

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



PRESIDENT'S MALARIA INITIATIVE



PRESIDENT'S MALARIA INITIATIVE

Malawi

Malaria Operational Plan FY 2013

TABLE OF CONTENTS

EXECUTIVE SUMMARY	3
ABBREVIATIONS AND ACRONYMS	8
STRATEGY	10
1. Introduction	10
2. Country malaria situation	11
3. Country health system delivery structure and MoH organization.....	13
4. Updates on MOP strategy.....	14
5. Country malaria control strategy	14
6. Integration, Collaboration, Coordination	17
7. PMI goals, targets and indicators	19
8. Progress on coverage and impact indicators to date.....	19
9. Other relevant evidence on progress	20
10. Challenges, opportunities and threats.....	21
11. PMI support strategy	22
OPERATIONAL PLAN	23
1. Insecticide-Treated Nets	23
2. Indoor Residual Spraying.....	27
3. Malaria in Pregnancy.....	30
4. Case Management	32
5. Monitoring & Evaluation	42
6. Behavior Change Communication	45
7. Capacity Building.....	48
8. Staffing and Administration	50
9. Table 1	52
10. Table 2.....	53

I. EXECUTIVE SUMMARY

Malaria prevention and control are major foreign assistance objectives of the U.S. Government (USG). In May 2009, President Barack Obama announced the Global Health Initiative (GHI), a six-year, comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States will help partner countries improve health outcomes, with a particular focus on improving the health of women, newborns, and children.

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS and tuberculosis. PMI was launched in June 2005 as a five-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. Programming of PMI activities follows the core principles of GHI: encouraging country ownership and investing in country-led plans and health systems; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; implementing a woman- and girl-centered approach; improving monitoring and evaluation; and promoting research and innovation.

Malawi became a PMI focus country in 2006. It also is one of eight countries from around the world to be selected in FY 2011 as a "GHI Plus" country, and will receive additional technical and management support to quickly implement GHI's approach. The Ministry of Health's (MoH) National Malaria Control Program (NMCP), with support from PMI and other partners, has been able to rapidly scale-up the distribution of long-lasting insecticide treated nets (LLINs) through antenatal clinics and immunization programs, intermittent preventive treatment in pregnancy (IPTp), and artemisinin-based combination therapies (ACTs) in spite of the country's weak health infrastructure. Accordingly, household ITN ownership increased from 38% in 2006 (Multiple Indicator Cluster Survey, MICS) to nearly 60% in 2010 (Malaria Indicator Survey, MIS). Similarly, children under five years and pregnant women who reported sleeping under an ITN the night prior increased from 25% and 8% (2006 MICS), respectively, to 55% and 49% (2010 MIS), respectively. Additionally, the 2010 MIS found that 60% of pregnant women reported taking two or more doses of sulfadoxine-pyrimethamine (SP) for IPTp, which is higher than in many African countries.

Despite these successes, the MoH estimates that malaria still accounts for over a third of all outpatient visits with approximately 6 million suspected cases treated each year. Additionally, malaria remains the number one cause of hospital admissions among children under five, responsible for about 40% of all hospitalizations in this age group. According to the 2010 MIS, among children under five, malaria parasite prevalence by microscopy was 43% nationally, and the prevalence of severe anemia (hemoglobin concentration <8 g/dl) was 12%. Approximately 98% of all malaria cases are due to *Plasmodium falciparum*.

Other than PMI, the majority of the funding for malaria activities in Malawi comes from the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) and donor and government funds pooled through the health sector-wide approach (SWAp). The Global Fund consolidated Round 2 and 7, and Round 9 grants support the majority of the ACT, LLIN and rapid diagnostic test (RDT) procurements, while pooled donor and government funds contribute to remaining national malaria control activities.

This FY 2013 PMI Malaria Operational Plan for Malawi was developed during a planning visit in June 2012 by representatives from the United States Agency for International Development (USAID), the Centers for Disease Control and Prevention (CDC) and the Malawi NMCP. The proposed activities align well with the MoH 2011-2015 Malaria National Strategic Plan. The FY 2013 Plan has been developed in close consultation with national and international partners involved with malaria control in the country and seeks to fill funding gaps from other major donors, while taking into account progress made to date. In addition to supporting efforts to control malaria, the team sought to increase integration with other GHI programs, and expand efforts in strengthening Malawi's health system. Based on these discussions and further meetings with the NMCP, the planning team proposes to support the following major activities outlined below. The total amount of PMI funding requested for Malawi in FY 2013 is \$23 million.

Insecticide-treated nets (ITNs): Malawi is likely to achieve close to universal coverage of ITNs (defined as one net per two persons) following a national LLIN mass distribution campaign that was conducted during June – August 2012. This is coupled with several years of consistent ITN distribution through the free, clinic-based routine system supported primarily by PMI. According to the 2010 MIS, nearly 60% of households owned one or more ITNs and 55% of children under five and 49% of pregnant women slept under an ITN the previous night. With FY 2013 funding, PMI will procure an additional 900,000 LLINs for free distribution through the routine system to maintain high coverage of net ownership and use in Malawi. Continued efforts will be directed at promoting LLIN use, care and repair through behavior change communication (BCC), and community mobilization.

Indoor residual spraying (IRS): In the first five years of PMI, Malawi expanded its IRS program from a pilot of 27,000 houses in part of Nkhosakota District to two full districts covering over 97,000 structures and protecting over 360,000 residents. Based on the success of the initial pilot, the MoH funded IRS activities in five additional districts in 2010, covering over 430,000 structures and nearly 2 million people. Nevertheless, Malawi's IRS activities have faced substantial challenges including the emergence of pyrethroid resistance and technical problems that resulted in missed targets during the 2010 spray campaign. In FY 2011, given increased costs associated with an insecticide change to an organophosphate insecticide, PMI scaled back its direct support to IRS to one district (Nkhosakota District) in order to contain costs and maintain the quality of IRS activities. In FY 2012, PMI suspended direct support to IRS activities in Nkhosakota District because the increased cost to protect approximately 3% of the population could not be justified within the current budget without seriously jeopardizing other

intervention areas of the PMI Malawi program. With FY 2013 funds, PMI will continue to support entomological monitoring, including mosquito resistance monitoring. PMI will work with the NMCP to discuss the current state of vector resistance and develop plans to update the current IRS plan using an evidence-based insecticide resistance management strategy to guide future vector control activities and entomologic monitoring.

Malaria in Pregnancy (MIP): The PMI MIP strategy includes IPTp, LLINs for pregnant women, and case management of malaria in pregnancy. Despite the impressive 60% coverage of pregnant women with two doses of SP in Malawi, the 2010 MIS showed considerably lower rates among poorer and less educated women. PMI has worked to achieve these high rates of coverage nationally in during the first five years of the program by strengthening focused antenatal care (ANC) at the district health facility level and by providing job aids and other relevant tools. PMI also has funded information, education and communication (IEC) efforts encouraging early and repeated ANC attendance, which increases the opportunity for successful delivery of the second IPTp dose. Nevertheless, the planning team recognizes that the advent of widespread *P. falciparum* resistance to SP is putting the effectiveness of the current IPTp strategy at risk, and is creating an urgent need to evaluate new drugs and approaches to reduce the burden of malaria in pregnancy. In the absence of new drugs, PMI is collaborating with the NMCP to update the MOH policy to encourage the use of IPTp after 36 weeks gestation, in accordance with WHO recommendations, as an approach to increase the number of opportunities to administer IPTp and communicate this policy change and other IPTp messages to health care providers. With FY 2013 funding, PMI will continue to support plans to increase uptake of IPTp by procuring SP, emphasizing supportive supervision of focused ANC (FANC) services, and encouraging earlier attendance to ANC, especially among primigravidae, with a goal of ensuring that at least 85% of pregnant women receive at least two doses of IPTp.

Case management: In 2007, Malawi changed its national first-line malaria treatment from SP to the ACT artemether-lumefantrine (AL). To date, PMI has supported case management with AL at both the facility and community level with recent efforts directed primarily at the community level. Due to repeated failures within the Central Medical Stores (CMS), a parallel supply chain was established in late 2010 to distribute Global Fund and USAID-procured health commodities directly to service delivery points. Implementing this privately-run and managed supply chain has increased commodity distribution costs and still is susceptible to theft, but the security and reliability of the system is greatly improved.

The 2011-2015 Malaria Strategic Plan recommends universal diagnosis and treatment for all age groups at the community and facility level. In November 2011, the NMCP began implementing RDTs in selected health facilities in an attempt to reach this goal. PMI also has provided substantial support to the RDT roll-out and to improved microscopy in conjunction with similar laboratory improvement efforts ongoing within the HIV/AIDS and tuberculosis control programs by jointly developing a quality assurance system for microscopy and training of laboratory technicians.

The Global Fund consolidated Round 2 and 7 grant, which has supported the majority of the ACT and RDT procurements in Malawi, will come to an end in December 2013 and no new funding has been identified to maintain this commodity purchase. Thus, with FY 2013 funding, PMI plans to continue strengthening supervision of laboratory and other personnel involved in malaria diagnostic testing while procuring RDTs (4 million), ACTs (3.5 million), and parenteral artesunate (375,000 ampules) in an attempt to maintain prompt and effective treatment of malaria at the health facility and community level. PMI also will continue to support the parallel supply chain and provide technical assistance to strengthen Malawi's public sector supply chain.

Monitoring and evaluation: PMI's monitoring and evaluation (M&E) framework is based on the goal of reducing malaria mortality by 70% and achieving 85% coverage targets with specific interventions by 2015. This framework is aligned with the standard methodology for evaluation of malaria programs that is promoted by the Roll Back Malaria (RBM) Partnership. PMI's M&E plan is coordinated with the NMCP and other partners to share resources, ensure that critical gaps are being filled, and standardize data collection and reporting. In 2010, Malawi conducted a Demographic and Health Survey (DHS) and its first ever nationally representative MIS that provided district level estimates. In FY 2012, PMI supported Malawi's second MIS, results of which are being analyzed at the time of writing of this MOP. Additionally, PMI has provided considerable support for entomological monitoring of IRS and ITNs and funded health facility surveys to assess case management practices.

With FY 2013 funding, PMI will provide support to Malawi's third MIS, scheduled for 2014, and entomological surveillance. There will be an independent evaluation of BCC activities as well as support to mid-term evaluations of existing programs. The efficacy of AL will continue to be monitored through a drug efficacy trial to be conducted in 2014.

Health systems strengthening and capacity building: As a GHI-plus country, PMI in Malawi has increased its efforts to strengthen health systems while integrating with other United States government (USG) programs to build capacity and improve outcomes. With FY 2013 funding, PMI will continue to provide logistical and operational support to the NMCP and support to HMIS strengthening and commodity management. PMI will work in collaboration with other USG program areas such as maternal and child health and HIV/AIDS to support building leadership, policy, finance and management capacity at the district, zonal, and central levels. In FY 2013 there will be a specific focus to work within the GHI framework to support infrastructure, health information systems and supervisory structures.

Behavior Change Communication (BCC): The 2009-2014 Malaria Communication Strategy for Malawi calls for an integrated approach to behavior change communication (BCC) using social mobilization and advocacy in the control of malaria and uptake of interventions targeting health providers to utilize effective case management strategies (e.g., proper RDT use, correct dosing of SP for IPTp, rational use of ACTs) and community members to participate in local initiatives to improve malaria prevention and control behaviors (e.g., LLIN use, ANC attendance, health care seeking). Building on the Malaria Communication Strategy, the 2011-

2015 National Malaria Strategic Plan calls for strengthening advocacy, communication and social mobilization capacities to move towards universal coverage for all malaria interventions. In FY 2013, PMI plans to continue support to the national level strategy and materials development and to the community-based small grants program for ITN, IPTp, and case management specific messaging. Additionally, PMI is proposing a new activity that targets malaria prevention messages to school-aged children to increase LLIN use.

ABBREVIATIONS AND ACRONYMS

ACT	artemisinin-based combination therapy
AL	artemether-lumefantrine
ANC	antenatal care
ASAQ	artesunate-amodiaquine
BCC	behavior change communication
CBO	community-based organizations
CCM	community case management
CDC	Centers for Disease Control and Prevention
CMS	Central Medical Stores
DDT	dichlorodiphenyltrichloroethane
DHS	Demographic and Health Survey
DOT	directly observed therapy
EHP	essential health package
EPI	Expanded Program on Immunization
EUV	end use verification
FANC	focused antenatal care
FY	fiscal year
GHI	Global Health Initiative
Global Fund	Global Fund to fight AIDS, Tuberculosis and Malaria
GoM	Government of Malawi
HIV/AIDS	human immunodeficiency virus/acquired immune deficiency syndrome
HMIS	health management information system
HSA	health surveillance assistant
HSSP	Health Sector Strategic Plan
IEC	information, education, communication
IPTp	intermittent preventive treatment in pregnancy
IPTp2	two doses of intermittent preventive treatment in pregnancy
IRS	indoor residual spraying
ITN	insecticide-treated net
IVM	integrated vector management
LLIN	long-lasting insecticide-treated net
LMIS	logistics management information system
M&E	monitoring and evaluation
MAC	Malaria Alert Centre
MIP	malaria in pregnancy
MICS	Multiple Indicator Cluster Survey
MIS	Malaria Indicator Survey
MOP	Malaria Operational Plan
MoH	Ministry of Health
NGO	non-governmental organization
NMCP	Malawi National Malaria Control Program
NMSP	Malawi National Malaria Strategic Plan
OTSS	outreach training and support supervision
PEPFAR	U.S. President's Emergency Plan for AIDS Relief

PMI	President's Malaria Initiative
PMTCT	prevention of mother-to-child transmission (HIV)
PSC	parallel supply chain
QA/QC	quality assurance/quality control
RBM	Roll Back Malaria
RDT	rapid diagnostic test
SP	sulfadoxine-pyrimethamine
SPA	service provision assessment
SSDI	Support for Service Delivery Integration
SWAp	sector-wide approach
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
USG	United States Government
VHC	village health clinic
WHO	World Health Organization

II. STRATEGY

1. Introduction

Global Health Initiative

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 six-year, comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States will invest \$63 billion over six years to help partner countries improve health outcomes, with a particular focus on improving the health of women, newborns and children. The GHI is a global commitment to invest in healthy and productive lives, building upon and expanding the USG's successes in addressing specific diseases and issues.

