

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 2015 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**

**Mali**

**Malaria Operational Plan FY 2015**

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## ACRONYMS AND ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
ANC	Antenatal care
ASC	<i>Agent de Santé Communautaire</i> (Community Health Worker)
BCC	Behavior change communication
CDC	Centers for Disease Control and Prevention
CRS	Catholic Relief Services
CNIECS	National Center for Information and Communication in Health
CSCOM	<i>Centre de Santé Communautaire</i> (Community Health Center)
CSREF	<i>Centre de Santé de Référence</i> (Reference/District Health Center)
DHS	Demographic and Health Survey
DHPS	<i>Division d'Hygiène Publique et Salubrité</i> (Division of Public Hygiene and Sanitation)
DPM	Directorate of Drugs and Pharmacies
ESR	Epidemic surveillance and response
FANC	Focused antenatal care
Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GOM	Government of Mali
iCCM	Integrated community case management
IDP	Internally displaced person
INRSP	<i>Institut National de Recherche en Santé Publique</i> (National Institute of Public Health Research)
IPTp	Intermittent preventive treatment of pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
IVM	Integrated vector management
LLIN	Long-lasting insecticide-treated mosquito net
MOH	Ministry of Health
MIP	Malaria in pregnancy
MRTC	Malaria Research and Training Center
NMCP	National Malaria Control Program
PMI	President's Malaria Initiative
PPM	<i>Pharmacie Populaire du Mali</i> (People's Pharmacy of Mali)
QA/QC	Quality assurance/quality control
RDT	Rapid diagnostic test
SLIS	<i>Système Local d'Information Sanitaire</i> (Health Management Information System)
SMC	Seasonal malaria chemoprevention
SP	Sulfadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

## EXECUTIVE SUMMARY

Malaria prevention and control is a major foreign assistance objective of the U.S. Government. In May 2009, President Barack Obama announced the Global Health Initiative, a comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the Global Health Initiative, 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 Global Health Initiative, along with family planning, maternal and child health, nutrition, 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 was extended

PMI began supporting activities in Mali in 2007 in close collaboration with the National Malaria Control Program (NMCP) as well as international and national partners. With the *coup d'état* of March 22, 2012, in which the democratically elected president was overthrown by the military, the U.S. Government and many other donors suspended foreign aid to the Government of Mali until a democratic solution to the political crisis could be achieved. For PMI, this meant suspending all assistance and funding to the NMCP and other Ministry of Health (MOH) entities. The U.S. Department of State authorized some PMI activities on humanitarian grounds, such as procurement and distribution of essential malaria commodities; however, the bulk of PMI projects were temporarily suspended. Following intervention by the Economic Community of West African States and the international community, Malians agreed on a consensual transitional government currently in place. In late July/early August 2013, the people of Mali democratically elected a new president who was sworn in on September 4, 2013. As a result, the U.S. Government lifted all restrictions on U.S. foreign assistance to Mali and authorized immediate return to normal bilateral relations with the Government of Mali, including direct support to the MOH.

Malaria is the primary cause of morbidity and mortality in Mali, particularly among children under five years of age. The disease is endemic to the central and southern regions (where over 90% of Mali's population lives), and considered epidemic in the north. In 2013, the national health management information system (*Système Local d'Information Sanitaire* [SLIS]), reported 2.3 million clinical cases of malaria in health facilities and 1680 fatal malaria cases. There has also been an increase in the number of suspected cases that were confirmed by laboratory means, from 52% in 2012 to 80% in 2013. However, given the inherent difficulties with the health information system, the SLIS data should be viewed with caution.

Since the 2006 Demographic and Health Survey (DHS), Mali has demonstrated significant progress in scaling up malaria prevention and control interventions, especially in vector control. Results from the 2012 DHS indicate a 50% reduction of under-five mortality rates from 191

deaths per 1,000 live births in 2006 DHS to 95 deaths per 1,000 live births in the 2012 DHS. Household ownership of at least one insecticide-treated bed net (ITN) increased from 50% in 2006 to 84% in 2012, and 69% of children under age five had slept under an ITN the previous night in 2012 compared with 27% in 2006. However, the same 2012 DHS survey also reported an increase in malaria parasite prevalence rates from 38% in 2010 to 52% in 2012.

Mali is the recipient of a \$26 million 5-year Global Fund Round 6 malaria grant to support procurement of long-lasting insecticide-treated nets (LLINs) and artemisinin-based combination therapies (ACTs) and has been approved for Phase 2 funding. However, the Round 6 grant was suspended in 2010 because of misappropriation of funds. As a result, PMI has procured emergency stocks of ACTs and rapid diagnostic tests (RDTs) to ensure sufficient quantities are available in-country. Mali's Round 10 Global Fund malaria proposal was recommended for funding; pre-disbursement assessment and negotiations with Population Services International, the new principal recipient and a consolidated version of the two malaria grants was signed in May 2013 with a total budget of approximately \$123 million. The consolidated grant focuses on nationwide implementation of integrated community case management and a 2015 universal LLIN campaign. During the Global Fund malaria grant negotiation process, PMI contributed to filling several commodity gaps including LLINs, ACTs, and RDTs, in order to meet the annual national needs. In May 2014, Global Fund commodities such as ACTs, LLINs, and lab diagnostic kits, began to arrive in Mali.

While universal access to malaria prevention and control measures is the goal, pregnant women and children under five remain the focus of PMI efforts since they are the most vulnerable to malaria infection. The activities that PMI is proposing to support with FY 2015 funding align with the new 2013–2017 National Malaria Control Strategy and Plan, complement activities supported in the Global Fund malaria grant, and build on investments made by PMI and other partners to improve and expand malaria-related services.

