county level, specific activities will include LMIS support, monthly review and analyses of data received from health facilities, review of supply chain performance, and forecasting for procurement planning. In addition, PMI will support quarterly review meetings with health facilities, supportive supervision, and the distribution of commodities. ($125,000)

5. Monitoring and Evaluation Plan

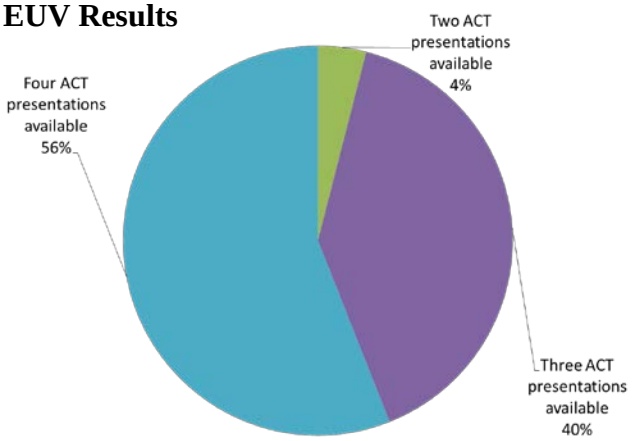
NMCP/PMI Objectives

Liberia's National Malaria Strategic Plan calls for monitoring the progress toward program goals and evaluation of the impact and outcomes of planned interventions. Additionally, the plan calls for the implementation of evidence-based program management, including the establishment of sentinel sites in each region for data monitoring and vector surveillance. The NMCP's M&E strategy uses globally accepted facility- and population-based indicators.

Progress during last 12 months

An MIS was conducted November – December 2011. Coverage rates for the main interventions are available (see table page 13) and show some progress since the previous MIS in 2009. The prevalence of malaria parasitemia in children under five was 28% (CI: 24.6% - 31.0%) according to the 2011 MIS.

EUV Results



Liberia has conducted four EUV exercises: January 2011, May 2011, October 2011 and April 2012. Efforts were made to ensure that EUV fits in with already planned supervisory activities carried out by the MOHSW and NMCP. Because the number of health facilities in Liberia is relatively small, the total annualized number of facilities assessed with the EUV tool provides statistically significant results. EUV is implemented quarterly and provides information like the graph above from the EUV conducted in May 2011. No health facilities were stocked out of all ACTs on the day of the EUV visit and 96% had at least three ACT presentations with which to treat malaria cases.

The MOHSW has a fully integrated computerized Health Management Information System (HMIS) that serves all departments and programs. Personnel at all levels have been trained and the system is operational nationwide. The system generates several monthly, quarterly, and annual reports; however, some counties are not reporting on time or accurately, and in the case of Montserrado, the largest county in Liberia, 20% of facilities are not reporting at all.

Challenges, opportunities, and threats

Results from the 2011 MIS (e.g., ITN ownership) appear to show little progress since the last MIS in 2009. Steps including a qualitative ITN survey and implementation of the SLICE tool are being planned to clarify reasons for less-than-expected performance.

In spite of a sound M&E vision, the MOHSW and NMCP have had problems with implementation of its more routine systems such as the HMIS because of reduced technical capacity, and limited funding and oversight. HMIS managers report that most counties do not use data collected by their facilities for making local decisions.

Plans and Justification

PMI, in collaboration with the Global Fund, with some support from WHO, will help to fund the NMCP's M&E strategy. Data collection tools are globally recognized and standardized to allow multi-year comparisons. Some non-standard indicators are also collected for monitoring specific malaria program activities. The plan is closely integrated with the HMIS of the MOHSW, for which there is also a written strategy and tools. A detailed operational monitoring and evaluation

plan is prepared on an annual basis and revised when necessary. The table below summarizes the approaches and systems for collecting data. The Global Fund will provide resources for several M&E activities, including support to the HMIS, the health facility surveys, and data quality assurance. In addition, the NMCP plans to conduct a therapeutic efficacy survey to be funded through the Global Fund.