The GHI aims to maximize the impact the United States achieves for every health dollar it invests, in a sustainable way. The GHI's business model is based on: implementing a woman and girl-centered approach; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; encouraging country ownership and investing in country-led plans and health systems; improving metrics, monitoring and evaluation; and promoting research and innovation. The GHI will build on the USG's accomplishments in global health, accelerating progress in health delivery and investing in a more lasting and shared approach through the strengthening of health systems. Framed within the larger context of the GHI and consistent with the GHI's overall principles and planning processes, BEST (Best practices at scale in the home, community and facilities) is a USAID planning and review process that draws on our best experience in Family Planning, Mother and Child Health and Nutrition to base our programs on the best practices to achieve the best impact.

President's Malaria Initiative

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

Malawi was selected as a PMI country in FY 2006. Large-scale implementation of ACTs and IPTp began in 2007 and has progressed rapidly with support from PMI and other partners. Artemisinin-based combination therapies and IPTp are now available and being used in all public health facilities nationwide and nearly three million long-lasting ITNs (LLINs) have been distributed through routine systems to pregnant women and children under five years of age in just the last three years.

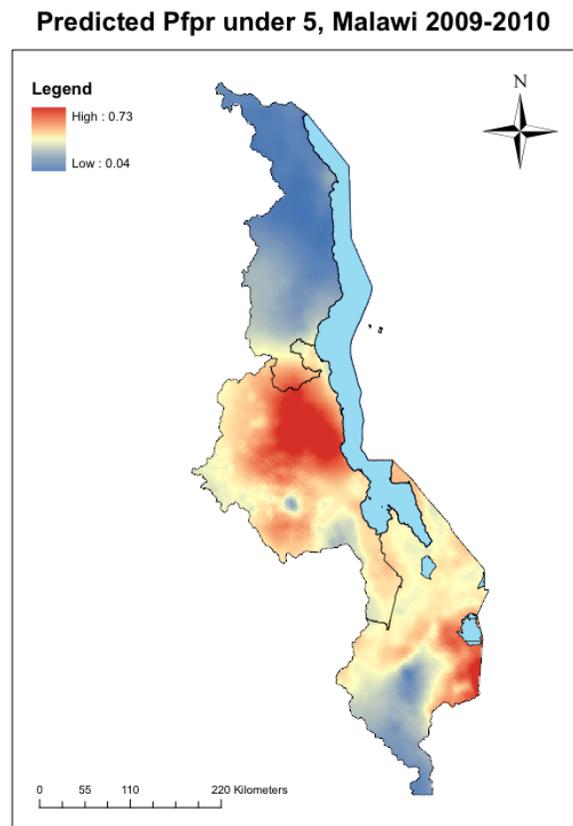
This FY 2013 Malaria Operational Plan (MOP) presents a detailed implementation plan for Malawi, based on the PMI Multi-Year Strategy and Plan and the National Malaria Control Program's (NMCP's) Five-Year Strategy. It was developed in consultation with the NMCP, with participation of national and international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

2. Malaria Situation in Malawi

Malawi, situated in south-central Africa, is a landlocked country bordered by Tanzania to the north, Zambia to the west, and Mozambique to the east and south. It has an estimated population of 15.5 million, comprised of approximately 51% women and 17% children less than five years old (National Statistical Office of Malawi).

In Malawi, malaria is endemic in more than 95% of the country. Transmission is perennial in most areas and peaks with the annual rains that typically begin in November-December and last through March-April in most parts of the country. The highest transmission areas are found along the hotter, wetter, and more humid low-lying areas (Lakeshore, Shire River valley, and central plain), while the lowest risk areas fall along the highland areas of Rumphu, Mzimba, Chitipa, and Kirk Range (Kazembe, 2006). *Anopheles (An.) funestus* is considered to be the primary vector species; *An. gambiae* ss and *An. arabiensis* also are present (Malaria Alert Center, unpublished data). *Plasmodium falciparum* is the most common species, accounting for 98% of the infections and almost all severe disease and deaths. Other species, including *P. malariae* and *P. ovale*, account for up to 2% of cases; *P. vivax* is very rare in Malawi.

Figure 1. Predicted *Plasmodium falciparum* parasite prevalence in children under five years of age—Malawi, 2009–2010¹ (Figure by Adam Bennett, Tulane University)



Emerging resistance of anopheline vectors to insecticides recently has been documented in Malawi. In 2002, Mzilahowa and colleagues conducted bioassays which demonstrated that *An. arabiensis* was susceptible to pyrethroids and organophosphate but exhibited reduced susceptibility to dichlorodiphenyltrichloroethane (DDT) (Mzilahowa, 2008). In 2009, resistance of *An. funestus* to pyrethroids and the carbamate insecticide bendiocarb was reported in Nkhosakota District, a site where a pilot IRS program had been implemented (Mzilahowa, personal communication) and on Likoma Island, situated on Lake Malawi (Hunt, 2010). The emergence of resistance is highly relevant to the implementation of ITNs and IRS.

Malaria continues to be a major public health problem in Malawi and is one of the major causes of morbidity and mortality, especially in children under five years. With approximately six

¹ Survey data from the 2010 Malaria Indicator Survey (MIS) and 2009 Malaria Alert Center (MAC) anemia and parasitemia surveys were used to produce a predictive map of mean parasite prevalence for children aged less than five years in 2009 and 2010. A multivariate model was built using a Bayesian framework and included population size, altitude, land use, rainfall, age and survey year. Mean prevalence for the prediction model was 12.5% for Northern Region, 41% for Central Region, and 31% for Southern Region. These represent high-transmission season prevalence estimates.

million suspected cases treated annually, malaria is responsible for about 40% of all hospitalizations of children less than five years old and 34% of all outpatient visits across all ages. Children under five constitute about 50% of the total suspected malaria cases and have an annual incidence rate as high as 1,160 episodes per 1,000 children (MoH, 2009). Nearly 60% of all hospital deaths in children under five are attributed to malaria and anemia. According to the 2010 Malaria Indicator Survey (MIS), among children under five, the malaria parasite prevalence by microscopy was 43% nationally, and the prevalence of severe anemia (hemoglobin concentration <8 g/dl) was 12%. From 1997 to 2009, the number of cases of cerebral malaria (as measured at Queen Elizabeth Central Hospital) has remained stable at approximately 100 cases per year (Kwizombe C, 2010).

Pregnant women also are at high risk of malaria. From 1996-2007, the incidence of placental malaria fell from 25% to 7% at the main referral hospital in Blantyre (Feng, 2010). However, this is a select population with unusually easy access to the best medical services available in the public sector in Malawi. Placental parasitemia prevalence in rural areas has not been evaluated.

The Health Management Information System (HMIS) provides passive surveillance data on outpatient and inpatient malaria cases reported from government and mission health facilities in Malawi. According to the HMIS, the number of reported cases of malaria in all age groups increased from 3.7 million in 2005 to 6.7 million in 2010. The reason for the marked increase during a period when malaria control measures were being scaled up is not known, but possible explanations include increased use of health services secondary to increased availability of free ACTs in health facilities and improved reporting. Notably, health care seeking among children under five with fever increased from 41% in 2004 to 65% in 2010, according to Demographic and Health Survey (DHS) estimates.

3. Country Health System Delivery Structure and Ministry of Health Organization

The Malawi health service delivery system is pyramidal, consisting of tertiary, secondary, primary, and community care levels. Malawi has a total of 1,007 health facilities providing direct patient care: six are tertiary, 100 are secondary and 901 are primary health facilities; the remainders are research facilities and other institutions (Malawi Human Resources for Health Census Report 2008). District and central hospitals provide secondary and tertiary care services, respectively. Primary care is delivered through clinics and health centers where curative, maternity, and preventive services are offered. Malawi also has more than 3,500 village health clinics (VHCs) in hard-to-reach areas as part of the community case management program (CCM). The CCM program is implemented by community-based health care workers (health surveillance assistants [HSAs]) who are trained to assess, classify, and provide first-line treatment to selected childhood illnesses in addition to referral to the next level of care. Local community-based organizations (CBOs) also provide non-clinical malaria services such as behavior change communication (BCC) on key malaria messages, counseling, and net distribution.

The Malawi health system is highly decentralized with many programming decisions made at the district level. The majority of health services in Malawi are provided through the Ministry of Health (MoH) and the Christian Health Association of Malawi, which operates approximately 40% of designated government health facilities nationwide and charges fees for service where service level agreements with government have not been established.

Rural populations' access to health facilities is generally good. Within a five-kilometer radius, accessibility is estimated at 54%. Using the eight-kilometer standard and including urban populations, accessibility is 84% nationally (Malawi National Health Facilities Development Plan 1999 – 2004).

The NMCP is located under the Directorate of Preventive Health Services. As such, the NMCP Program Manager is the Deputy Director of Preventive Health Services for the MoH. In recent years, the program has expanded and now incorporates a core group of 12 technical officers, including an M&E position supported by PMI. The NMCP sets policies, establishes strategies, coordinates activities, and provides technical guidance for the MoH with respect to malaria prevention and control interventions. The management structure is comprised of 28 district malaria coordinators to direct activities in each district, 28 ITN coordinators, and 7 IRS coordinators in the 7 districts where IRS has been conducted.

4. Updates to MOP Strategy Section

The second MIS was conducted in spring 2012, but results were not available at the time of writing this MOP. The 2010 DHS and the 2011-2015 GoM Malaria National Strategic Plan reported in the FY 2012 MOP both remain the best current data source. The major change in strategy concerns the decision by PMI to suspend direct support for IRS activities in Nkhotakota and Salima Districts due to the emergence and extension of mosquito resistance to pyrethroid and carbamate insecticides. Given the current budget envelope, PMI could not justify the increased IRS costs to protect approximately 3% of the Malawi population without seriously jeopardizing other intervention areas of the PMI Malawi program. The fact that high LLIN coverage levels had been achieved in Nkhotakota and neighboring Salima Districts through mass distribution campaigns provided some assurance that reductions in malaria transmission achieved with IRS would be maintained in the absence of IRS. The 2011-2015 Malawi Malaria Strategic Plan continues to recognize IRS as a key malaria prevention strategy and includes plans to scale up IRS to a total of 12 high-burden districts by 2015. Nonetheless, the NMCP recently raised concerns about the emergence of insecticide resistance and the performance of IRS as they would like to use an evidence-based insecticide resistance management strategy to guide future vector control activities and entomologic monitoring.

5. Malaria Control Strategy in Malawi

Malawi has developed a new 2011-2015 Malaria Strategic Plan that builds on the successes achieved and lessons learned during implementation of the two previous Plans. The 2011-2015

Malaria Strategic Plan, entitled “Towards Universal Access,” was developed and approved by the MoH in early 2011. Within this new strategy, Malawi aims to move from targeting malaria control interventions to provision of universal access of proven interventions under which all Malawians at risk of malaria should have equitable access to malaria prevention, care and treatment. The NMCP activities are designed to be implemented within the Health Sector Strategic Plan (HSSP) and the sector-wide approach (SWAp), including the provision of the Essential Health Package (EHP). Specifically, the 2011-2015 Malaria Strategic Plan objectives aim to ensure that the MoH through the NMCP is in a position to:

- Achieve universal coverage of all interventions by 2015 with an 80% utilization rate of the interventions;
- Strengthen advocacy, communication, and social mobilization capacities for malaria control by 2015 in order to improve use and adherence;
- Strengthen surveillance and M&E systems, including operational research for tracking progress in the implementation of malaria control activities by 2015;
- Strengthen capacity in program management in order to achieve malaria program objectives at all levels of health service delivery.

Within the new Malaria Strategic Plan, six primary intervention areas are targeted: integrated vector management (IVM); case management; malaria in pregnancy; social mobilization and advocacy; surveillance, monitoring, evaluation and operations research; and program management.

IVM/ITNs: Malawi adopted an ITN policy in 2006 that includes free distribution of ITNs for children born in health facilities, children attending their first visit under the Expanded Program on Immunization (EPI) (if an ITN was not received at birth), and to pregnant women at their first visit to an antenatal care (ANC) clinic. The policy supports time-limited, national, free distribution campaigns that are conducted every two to three years. In February 2008, this policy was amended to include distribution to all children under five years during their first visit to a health facility. Malawi aims to achieve universal coverage with LLINs, defined as one net for every two people, with the objective of increasing net ownership to 90% and net usage to 80% by 2015.

IVM/IRS: With the 2011-2015 Malaria Strategic Plan, Malawi intended to expand IRS from the current targeted 7 districts to 12 highly endemic districts through public, private sector and community partnerships by 2015. Nevertheless, the NMCP recently raised concerns about the emergence and extension of insecticide resistance and the performance of IRS as they would like to use an evidence-based insecticide resistance management strategy to guide future vector control activities and entomologic monitoring.

Malaria in pregnancy: As part of a comprehensive focused ANC (FANC) package, Malawi’s policy on IPTp recommends the provision of at least two doses of sulfadoxine-pyrimethamine (SP) to pregnant women during the second and third trimester. The policy states that the

treatments should be given under direct observation at least one month apart, delivered before the 36th week of pregnancy.

Case management/diagnostics: A primary focus of the new Malaria Strategic Plan includes expansion of parasitological confirmation of malaria through the use of microscopy in central and district hospitals as well as in facilities with high patient loads. The phased roll-out of rapid diagnostic tests (RDTs) to all health facilities began in November 2011, with a goal of expansion to community levels in subsequent years.

Case management/ACTs: In 2006, the MoH selected artemether-lumefantrine (AL) as the first-line drug for the treatment of uncomplicated malaria and artesunate-amodiaquine (ASAQ) as the second-line ACT, reserving parenteral quinine for the treatment of severe malaria and oral quinine for the management of malaria in the first trimester of pregnancy. The MoH published the Revised Guide for the Management of Malaria in 2011 that recommended parenteral artesunate as an equivalent option to parenteral quinine and pre-referral treatment at peripheral facilities with intramuscular quinine, intramuscular artesunate, or rectal artesunate. The MoH now is working to expand the availability of ACTs to the community through CCM, with a focus on the approximately 4,000 hard-to-reach villages.