To achieve PMI's goals and targets in Mali, the following major activities will be supported with FY 2015 funding at a proposed \$25 million level:

**Insecticide-Treated Nets:** The Malaria Strategic Plan promotes universal LLIN coverage for all age groups (defined as one LLIN for every two people). The MOH supports the provision of free LLINs distributed to target populations through two main delivery channels: mass distribution to households as part of universal coverage campaigns and routine distribution through antenatal care (ANC) and Expanded Program for Immunization clinics targeting pregnant women and infants. The NMCP has made significant progress recently toward achieving its initial goal of 80% use of LLINs among children under five and pregnant women. According to the recent 2012-2013 DHS conducted during the peak transmission season, 84% of households owned an ITN. With FY 2013 funds, PMI procured 2 million nets of which 1.4 million were used for the universal coverage campaign in Kayes and 2 districts of Mopti that were not covered in 2012 due to insecurity. The remaining 600,000 nets were used for routine distribution through ANC and EPI clinics. In FY 2015, PMI will procure 1.4 million nets to support the NMCP's universal coverage objectives. Of these nets, 950,000 will be used for routine distribution to children and pregnant women and 450,000 will be used for the campaign in Mopti region to replace nets distributed in 2012/13. PMI will also continue to strengthen LLIN distribution systems at the

national, district, and community levels to prevent stockouts. PMI will continue to support capacity building of the MOH and partners to coordinate donor inputs, track LLINs, and manage logistics and distribution systems.

**Indoor Residual Spraying (IRS):** PMI supports the NMCP's strategy to reduce malaria transmission through targeted IRS in select high-risk areas. Since 2008, PMI has supported three IRS campaigns in the districts of Bla and Koulikoro, adding a third district (Baraoueli) in 2011. Support in 2013 included initial and refresher training of supervisors and spray operators as well as community health volunteers (*relais*); purchase of all commodities and personal protective equipment; and communication, supervision, monitoring, and environmental compliance activities. The 2013 IRS campaign covered approximately 229,000 houses, and protecting approximately 850,000 residents. The 2014 IRS campaign was launched in late summer and is covering the same three IRS districts. With FY 2015 funding, PMI plans to reduce IRS to two districts given the added cost of moving to a new class of insecticide due to resistance. The district no longer covered by IRS will benefit from seasonal malaria chemoprevention (SMC). PMI will also continue strengthening the MOH's capacity to plan and supervise IRS activities within the context of its integrated vector management strategy. Other support will go to entomological monitoring related to IRS, including insecticide monitoring, insecticide resistance testing, and overall implementation of the entomological monitoring plan.

**Malaria in Pregnancy:** Preliminary results from the 2012 DHS showed an increased percentage of pregnant women received the recommended two doses of sulfadoxine-pyrimethamine (SP) for intermittent preventive treatment for pregnant women (IPTp) at antenatal care visits during their pregnancy (from 4% in 2006 to 20% in 2012). Coverage of IPTp2 remains low despite high antenatal care attendance rates by pregnant women: 74% of pregnant women visit ANC at least once. With funds from FY 2012 and 2013, PMI procured 1.9 million SP treatments for IPTp. An MIP Working Group was established to revise the national guidelines to bring them in line with new WHO recommendations. Subsequently, 22 regional staff participated in a training of trainers to assist with the rollout of the new policy. Communications strategies on malaria in pregnancy have targeted religious leaders, traditional leaders, grandmothers, women in positions of authority, women of childbearing age, and men. With FY 2015 funding, PMI will procure 2 million SP treatments to help ensure that all pregnant women can receive at least three doses of IPTp administered as directly observed therapy. Funds will also be provided to address barriers identified in an assessment of IPTp uptake and enhanced monitoring of ANC attendance and IPTp coverage will be developed.

**Case Management:** Poor geographic and economic access to care is a major challenge for malaria diagnosis and treatment in Mali. In 2010, due to advocacy efforts of PMI and other partners, the MOH adopted significant policy changes including a community case management policy and updated severe malaria treatment and pre-referral guidelines. As a result, routine health information systems data reports 80% of all suspected malaria cases were tested by microscopy or RDT in 2013, a significant improvement from 18% in 2010. PMI continued its support of the integrated community case management strategy in 2014 in five districts of Sikasso Region and expanded activities to four additional districts (two in Kayes Region and two in Segou Region). This support included training and deploying community health workers (*Agents de Santé Communautaire*), procuring RDTs and ACTs for community-based diagnosis

and treatment, and ensuring sufficient supplies of RDTs and ACTs for children under five years of age in health facilities. PMI has also procured drugs for the management of severe malaria as well as supported in-service training and supportive supervision of health workers and community health workers. In the new 2013-2017 Malaria Strategic Plan, Mali introduced seasonal malaria chemoprevention (SMC) in selected districts targeting all children under five with four monthly rounds of a preventive treatment with SP and amodiaquine. In 2013, 5 of Mali's 60 districts were covered with SMC and 10 districts are slated for coverage in 2014, including one to be covered by PMI.

With FY 2015 funding, PMI will continue to support and strengthen efforts to ensure prompt and effective case management of malaria at health facilities and support the scale-up of the integrated community case management policy nationwide. At the health facility level, PMI will concentrate on strengthening capacity in laboratory diagnostics (including quality assurance and quality control), and supply chain management. With the NMCP's scale up of SMC, PMI will support implementation of this new approach in 10 districts. PMI will procure 2 million RDTs and 1.5 million ACTs to contribute to filling gaps in annual malaria commodity needs for health facilities and integrated community case management. PMI will strengthen quality assurance/quality control systems at national and district levels for accurate malaria diagnosis, and will support the NMCP to monitor and reinforce the correct use of ACTs at health facilities and in communities.

**Behavior Change Communication (BCC):** The NMCP developed a new BCC strategy for 2014-2018 with PMI support over the past year. The strategy describes BCC messages targeted to vulnerable groups including pregnant women and children under five as well as families and caretakers of children, community health workers, and *relais*. The national strategy supports multiple delivery channels for messages, including mass media and interpersonal communications. PMI supports harmonization of the national BCC strategy at all levels, ensuring consistency of messages and appropriate use of all communication channels. In FY 2015, the USAID/Mali Mission anticipates a new BCC bilateral to work across all its health programs and PMI will channel its BCC work through that mechanism. Through this mechanism, PMI will support BCC activities at national and community levels to promote correct and consistent LLIN use, especially among the most vulnerable groups. PMI will continue to support engagement and mobilization of pregnant women and the promotion of malaria in pregnancy and IPTp in the community through traditional leaders and midwives. PMI will support coordination and harmonization of work among implementing partners to ensure that effective BCC messages on prompt diagnosis and early case management of malaria are promoted and disseminated.