Data Sources for Monitoring and Evaluation in Liberia, 2005 – 2015

Data Source	Calendar/PMI Year									
	2005	2006	2007	2008 1	2009 2	2010 3	2011 4	2012 5	2013 6	2014 7
HMIS	X	X	X	X	X	X	X	X	X	X
Sentinel sites	X	X	X	X	X	X				
DHS				X					X	
MIS			X		X		X			X
MICS										
Health Facility Survey	X				X			X		X
Supervision and Evaluation Reports	X	X	X	X	X	X	X	X	X	X
End Use Tool							X	X	X	X

Proposed activities with FY 2013 funding ($762,100)

- PMI will provide resources to implement EUV every quarter. Emphasis will be placed in simplification of the reports, dissemination, and follow-up action for any problems identified. ($100,000)

- As districts and regional health teams become more self-reliant and are able to implement activities on their own, the role of the NMCP is shifting to a more normative and supportive role. Resources will be made available to the NMCP, either directly or through an implementing partner, to do supportive supervision to district health teams and facilities to support health teams in areas of planning, program monitoring, case management, etc. ($100,000)

- PMI will support strengthening HMIS data collection and follow-up, particularly for improving the use of HMIS data collection and reporting in Montserrado County. As Montserrado has one of the worst HMIS reporting rates in Liberia and about 40% of the population, resources will be made available to the NMCP's M&E team through an implementing partner to visit health facilities in the county. Visits will be made to facilities with low reporting, and the team will work with facility staff to increase reporting and data use. This effort will be complemented by resources from the Global Fund. ($50,000)

- PMI-Liberia will provide financial and technical resources to support the MIS in 2014. The MIS uses standard indicators and methodology approved by the RBM Monitoring and Evaluation Reference Group. The sample size will be similar to the 2011 MIS, which sampled almost 4,500 households. This will be the fourth MIS and will provide invaluable comparison data. ($500,000)

- CDC will conduct one technical assistance visit to support the NMCP on monitoring and evaluation activities. This visit will support upgrading the HMIS, including helping to validate data on IPTp emanating from health facilities to the HMIS. Additionally, the visit will support the roll out of the DHS 2.4 software. ($12,100)

6. Behavior Change and Communication

NMCP/PMI Objectives

The NMCP's National Malaria Strategic Plan and the National BCC Strategy include a multichannel approach for health education with an emphasis on radio messages and the use of gCHVs for dissemination of malaria information at community level. Additionally, the plan supports the use of peer educators, trained care-givers, traditional authorities, and child-to-child communicators as agents for behavior change, and the use of social mobilization and health system support for capacity building at all levels. PMI and Global Fund are the principal funders of BCC activities at the national and community level.

Progress during last 12 months

PMI, through its implementing partners, has assisted in training and equipping gCHVs with communication materials to reach households, conveying messages about ITN use and care seeking behavior for people with fever, particularly for children under-five. Messages about ANC attendance are also communicated. To date, a total of 432 gCHVs have been trained.

PMI partners have contributed to the development of communication materials including posters, flipcharts, and training aids. These materials were developed using guidelines provided by the NMCP, and have been deployed by PMI implementing partners and other donors including the Global Fund. Many implementing partners have also assisted with the production and transmission of radio spots including dramas and advertisements. The content of the messages was provided by the NMCP and implementing partners have assisted with translation into local dialect, production of shows and ads, as well as transmission of the final product. Radio programs include dialogues about signs and symptoms of malaria, as well as proper care-seeking behaviors, in addition to use of ITNs. According to surveys conducted in April 2011 in five counties, 84% of respondents had seen or heard ITN IEC/BCC messaging through radio spots, jingles, posters, etc.[15] The table below shows results of key indicators in areas in which commodities have been available and BCC activities have been consistent and constant compared with results from the 2011 MIS. The BCC surveys are too small in size to establish

[15] Exposure to anti-malaria BCC messages: Fifth RBHS ITN survey, April 2011

attribution; however, the results are clearly better in those areas where BCC was carried out regularly.

Key Malaria Indicators at Subnational Level in PMI Focus Areas with Commodity Availability and BCC Implemented[16]

Indicator	Percentage from BCC rapid surveys	Percentage from MIS 2011
Pregnant women provided with IPT2	81% of expected pregnant women (October- December 2011)	50%
Children under 5 treated with anti-malarial	56% of all OPD U5 consultations (October- December 2011)	NA
Children under 5 treated with ACTs	94% of children treated with antimalarials (October- December 2011)	40%
Pregnant women who slept under an ITN previous night (if owned)	60%, CI: 67%-89% (Jan 2011)	77%
Children under 5 who slept under an ITN previous night (if owned)	80%, CI: 21%-99% (Jan 2011)	68%

Finally, PMI has trained HCWs on how to communicate important messages about malaria prevention and treatment-seeking behavior. The training has included community outreach activities that can be undertaken in the health facility catchment area, such as interaction with gCHVs and mobilization for ITN campaigns.