Surveillance, monitoring and evaluation, and operations research: With the new Malaria Strategic Plan, the NMCP aims to strengthen routine data systems, surveillance, and operational research, promoting use of information while strengthening capacities for data use at all levels. There is a specific emphasis on liaising closely with the MoH Central Monitoring and Evaluation Department for the inclusion of core malaria indicators into the HMIS. A draft 2011-2015 Monitoring and Evaluation Plan currently is in place to outline the strategic areas to emphasize a renewed focus at tracking progress and measuring results of the various malaria prevention and control interventions to better inform policy, planning, and decision making.

Social mobilization and advocacy: The 2011-2015 Malaria Strategic Plan, in line with the 2009-2014 Malaria Communication Strategy for Malawi, recommends social mobilization and advocacy strategies in order to increase the use of all malaria interventions through increased efforts aimed at qualitative and quantitative research, prioritization for promotion of targeted positive behaviors, and capacity building with an emphasis on the role of political and local leaders.

Program Management: With the new Malaria Strategic Plan, there also is an emphasis on strengthening capacity in program management at all levels of health service delivery. This will require resource mobilization and strengthened coordination across partners. The NMCP has linked its management objectives to existing national and international development strategies to enhance its policy direction. The procurement and supply chain management system was highlighted as an area requiring significant strengthening for program progress.

6. Integration, Collaboration and Coordination

Malawi has been selected as one of a subset of countries for GHI's initial focus. To operationalize GHI, the USG health team in Malawi will prioritize close harmonization and communication internally across its agencies and disciplines, and externally with GoM and partners, both local and international. The State Department will coordinate this effort among in-country agencies including USAID, Health and Human Services/CDC, Department of Defense, and Peace Corps, as well as other USG agencies with potential contributions to GHI, but without in-country presence. Lessons learned from successful business models will improve efficiencies in coordination and implementation within USG, as well as with GoM and all partners. To ensure USG health programs are effectively aligned and coordinated with the priorities and efforts of Malawi's national health strategies and reports on health targets, the team will strive to include Malawian leadership in the development and selection phase of various types of funding opportunities. The USG will also ensure the women, girls and gender equality principle is consistently applied.

Malawi has identified three key areas where it will focus its GHI efforts:

- Enhancing leadership, governance, management and accountability: In this area, specific interventions will be identified to ensure demonstrable health leadership outcomes by the GoM, including: timely decision-making; improved accountability; enhanced use of evidence-based approaches in program development and resource allocation; and increased engagement of civil society. A combination of interventions will be undertaken including performance-based financing, professional academic and mentor-based training, leadership and management training, and technical support for organizational development in key government ministries. This multi-pronged approach will improve the health programs developed at the central level, and the quality of those programs implemented at district and facility levels both in services provided and commodities procured and distributed.
- Improving human resources for health: USG will support the MoH to provide sustained and sufficient human resources and the equitable distribution of these workers; increase access to community health services; produce highly motivated and skilled staff whose performance is improved; and develop and approve key government policies impacting salaries, resources, and task-shifting. The strategic deployment of better-trained staff across districts and increased incentives for provision of quality services, in combination with strengthened quality improvement mechanisms, is expected to improve the community's confidence in the public health care system.
- Addressing health infrastructure deficiencies: Upgrades of facilities will make labor and delivery services more accessible in hard-to-reach communities and increase the accessibility of essential lab and other support services. Improved health information

management will allow clinics to better manage patient information and better layouts will ensure integrated services are available at all facilities. These efforts will be strengthened through renovations and maintenance of both ANC and labor and delivery settings to improve patient experiences and outcomes. We expect these enhancements to improve attendance and retention of staff in maternal and child health services.

In Malawi, the SWAp is the primary structure used to manage the health sector inputs. The SWAp is governed by a secretariat supported by technical working groups, which engage government and development partners to provide technical guidance and decision-making on key technical issues to the SWAp and ultimately the MoH. Development partners are also engaged in the SWAp governance structures through the Health Donor Group.

The NMCP also receives technical assistance from the United Nations Children’s Fund (UNICEF) to support programmatic management, malaria prevention and control efforts at the district level, and development of information, education, and communication (IEC) materials. The World Health Organization (WHO) also provides assistance on a variety of technical issues.

Malawi has three approved grants from the Global Fund, all of which designate the MoH as the Principal Recipient. The consolidated Rounds 2 and 7 are in Phase Two and will end in December 2013, and Round 9 is nearing the end of Phase One. The Global Fund grants focus on commodity procurement and distribution of LLINs for routine and mass distribution and RDTs and AL for case management at the facility level. Malawi’s Global Fund Round 9 grant funded the 2012 LLIN mass distribution campaign and the roll out of RDTs. Round 9 Phase 2 funding is targeted for a follow-up mass LLIN campaign in 2015 and additional RDTs but, because it is a performance-based grant and the LLIN mass distribution campaign experienced delays, it is unclear if this grant will proceed to Phase 2. Neither grant provides funding for ACTs past 2013.

Table 1. Global Fund malaria grants in Malawi

Round	Phase 1 Amounts	Five-year funding maximum
2	\$17,957,714	\$44,706,715 (combined)
7	\$36,545,312	
2 & 7 (consolidated)	\$54,503,026	\$99,209,471
9	\$28,032,760	\$91,945,450 (pending approval)
Total	\$82,535,786	\$191,154,921

Currently, Malawi has one of the largest Global Fund HIV/AIDS grants, receiving \$170 million for treatment in Round 1, in addition to \$19 million for the care of orphans and vulnerable children in Round 5. Malawi also has one of the only three Health Systems Strengthening grants globally, which supports approximately half of the country’s community HSAs; this will end 30

June 2012. To support tuberculosis control, the Global Fund awarded Malawi a Round 7 grant, totaling \$9.1 million.

Malawi is also a President's Emergency Plan for AIDS Relief (PEPFAR) non-focus country, receiving \$65 million in FY 2011 for the prevention, care, and treatment of HIV/AIDS. The PEPFAR and PMI share several implementation partners working on integrated or common platforms to support improved health outcomes in Malawi. The PMI team works closely with PEPFAR and the USAID health teams to coordinate activities.

7. PMI Goals, Targets and Indicators

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 Malawi 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 6 months;
- 85% of women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy; and
- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria.

8. Progress on Indicators to Date

The most up-to-date information on the status of malaria prevention and control interventions in Malawi comes from the 2010 MIS and 2010 DHS. The table below shows progress since the 2006 Multiple Indicator Cluster Survey (MICS). Results from the 2012 MIS should be available by November 2012.

Table 2. Progress on indicators to date

Indicator	MICS 2006	MIS 2010	DHS 2010
Percentage of households that own one or more ITNs	38	58	57
Percentage of children less than five years old who slept under an ITN the previous night	25	55	38
Percentage of pregnant women who slept under an ITN the previous night	8	49	35
Percentage of children less than five years old with fever in the last two weeks who received an appropriate antimalarial drug	24	31	43
Percentage of children less than five years old who took an antimalarial drug the same or next day	N/A	22	28
Percentage of pregnant women who took two or more doses of IPTp during their last pregnancy	48	60	55
Percentage of surveyed households sprayed with a residual insecticide in the last 12 months	N/A	2	2
Prevalence of malaria parasitemia by slide microscopy	N/A	43%	N/A

9. Other Relevant Evidence on Progress

PMI supported a 2011 Malawi Health Facility Survey conducted to assess the case management of uncomplicated malaria at public health facilities regionally and nationally. In total, 107 health facilities, 2,019 outpatients, and 135 health workers were surveyed.

Key findings are as follows:

- 34% of all patients seeking curative care at outpatient departments in Malawi during the high-transmission season have parasitologically-confirmed uncomplicated malaria
- 46% of patients <5 years and 27% of patients ≥5 years have malaria
- 67% of patients with malaria confirmed by microscopy are correctly treated with an artemisinin-based combination therapy (ACT). Correct dosing of ACTs is very high (95% correct by age or weight).
- The main cause of incorrect treatment is missed diagnosis by clinicians (27% of patients with malaria were not diagnosed with malaria by clinicians).

- 31% of patients without malaria receive an ACT, resulting in overtreatment. Among patients with negative microscopy results (according to facility microscopy), 22% were nevertheless prescribed AL.
- Availability of malaria diagnostics is insufficient (only 42% of patients attended facilities with functional microscopy). The quality of facility microscopy is poor compared to expert microscopists (sensitivity = 47% and specificity = 84%).
- The first dose of AL was not often given at the facility, even when AL was dispensed at the facility. Overall, the first dose of AL was given only 13% of the time (17% of the time when it was dispensed). Only 59% of health facilities had cups and supplies for administering medications.
- Most patients were seen by health workers (69%) explicitly trained on the new malaria (2007) treatment guidelines. Eighty-four percent of patients were seen by health workers trained in some way—e.g., through IMCI training, on-the-job training, in-service training—on malaria case management guidelines since AL was adopted in 2007.

10. Challenges, Opportunities and Threats

Malawi's malaria program has reached a critical juncture with several threats to its success including: 1) continued supply chain issues; 2) the potential conclusion of both Global Fund malaria grants as well as the Health Systems Strengthening (HSS) grant; 3) insecticide resistance, which threatens the IRS program and potentially the ITN program; 4) unreliable malaria data from the HMIS and logistics management information system (LMIS) resulting in quantification and monitoring challenges; and 5) contextual factors such as the lack of availability of fuel and foreign exchange, which limits every government program in Malawi.

Since PMI began work in Malawi, supply chain issues have plagued the program. Stockouts of antimalarials and other essential drugs occur regularly due to issues related to quantification of need, ordering, tendering, receipt, storage, and the logistics of distribution. Beginning in 2007, PMI distributed its ACTs through the Central Medical Stores (CMS), under the stipulation that CMS improve its storage facilities, documentation and information management system, transportation capacity, security, and logistics management system. Many of these assurances did not materialize and difficulties in record keeping, data management, warehousing, and commodity tracking highlight barriers to maintaining a strong supply chain, both within CMS and the MoH at large.

In mid-2010, PMI became aware of significant thefts of PMI-procured antimalarial drugs from CMS, resulting in the USG withdrawing its funded commodities from CMS and establishing a temporary parallel supply chain for the distribution of PMI-procured health commodities and other family planning commodities directly to service delivery points. In spite of the parallel

system, a weak logistics management information system and irregular procurements of ACTs have resulted in continued stockouts nationwide.

Even if the supply chain system were dramatically strengthened, the supply of ACTs would be in jeopardy. With the conclusion of the consolidated Round 2/7 Global Fund grant in 2013 and the uncertainty around future Global Fund financial support, PMI may be the only supplier of ACTs after 2013. Additionally, the end of the HSS grant, which funded 2,500 HSAs nationally as well as salary top-ups for health workers, will conclude 30 June 2012. Given that HSAs are the backbone of the community case management program and the salary top ups are a vital incentive to keep health workers motivated, this could have dramatic effects on the overall delivery of health services. It is unclear if the government can and will continue this support.

Vector control faces its own challenges, primarily related to the emergence and extension of insecticide resistance to pyrethroids and carbamates. This resistance necessitated that the PMI-supported IRS program change to a more expensive and short-acting organophosphate insecticide, which ultimately made the IRS program unsustainable within the existing budget envelope. The impact of the pyrethroid resistance on the effectiveness of ITNs is unknown and PMI is supporting research to answer that question.

Finally, the country overall has been plagued with major foreign exchange market issues which have resulted in fuel shortages nationally. While this appears to be improving, fuel shortages substantially hinder PMI's ability to distribute commodities such as LLINs, RDTs, and ACTs in a timely manner as well as provide support for the supervision of health workers and projects.

On a positive note, the new Malawi President has shown strong commitment to improving health and supporting the health sector. The Vice President also is the Minister of Health. Such political will may result in increased GoM resources dedicated to health as well as potential increased donor support.

11. PMI Support Strategy

PMI's strategy is to support the NMCP's malaria control and prevention efforts. PMI is committed to ensuring high net ownership and use by continuing to support the distribution of LLINs through a routine system at ANC and EPI clinics. This well-established system has been effective at ensuring that nets are available to these vulnerable populations. Looking forward, PMI will explore other channels to provide LLINs on a continuous basis, potentially through community or school-based distribution, to provide more opportunities to increase the number of nets in each household.

Although PMI recognizes IRS as a key malaria prevention strategy, the PMI Malawi team does not believe that continued spraying can be justified within the current budget without seriously jeopardizing other intervention areas of the PMI Malawi program. The NMCP recently raised concerns about the emergence and extension of insecticide resistance and the performance of

IRS, and PMI will work with the NMCP to implement an evidence-based insecticide resistance management strategy to guide future vector control activities and entomologic monitoring.

PMI and NMCP are collaborating to develop a plan to monitor and respond to any potential upsurge in malaria cases in Nkhotakota District in 2012 subsequent to the suspension of IRS. In addition to sensitizing the community regarding the strategy change and ensuring high LLIN coverage, PMI will support monitoring for cases of severe malaria and maintenance of an extra supply of RDTs and ACTs for use in Nkhotakota District. In the last quarter of 2012, PMI will conduct a retrospective review of severe malaria cases in Nkhotakota District for the five-year period starting prior to the initiation of IRS activities (i.e., 2002-2006) and for the five-year period in which IRS was conducted (i.e., 2007-2011), and initiate prospective monitoring for severe malaria cases.

At the facility and community levels, PMI is committed to ensuring that there is access to high quality malaria case management. To ensure that there is a consistent availability of commodities, PMI will maintain support to the parallel supply chain while providing technical assistance to improve the capacity of CMS at the central level and strengthening the LMIS at the district level. PMI will continue to provide supportive supervision and training for the management of uncomplicated malaria in its focus districts as part of a broader MCH effort. Additionally, PMI will support the NMCP's efforts to implement a new treatment policy for the management of severe malaria with parenteral artesunate in health facilities. At the community level, PMI will continue to work in the 12 designated districts to support HSAs providing CCM with training, commodities, and oversight for the use of RDTs and ACTs. In the coming years, PMI will work with the NMCP to expand the CCM program to include pre-referral rectal artesunate and rapid diagnostic tests. PMI will also continue to support diagnostics at the facility level, particularly microscopy in facilities with microscopes.