**Monitoring and Evaluation:** The NMCP, with support from PMI and other partners, has developed a comprehensive national malaria monitoring and evaluation plan for 2013-2017, including capacity building, improvement of data collection, and provision of equipment to collect and analyze data. The quality of routine data collection, analysis and reporting through the health information system is variable and feedback is not delivered in a timely manner for program management. In 2013-2014, a comprehensive assessment of the health information system and the community-based information system was conducted and the report provided critical information to guide future investments in this area.

With FY 2015 funding, PMI will support a national Malaria Indicator Survey in 2015 to provide follow-up data on key malaria indicators along with anemia and parasitemia. PMI will build on the recent assessment of the national health information system to strengthen the SLIS through training and supervision, with a focus on the community health center level (*Centres de Santé Communautaire*). Activities will also focus on the integration of integrated community case management data into the SLIS. Through training and supportive supervision, PMI will build capacity of local and regional health system staff to utilize surveillance data for epidemic detection and responding to epidemics in Mopti and the Northern Regions. PMI will conduct a thorough review of key program and HMIS data from IRS and SMC districts to inform the NMCP's strategic direction on IRS and the further expansion of SMC.

**Operations Research:** PMI is supporting two operations research activities: 1) a project to evaluate the impact of LLINs treated with dual insecticides to inform PMI about the potential ability of this new LLIN variety to affect malaria transmission in areas with high pyrethroid resistance; and 2) an evaluation of the SMC intervention to determine its relative usefulness as part of the malaria control strategy in Mali.

**Health System Strengthening / Capacity Building:** Since its first year, PMI has contributed substantially to building capacity of the NMCP and other Government of Mali entities. This support has allowed the government's partners to improve training, supervision and quality assurance and quality control for diagnostics; to oversee implementation of BCC activities related to malaria; and to improve partner coordination. With the *coup* in 2012, PMI suspended direct funding for NMCP capacity-building efforts and focused on strengthening the health system at the community level. In 2013, the restrictions were lifted but direct funding to the NMCP is capped. PMI will provide a small amount in direct funding to the NMCP in FY 2015 to support day-to-day operations including support for databases and servers used for communications. Collaboration will continue with other partners to support NMCP structure and staff, specifically to increase capacity at all levels for program management, including training, supervision, and facilitating forecasting and quantification for malaria commodities and training in logistic management information systems.

## STRATEGY

### INTRODUCTION

The President's Malaria Initiative (PMI) is a core component of the Global Health Initiative (GHI), along with HIV/AIDS, and tuberculosis. PMI was launched in June 2005 as a 5-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI was extended

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).

Mali was selected as a PMI country in FY 2007. This FY 2015 Malaria Operational Plan presents a detailed implementation plan for Mali, based on the PMI Multi-Year Strategy and Plan and the National Malaria Control Program's 5-Year Strategy (2013-2017).

In 2015, the population of Mali will reach approximately 17.8 million, with more than 47% less than 15 years of age; children under the age of five represent 17% of the total population.<sup>1</sup> Approximately 64% of Malians live in poverty (i.e., on less than US\$1 a day). In 2012, the estimated annual gross national income (GNI) per capita was just \$1,550.0 (World Bank, 2012), making Mali one of the world's poorest countries.

Mali is emerging from a period of instability, including a January 2012 rebellion in the north, a *coup d'état* followed by an attempted counter coup, and the loss of the northern two-thirds of the country to violent extremist groups. A new president was democratically elected in Mali in September 2013, and legislative elections were held in December 2013. This peaceful democratic election allowed for the resumption of development aid signaling the willingness of the donor community to help the president to fulfill his promises of peace, accountability, and reconciliation. Despite the recuperation of the northern territories, hundreds of thousands of Malians remain displaced, insecurity and banditry persist, and service delivery remains uneven and insufficient.

This document briefly reviews the current status of malaria control policies and interventions in Mali, 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 2015 activities.

### MALARIA SITUATION IN MALI

Malaria is the primary cause of morbidity and mortality in Mali, particularly for children less than five years old. In 2013, the national health information system (*Système Local d'Information Sanitaire* or [SLIS]) reported 2.3 million clinical cases of malaria in health

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<sup>1</sup> Extrapolated from the 2011 General Census, using a 3% growth per year projection

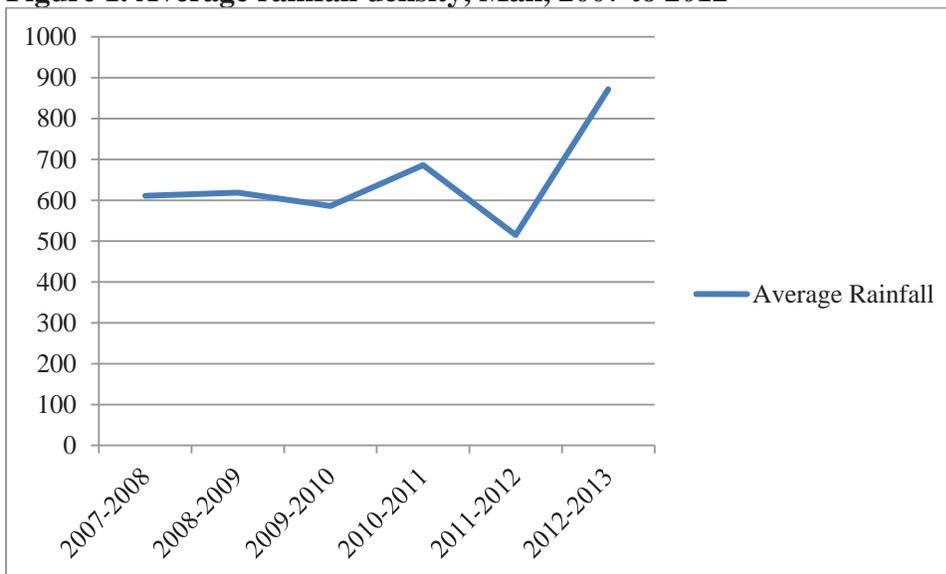
facilities, accounting for 42% of all outpatient visits for all age groups. A total of 1,680 fatal malaria cases were reported. SLIS data should be viewed with caution due to its poor quality. According to the 2012 Demographic and Health Survey (DHS), the prevalence of malaria among children under five years of age was 52% based on microscopy and 47% based on rapid diagnostic tests (RDTs).