Challenges, opportunities, and threats

The 2011 MIS indicates high levels of knowledge about malaria however the population has not yet fully translated this knowledge into desired behaviors or practices. In addition, there is continued need to synchronize inputs and availability of services or commodities to support desired behavior change – for instance, ITN use among pregnant women in household with at least one LLIN has reached over 77%. Some of the challenges reported by partners working at the community level include inconsistent availability of job aids, transportation, string and nails.

Plans and Justification

Although a concerted effort was made between 2009 and 2011 by partners to encourage behavior change for preventing and treating malaria, there were still 1.8 million malaria cases in Liberia in

[16] Data from RBHS surveys

2011.[17] The NMCP has initiated a strategic change that will augment current BCC interventions by bolstering the interpersonal communication skills of health workers and community health volunteers. When done appropriately, interpersonal communication is one of the most effective means of encouraging behavior changes in care seekers at both the facility and community level. PMI will support the NMCP to roll out its latest BCC strategy by providing resources to train health workers and community health volunteers to improve their interpersonal communication skills. Training will focus on communication skills for increased patient adherence to treatment regimens and use of malaria prevention measures. Targeted communication to clinicians on the need for laboratory confirmation of malaria will also be supported.

Proposed activities with FY 2013 funding ($350,000)

PMI will support the national BCC strategy by implementing an integrated interpersonal communication campaign, including HCW training, to promote all aspects of malaria interventions. The interpersonal communication training for HCW will be conducted in synergy with other interventions. For example, the Family Health Division has also identified interpersonal communication as a strategy to improve maternal care. PMI will support the broad communication strategy of the NMCP on dangers of malaria, the need for prompt referral to health facilities, current drug policy, and MIP. IRS-BCC and ITN-BCC are covered in the IRS and ITN sections, respectively. ($350,000)

7. Capacity Building and Health Systems Strengthening

NMCP/PMI Objectives

A primary objective of the NMCP is to increase the qualifications of NMCP staff, particularly in terms of their managerial and supervisory capacity. In addition, the Liberia MOHSW has made a commitment to integrate health services at both the health facility and the community level in order to improve access to health care.

Progress during last 12 months

The NMCP managed the field activities of the MIS in 2011. The NMCP also trained health workers for IPTp and gCHVs involved in iCCM. The latest data show 3,500 gCHVs available in Liberia. At least a third have received training for iCCM. Under the FARA, a reimbursement agreement with the MOHSW for health services delivery, the NMCP led the distribution of 300,000 ITNs and conducted supportive supervision. Additionally, the vector control focal person at the NMCP recently completed vector control training in Ghana supported by PMI, and four other members of the vector control unit of the NMCP benefitted from entomology training in Ethiopia with support from PMI. Furthermore, PMI is providing technical assistance to the NMCP, the SCMU, and the NDU for the establishment of an effective and coordinated supply chain network that will ensure timely and adequate forecasting of malaria commodities and laboratory supplies. The establishment of a comprehensive procurement plan is also underway.

[17] Ministry of Health and Social Welfare 2011 Annual Report

PMI continues to work with other partners in health systems strengthening. PMI collaboration with the Global Fund has provided compensation for two NMCP staff trained in entomology to provide insectary services. Other collaborations with the Global Fund include coordination in supply chain activities, ACT private sector initiatives, and diagnostics. The NMCP remains engaged in these collective efforts and has provided the leadership to guide the outcomes of these efforts.

Challenges, opportunities, and threats

After almost 15 years of war, the health system in Liberia continues to suffer from an insufficient number of qualified health workers and the provision of quality health care is still a major challenge. In addition, procuring and distributing malaria commodities (LLINs, ACTs, severe malaria kits, RDTs, etc.) in the 500 health facilities in Liberia remains a challenge.

Plans and Justification

PMI, in collaboration with the Global Fund and other partners, has supported training of NMCP staff in M&E, entomology, supply chain management, and vector control. PMI will continue its strong focus on building technical and managerial capacity for malaria prevention and control at all levels of the health care system. PMI will continue to support the NMCP to improve the quality, completeness, and timeliness of malaria-specific data reporting from health facilities and to increase staff skills in data analysis and interpretation.