All of these activities will be grounded in a strong monitoring and evaluation framework that includes both population-based surveys, operations research, review of HMIS data and other relevant activities. As per PMI guidance, PMI will support the implementation of a DHS every five years with an MIS survey in the intermediate years to determine progress against PMI and NMCP targets. This will be complemented by regular monitoring of HMIS data by the NMCP, treatment consumption data, our entomological data, and other surveys such as health facility surveys and targeted operations research supported by PMI and other groups.

III. OPERATIONAL PLAN

Insecticide Treated Nets

NMCP/PMI Objectives

The 2011-15 Malaria Strategic Plan calls for universal coverage with LLINs, defined as one net for every two people. The plan includes specific targets to increase household LLIN ownership

of at least one LLIN to 90% of households and utilization among children less than five years old and pregnant women to 80% by 2015. Malawi has a three-pronged strategy for LLIN distribution: (1) free routine distribution through ANC to pregnant women and EPI clinics to children under five; (2) time-limited mass campaigns to the general population; and (3) sale of subsidized LLINs through the private sector to complement the free public sector distributions.

Progress in the last 12 months

Malawi is conducting a nationwide mass distribution LLIN campaign during June – August 2012. The campaign originally was scheduled to occur towards the end of calendar year 2011 to coincide with the peak malaria season and just before the 2012 Malaria Indicator Survey data collection; however, due to logistical and programmatic challenges, the distribution of the LLINs did not start until June 2012. To complement the distribution campaign, a “hang-up campaign” program with an IEC/BCC focus on correct and consistent usage and net care will occur soon after the mass distribution campaign. The NMCP has planned to conduct an LLIN coverage survey nationwide within three months of the completion of the 2012 mass distribution campaign to evaluate the impact of the campaign; PMI will complement this activity by providing technical assistance in the design and implementation of this activity.

ITN ownership has increased from 38% in 2006 (MICS 2006) to 58% in 2010 (MIS 2010); a similar increase was noted in the 2010 DHS (ITN ownership = 57%). The reported utilization of ITNs the night before the survey by children less than five years old and pregnant women was 55% and 49%, respectively (MIS 2010). Perhaps most importantly, in households where at least one ITN was available, almost 81% of children less than five years old slept under an ITN the night before the survey. This finding suggests that once the 2012 national mass distribution campaign is over, utilization of ITNs in children less than five years old should approach the national goal of 80%.

In light of increasing LLIN coverage due to mass distributions and the routine system, the national mass media campaigns and print media have been modified to emphasize nightly LLIN use by all members of the household as well as proper care and repair of nets. The Malaria Alert Centre (MAC), in conjunction with CDC, is conducting a study of the longevity and durability of LLINs, and these data will be available for analysis by the end of FY 2012.

PMI continues to fund CBOs and local NGOs through the sub-granting mechanism under the Support for Service Delivery Integration (SSDI)-Communications project. These local partners are using community mobilization to increase awareness of LLINs, improve messaging about correct and consistent use, educate on proper care and repair, and conduct hang-up campaigns and behavior change interventions through community-based activities.

PMI continues to work with the NMCP to enhance partnerships that exist between the NMCP and stakeholders and partners around LLIN procurement and distribution. These partnerships have proved beneficial in enhancing the national strategic plan for malaria control from; policy revisions, BCC/IEC, and implementation of mass distributions.

Challenges, opportunities and threats

Challenges to the LLIN program include inconsistent reporting and record keeping at the health facility level; lack of priority on LLIN issues in the HMIS; distribution planning not based on actual demand; lack of training for healthcare workers (including health surveillance assistants [HSAs]) on LLIN reporting, messaging and targeting; lack of a clear definition of the lifespan of LLINs in Malawi; and emerging pyrethroid resistance.

The biggest threat faced by the NMCP in FY 2013 is the uncertainty surrounding the availability of Global Fund Round 9 Phase Two funds to procure and distribute LLINs for the routine system and the planned 2015 universal net campaign. The availability of Round 9 Phase Two funding is dependent on the outcome of the assessment by the Global Fund of Malawi's performance on the other Global Fund grants currently underway.

Another critical issue is the emergence of mosquito resistance to pyrethroid insecticides. It is not clear how much of a threat this presents to the continued effectiveness of LLINs. The MAC, NMCP and CDC are currently involved in research efforts to help understand the impact of pyrethroid resistance on LLIN effectiveness, and to evaluate new combination ITNs that carry a synergist that can mitigate pyrethroid resistance. High attendance rates for ANC and EPI visits mean that the routine system is able to reach high coverage of the target group. Use of LLINs by children under five is high in households with LLINs, suggesting that the recent mass distribution campaign could lead to significantly improved utilization of ITNs in this target group.

Gap analysis

The table on the next page shows the actual net distribution by partner and the projected distributions from FY 2009 to FY 2014. Note that FY 2012 still has projected figures because the year is not completed yet.

Year	Route	Donor					Total
		Global Fund Rounds 2/7	Global Fund Round 9	PMI	UNICEF	Other	
FY 2009	Routine	443,938		772,789			
	Campaign	N/A	N/A	N/A	N/A	N/A	
	PS					170,870	1,387,597
FY 2010	Routine	751,500		234,654	101,060		
	Campaign						
	PS					170,787	1,258,001
FY 2011	Routine			755,538	125,000		
	Campaign	2,090,480	2,430,257	407,400		230,000	
	PS					113,778	6,152,453
<i>FY 2012 projected</i>	Routine	729,618	650,000	800,000			
	Campaign						
	PS					170,000	2,349,618
<i>FY 2013 projected</i>	Routine	0	680,500	900,000	<i>No data</i>	<i>No data</i>	
	Campaign	0	0	0	0	0	
	PS					170,000	1,750,500
<i>FY 2014 projected</i>	Routine						
	Campaign		7,710,490				
	PS					170,000	7,880,490
Total Nets between FY09-FY13							20,778,659

The routine system need for LLINs in Malawi is approximately 1,580,000, which is based on an estimated population of 15,805,239 and that approximately 10% of the population is either a child under five or a pregnant woman. The NMCP will procure approximately 680,000 LLINs with the Global Fund's consolidated grant leaving a gap of 900,000 LLINs.

Population at risk in 2014 (Routine System)	1,580,000
Total number of LLINs needed	1,580,000
ITN Pledges	
GF pledged LLINs	680,000
Net gap for PMI to fill	900,000

Planned activities with FY 2013 funding and justification: (\$5,750,000)

Malawi continues to strive for universal coverage of LLINs by providing LLIN distribution through the routine system complemented by periodic mass LLIN distributions nationwide.

Efforts by PMI will focus on sustaining the high volume routine distribution system to pregnant women and children under five through ANC and EPI programs, respectively.

Primary support for BCC activities will be divided between national level communication and the community-based small grants program and will promote LLIN use among all household members to enhance a “net utilization culture” and LLIN care and repair. Care and repair of LLINs is being promoted due to preliminary data from the LLIN durability study that found substantial degradation of LLINs at 12 months post-distribution (CDC, unpublished data). Although the LLIN durability study did not confirm that the degradation was due to user behaviors, the degradation has been documented with all LLINs suggesting that it is not an issue specific to a brand or lot. In addition, PMI plans to develop and pilot malaria specific prevention messages and activities to school-aged children in two high incidence PMI districts through an integrated program with the local mission APS with FY 2012 funding and, if successful, expand this project to other PMI-supported districts in FY 2013. Please see the BCC section for details of BCC activities.

Lastly, the MoH is planning a second mass LLIN distribution campaign for 2015. PMI will provide technical and logistical support to the initial planning efforts.

Description and budget for proposed activities:

- Procure approximately 900,000 LLINs targeting pregnant women and children under five through the ANC and EPI free distribution programs (\$4,000,000);
- Support the cost of distributing the procured LLINs from the central level to the health facilities including customs clearing, warehousing, transport, distribution and LLIN tracking at the health facility (\$1,000,000);
- Promote LLIN use among all household members to enhance a “net utilization culture” through **national** level BCC (\$100,000);
- Promote LLIN use among all household members to enhance a “net utilization culture” and LLIN care and repair through **community-based** BCC (\$400,000);
- Promote malaria prevention by targeting school-aged children with LLIN utilization messaging (\$200,000);
- Provide technical and logistical support to the NMCP to plan for the 2015 mass distribution campaign (\$50,000).

Indoor Residual Spraying

NMCP/PMI objectives

The 2011-2015 Malawi National Malaria Strategic Plan (NMSP) recognizes IRS as a key malaria intervention strategy and part of a comprehensive IVM approach. The primary IRS objectives of the new NMSP include coverage of at least 85% of all targeted structures in 12 high transmission districts by 2015 through public, private sector and community partnerships;

advocacy for the removal of taxes and tariffs of IRS commodities and supplies; and advocacy for more resources for IRS from government and external funders. IRS activities include planning and training, operational work, comprehensive monitoring and evaluation of spraying activities, and entomological monitoring and surveillance.

Progress in the last 12 months

In May 2010, entomological monitoring documented evidence of mosquito resistance to both the pyrethroid and carbamate classes of insecticides in Nkhotakota District. Consequently, the PMI entomology team concluded that insecticides from these classes could no longer be recommended for IRS activities in Nkhotakota and neighboring Salima Districts. Therefore, the PMI supported IRS campaign in Nkhotakota and Salima Districts used an organophosphate (i.e., Actellic 50 EC); the MoH sprayed in the five other districts using a pyrethroid (i.e., alpha-cypermethrin). Although effective, the high unit cost of Actellic 50 EC substantially increased the IRS costs. Although only one round of IRS was conducted, monitoring efforts showed that Actellic 50 EC had a shorter residual duration of effectiveness on walls (i.e., two to three months), meaning that two spray rounds annually would be required to provide protection during the malaria transmission season, further increasing IRS costs.

In 2011, PMI provided direct support to one round of IRS with Actellic 50 EC in Nkhotakota District in order to contain costs and maintain the high quality of IRS activities. Although the MoH planned to conduct IRS activities in the six other targeted districts in 2011 using a pyrethroid insecticide, they were not able to do so due to a lack of funding.

In May 2012, after careful review and consultation with interagency technical teams and the NMCP, PMI suspended direct support to IRS activities in Nkhotakota District. PMI could not justify the increased IRS costs (i.e., approximately 15% of annual PMI budget) to protect approximately 3% of the population without seriously jeopardizing other intervention areas. The fact that high LLIN coverage levels had been achieved in Nkhotakota and neighboring Salima Districts through routine and mass distribution efforts provided some assurance that reductions in malaria transmission achieved with IRS would be maintained in the absence of IRS.

In response to the suspension of IRS activities in Nkhotakota District, PMI and the NMCP are collaborating to develop a plan to monitor and respond to any potential upsurge in malaria cases in 2012. In addition to having assisted in ensuring high LLIN coverage, PMI will support efforts to monitor for significant increases in cases of severe malaria and ensure that an extra supply of RDTs and ACTs is available for use in Nkhotakota District. In the last quarter of 2012, PMI will conduct a retrospective review of severe malaria cases in Nkhotakota District inclusive of the five-year period starting prior to the initiation of IRS activities (i.e., 2002-2006) and the five-year period in which IRS was conducted (i.e., 2007-2011), and prospective monitoring for at least the next couple of years. Notably, the PMI team considered monitoring all cases of malaria but ultimately decided that this data would be too unreliable due to the introduction of increased diagnostic capacity (e.g., RDTs) and treatment availability during the past five years.

The NMCP recently raised concerns about the emergence and extension of insecticide resistance and the performance of IRS. PMI is providing technical assistance to the NMCP to implement an evidence-based insecticide resistance management strategy that will guide future vector control activities and entomologic monitoring.

In addition to spraying activities, the NMCP, with PMI support, has developed IRS guidelines, ensured environmental compliance and assisted with trainings of national trainers to ensure standardization of IRS across all the implementation districts. PMI has also supported pre-, mid- and post-spray environmental compliance inspections to support the national IRS program, waste disposal and entomological monitoring, including maintaining an insectary.

Table 3. Summary of IRS achievements in Malawi

District	Insecticide used	Total structures sprayed (% coverage in district)	Number of persons protected (% of Malawi population)
2010			
Nkhotakota & Salima	Pirimiphos-methyl (Actellic 50 EC)	97,329 (73%)	364,349 (3%)
Karonga, Nkhata Bay, Mangochi, Chikhwawa, Nsanje (MoH supported)	Alpha-cypermethrin	430,043 (85%)	1,967,154 (14%)
2011			
Nkhotakota	Pirimiphos-methyl (Actellic 50EC)	77,647 (94%)	321,919 (2%)

Challenges, opportunities and threats

Despite steady progress to scale up IRS activities from a pilot program in 2007 to a regional program implemented in seven districts, IRS activities in Malawi have encountered several challenges. Malaria transmission is intense and perennial with a peak malaria transmission period of at least six months duration. Entomological monitoring and surveillance has provided evidence of emergence and extension of resistance of *An. funestus* to pyrethroids in most of the IRS implementation districts, with high levels of resistance documented in Nkhotakota District. Additionally, GoM funding and resources to support the implementation of IRS in the remaining six IRS targeted districts have not been adequate, as evidenced by the purchase of poor quality spray pumps and personal protective equipment (PPE), delayed logistics and scheduling, and poor maintenance of warehouses. The GoM was unable to provide funds to conduct IRS in 2011 and, while the NMCP continues to plan for IRS activities in late 2012, it is not clear if adequate funding will be available to support GoM sponsored IRS activities. Should the GoM choose to spray in 2012, it will be faced with solving several problems encountered during the previous

GoM IRS campaign including: inadequate supervision at the district level; inadequate storage facilities; difficulty adhering to the IRS spray schedule and environmental requirements; and disposing of waste resulting from the spray campaign.

Despite these challenges, the GoM continues to support IRS as one of the main strategies to reduce malaria transmission in high burden districts. Previous IRS efforts have substantially improved capacity within the NMCP (i.e., two staff members are dedicated to IRS activities) together with district health offices in the current seven IRS-targeted districts. Additionally, several private sector institutions are implementing IRS at a smaller scale, which presents an opportunity to build partnerships and improve program sustainability.

Commodity gap analysis

The GoM IRS program does not have adequate spray equipment and personal protective equipment (PPE). The program procured 2,000 spray pumps and 2,000 pieces of PPE for spray operators during the scale-up period. The majority of these pumps have developed faults and are causing environmental concerns due to leakages during spraying. Additionally, each spray operator has only one set of PPE, which is concerning for the health and safety of the spray operators.