*Plasmodium falciparum* accounts for 85-90% of malaria infections, while *P. malariae* (10-14%) and *P. ovale* (1%) make up the remainder. A 2004 study conducted by the Malaria Research and Training Center (MRTC) in Menaka, an epidemic-prone region in the north, indicated a prevalence of *P. vivax* of 8%, which was confirmed by polymerase chain reaction.

Malaria is endemic to the central and southern regions, where about 90% of Mali’s population lives, and it is epidemic in the north due to the limited viability of *Anopheles* species in the desert climate. Malaria transmission varies in Mali’s five geoclimatic zones. It occurs year-round in the Sudano-Guinean zone in the south, with a seasonal peak between June and November. The transmission season is shorter in the northern Sahelian zone, lasting approximately three to four months (July/August to October). Malaria transmission is endemic in the Niger River Delta and areas around dams with rice cultivation, and is endemic with low transmission in urban areas including Bamako and Mopti. Epidemics occur in the north (Tombouctou, Gao, and Kidal Regions) and in the northern districts of Kayes, Koulikoro, Segou and Mopti Regions; the last epidemic was identified by the MOH and WHO in November 2012 in Tombouctou.

In 2012 the country registered a record-setting rainfall; this may partially explain the high prevalence of parasitemia observed during the 2012 DHS. The figure below shows Mali’s average rainfall density from 2007 to 2012.

**Figure 1. Average rainfall density, Mali, 2007 to 2012**



Note: Rainfall ranges from 62mm in Aguelhoc in 2011 (Kidal Region) to 1377mm in Kolondiebain (Sikasso Region) in 2012.

With the insecurity in the north, almost 300,000 internally displaced persons (IDPs) have migrated from the north to the south, As of June 2014, 128,866 still remain in the south and are at risk of severe disease and death from malaria because of their low immunity to malaria infections. Parasite prevalence in the Mopti Region, which borders the northern regions and has received the majority of the IDPs, has increased from 47% to 71% from 2010 to 2012, according to the 2012 DHS data.

## **HEALTH SYSTEM DELIVERY STRUCTURE AND MINISTRY OF HEALTH ORGANIZATION**

At the national level, Mali's MOH is composed of the cabinet of the minister of health and national directorates reporting directly to the secretary general of the MOH. The NMCP was established in 1993 under the oversight of the Disease Control Division of the National Health Directorate. In July 2007, the GOM elevated the NMCP to a directorate level in the MOH organizational structure. The NMCP director supervises four technical divisions and one administrative and finance division, and reports directly to the secretary general of the MOH. Due to its new, higher profile in the MOH, the NMCP can now participate in and influence decision-making about malaria control more effectively, including development of MOH work plans and budgets.

Mali is divided into eight administrative regions (Kayes, Koulikoro, Sikasso, Ségou, Mopti, Gao, Tombouctou, and Kidal) plus the capital, Bamako. Each represents a regional health directorate. The regions are subdivided into 49 administrative “*cercles*” comprised of 56 health districts, and Bamako is divided into six administrative communes that correspond to six health districts; thus the country has a total of 62 health districts. Governance is decentralized into 703 communes, each one administered by an elected local council headed by a mayor. The organization of the health system is based upon the principles of decentralization of health services and community participation to extend health service coverage and to ensure access to essential and effective medicines.

The health delivery system is composed of three levels:

- The central level with five national reference hospitals
- The intermediate level with eight regional hospitals (Kayes, Kati, Sikasso, Ségou, Mopti, Tombouctou, Gao, and the maternal and child hospital of Bamako)
- The local level with 62 referral health centers (*Centre de Santé de Référence* [CSREF]) constituting the district reference level

As of December 2013, a total of 1170 functional community health centers (*Centre de Santé Communautaire* [CSCOM]) as well as parastatal, faith-based, military, and other private health centers, make up the community health services level. The CSCOMs are established and managed by community health associations.

The MOH has a critical staff shortage at all levels of the public health system, especially for service provision below the national level. In addition, health workers are not distributed proportionally to population throughout the country. In 2012, the national ratio of doctors to the

population was 1/8,528, (WHO recommends 1/10,000) but rural regions have less than one doctor for every 24,000 inhabitants. Regional directors oversee health teams that implement integrated health interventions; currently all regional teams have malaria focal persons. The CSREF (at the district level) is the first referral structure for CSCOMs; the district health team is headed by a medical chief responsible for technical supervision of CSCOMs and has a malaria focal person as well. The community health associations manage CSCOM staff and operations; collect proceeds from drug sales, consultations, and user fees; and pay salaries and other expenses. As is the case at the central level, distribution of staff is uneven. In 2009, the percentage of CSCOMs headed by a certified head nurse was close to the World Health Organization (WHO) norms and ranged from 100% in five regions to 95% in Kayes. According to the strategic plan for health and social development (2013-2022), in 2011, 30% of CSCOMs were headed by a medical doctor. The number of staff employed depends on the level of community resources to pay them. In 2011, The MOH started the “medicalization” of CSCOMs, meaning the appointment of qualified medical doctors in CSCOMs.

In 2010, Mali approved an integrated community case management (iCCM) package offered by community health workers (*Agents de Santé Communautaires* [ASCs]) to provide health services at the village and household levels. The ASCs, who receive a financial incentive or salaries from the local government and different partners for their services, provide free treatment for uncomplicated malaria and malnutrition, with payment for treatment of acute respiratory infections, and diarrhea. The ASCs also provide primary care to newborns and family planning for eligible families. Based on national iCCM directives, the iCCM package and ASC model has been introduced in villages located 5 km or more from a health facility and covers 2-3 villages in a radius of 3 km with a catchment area of approximately 1,500 people. This iCCM approach and ASC efforts are supported by an additional cadre of community health volunteers, the *relais*, whose role is to carry out behavior change communication activities (BCC) and health education to promote key health messages to complement iCCM activities. Support for the GOM scale-up plan for nationwide implementation of the iCCM package including supervision, commodity management, RDT confirmation, and quality assurance/quality control (QA/QC) were incorporated into the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) consolidated grant. As of June 2014, a total of 2,317 ASCs had been trained and are fully functional; an estimated 4,876 community health workers are needed to achieve full coverage of iCCM activities. The iCCM ad-hoc group is developing a plan where each donor partner will indicate the number of CHWs to be supported by the partner and in which geographic area.