Proposed activities with FY 2013 funding ($100,000)

- Efforts will include conducting and strengthening malaria-focused supportive supervision from the county level down to the community level, post-training follow-up of health workers, and mentoring. Supportive supervision will involve instituting corrective measures during supervision; post-training follow-up will involve ensuring that new methods/techniques are being practiced by health workers following training. An example of this will be the follow-up of health workers to ensure that artesunate injection is used to treat severe malaria after ongoing training. Technical assistance from PMI will complement Global Fund investments in NMCP capacity building. Support for supply chain strengthening is covered in the Case Management section. ($100,000)

8. Staffing and Administration

Three health professionals, two serving as Resident Advisors (one representing CDC and one representing USAID) and a Foreign Service National, oversee PMI activities in Liberia. All PMI staff members are part of a single inter-agency team led by the USAID Mission Director or his/her designee in country. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, managing collaborating agencies and supervising day-to-day activities. Candidates for resident advisor positions (whether initial hires or replacements) will be evaluated and/or interviewed

jointly by USAID and CDC, and both agencies will be involved in hiring decisions, with the final decision made by the individual agency.

The PMI professional staff works together to oversee all technical and administrative aspects of PMI, including finalizing details of the project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, and reporting of results. Both resident advisors and other PMI staff members report to the USAID Mission Director or his/her designee. CDC supervises the CDC staff person 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 GFATM, 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 other host government institutions will need to be approved by the USAID Mission Director.

Proposed activities with FY 2013 funding (*$1,020,000)*

- These funds will be used for coordination and management of all in-country PMI activities including staff salaries and benefits, office equipment and supplies, and routine expenses.

Table 1
President's Malaria Initiative - Liberia
(FY 2013) Budget Breakdown by Partner

Partner	Activity		%
CDC	Technical assistance to various parts of the malaria program	$60,500	0.5%
Deliver TO7	Procurement of ITNs, ACTs, severe malaria drugs, RDTs and laboratory supplies; support supply chain management	$4,624,500	38.5%
Abt Associates	Indoor residual spraying in at least 25,000 structures	$2,615,000	21.8%
Macro	Support Malaria Indicator Survey	$500,000	4.2%
TBD	Support NMCP to carry out supervision. Support for training for NMCP personnel. Distribution of ITNs.	$850,000	7.1%
IMaD	Strengthen the national reference laboratory and refresher training for laboratory technicians in malaria diagnostics	$80,000	0.7%
New Mechanism	Continue training in MIP in select pre-service schools; support implementation of private sector case management; improve the use of HMIS data collection and reporting in Montserrado county.	$150,000	1.3%
FARA	Integrated BCC for malaria control; support IPTp, iCCM, IMCI, and training activities	$1,950,000	16.3%
PQM	Monitoring of drug quality	$150,000	1.3%
CDC/USAID	Technical advisors	$1,020,000	8.5%
Total		**$12,000,000**	**100%**

Table 2
President's Malaria Initiative - Liberia
Planned Obligations for FY 2013

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total $	Commodity $		
PREVENTION					
Insecticide Treated Nets					
Procure LLINs	Deliver TO7	1,125,000	1,125,000	Nationwide	Procure 250,000 LLINs for distribution during replacement campaigns, in health facilities and/or community-based systems
Distribution of LLINs	TBD	650,500	650,500	Nationwide	LLIN distribution (including warehousing and transportation), training and supervision, IEC/BCC and community mobilization, follow-up visits and ITN use surveys
SUBTOTAL ITNs		**1,775,000**	**1,775,000**		
Indoor Residual Spraying & Other Vector Control Measures					
Indoor residual spraying	Abt Associates	2,470,000	2,470,000	Selected areas based on need, projected effectiveness and insecticide resistance levels	Spray at least 25,000 structures with an appropriate insecticide. Costs include BCC in support of IRS and entomological monitoring
Increase NMCP entomology capacity	Abt Associates	75,000		Nationwide	Provide training, equipment and supplies for NMCP entomology technicians, including insectary support
Increased vector and epidemiological surveillance in former IRS districts	Abt Associates	70,000		IRS Target areas	Increased vector & epidemiological surveillance, bed net distribution monitoring, and BCC in those districts where IRS is withdrawn
Technical assistance for vector control activities	CDC	24,200		NMCP	Two visits to assist with training and to monitor planning and implementation of vector control activities
SUBTOTAL IRS		**2,639,200**	**2,500,000**		
Intermittent Preventive Treatment in Pregnancy					
Pre-service for malaria in pregnancy	New Mechanism	50,000		Nationwide	Quarterly joint monitoring and supervision visits on