Planned activities with FY 2013 funding and justification (No funding planned at this time)

The future of the IRS program in Malawi is uncertain due to the economic challenges being experienced in the country. The GoM is prioritizing the execution of its health activities and it is unknown if IRS will remain a high priority intervention in Malawi given the emergence and extension of pyrethroid resistance and the recent LLIN mass distribution campaign. PMI will provide technical assistance to the NMCP to implement an evidence-based insecticide resistance management strategy to guide future vector control activities and entomologic monitoring.

PMI will continue supporting entomological and insecticide resistance monitoring in sentinel sites. Although these sentinel sites have been located primarily in the seven districts where IRS activities have been conducted, PMI and the NMCP plan to review the entomological monitoring strategy and relocate some sites to better represent the distinct eco-epidemiological zones in Malawi.

Description and budget for proposed activities

- Support for continued entomological monitoring, including entomological collections, analysis, and resistance monitoring, and for routine maintenance and operation of the insectary (see M&E section).

Malaria in Pregnancy

NMCP/PMI objectives

The MOH has a three-pronged approach to reducing the burden of malaria in pregnancy: IPTp,

LLINs, and prompt treatment and diagnosis. Malawi historically has played an important role in the development of IPTp policy and continues to be one of the countries with the highest rate of IPTp coverage. The MoH's objective for IPTp is at least 80% of pregnant women receiving two or more doses of SP during pregnancy. This objective is to be accomplished through a partnership with the Reproductive Health Unit (RHU) to provide directly observed IPTp during FANC visits at least twice during pregnancy. In addition, health education messages are constantly communicated to keep demand for IPTp high. LLINs are provided to pregnant women through ANC services and BCC campaigns specifically promote use of LLINs in pregnancy.

Country/PMI progress in the last 12 months

PMI, in conjunction with the NMCP and RHU, has worked to increase uptake of IPTp through training of providers and assistance with directly observing treatment, including supporting infrastructure improvements to assure a clean water supply and provision of cups. In addition, through CBOs and the small grants program, funds have been made available at the local level to increase demand for IPTp services. Specifically, community-based messages help increase demand for ANC and IPTp, and encourage women to attend ANC early in their pregnancy and receive at least two doses of SP to prevent malaria in pregnancy. These messages are being delivered as part of an integrated package addressing all malaria interventions. PMI has also sponsored a communications campaign at the national level using radio and other mass media.

As a result of these efforts, the 2010 MIS found that 60% of women who had a live birth in the two years preceding the survey reported taking two or more doses of SP, at least one of which was at an ANC visit. This percentage is still below the 80% goal set by the MOH but is higher than in many African countries.

Awareness campaigns and provision of LLINs through ANC clinics support the use of LLINs during pregnancy. In the 2010 MIS, 49% of pregnant women reported sleeping under an ITN the night before. This goal is also below the 80% coverage level set by the MOH but there is hope that the 2012 LLIN mass distribution campaign has increased this proportion.

Challenges, opportunities and threats

Despite high attendance at ANC clinics, IPTp goals in Malawi have not yet been met. Although the integration of IPTp into FANC services helps assure that IPTp is available in all health centers and administered by trained personnel, there is potentially some dilution of impact as IPTp is one among many services offered at ANC. The Malawi IPTp policy states that SP should not be given for IPTp after 36 weeks of gestation. However, since many women do not start ANC visits until later in their pregnancy, this policy may limit the number of women who can take a second or third dose of SP. To update this policy, PMI reprogrammed \$150,000 in FY 2012 funds to support IPTp policy changes that should improve uptake of this intervention.

One significant threat to IPTp in Malawi is the development of SP resistance. More than 94% of the malaria parasites of pregnant women with asymptomatic parasitemia presenting at an ANC visit at Machinga District Hospital had quintuple mutations for SP resistance, indicating that

resistance is almost fixed in this population (Mwandama D, pers. comm.). The PCR-corrected day 42 treatment efficacy for SP to cure asymptomatic parasitemia in this group was only 69%. A birth cross-sectional survey at the same hospital found that two or more doses of IPTp with SP during pregnancy compared to none or one dose was not associated with any reduction in placental malaria for any gravidity (Gutman J., personal communication). However, two or more doses of IPTp with SP was found to reduce the prevalence of a composite birth outcome (i.e., any of the following: small for gestational age, prematurity, or low birth weight). The conclusion from this study is that two or more doses of IPTp with SP currently provides some small benefit to infants but does not show the same effect seen in studies conducted when SP was more efficacious in treating *P. falciparum*. There is an urgent need for studies that evaluate other drugs that can be used as alternatives to SP in IPTp to reduce the burden of malaria in pregnancy.

Gap analysis

The number of pregnant women in 2014 is estimated to be 771,049 (5% of the population). To ensure that each pregnant woman is eligible to receive three doses of SP, approximately 2,310,000 SP treatments are needed annually. Currently, there is no other donor for SP.

Planned Activities with FY 2013 Funding: (\$415,000)

The plan for activities to reduce malaria in pregnancy is to continue to support the procurement of SP and promotion of health education messaging at national, sub-national, and community levels to maintain and improve on current coverage with IPTp2. In addition, PMI will continue to support the use of LLINs in pregnancy through provision of free LLINs for the routine distribution system at ANC and EPI visits.

Description and budget for proposed activities

- Provide 2,310,000 treatments of SP to cover up to three SP doses per pregnancy (\$215,000);
- Contribute to a national-level BCC strategy and material development with focused messaging at subnational levels (\$100,000);
- Provide small grants for community BCC aimed at increasing IPTp uptake (\$100,000);
- Strengthen IPTp via support for the FANC to provide directly observed IPTp during focused antenatal care visits at least twice during pregnancy in collaboration with the RHU (funding included in case management, diagnostics section);
- Procure approximately 900,000 LLINs targeting pregnant women and children under five through the ANC and EPI free distribution programs (funding included in ITN section).

Case Management

Diagnostics

NMCP/PMI objectives

Malawi's 2011 - 2015 Malaria Strategic Plan calls for universal laboratory diagnosis of persons presenting with fever before malaria treatment is provided. Malaria microscopy or malaria RDTs may be used to make the laboratory diagnosis. Malaria microscopy is recommended to confirm the diagnosis of malaria in all admitted patients, patients with treatment failures, and during *in vivo* studies. In all other instances, the NMCP provides flexibility to health facilities to determine their own recommendations regarding the use of microscopy and RDTs.

Progress in the last 12 months

Currently, about 25% of health facilities have the capacity for malaria microscopy, which is provided by trained and qualified laboratory staff. The main constraint for malaria microscopy continues to be a lack of trained qualified health workers, consistent electricity and adequate laboratory supplies.

PMI is supporting the implementation of the national malaria quality assurance/quality control (QA/QC) plan through the outreach training and support supervision (OTSS) program for laboratory and clinical health workers with a focus on microscopy. Outreach training and support supervision is an on-site supervision program designed to provide ongoing support to diagnostic services in health facilities by identifying areas in need of improvement and supporting clinicians and laboratory staff through on-site training. Malaria OTSS supervision is being integrated with supervision and laboratory strengthening efforts for tuberculosis and PEPFAR. To date, a core group of laboratory and clinical supervisors at the national and district levels has been established and OTSS has been rolled out to all health districts and has reached 107 health facilities. With FY 2012 funding, PMI will continue to scale up OTSS with an eventual goal of national coverage, establish a national slide bank to strengthen malaria microscopy QA, and conduct a WHO malaria microscopy accreditation course in Malawi.

Diagnostic capacity in health facilities has improved with the recent roll out of RDTs. The RDT implementation plan has been divided into two phases: 1) all health facilities including those operated by the Christian Health Association of Malawi, and 2) VHCs through CCM.

Implementation activities include: the training of health workers on malaria epidemiology, clinical assessments, RDT testing process, quality assurance and reporting, and distribution of RDTs. The RDT roll out to health facilities began in earnest in November 2011 but has experienced problems due to stockouts of commodities. The status of RDT stock is expected to normalize during the second half of 2012 after additional Global Fund and PMI RDT procurements. The RDT roll out to CCM is planned to occur incrementally over four years and will incorporate lessons learned from the health facility phase. The CCM phase was expected to start in early 2013 but it may be delayed due to delays experienced during the health facility roll out.

Challenges, opportunities, and threats

The main challenges to reaching the goal of universal diagnosis continue to be inadequate diagnostic technical capacity and shortages of diagnostic supplies in most health facilities and VHCs resulting in the continued reliance on presumptive clinical diagnosis. Additionally, the NMCP's guidance to health facilities to determine the use of microscopy versus RDTs has provided flexibility to health facilities. Nevertheless, this has caused confusion in some health facilities and increased reliance on RDTs, when available, thereby threatening the maintenance of microscopic capacity.

Because the Global Fund consolidated Rounds 2 and 7 grant, which has supported the majority of the RDT procurements in Malawi, will come to an end in December 2013 and no new funding has been identified to maintain this commodity purchase, the RDT roll out to health facilities and the start of scale up to CCM are in jeopardy.

Commodity gap analysis

RDTs are primarily procured through the Global Fund with some support from PMI. Due to the end of Global Fund consolidated Rounds 2 and 7 grant, a gap of approximately 8 million RDTs is projected for calendar year 2013. PMI funds were re-programmed from FY 2011 and FY 2012 to purchase approximately 3 million RDTs towards the end of calendar year 2012 to help reduce this gap. The following table presents the projected needs for RDTs:

YEAR	2011	2012*	2013*	2014*	2015*
Country need (based on quantification forecasts)	8,748,850	13,123,275 †	8,151,275	8,212,450	8,450,625
Global Fund	4,800,000	6,448,600	708,100	0	0
PMI		2,966,675	5,000,000	4,000,000	
PMI reprogramming funds	N/A	N/A	3,000,000 ‡		
Government	1,000,000	2,500,000	unknown	unknown	unknown
Total	5,800,000	11,915,275	8,708,100		
Gap	2,948,850	1,208,800	(556,825)	4,212,450	7,656,425

*Data updated from the estimates presented in FY 2012 MOP for years 2012 – 2015

†Estimate increased to include an extra six-month supply to account for lead-time and buffer

‡RDT supply to be purchased in FY 2012 and may be used to close gap in 2013 if needed depending on success of RDT roll out

Plans and justification for FY 2013

With FY 2013 funds, PMI will focus support in three areas: 1) maintaining the QA/QC plan through OTSS; 2) procuring RDTs and ancillary supplies; and 3) training, supervision, and

support of health workers. OTSS supervisors will continue to provide guidance and support in districts and villages across Malawi through constant supervision of malaria diagnostic testing, quality assurance, microscopy support, supply chain management, health facility management, on-the-job supervision, and monitoring and evaluation of RDT program. The supervision support will also assist with RDT implementation in health facilities and village health clinics.

Description and budget for proposed activities with FY 2013 funding: (\$4,635,000)

- Diagnostic supervision and lab strengthening: In order to harmonize supervision and laboratory strengthening efforts in health facilities and maximize efficiencies, PMI will continue to integrate the malaria OTSS supervision and quality assurance activities with efforts for tuberculosis and HIV/AIDS. This will include joint supervisory visits, integrating supervision checklists where applicable, and developing a core team of district supervisors to supervise lab services for malaria, tuberculosis and HIV/AIDS (\$750,000);
- Procure and distribute 4 million RDTs (\$2,960,000);
- Procure and distribute ancillary commodities for RDT use, such as lancets and gloves (\$175,000);
- Provide technical assistance and support for strengthening malaria case management at the health facility and community level through an integrated health systems strengthening program that includes MIP, diagnostic, and treatment activities. Diagnostic specific activities will focus on continued support for the phased RDT implementation, which is scheduled to begin at the community level in 2013, including the correct and consistent use of RDTs in the evaluation of patients with fever (\$750,000).

Treatment

NMCP/PMI objectives

The MoH published a revised guide for the management of malaria in June 2011. For the management of uncomplicated malaria, AL remains the first-line treatment; ASAQ is the second-line treatment. Updates to the guidelines reflect changes in the management of severe malaria at the health facility and pre-health facility level. In health facilities with the capacity for the administration of intravenous medications and patient monitoring, both parenteral artesunate and quinine are recommended. In peripheral health facilities and VHCs, the MoH recommends that health personnel and HSAs provide pre-referral treatment to patients with suspected severe malaria in combination with emergency referral to a higher level health facility. Options for pre-referral treatment include intramuscular quinine, intramuscular artesunate, and rectal artesunate.

Progress in the last 12 months

At the facility level, PMI provided support to strengthening of malaria case management in health centers and hospitals to ensure quality of care throughout the referral system. AL was

provided primarily with support from the Global Fund consolidated Rounds 2 and 7 grant. This Global Fund grant is due to end in December 2013. Although no additional funding to support the purchase of AL has yet been identified, PMI is working closely with the NMCP and other stakeholders to ensure a continuous supply of AL at the health facility level.

At the community level, PMI provided continued to support CCM implementation, in collaboration with other partners, by procuring AL for use in VHCs and providing supervision and management to HSAs in 12 PMI-supported districts. There currently are 3,672 active CCM VHCs, 971 (26%) of which receive support from PMI. PMI, along with USAID maternal and child health funding, also supported the training of HSAs in CCM and the community logistics management information system with the aim of both improving quality of care and extending the routine reporting system to the community level.

Furthermore, PMI provided support to the quarterly end use verification (EUV) survey that assesses the supplies and use of malaria-related commodities at a sample of health facilities. End use verification survey results are nationally representative when aggregated annually.

The MoH/NMCP estimates approximately 300,000 cases of severe malaria occur annually (i.e., 6 million cases of malaria, 5% of which are severe). Approximately 75% of cases (e.g., 225,000 cases) occur in children, with about 10-20% of cases (i.e., 22,500 – 45,000 cases) seen by HSAs through the CCM program. Based on these estimations, PMI is planning to procure approximately 370,000 ampules of parental artesunate and 20,000 artesunate suppositories in FY 2012. Currently, no support other than PMI exists to procure parenteral or rectal artesunate, both of which have the potential to reduce significantly the number of malaria deaths.