### ***Health Financing Through Cost Recovery***

Mali has a strong cost recovery system that is based on the Bamako Initiative. At the district level, communities can establish CSCOMs based on the following criteria: the establishment of a community health association; raising a minimum of 10% of the cost of construction or renovation of the health facility; and the hiring and support of health personnel. All CSCOMs are required to deliver the national minimum package of services comprising curative, preventive and promotional health activities. Once authorized by the district medical officer, the MOH provides an initial stock of medicines, consumables, and equipment. In principle, communes are expected to allocate 15% of their budget for social services including water, education, and health.

CSCOMs have three forms of revenue generation that are managed by the community health association: membership fees, sales of essential drugs, and fees for services. Service fees vary by health area and are set by the community health association after consultation with the population. Membership fees allow for reduced service charges at some CSCOMs. Funds derived from the sale of medications are kept in a separate account to prevent providers from overprescribing to generate revenue and to prevent decapitalization of pharmacy stock. The community health association management committee purchases replacement drugs for the CSCOM through the national pharmacy system or from approved private sector companies based on availability. Selected drugs (e.g., antimalarials for children under five and pregnant women, vitamin A, and immunization services) are provided free by the government or donors. The CSCOMs must finance the transportation of their drugs from CSREFs. However, due to small profit margins and the loss of or use of revenues for non-pharmaceutical purposes, CSCOM drug stores often lack available funds to cover these costs.

### ***National Financial Planning for Malaria and Health/Social Development***

The NMCP receives annual budget support from the National Health and Social Development Program. Its Evaluation Committee manages and approves the annual operating budget plan. Several partners (including the governments of the Netherlands, Sweden, and Canada) provide direct budget support on an annual basis. Other donors, including the USG, target their funding to sub-sectors and specific programs. The GOM contributes mostly to salaries, office space, and other operating costs in the program's annual budget, but also procures malaria commodities such as artemisinin-based combination therapy (ACTs), rapid diagnostic tests (RDTs), severe malaria drugs, and long-lasting insecticide-treated mosquito nets (LLINs). The GOM, local governments, community health associations and other donor partners, such as the Global Alliance for Vaccines and Immunizations (GAVI) are supporting the salaries of CSCOM staff, including qualified medical doctors. While the GOM increased its annual investment in malaria control from about \$1 million in FY 2007 to \$6.7 million in FY 2008 and \$9 million in FY 2009, this support decreased to approximately \$4 million in FY 2010, \$3 million in FY 2011, and \$2.5 million in 2012.

## **UPDATES IN MOP STRATEGY SECTION**

This MOP Strategy section contains the following updates from the previous year:

- New data from the 2012-2013 DHS
- New five-year NMCP Strategic Plan (2013-2017)
- Reintegration of Global Fund following the earlier suspension

## **COUNTRY MALARIA CONTROL STRATEGY**

The NMCP establishes strategies for all malaria interventions; coordinates research; proposes policies, norms, and guidelines; and coordinates partner work plans. The NMCP also supports decentralized regional and district health teams through training and supervision. The 2007–2011 NMCP Strategic Plan was reviewed in early 2012 and a new five-year plan (2013–2017) was developed and published by the NMCP and partners in 2013. Its goal is to “reduce the burden of

malaria to a level that will not constitute a major cause of morbidity and mortality nor a barrier to economic and social development.”

The new NMCP Strategic Plan aims to achieve the following targets by 2015:

- Reduce malaria mortality to near zero
- Reduce malaria morbidity by at least 75% as compared to 2000 levels
- Reinforce/strengthen the NMCP coordination and management capacity

Expected results to be achieved by the 2013-2017 strategic plan are as follows:

- At least 80% of the population at risk of malaria is using LLINs including pregnant women and children under five years old;
- At least 80% of pregnant women have received three sulfadoxine-pyrimethamine (SP) doses as intermittent preventive treatment for pregnant women (IPTp) during their pregnancy;
- At least 80% of children under five received the four full courses of seasonal malaria chemoprevention (SMC) in selected zones;
- At least 90% of suspected malaria cases are confirmed using microscopy or RDTs before treatment, at all levels of the health system including the CHW level;
- At least 90% of confirmed malaria cases receive appropriate malaria treatment both for severe and uncomplicated cases as indicated in the national guidelines;
- At least 80% of the population is protected by indoor residual spraying (IRS) in IRS target zones;
- At least 80% of the general population knows what tools are recommended to prevent malaria;
- At least 90% of emergency cases and malaria epidemics are detected in the following two weeks and receive an appropriate response.

Due to the diversity of malaria transmission in Mali (largely endemic in the south and epidemic-prone in the north), the strategic plan emphasizes nationwide universal coverage of key malaria interventions for prevention and control of malaria, as well as specific interventions such as epidemic and entomological surveillance and targeted operational research in areas with unstable malaria transmission. The main interventions in the new national strategic plan for 2013–2017 include:

- Ensure universal access to malaria prevention tools the population at risk including use of LLINs, IPTp for pregnant women, and SMC for children under five;
- Ensure protection of the population with IRS in targeted areas;
- Ensure diagnostic confirmation using microscopy or RDTs at all levels including the CHW level;
- Ensure correct case management confirmed cases at all levels including the community level;
- Strengthen the sentinel surveillance systems (epidemiological and entomological) in areas with unstable malaria transmission;
- Strengthen the integrated disease surveillance system in all districts and hospitals to collect weekly malaria data for prompt decision making;

- Strengthen BCC in order to increase the use of prevention tools and promote early care seeking for patients with fever;
- Revitalize the monitoring and evaluation and surveillance interventions by introducing a functional routine surveillance system at all the levels of the health system;
- Strengthen operational research through studies and surveys on malaria;
- Revitalize and strengthen the national Roll Back Malaria partnership to leverage sustainable funds for malaria activities;
- Reinforce regional malaria coordination and collaboration;
- Reinforce managerial capacity of the NMCP and coordination mechanisms at all levels of the health pyramid.

The NMCP updated its national policy to reflect two new WHO recommendations: implementation of SMC in the Sahel zones and administration of monthly IPTp-SP to pregnant women at every ANC visit after the first trimester. In 2012, the NMCP with support from the nongovernmental organization *Médecins Sans Frontières* (MSF) piloted SMC in one district, administering a monthly treatment of SP and AQ to children under five during the peak malaria transmission period (August – October). The NMCP expanded SMC to five additional districts in 2013 with support from the United Nations Children’s Fund (UNICEF). PMI plans to support implementation and evaluation of SMC in one district with FY2013 funds. PMI will expand its support of SMC to 3 districts with FY 2014 funds and to 10 districts with FY 2015 funds.