					implementation of new curricula.
In-service training of health care workers	FARA	450,000		Bong, Nimba, Lofa	Continue in-service training and supervision of health workers for malaria in pregnancy
Support distribution of malaria in pregnancy commodities	FARA	150,000		Bong, Nimba, Lofa	Support distribution of LLINs and SP through ANC delivery points
SUBTOTAL IPTp		**650,000**	**0**		
TOTAL PREVENTION		**5,064,200**	**4,275,000**		
CASE MANAGEMENT					
Diagnosis					
RDT procurement	Deliver TO7	1,277,500	1,277,500	Nationwide	Procure 1.75 million RDTs to help fill gap
Procure laboratory supplies	Deliver TO7	70,000	70,000	Nationwide	Procure laboratory supplies, including reagents, for health facilities and national reference lab
Support NPHRL, NDU, and NMCP for EQA and supportive supervision	IMaD	80,000		Nationwide	Support NPHRL, NDU, and NMCP with technical assistance to strengthen the National Reference Laboratory for external quality assurance, refresher training for laboratory technicians, and supportive supervision
Support capacity development of malaria diagnostics in health facilities	FARA	150,000		Bong, Nimba, Lofa	Continue support to health facilities for early and accurate diagnosis of malaria cases.
Technical assistance for malaria diagnostics	CDC	24,200		NMCP	Two technical assistance visits to support efforts of the NMCP to rationalize treatment guidelines and improve the rollout of malaria diagnostics
SUBTOTAL Diagnosis		**1,601,700**	**1,347,500**		
Treatment & Pharmaceutical Management					
ACT procurement	Deliver TO7	1,173,500	1,173,500	Nationwide	Procure 1,117,000 ACT doses for private sector, public and community
Procure severe malaria medications	Deliver TO7	200,000	200,000	Nationwide	Procure treatments for severe malaria
Support capacity development of health workers in prompt and appropriate treatment of	FARA	850,000		Bong, Nimba, Lofa	Continue support for appropriate and prompt treatment and early referral of malaria cases, with an emphasis on iCCM

malaria					
Monitor antimalarial drug quality	PQM	150,000		Nationwide	To monitor the quality of antimalarials in county
Private sector case management with ACTs	New Mechanism	50,000		Nationwide	Support the implementation of private sector case management through training activities, supervision and implementation of costs and logistics mechanisms
Strengthen supply chain management (central level)	Deliver TO7	553,500		Nationwide	Support NMCP/MOHSW to strengthen the drug and laboratory supply chain system, including development of drug financing, registration, logistics, information systems, supervision, forecasting, and warehousing plans at the central level
Strengthen supply chain management (county/district level)	Deliver TO7	125,000		Bong, Nimba, Lofa	Support NMCP/MOHSW to strengthen the drug management system capacity. Activities at the county level will include LMIS support, monthly review and analyses of data received from health facilities, review of supply chain performance, and forecasting for procurement planning
SUBTOTAL Treatment & Pharmaceutical Management		**3,102,000**	**1,373,500**		
TOTAL CASE MANAGEMENT		**4,703,700**	**2,721,000**		
MONITORING AND EVALUATION					
End-use verification tool	Deliver TO7	100,000		Nationwide	To support NMCP in the implementation of End-Use Verification Tool
Supportive supervision to district health teams and facilities	TBD	100,000		Nationwide	Support NMCP to conduct supervisory activities in the areas of planning, program monitoring, case management, etc.
Strengthening HMIS data collection and follow-up	New Mechanism	50,000		Nationwide	Improve the use of HMIS data collection and reporting in Montserrado county. Improve use of HMIS data for decision making at all levels of the health system

Support to MIS 2014	TBD	500,000		Nationwide	Support for Malaria Indicator Survey
Technical assistance for monitoring and evaluation activities	CDC	12,100		NMCP	Provide technical assistance to the NMCP and implementing partners in monitoring and evaluation
TOTAL M & E		**762,100**	**0**		
BEHAVIOR CHANGE AND COMMUNICATION					
Interpersonal communication	FARA	350,000		Bong, Nimba, Lofa	Implement an integrated interpersonal communication campaign, including HCW training, to promote all aspects of malaria interventions
TOTAL BCC		**350,000**	**0**		
CAPACITY BUILDING					
Post-training follow-up at facility level	TBD	100,000		Nationwide	Strengthening capacity of the NMCP to conduct post-training follow-up to train health workers in the field
TOTAL CAPACITY BUILDING		**100,000**	**0**		
STAFFING AND ADMIISTRATION					
In-country staffing and administration		1,020,000		Monrovia	Salaries and benefits, as well as administrative-related costs of in-country PMI staff, and support of activities as needed by the Mission
TOTAL STAFFING AND ADMINISTRATION		**1,020,000**	**0**		
GRAND TOTAL		**12,000,000**	**6,996,000**		