Challenges, opportunities, and threats

Although Malawi has made steady progress towards ensuring effective case management at the health facility and community level, several challenges remain. The most pressing one is the end of Global Fund support for ACT procurement after December 2013. The Global Fund currently procures the majority of the ACT supply nationally, and no new funding has been identified to maintain this commodity purchase. Similarly, there is no financial support to procure parenteral and rectal artesunate in response to the revised national guidelines for the management of severe malaria. PMI continues to work with the NMCP, Global Fund, and other stakeholders to identify additional funding to support procurement of treatment commodities.

Another issue is that reported consumption of ACTs continues to be well above reported suspected cases of malaria. Overconsumption may be due to a variety of factors, including irrational ACT use, poor quality LMIS data, and leakage of ACT stocks at the district and facility level (see pharmaceutical and supply chain management section below). The discrepancy between consumption data and reported cases complicates efforts to project the amount of ACT treatments needed annually. Finally, continued supply chain issues and stockouts have hampered efforts to maintain adequate supplies of ACTs at the health facility and community levels when procurement support exists (see pharmaceutical and supply chain management section below).

Nevertheless, the success of the CCM program in hard-to-reach areas provides an opportunity to expand access to ACTs for people living in rural, remote locations and a platform to pilot and scale up implementation of pre-referral rectal artesunate.

Commodity gap analysis

Artemeter-lumefantrine primarily is procured through the Global Fund with some support from PMI and other stakeholders. Due to the end of the Global Fund consolidated Rounds 2 and 7 grant, a gap of approximately 4 million AL treatment courses is projected for calendar year 2013. The following table presents the projected needs for AL treatments (based on consumption data):

	2011	2012	2013	2014	2015
AL needs	13,976,218	12,997,883	12,088,031	11,241,869	10,454,938
AL resources/ supplies					
Global Fund	8,000,000	5,471,000	4,500,000	0	0
PMI (CCM)	2,000,000	4,800,000	3,000,000		
UNICEF (CCM)	800,000		0		
Save the Children (CCM)	700,000	700,000	0		
PSI (CCM)	300,000	300,000	0		
Government of Malawi	600,000	600,000	600,000		
TOTAL	12,400,000	10,671,000	8,100,000		
Gap	1,576,218	1,126,883	3,988,031	11,241,869	10,454,938

With regards to concerns of overconsumption, the following table presents malaria cases reported to the NMCP:

	2007	2008	2009	2010	2011
Reported malaria cases	4,787,706	5,185,082	6,161,421	6,748,535	4,613,528*

*Data are incomplete for 2011. NMCP estimates approximately 5,500,000 when the final case counts are confirmed.

The following table provides ACT quantification estimates provided by the NMCP to the Global Fund. Estimates are based on the number of reported fever episodes in 2011, which are then adjusted for population increase, change in number of cases annually, and the proportion of cases seen at a health facility vs. CCM.

	Age groups	# fever episodes per age group (2011)*	% pop increase	Projected Fever cases	% increase/decrease in case load	Projected fevers including % for increase or decrease at HF level	Case positivity rate	Total # of AL estimated / forecasted	3 Months Buffer stock and lead time supply three months	# AL treatments required	Annual Procurement Plan for AL	AL procurement plan adjusted to nearest pack
2012	All	8,039,980	0.029	8,273,139	0.05	5,791,198	0.50	5,791,198	2,895,599	8,686,796	8,686,796	8,686,800
2013	All	8,273,139	0.029	8,513,060	-0.05	5,107,836	0.50	5,533,489	2,766,745	8,300,234	5,533,489	5,533,500
2014	All	8,513,060	0.029	8,759,939	-0.07	5,080,765	0.45	3,941,973	1,970,986	5,912,959	3,941,973	3,942,000
2015	All	8,759,939	0.029	9,013,977	-0.07	5,228,107	0.40	3,605,591	1,802,795	5,408,386	3,605,591	3,605,610

*Estimated fever episodes for 2011 is the average of morbidity and logistics information

Assumptions in table include: declining malaria positivity rates (i.e., 50% in 2012, 50% in 2013, 45% in 2014, 40% in 2015), 35% of cases to be presumptively treated through CCM, and a reduction in malaria case load due to interventions (i.e., 5% in 2013, 7% in 2014, 7% in 2015)

Plans and justification for FY 2013

With FY 2013 funds, PMI will focus support on procurement of AL and parenteral and rectal artesunate, and strengthening case management at facility and community level. Due to the end of Global Fund support for AL, PMI proposes to procure approximately 50% of the estimated AL need. However, it is difficult to determine the denominator number of AL treatments needed because of the discrepancy between consumption data, reported malaria cases and NMCP quantification estimates. To account for concerns regarding leakage of ACT stocks at the district and facility level, continued irrational use of ACTs, and optimistic assumptions regarding a complete roll out of RDTs in health facilities and the CCM program by 2014, PMI based its denominator estimations on the number of reported cases in 2011 (i.e., approximately 6 million) plus an estimated 30% additional cases (i.e., 2 million cases) for a total of 8 million cases. Additionally, PMI will procure parenteral and rectal artesunate to treat approximately 30% of the estimated severe malaria cases; this amount should be sufficient because parenteral quinine still is recommended and available in Malawi and pre-referral case management of severe malaria

will be implemented in a phased manner. PMI will also support technical assistance for case management as part of a larger effort to strengthen services at the facility and community level (see Diagnostics section) and BCC projects on integrated community case management.

PMI also would like to support the development or updating of malaria specific pre-service curriculum for health workers who are graduating from medical schools and colleges to include current information on malaria prevention and case management practices. If successful, this will reduce the medium term cost for in-service trainings of established health workers. PMI also will conduct malaria specific training for at least five GOM health workers enrolled in post graduate courses in maternal and child health in an effort to strengthen the malaria component of maternal child health programming.

Proposed activities with FY 2013 funding (\$5,885,000)

- Procure and distribute approximately 3.5 million AL treatment courses (\$4,735,000);
- Procure and distribute 375,000 ampules of parenteral artesunate and 20,000 artesunate suppositories (\$850,000);
- Provide technical assistance and support for strengthening malaria case management at the health facility and community level through an integrated health systems strengthening program that includes MIP, diagnostic, and treatment activities. Treatment specific activities include support for appropriate patient assessment and management, including treatment of malaria in pregnancy, and rational use of ACTs (Integrated project, funds included in Diagnostics section);
- Promote prompt evaluation of fever, and encourage acceptance of ACTs and treatment compliance through an integrated community case management BCC campaign (\$150,000);
- Support for pre-service training to develop or update of malaria specific pre-service curriculum in medical schools and colleges and malaria specific training for at least five GOM health workers enrolled in post-graduate courses in maternal and child health in an effort to strengthen the malaria component of maternal child health programming (\$150,000).

Pharmaceutical and supply chain management

NMCP/PMI objectives

In the medium-to long-term, the GoM and broader health donor community intend to collaborate to strengthen both Central Medical Stores (CMS) and the district-level supply chain such that essential medicines, including PMI-procured ACTs and RDTs, can be reintegrated in the government supply chain. Since late 2010, due to issues of leakage and general mismanagement, all USG and Global Fund supported commodities have been distributed through a parallel supply chain (PSC). A multi-donor strategy for re-integration of the PSC into one national system is needed to provide clarity to both the GoM and key donors on benchmarks to determine when

CMS is ready to reassume the supply chain. USG is currently developing a supply chain strategy in concert with the Global Fund and other health donors.

In the near term, GoM and PMI objectives focus on minimizing or eliminating stockouts of malaria commodities at service delivery points by ensuring access to a secure, reliable distribution system, and strengthening supply planning and commodity management for malaria and other essential medicines at all levels.

Progress in the last 12 months

Supply chain issues continue to be a key concern of the health donor community in Malawi. The PSC, which was established in late 2010, pushes commodities from central warehouses in Lilongwe directly to services delivery points bypassing the CMS entirely. Despite tight controls, the PSC has experienced periodic delays or disruptions to deliveries due to fuel shortages and poor road conditions, two incidents of theft, and continued stockouts. Health facilities reporting stockouts of all ACTs ranged month-to-month from a low of 10% to a high of 51% between April, 2010 and June, 2011; during July 2011 to February 2012, stockout rates continued to vary but remained below 20%. Additionally, reporting through the LMIS dropped to a low of 41% in February 2012, down from a high of 82% just a year earlier, eroding the foundation on which supply planning and distribution planning are conducted by the district and central levels. Existing issues such as lack of human resources for commodity management and limited knowledge on stock management, ordering, and planning continue to hinder the system. Consumption of ACTs continues to be well above reported suspected cases of malaria, which may be due to a variety of factors including irrational ACT use, poor quality LMIS data, limited diagnostic capacity, and weak controls over ACT stocks at the district and facility level.

In the meantime, CMS has continued to face challenges, reaching the point of near-collapse in mid-2011 when its procurement systems became de-capitalized due to non-payment of arrears by district governments. The resulting emergency request for procurement support from the GoM to health donors resulted in the creation of a multi-donor emergency essential drugs project valued at almost \$33 million, funded by the UK Department for International Development (DFID), Kreditanstalt für Wiederaufbau (KfW, a German government-owned development bank), and Norway, and implemented through UNICEF (for procurement) and USAID | DELIVER PROJECT (for warehousing and distribution). The purpose of the project, which will distribute essential drug kits nationwide from January 2012 to June 2013, is two-fold: to immediately improve the availability of essential medicines and to support CMS reform by temporarily lightening the burden on CMS systems while contributing to its recapitalization with GOM funds freed up from the district level. Districts are now paying 55% of the kit value to CMS to be used for recapitalization and reform.

Efforts to reform CMS have accelerated substantially since late 2011. Now established as an independent public trust with a Board of Trustees, CMS has hired the firm AEDES to serve as a Supply Chain Management Agent for provision of technical assistance to strengthen its operations and warehousing systems. Significant infrastructure upgrades are being undertaken to

warehousing through joint funding between the Global Fund and the GoM, and plans are underway to transfer storage of HIV commodities from UNICEF-SDV over to CMS once warehouse renovations are complete. DFID is also in the process of recruiting a second technical assistance agent who will focus on supporting the reform of CMS' procurement systems and procedures in line with Malawian law.

The CMS Board of Trustees appointed a new CEO in April 2012, who has moved quickly to institute new reforms and fill other positions. Current priorities include staffing reform and separation of CMS staff from the civil service (e.g., all CMS staff have to reapply for their positions), development of a business plan, recruiting additional technical assistance from DFID, improving coordination with districts and the PSC, implementation of the recapitalization plan and preventing districts from continuing to amass debt, implementing reforms recommended by AEDES, and planning for end of kit distributions and resumption of full nationwide distribution of essential medicines and supplies in June 2013.

The USG has continued its efforts to improve the overall supply chain beyond CMS through continued support to the MoH – both the pharmaceutical services department (HTSS/P) and NMCP – to strengthen planning and coordination centrally while taking steps to improve commodity management and reporting at the community, district, and facility levels. Support to the central level has included TA to implement an annual national quantification and forecasting of all essential medicines, conduct supply planning and monitoring for malaria commodities, manage supply chain manager and the National Stock Status Database, and support planning and supervision by the NMCP. Support to the district, facility, and community levels has included quarterly supervision and end use verification exercises for malaria commodities, ongoing support to operate and expand access to supply chain manager as a key component of the national LMIS, and support to improve access to malaria commodities for community-level distribution through CCM. To help improve commodity management at the facility level and overcome critical human resources shortages for managing malaria commodities, USG has supported a MoH initiative to train two HSAs per health center (450 HSAs total) and HSA supervisors on stock management to improve inventory management and LMIS reporting. This is viewed by the MoH as an interim solution to address immediate HRH gaps, while the medium-term goal is to recruit and place a new cadre of pharmacy assistants (PA). The Barr Foundation is supporting an initial class of PAs starting in 2012, and the USG has supported the establishment of a pre-service training curriculum in logistics management to be incorporated into the pharmacy technician training program. Also, tools have been developed to conduct quarterly supportive supervision led by HTSS/P, and USG is in the process of recruiting and placing two technical advisors directly inside HTSS/P to support the government's supply chain planning and information management systems.

Challenges, opportunities and threats

In terms of CMS reform, the pressure is on the newly established CMS Trust to make rapid progress on long-awaited reforms. The Global Fund, DFID, and other health donors have

committed to supporting CMS reform with a range of technical assistance, and USAID has played a key role in coordinating donor engagement around CMS reform and participating intensively in supply chain governance bodies with oversight over CMS reform processes (such as the SWAp Technical Working Group, the CMS Trust Legal and Administration Committee, and the Essential Drugs Project Implementation Team chaired by the Principal Secretary for Health). The Global Fund will be supporting operations, particularly distribution warehousing and inventory management, while DFID will be focusing on procurement management. The GoM Department of Treasury has committed 1 billion Malawi kwacha (approximately \$3,500,000 US) annually to pay down the district debt to CMS. Nevertheless, the CMS Trust faces an uphill battle to re-establish its credibility and regain the trust of clients (i.e., districts and health facilities) as well as the donor community.

Without increased investment in core capacities of the national supply system to improve the availability and use of data for planning and to improve the control and management of commodities at facilities, it is unlikely that even a fully successful and speedy CMS reform process and full reintegration of the PSC will be able to address stockouts and ensure a reliable supply of ACTs and other malaria commodities to the end user.

Plans and justification for FY 2013

The USG support for supply chain is at a turning point. PMI and the USG need to determine how to monitor and support the ongoing reform and transition at CMS, and determine when to reenter CMS. In the meantime, PMI must remain committed to supporting the operation of the PSC and MoH efforts to strengthen commodity management and planning at all levels of the system.

It is anticipated that this support, including all technical assistance functions, will be provided through the USAID | DELIVER PROJECT. However, an assessment of the USG's supply chain strengthening work under DELIVER will be conducted in late 2012 and PMI's approach may be altered as a result of their recommendations.

Description and budget for proposed activities with FY 2013 funding (\$1,600,000)

- Provide support for warehousing, management and oversight and physical distribution of PMI procured case management commodities through the PSC directly to the health facility level (\$900,000);
- Provide support for technical assistance to activities (\$700,000) including:
 - **Building leadership capacity and strengthening MoH systems to improve commodity security.** Supporting ongoing technical assistance to the HTSS/Pharmaceuticals division of the MOH, including two full-time technical advisers with a mandate to improve the quality, availability, and use of supply chain and logistics data for decision-making. For NMCP in particular, support and build capacity for distribution planning, monitoring, supervision, and reporting including responding to information and planning requirements for the Global Fund;

- **Support the MOH to undertake reform of the integrated LMIS;**
- **Building human capacity for supply chain management;**
- **Strengthening district supply chains;**
- **Ensuring strong coordination** between the PSC, CMS, and other key supply chain stakeholders;
- **Enabling the Pharmacy, Medicines and Poisons Board (PMPB) to undertake its role in oversight and quality assurance** of pharmaceuticals in Malawi.