## **INTEGRATION, COLLABORATION, AND COORDINATION**

Communications among malaria control partners in Mali are coordinated through the NMCP monthly partners’ meetings. Malaria control is part of the national sector-wide approach, based on a strategic Ten-Year Plan for Social and Health Development and operationalized through the five-year National Health and Social Development Program. The plan is supported by the Financial and Technical Partners’ Forum, which meets monthly to share information on ongoing programs, new initiatives, strategies, and policies; to coordinate interventions; and to help leverage resources. The NMCP is responsible for overseeing all malaria control activities conducted in Mali, but cites partner and donor coordination as one of its biggest challenges. The NMCP seeks better mechanisms for ensuring increased partner information sharing around key activities.

### ***Funding***

Key funding and technical partners to the NCMP include the Global Fund, WHO, UNICEF, the World Bank, and the USG. The U.S. National Institutes of Health also supports the MRTC within the Faculty of Medicine at the University of Bamako. At the implementation level, partners include numerous nongovernmental and private voluntary organizations including *Groupe Pivot Santé*, the National Federation of Community Health Associations (*Fédération Nationale des Associations de Santé Communautaire*), Doctors without Borders (*Médecins Sans Frontières*), World Vision, and Plan International. Partner funding activities include the following:

- UNICEF implements iCCM in 30 health districts

- World Vision provided 470,000 LLINs to implement the universal coverage LLIN campaign in two districts in Koulikoro and Kayes Regions;
- The Muskoka Initiative, funded by the Canadian International Development Agency (CIDA), is implementing iCCM in four districts in the Sikasso Region that are not already covered by PMI;
- WHO provides technical assistance in malaria with the development of Global Fund proposals and the development of new NMCP and MOH policy and strategy documents.

Mali's Global Fund Round 6 Phase 2 grant for malaria and its Global Fund tuberculosis grant were suspended in 2010 based on the Global Fund Inspector General's (IG) identification of misuse of approximately US \$5.3 million from the tuberculosis and malaria grants. The GOM has been responsive to Global Fund IG concerns and has taken steps to rectify the situation by replacing the Minister of Health and making a commitment to provide a reimbursement plan and timeline. Unfortunately, the destruction of MOH offices during the recent *coup d'état* has delayed the submission of these documents. Due to the misuse of funds, Global Fund and the MOH selected a new principal recipient, Population Services International, to manage the Global Fund grants. The approved Round 10 malaria grant and the Round 6 Phase 2 grant have been consolidated into one malaria grant, which was signed in May 2013. The consolidated malaria grant supports scaling up iCCM implementation, procurement of ACTs and RDTs, and support for a universal LLIN coverage campaign in 2015. The total budget amount under this grant is approximately \$60 million for the first three years and with the New Funding Model, Mali will develop a concept note for funding in March/April 2015.

### ***Other USG Programs***

Malaria prevention and control is a major foreign assistance objective of the USG. The U.S. Agency for International Development (USAID)/Mali has provided direct funding to the MOH, including PMI funding to support the NMCP and its priority activities. However, no USG funding was provided during FY 2012 and FY 2013 due to restrictions following the *coup d'état*. USAID/Mali supported a team of two accountants and an auditor at the MOH to oversee all USG funding and ensure that all USG requirements are applied. USG funds are disbursed in small increments following a review of the MOH work plans and justifications. These funds are audited annually and the results shared with USAID's Regional Office of the Inspector General in Dakar. The audits have revealed no misuse of USG funds. USG support to GOM is expected to resume with FY 2013 funds. The USAID Mali Mission has decided to start with \$300,000 per year. The USAID Mission Director can approve a maximum of \$500,000 but justification is required.

As a USG Feed the Future country (2011–2016), Mali is implementing a coordinated government strategy to address food security and nutrition issues. Anemia, due to iron deficiency, malaria, and helminthes infections, affects over 80% of children under five nationwide and exceeds 90% in some regions (e.g., Sikasso). The GOM is committed to developing multisectorial programs that address access to health care to improve overall dietary intake and disease status of Malians. PMI will discuss opportunities for collaboration with Feed the Future and GHI to improve maternal and child health services and coordinate on relevant malaria and nutrition BCC messages.

## ***Private Sector Partnerships***

The NMCP and PMI maintain working relationships with several members of the private sector:

The NMCP has recently partnered with the Association of Employers and Business Owners (*Patronnat du Mali*) including the bank sector. During the World Malaria Day 2013 celebration, the members of the *Patronnat* held malaria prevention awareness events and pledged to provide free nets to their employees and their dependents. The NMCP has a long-established collaboration with mosquito net vendors in the country. With the country's well-established net culture, mosquito net vendors in Mali enjoy a large market in both urban and rural areas. Private clinics, pharmacies, and laboratories are becoming more prevalent with a larger presence in urban areas. To date, the NMCP has provided them with diagnosis and malaria case management information based on country guidelines. The NMCP plans to train and supervise their personnel in order to ensure they understand and apply the national directives related to malaria diagnostics and treatment. PMI and the USAID/Mali Mission will support efforts to strengthen medical practices, including the testing and treatment of malaria, of private pharmacies.

The mining industry is growing in Mali. Currently, at least five mining companies are supporting IRS activities in their employees' residence sites and neighboring villages. PMI will continue to facilitate a dialogue between the NMCP and the mining companies to ensure that they adhere to national and international IRS standards and to promote best practices, such as entomological surveillance.

## **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 2015, PMI will assist Mali 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 insecticide-treated net (ITN)
- 85% of children under five will have slept under an ITN the previous night
- 85% of pregnant women will have slept under an ITN the previous night
- 85% of houses in geographic areas targeted for IRS will have been sprayed
- 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been protected by IRS
- 85% of women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy

## **PROGRESS ON COVERAGE AND IMPACT INDICATORS TO DATE**

Mali has made significant progress on malaria control in the past decade and has seen subsequent gains in child survival. The under-five mortality decreased from 191 deaths per 1,000 live births in the 2006 DHS to 95 deaths per 1,000 live births in the 2012-2013 DHS, representing a

reduction in under-five deaths of 50%. However, there is still much work to be done in order to reach the intervention coverage targets established by NMCP and PMI.