Monitoring and Evaluation, Surveillance, and Operational Research

NMCP/PMI objectives

The 2011-2015 National Malaria Strategic Plan calls for strengthening of surveillance and monitoring and evaluation systems through both routine health management information systems and malaria-specific surveillance and special surveys to gather entomologic, epidemiologic, and coverage indicator data. The National Malaria Strategic Plan also includes objectives related to the support of local capacity building in operational research issues.

Progress in the last 12 months

PMI, in collaboration with the NMCP, continues to support monitoring and evaluation activities of Malawi's malaria control and prevention efforts. The 2011-2015 National Malaria Monitoring and Evaluation Plan is awaiting finalization and formal dissemination. Between FY 2010 and FY 2012, PMI supported the NMCP's first M&E technical program officer. With FY 2013 this will transition to a MOH permanent employee, although heightened efforts are needed to truly develop a fully operational and appropriately staffed M&E Unit within the NMCP. To date, Malawi has completed two MISs (2010 and 2012) though results from the latter are pending. Routine system monitoring of malaria indicators remains a challenge but is a continued goal for the program.

Surveillance for malaria is conducted through the national HMIS, but reporting is incomplete and inconsistent and often lacks parasitologic confirmation, making it difficult to analyze data. The NMCP was granted authority to develop a parallel reporting system for malaria surveillance while the MOH works on overhauling the HMIS. PMI has supported this activity with training of district health management teams in the surveillance forms and mentoring visits from the NMCP M&E officers. PMI will work with the NMCP to evaluate this parallel reporting system in FY 2012 relative to the existing HMIS.

PMI-funded operational research continues to support systematic data collection activities that provide important data for decision-making, including a nationally-representative health facility survey to examine indicators of uncomplicated malaria case management quality, a similar study of severe, hospitalized malaria and a study of the effectiveness of LLINs in an area with significant pyrethroid resistance.

Population-based surveys, health facility surveys, routine data collection, and operations research have all been critical sources of information for monitoring and evaluating the PMI program.

Population-based surveys

Malawi recently completed the 2012 MIS. Data analysis is underway and preliminary results will be available in November 2012. Malawi's first MIS was completed in 2010 and will serve as a baseline for these results. However, UNICEF's MICS, which was completed in 2006, provides the actual baseline data for PMI's program, which began with FY 2007 funding. When comparing these household surveys, remarkable gains have been made, particularly in the areas of household net ownership and use and IPTp uptake. High parasitemia was noted in the 2010 MIS (~43%) and will be compared to results provided from the 2012 MIS. With funding and support from PMI, Malawi and the RBM partnership are in the process of completing an impact evaluation of malaria control efforts between 2000 and 2010. The report is expected toward the end of 2012; preliminary results show a decline in mortality in children under five years that can be attributed in part to malaria control efforts.

Health facility surveys

In 2011, a nationwide health facility survey assessed the quality of malaria case management in outpatient facilities. Results from this evaluation showed that nearly one-third of patients with uncomplicated malaria confirmed by microscopy were not appropriately treated for malaria, due primarily to missed diagnoses. This survey preceded the roll-out of RDTs, and it is hoped that since the effort to expand malaria diagnostic services has scaled up, improvements will be noted in future. Simple strategies such as facilitating a proper assessment of fever by probing and ensuring availability of materials such as job aids and thermometers to support appropriate diagnosis are stated recommendations aimed at improving case management practices. With FY 2012 funding another health facility survey will take place aimed at evaluating severe malaria case management practices in the inpatient setting. This health facility survey is distinct from the service provision assessment (SPA), which neither focuses on severe malaria nor tests patients for malaria.

Entomologic monitoring and evaluation of IRS activities

PMI has supported entomological monitoring activities, including vector assessments and insecticide resistance testing, in IRS districts in Malawi. Although the NMCP, with assistance from PMI, managed to scale up its IRS program to seven districts in 2010, IRS activities were only conducted in Nkhosakota District due to GoM economic difficulties. PMI has suspended its IRS program in Malawi but entomological monitoring will continue using pyrethrum spray catches throughout the year and WHO-insecticide resistance testing of mosquitoes. In FY 2013, PMI will work with the NMCP to develop a new entomologic monitoring plan that will not be based solely on the IRS districts but will capture the most important variation in vector species, ecologic and agricultural zones to monitor insecticide resistance in areas representative of the entire country.

Antimalarial therapeutic efficacy testing

Malawi has continued to monitor the efficacy of Malawi's first- and second-line antimalarial drugs (AL and artesunate-amodiaquine, respectively), and other alternatives, (dihydroartemisinin-piperaquine), through *in-vivo* drug efficacy trials. The results of the PMI ongoing evaluation should be available in the fall of 2012 and will help to guide PMI and Malawi's decision-making regarding prompt and effective case management of malaria including the possibility of alternate drug regimens.

Planned Activities with FY 2013 Funding (\$2,275,000)

Specifically, in FY 2013, PMI will:

- Work with the NMCP to update the overall malaria data collection strategy including plans for a potential 2014 MIS. The NMCP would like to conduct a 2014 MIS to track progress on key malaria indicators, specifically parasitemia, although the timing of the MIS needs to be considered in light of the planned 2015 DHS. Funds are being allocated to plan for a 2014 MIS (\$1,200,000);
- Support routine LLIN durability monitoring in order to understand the necessary rate of replacement within the Malawi context given a recent mass campaign. Studies have shown significant variability in durability between countries and this could signal differences over time as well. Routine monitoring could be done cheaply in a few sentinel sites to help: a) determine when ITNs from mass distribution campaigns have 'failed,' b) the lifespan of a net to be used if existing nets are taken into consideration when calculating nets needed in repeat campaigns, and c) to help understand epidemiologic changes in malaria patterns in country that might be attributable to net degradation. This monitoring will help guide evidence-based support to the continuous and mass distributions (\$100,000);
- Support an evaluation building upon lessons learned from the recent outpatient and inpatient health facility surveys to assess if targeted cell phone based messaging to health care workers (HCW) can improve case management practices. A randomized controlled trial at rural health facilities in Kenya showed that SMS reminders sent to HCW's personal phones significantly improved their adherence to malaria guidelines with sustained improvements in case management practices over time (Zurovac *et al.*, Lancet 2011 378: 795-803). Given specific recommendations from the health facility surveys in Malawi this is an important evaluation to assess if such improvements can be documented in Malawi to improve case management practices (\$350,000);
- Revise the entomologic monitoring plan to identify sites representative of the entire country and support entomological monitoring in these areas with routine surveys of vector density and insecticide resistance testing of mosquitoes collected from sentinel villages and in Nkhotakota District to monitor for a potential rebound in vector abundance (\$350,000);

- Support therapeutic *in vivo* efficacy studies to monitor for the development of antimalarial drug resistance (\$175,000);
- Support for quarterly EUV surveys to assess the availability of malaria commodities at the end user level (\$100,000);
- Work with the NMCP to review and update the overall data collection strategy including routine data collection and reporting of malaria specific indicators from the district to the central level through existing health information systems. These efforts are intended to build upon existing electronic data systems within Malawi with a particular aim to develop synergy between lab and outpatient department registers so confirmed malaria cases can be tracked at the patient level. These efforts will include a review of the existing Integrated Disease Surveillance and Response (IDSR), HMIS, parallel system, and Baobab Health. (included in Capacity Building section);
- Continue to monitor rates of severe malaria in Nkhotakota District for increases in the incidence or changes in the age distribution of cases due to changes in malaria transmission resulting from the cessation of IRS. No additional funding is needed as Nkhotakota District is part of the PMI-supported integrated case management network, and prospective monitoring efforts are captured as part of this effort.

Behavior Change Communication

NMCP/PMI Objectives

The 2009-2014 Malaria Communication Strategy for Malawi calls for an integrated approach to behavior change communication using social mobilization and advocacy. Social mobilization emphasizes the role and responsibility of the community in the control of malaria and uptake of interventions targeting health providers to utilize effective case management strategies and community members to participate in local initiatives to improve malaria prevention and control behaviors. Advocacy is focused at the national level and attempts to raise public awareness of malaria and mobilize resources. Building on the 2011-2015 Malaria Communication Strategy, the National Malaria Strategic Plan calls for strengthening advocacy, communication, and social mobilization capacities to move towards universal coverage for all malaria interventions.

Progress during the last 12 months

PMI has supported an integrated approach to BCC focusing on ITNs, IPTp, and case management. Behavior change communication strategies have been employed from the national to the community level, and targeted to health care providers and community members. Depending on the intervention being promoted, PMI has utilized a variety of BCC approaches, including educational meetings, mass media, posters and brochures, community drama, and interpersonal communication.

Behavior change communication has been a strong and vital component of PMI since its efforts were launched in Malawi in 2007. Behavior change communication activities have centered on a

national campaign to promote year-round universal ITN use, a mass media campaign to continue emphasis on ANC attendance for IPTp, and community-based campaigns to support ITN hang-and-use and case management IEC activities. The small grants program has remained a central component of the BCC strategy to ensure coverage of all districts in Malawi.

The monitoring and evaluation component of the BCC program has been less well developed. Most interim reports have been focused on documenting activities conducted. PMI planned for an independent assessment of BCC activities in FY 2012 but the assessment had not occurred at the time of writing. Results from the 2010 MIS provided evidence to suggest BCC efforts have been effective (e.g., nearly 81% of children aged less than five years slept under an ITN the night before the survey in households where at least one ITN was available; 60.1% of women who had a live birth in the two years preceding the survey reported taking two or more doses of SP, at least one of which was at an ANC visit).

In FY 2012, PMI transitioned its BCC program to a new implementing partner that integrates its messages within a larger program of BCC messages, including maternal and child health and HIV. The objectives remain in line with the NMCP strategic plan focusing on building capacity of key national institutional partners, strengthening national and community level planning and coordination, developing and producing evidence-based SBCC packages under a multi-level media campaign, and identifying and implementing best practices.

Progress during the past 12 months has been slow due to the transition to the new implementing partner, but is now beginning to improve. The contract was finalized late in calendar year 2011, and progress in the interim has centered on staff recruitment, research tools and plan development, and community based small grant awards.

Challenges, opportunities and threats

The major challenge to BCC efforts is the program transition to a new implementing partner. Delays in completing contracts and complications have hampered initial efforts. Nevertheless, the SSDI-Communications program should be able to build on the success of previous efforts, capitalize on its relationship with the SSDI-Services, and integrate with other health education programs. To facilitate malaria specific messaging, the implementing partner is hiring a malaria specialist to work within the program.

Plans and justifications for FY 2013

PMI plans to continue support to an integrated BCC approach at the national and community level for ITN, IPTp, and case management specific messaging.

National level efforts will focus on advocacy, mass media communication and materials development. The national level communications campaign use radio and other mass media to help encourage universal ITN use, increase awareness of IPTp and demand for ANC services, promote universal diagnosis of suspected malaria cases and prompt evaluation of fever, and encourage acceptance of ACTs and treatment compliance.

Community level efforts are coordinated through the small grants program, which will provide eight awards of approximately \$50,000 each to support eligible Malawian-based non-governmental organizations (NGOs) to implement activities in 12 highly malaria endemic districts. Specific activities will be determined by the grantee, but may include community or social mobilization, training of community workers, radio listening clubs, community theater, and engagement of CBOs. Grantees will work together with the district health management teams (DHMTs) to develop annual work plans. Monitoring to achieve maximum coverage and integration into District Implementation Plans will be a key component. SSDI-Communications will provide technical assistance through the district health management teams to ensure sustainable quality and systems support and will be responsible for financial monitoring of the grantees.

In addition to the integrated BCC efforts, PMI plans to develop and pilot malaria specific prevention messages and activities to school-aged children in two high incidence PMI districts through an integrated program with the local mission APS with FY 2012 funding and, if successful, expand this project to other PMI-supported districts in FY 2013. Although not considered a group most vulnerable to malaria, children aged 5-14 years, most of who attend school, represent approximately one-third of the population in Malawi and are at risk for malaria (Malawi DHS 2010). In a recent survey of school-aged children in 50 schools in Zomba district, the parasitemia prevalence for children aged 5-14 years was 60% while self-reported ITN use was below 40%, which is 30-50% lower than ITN usage rates reported in high-risk populations (MAC, unpublished data). With the recent LLIN mass distribution campaign, school-aged children are a prime group at whom to target BCC messages on ITN use. Additionally, over 60% of females in Malawi begin childbearing prior to age 19 and primigravida are most susceptible to the effects of malaria in pregnancy (Malawi DHS 2010). Despite 60% coverage of pregnant women with two doses of IPTp in Malawi, the 2010 MIS showed considerably lower rates among adolescent mothers. School-aged females are an ideal group at whom to target antenatal care and MIP health messages.

Description of budget for proposed activities

- LLIN: Promote LLIN use among all household members and enhance a “net utilization culture” through national level and community-based BCC efforts (funds included in ITN section);
- MIP: Contribute to a national-level MIP strategy and material development with focused messaging at subnational levels and provide support to the small grants program aimed at increasing IPTp uptake (funds included in MIP section);
- Case management: Integrated community case management BCC campaign to promote prompt evaluation of fever, and encourage acceptance of ACTs and treatment compliance (funds included in case management, treatment section);

- LLIN: Promote malaria prevention by targeting adolescents with LLIN utilization messaging (funds included in ITN section).

Health Systems Strengthening and NMCP Capacity Building

NMCP/PMI objectives

The 2011-2015 National Malaria Strategic Plan calls for efforts to strengthen capacity in program management in order to achieve objectives at all levels of health service delivery through strengthening human resource capacity, mobilizing resources more effectively, providing policy direction, strengthening coordination, and strengthening procurement and supply chain management.

The NMCP plans to achieve these goals through strong leadership, creation of a supportive environment, improved infrastructure, equipment and supplies at all levels, and effective collaboration with partners.

Progress in the last 12 months

As Malawi's SWAp came to a close in 2011, the 2011-2016 Health Sector Strategic Plan (HSSP), which will guide health sector activities in the coming years, was developed and finalized by stakeholders. This coincided with finalization of the Malawi Growth and Development Strategy, which is an overall development agenda for the GoM. The HSSP will continue to focus on primary, secondary, and tertiary levels of health care delivery. The MoH will strengthen its focus on policy and guideline development and evidence-based decision making to improve overall effectiveness in health planning and management. The five MoH zones will continue to provide supervisory support to the districts, and offer a link to the central level. In order to effectively monitor the performance of the health sector during the HSSP implementation period, the Health Systems Strengthening Framework, based on the principles of the Paris Declaration on Aid Effectiveness will be utilized.

Challenges, opportunities, and threats

The HSSP highlights numerous challenges faced by Malawi's health system including: 1) a poor health commodities supply chain and logistics management system from the central to district level, which affects availability of commodities such as essential drugs, condoms and HIV/AIDS test kits at health facility level; 2) a lack of significant investment in human resources for health for Malawi to achieve a fully-staffed health system; 3) poor infrastructure and a lack of necessary equipment in health facilities, 4) inefficient program management; 5) poor quality data that negatively impacts the measurement of impact and outcomes; and 6) inefficient financial management systems at all levels. In light of these complex and interlinked challenges, USG prioritized three health systems strengthening areas for greater support and strengthening under the GHI: 1) human resources for health; 2) infrastructure; and 3) leadership, governance, management and accountability.

Within the HSSP, GoM has prioritized the training of nurses as a key frontline cadre that will assist to deliver the Essential Health Package. The GoM priority infrastructure activities have been defined to encompass: 1) constructing and renovating fit-for-purpose, environmentally friendly physical spaces (health facilities, laboratories, and health care workers housing); 2) ensuring the required utilities are in place to provide constant water, electricity, sanitation, and other services; 3) designing useful, standardized spaces that streamline services and reduce the time burdens on both patients and providers; 4) expanding electronic data collection and other HMIS; and 5) providing basic furniture and equipment along with equipment maintenance and repair. The HSSP also highlights issues of leadership and management as key for improving effectiveness of implementation of health services. The GHI strategy is aligned to the HSSP and will continue to prioritize USG support to these efforts.

At the NMCP in particular, there continue to be funding and capacity challenges. The program lacks resources to facilitate basic coordination functions such as holding regular technical working group meetings, supporting forums to disseminate research, and conducting planning with stakeholders. The NMCP is also in the process of developing an M&E Unit to better track data and coordinate their analysis.

Planned Activities with FY 2013 Funding: (\$550,000)

Working closely with other USG programs in Malawi, PMI will contribute to the GHI activities that support HSSP's implementation and lie specifically under USG stewardship. Though PMI continues to address malaria-specific challenges, real and documented progress will require increased attention to strengthen the health system with in-country partners. Thus, PMI will work with other USG health programs to enhance infrastructure, improve health information systems, and provide support to the NMCP. To strengthen routine, systematic data collection efforts, the PMI Malawi Team, in consultation with the PMI M&E team, will work with the NMCP to add malaria specific indicators to an automated HMIS system. PMI also will work with the Peace Corps office in Malawi to identify two or three Peace Corps volunteers to conduct BCC activities at the village and local level.

Description and budget for proposed activities:

- Support to the NMCP: The NMCP continues to lack sufficient staff to conduct its normal function and resources for standard operations and activities. PMI will provide support to the NMCP to hold technical working group and research dissemination meetings, and support basic logistical and operational function, including printing, equipment maintenance, and internet time (\$100,000);
- Strengthening infrastructure with specific inputs to GHI Malawi's prioritized interventions, including ANC and labor and delivery settings that will be renovated with new approaches to maintenance developed to improve patient experiences, address referral deficiencies, enhance maternal and neonatal outcomes, and decrease loss-to-follow up. Specific activities will include renovating health facilities, ensuring that there

are utilities in place such as electricity and water, and provision of equipment. This activity will be done as part of a GHI cross-program effort using funds proportionally from PMI, Maternal and Child Health, and other USAID health programs. (\$200,000);

- Work with the NMCP to review and update the overall data collection strategy including routine data collection and reporting of malaria specific indicators from the district to the central level through existing health information systems. These efforts are intended to build upon existing electronic data systems within Malawi with a particular aim to develop synergy between lab and outpatient department registers so confirmed malaria cases can be tracked at the patient level. These efforts will include a review of the existing IDSR, HMIS, parallel system, and Baobab Health to determine most appropriate system(s) moving forward, and support will be provided accordingly. (\$200,000);
- Support to two or three Peace Corps volunteers to conduct BCC activities at the village and local level (\$50,000).

Staffing and Administration

Two health professionals serve as Resident Advisors to oversee PMI in Malawi, one representing CDC and one representing USAID. In addition, two FSNs work as part of the PMI team as Project Management Specialists in support of the management and administration of PMI activities. All PMI staff members are part of a single inter-agency team led by the USAID Mission Director or his 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 designee. The CDC Resident Advisor is supervised by CDC both technically and administratively. All technical activities are undertaken in close coordination with the NMCP and other national and international partners, including the WHO, UNICEF, the Global Fund, World Bank, and the private sector.

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

In early 2012, the PMI Malawi team experienced substantial staff turnover as both Resident Advisors and a couple members of headquarters support staff at USAID and CDC departed the

PMI Malawi team. At time of writing, both USAID and CDC Resident Advisor positions are vacant. The two Program Management Specialists in Malawi are managing the program in collaboration with USAID and CDC headquarters staff; a short-term USAID Resident Advisor is being hired until the vacancies are filled.

Planned Activities with FY 2013 Funding: (\$1,890,000)

- Support for CDC staffing (\$550,000);
- Support to USAID for administration and technical oversight (\$460,000);
- Support to USAID for staffing (\$800,000);
- Support to CDC for eight temporary duty assignments, including two for the annual MOP meeting, two for entomological monitoring, one for general epidemiological support, and three to assist with operational research (\$80,000).

Table 1
President's Malaria Initiative – Malawi
Budget Breakdown by Partner for FY 2013

Partner	Geographical Area	Activity	Budget (\$)	%
CDC/MAC	Nationwide	Entomology, drug efficacy study, support to HMIS strengthening, staffing	\$1,705,000	7%
DELIVER	Nationwide	Procurement of LLINs, SP, RDTs, ACTs, parenteral/rectal artesunate, and ancillary supplies, and support to supply chain and end user verification	\$14,635,000	64%
PSI	Nationwide	LLIN distribution	\$1,150,000	5%
SSDI-Communications	Nationwide	IEC/BCC	\$350,000	2%
SSDI-Systems	Nationwide	Infrastructure repairs of selected health centers	\$200,000	1%
SSDI-Services	Nationwide	Support to health service implementation and delivery	\$1,250,000	5%
Local Mission APS	Selected districts	Support to targeted IEC/BCC for school-aged children and pre-service training	\$350,000	2%
TBD	Nationwide	Support for OTSS for microscopy as part of TB/PEPFAR lab strengthening efforts	\$750,000	3%
TBD	Nationwide	Support the Malaria Indicator Survey in 2014 to obtain data on coverage of key interventions and assess possible impact on febrile illness and under-five mortality	\$1,200,000	5%
TBD	Nationwide	Logistical and operational support to NMCP Secretariat	\$100,000	0%
Peace Corps	Selected districts	Support to local IEC small projects	\$50,000	0%
USAID	Nationwide	Support for staffing and administration	\$1,260,000	6%
Total			\$23,000,000	100%

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

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total (\$)	Commodity (\$)		
PREVENTIVE ACTIVITIES					
Insecticide Treated Nets					
Procurement of LLINs	DELIVER	4,000,000	4,000,000	Nationwide	Procurement of approximately 900,000 WHOPEs approved polyester LLINs
Continuous distribution of LLINs through ANC and EPI	PSI	1,000,000		Nationwide	Distribution of LLINs to clinics and other continuous systems, including monitoring of distribution
National BCC strategy and materials development	SSDI-Communications	100,000		Nationwide	Promote LLIN use among all household members to enhance a "net utilization culture"
Small grants for community-based BCC	SSDI-Services	400,000		Selected districts	Promote LLIN use among all household members to enhance a "net utilization culture" and LLIN care and repair
Malaria prevention activities targeted to adolescents	Local Mission APS	200,000		Nationwide	Use of community-based organizations to engage school-aged children in malaria prevention activities
Technical assistance to the NMCP for 2015 LLIN mass distribution planning	PSI	50,000		Nationwide	Support to the NMCP efforts to plan the 2015 mass distribution campaign
SUBTOTAL – ITNs		5,750,000	4,000,000		
Indoor Residual Spraying					

Technical assistance to the NMCP in support of IRS activities	N/A	0	0		Note: The NMCP remains committed to the principle of IRS but currently does not have the resources to continue IRS activities beyond FY 2012. PMI will provide technical assistance to the NMCP to implement an evidence-based insecticide resistance management strategy to guide future vector control activities and entomologic monitoring.
SUBTOTAL – IRS		0	0		
Malaria in Pregnancy					
Procurement of SP	DELIVER	215,000	215,000	Nationwide	Procurement and distribution of approximately 2,310,000 doses of quality-assured SP for malaria prevention in pregnancy
National level BCC strategy and material development	SSDI-Communications	100,000		Nationwide	National level BCC with focused messaging at sub-national levels to improve current IPTp2 coverage
Small grants for community IPTp BCC activities	SSDI-Services	100,000		Selected districts	Community-based BCC campaign to increase the uptake of two doses of SP and improve ANC attendance by late or non-attending pregnant women
Strengthening of IPTp via support for focused-ANC	SSDI-Services	see CM		Nationwide	Support for the strengthening of national focused antenatal care programs particularly focused on improving the quality of Focused ANC services and proper implementation of IPTp guidelines
SUBTOTAL – IPTp		415,000	215,000		
SUBTOTAL PREVENTIVE		6,165,000	4,215,000		
Case Management					
Diagnosis					

Strengthen microscopy and RDT as part of a larger lab strengthening effort	TBD	750,000		Nationwide	Support for OTSS for microscopy as part of TB/PEPFAR lab strengthening efforts
Procurement of RDTs	DELIVER	2,960,000	2,960,000	Nationwide	Procurement and distribution of approximately 4 million RDTs for health facilities and village health clinics through the PMI supported supply chain systems.
Procurement of ancillary diagnostic supplies	DELIVER	175,000	175,000	Nationwide	Procurement and distribution of approximately 4 million pairs of examination gloves and 20,000 sharp boxes for PMI-supported village health clinics and health facilities through the PMI supported supply chain systems.
Strengthen facility and community based services	SSDI-Services	750,000		Nationwide	Technical assistance for improving the case management system at the facility and community level using quality improvement procedures, including malaria in pregnancy activities
SUBTOTAL – Diagnosis		4,635,000	3,135,000		
Treatment & Pharmaceutical Management					
Procurement of ACTs	DELIVER	4,735,000	4,735,000	Nationwide	Procurement and distribution of approximately 3.5 million ACTs for health facilities and village health clinics through the PMI-supported supply chain
Procurement of parenteral and rectal artesunate	DELIVER	850,000	850,000	Nationwide	Procurement and distribution of approximately 375,000 ampules of parenteral artesunate and 20,000 artesunate suppositories for the management of severe malaria
Integrated community case management	SSDI - Communications	150,000		Selected districts	BCC material development and production to promote prompt and effective treatment of fever and

BCC campaign					educate communities on national drug policy and the need for adherence
Support to pre-service training	Local APS	150,000		Nationwide	Review malaria curriculum and conduct training of new and current health workers
Parallel supply chain	DELIVER	900,000		Nationwide	Support management, oversight and distribution of PMI-procured case management commodities
TA to strengthen supply chain	DELIVER	700,000		Nationwide	Support for technical advisors to provide technical assistance on supply chain issues
SUBTOTAL - Treatment & Pharmaceutical Management		7,485,000	5,585,000		
SUBTOTAL CASE MANAGEMENT		12,120,000	8,720,000		
Monitoring and Evaluation					
Malaria Indicator Survey	TBD	1,200,000			Support the Malaria Indicator Survey in 2014 to obtain data on coverage of key interventions and assess possible impact on febrile illness and under-five mortality
LLIN durability	PSI	100,000			Support to develop and implement an ITN durability monitoring system to help inform decisions regarding the timing of LLIN replacement
Study to evaluate targeted, cell phone-based messaging to health care providers to improve case management	MAC	350,000			Support an evaluation building upon lessons learned from the recent outpatient and inpatient health facility surveys to assess if targeted cell phone based messaging to health care workers (HCW) can improve case management practices

Entomologic monitoring	MAC	350,000			Continued support to entomological monitoring
Therapeutic drug efficacy evaluation	MAC	175,000			Support therapeutic efficacy surveillance to evaluate the anti-malarial drugs in addition to AL
End use verification surveys	DELIVER	100,000			Quarterly monitoring of PMI-procured commodities at health facility level
SUBTOTAL – M & E		2,275,000	0		
Capacity building					
Logistical and operational support to NMCP Secretariat	TBD	100,000			Assist the TWG operations via logistical and operational support
Infrastructure repairs of selected health centers	SSDI-Systems	200,000			Support to integrated GHI investments to health facilities in need of electrification, running water, structural repairs
Support to automated HMIS system strengthening to incorporate malaria-specific indicators	TBD/CDC	200,000			Support to routine data collection for health information systems with emphasis on malaria specific indicators for improved reporting from the district to the central level
Peace Corps small projects assistance	Peace Corps	50,000			Support to Peace Corps volunteers for development of IEC messaging at the village or local level
SUBTOTAL – Capacity Building		550,000	0		
In-country Staffing and Administration					
CDC Staffing	CDC	550,000			Support CDC staffing
Admin & oversight - technical	USAID	460,000			Support USAID program costs
USAID	USAID	800,000			Support USAID staffing

Staffing					
CDC temporary duties	CDC	80,000			Eight temporary duty assignments including attending the annual MOP meeting and providing technical assistance for entomology activities and operational research
SUBTOTAL - In-Country Staffing		1,890,000	0		
GRAND TOTAL		23,000,000	12,935,000		