**Table 1: Recent malaria prevention and control indicators in Mali**

Indicator	DHS 2006	Anemia and parasitemia survey 2010	Other data sources	DHS 2012*
Proportion of households with at least one ITN	50%	85%	-	84%
Proportion of children less than five years old who slept under an ITN the previous night	27%	70%	-	69%
Proportion of pregnant women who slept under an ITN the previous night	29%	-	55% (2010 Multiple Indicator Cluster Survey)	73%
Proportion of households in targeted zones reached by IRS	-	-	97% (2011 RTI coverage data)	98% (2012 Abt coverage data)
Proportion of women who received two or more doses of IPTp during their last pregnancy in the last two years	4%	-	32% (HMIS 2012)	20%
Proportion of children less than five years old with fever in the last two weeks who received treatment with ACT within 24 hours of onset of fever	-	8%	-	2.4%
Any anemia (<11g/dL)	81%	85%	-	82%
Severe anemia (<8g/dL)	10%	26%	-	20.6%
Parasite prevalence (microscopy/RDT)	-	38%/43%	-	52%/47%*

\*National estimate that excludes the lower-prevalence northern region.

## RELEVANT EVIDENCE OF PROGRESS

Following its adoption of universal coverage goals, Mali launched a rolling phased campaign in April 2011 to achieve 100% ownership and 80% use of LLINs in the general population, and to replace old nets distributed in 2006. An estimated 8.67 million nets were originally required based on a population of 15.6 million people. As of June 2014, PMI has procured a total of 9.1 million LLINs, of which 7 million nets have been distributed. The remaining 2 million LLINs will be arriving between July and December 2014, and those LLINs will be used for a mass campaign in Koulikoro and Sikasso which benefited from a mass campaign in 2011. A mass

campaign targeting LLINs for the population living in Bamako will be covered by the Global Fund and all routine LLINs in 2015 will be also covered by Global fund.

Over the past year, RDTs were scaled up nationwide, leading to increased levels of confirmed testing. The 2013 SLIS reported that 80% of all suspected malaria cases have been tested by microscopy or RDT, compared with 52% in 2012 and 32% in 2011. The 2012 health facility survey found that about half of suspect malaria cases were diagnostically confirmed: 63% of children under five years with suspected malaria were tested with either microscopy or RDT, while 47% of over-five patients with suspected malaria were tested at these facilities. In addition, according to a new short message service (SMS)-based reporting system piloted in two districts, the percentage of suspected fever cases tested by microscopy or RDT between October 2013 and March 2014 has reached 96%.

Since PMI's launch in 2007 in Mali, impressive gains in child survival have been noticed; all-cause under-five-mortality fell from 191 deaths per 1,000 live births in 2006 DHS to 95 deaths per 1000 live births in the 2012-2013 DHS. This represents a reduction of under-five deaths by 50%. Since malaria is the number one cause of mortality among children under five, these results are likely due to the success of malaria control efforts. The preliminary results from the 2012-2013 DHS show mixed evidence of progress for the malaria control program. Coverage of key interventions has remained steady since 2010 and in some cases increased despite the political turmoil of 2012/2013. Household ownership of ITN remained constant at 84%, one of the highest coverage levels among PMI countries and a major achievement given the instability in the country. ITN use among children under five also remained steady at 69%, while use among pregnant women increased from 55% in 2010 to 73% in 2012. There was likewise an increase in the percentage of women receiving two doses of IPTp from 4% in 2006 to 20% in 2012. In terms of impact, the percentage of children with severe anemia (<8g/dl) fell from 26% in 2010 to 20.6% in 2012.

However, the same survey's preliminary figures on parasitemia indicate an increase in prevalence from 38% in 2010 to 52% in 2012. There are many hypotheses as to why the high levels of coverage have not translated to reductions in parasitemia in this age group. Mali experienced record-setting rainfall in 2012 just prior to the field work for the survey which may have acted as a catalyst to transmission. In addition, the sampling frame for the anemia and parasitemia survey included the low-transmission regions of the North in the denominator, whereas the DHS 2012-2013 excluded the North because of the instability. Thus, the higher level of parasitemia in 2012 might be partially derived from a difference in sampling frames between the two surveys. Finally, the high transmission zones of southern Mali have seen an influx of IDPs from the low malaria burden areas of the North. These IDPs do not have acquired immunity to malaria and may exhibit higher parasite prevalence.

## **CHALLENGES, OPPORTUNITIES, AND THREATS**

Recent political and security instability, persistent issues related to NMCP capacity, and challenges in coordinating donor funding conspire to threaten Malians' access to malaria prevention and treatment interventions. The situation in Mali is dynamic, however, and with a

thorough understanding of these challenges, PMI can leverage resources, both technical and financial, to address these threats.

Two specific issues posed major challenges to malaria activities in general, and PMI activities specifically:

- Security issues particularly in the three northern regions of Gao, Tombouctou, and Kidal, which were recently freed by the French and MISMA (Mission to Support Mali). This situation limited the ability of the NMCP to implement and monitor malaria activities in those regions where the population has low immunity to malaria and limited access to quality malaria services. In addition, data collection activities for the 2012-2013 DHS were not able to take place in the three northern regions and the routine data collection for HMIS was discontinued during the long period of occupation by rebel groups. The security situation improved considerably after the rebels were driven out by international forces and with the progressive installation of Malian authorities in the northern regions. However, residual resurrections of rebel activities, particularly in the region of Kidal, continue to be a challenge for the full implementation of basic services such as health and education to the population in this region. The country anticipates that as the region stabilizes, proposed activities, such as epidemic surveillance and response (ESR), can be resumed.
- Mali's southern regions comprise the hyperendemic malaria zone and have received more than 300,000 IDPs from the northern regions. With the improvement of the security situation, some internally displaced families are returning back to the north. This presents a logistical problem in many ways: the need to plan and budget commodities for an increased internally displaced population in Mopti and other southern cities, and the real possibility of epidemics of malaria due to the lower immunity of the IDPs who have not been exposed to endemic malaria previously. PMI's FY 2012 and FY 2013 funding is being reprogrammed to address some of these concerns.

The NMCP has several administrative and managerial issues to resolve, including:

- Inadequate office space and unreliable electricity supply and internet connectivity;
- Insufficient qualified staff at all levels;
- Inefficient supply chain management systems where malaria drugs are often available at national and regional levels but not at the health facilities and community levels;
- Difficulty coordinating multiple donor partners with different agendas;
- Despite some progress in routine system strengthening, the quality and use of HMIS data still has major issues including timeliness, completeness, and accuracy, and data are not routinely used to inform decision-making.

The Mali team has taken these challenges into consideration during the FY 2015 MOP planning process. Proposed activities seek to address these issues, including continued M&E support for routine system strengthening, supply chain management, and continued implementation of iCCM to increase community access to health care. PMI has also reprogrammed some FY 2014 funds to procure one vehicle and a generator for the NMCP to support the monitoring of malaria activities in the field and allow continued electricity supply.

Finally, the two and a half year suspension of the Global Fund malaria grant activities and disbursement of funding created additional challenges in ensuring that adequate malaria prevention and control measures are in place for the population. Mali's Global Fund consolidated malaria grant (Round 6 Phase 2 and Round 10) is signed in 2013 with a new principal recipient (Population Services International) which will increase malaria prevention and control efforts in Mali and procurements of key malaria commodities, including LLINs, ACTs, RDTs, and laboratory microscopy kits. PMI will work closely with the Global Fund and the new Principal Recipient to coordinate these efforts.

## **PMI SUPPORT STRATEGY**

PMI will support the NMCP and its key objective in malaria control by filling gaps in commodity procurement to ensure the availability of LLINs, RDTs, ACTs, and SP at the local level and bolstering the supply chain to avoid future stockouts. PMI funds will be used to update and develop skills in diagnostics and case management among providers, principally at the community and CSCOM levels, but also throughout the health system. The overall health system will be strengthened through improved approaches to monitoring and evaluation, including enhancements to the routine HMIS and training of health care providers and managers on use of data for decision-making. Operational research activities will be undertaken to fine tune program implementation for the Malian context. Finally, all the service provision improvements will be supported through a strong program of BCC to improve knowledge about malaria control in the communities.

## **OPERATIONAL PLAN**

### **INSECTICIDE-TREATED NETS**

#### *NMCP/PMI objectives*

The MOH supports the provision of free LLINs distributed to target populations through two main delivery channels: mass distribution to households as part of universal coverage campaigns and routine distribution through antenatal care (ANC) and child immunization clinics. Mali defines achievement of universal coverage as one LLIN for every two persons. Since 2007, the MOH has provided free LLINs to children under five years of age in an integrated campaign and through a phased national universal coverage campaign for all susceptible populations. To sustain coverage, the MOH seeks to provide free nets to pregnant women at their first ANC visit and to infants when they complete their national immunization series.

#### *Progress since PMI was launched*

Traditionally Mali has had a strong culture of net ownership and use; ownership of at least one net per household is high and the use of nets in the vulnerable population is even higher. According to the 2012 DHS survey conducted during the peak transmission season, 84% of households owned at least one LLIN and 70% of children under five and 75% pregnant women slept under a LLIN the previous night. These findings suggest that Mali has not only maintained high net ownership since December 2007, but has increased coverage.

Following its adoption of universal coverage, Mali launched a rolling, phased campaign in April 2011 to achieve 100% ownership and 80% use of LLINs in the general population. The NMCP and partners opted for a phased approach to the campaign, starting with the region of Sikasso in 2011, then covering the regions of Segou, Mopti, and Kayes from 2012 to 2014. Koulikoro and Bamako will receive nets in late 2014/early 2015. It is anticipated that the three regions of the north (Gao, Tombouctou, and Kidal) will receive mass distribution campaign as nets become available and security permits. An estimated 8.67 million nets were originally needed based on a population of 15.6 million for one round. As of June 2014, more than 5.8 million LLINs had been distributed in five of nine regions, of which PMI provided more than 5.3 million LLINs.

#### *Progress in the last 12 months*

During the last 12 months, PMI distributed 1.2 million nets as part of the rolling campaign in the region of Kayes. The tranche of 200,000 nets targeted for the region of Mopti has not yet been distributed due to the insecurity during the rebellion crisis. In late 2014, PMI will distribute 1.4 million nets in Koulikoro and 910,239 nets in Sikasso (to replace the nets distributed in 2011).

PMI continued to provide nets for ANC and immunization services. In 2014, PMI distributed 1,596,114 nets to cover the entire need for routine distribution to children under one year old and pregnant women.

In 2015, PMI will procure 1.35 million nets to support the second round of distribution in the region of Segou, complemented by 156,000 and 500,000 nets procured by the Global Fund and GOM, respectively. In 2014, the Global Fund procured a total of 4,861,720 nets, of which 1,864,372 already arrived in country and the remaining will arrive before the end of the 2014. Approximately 1.2 million nets will be directed to support the universal coverage campaign in Bamako.

The total need for 2015 routine distribution for pregnant women and children under one year old is 1,603,723 nets, which are expected to be covered through Global Fund-procured nets (1,119,846 total) and GOM-procured nets (500,000 total).

**Table 2: LLIN Gap Analysis**

<b>Mali LLIN Gap Analysis - MOP 2015</b>			
<b>Calendar Year</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Total Targeted Population <sup>2</sup>	17,308,179	17,819,147	18,341,245
Pregnant women	865,409	890,957	917,062
Children under one <sup>3</sup>	692,327	712,766	733,650
<b>Continuous Distribution Needs/Routine</b>			
<i>ANC and EPI</i>	1,557,736	1,603,723	1,650,712
<i>Estimated Total Need for Continuous</i>	<b>1,557,736</b>	<b>1,603,723</b>	<b>1,650,712</b>
<b>Mass Distribution Needs</b>			
2014/15/16 mass distribution campaign	Kayes: 1,200,000 (completed); Mopti (2 districts): 200,000 (completed); Koulikoro: 1,400,000 (Oct-Dec 2014); Sikasso: 1,500,000 (Oct-Dec 2104)	Segou: 1,556,878 (Oct-Nov 2014) Bamako:1,205,213 Gao: 360,873 Tombouctou: 449,509 Kidal: 44,893	Mopti (5 districts): 449,858
<i>Estimated Total Need for Campaigns</i>	<b>4,300,000</b>	<b>3,617,366</b>	<b>449,858</b>
<b>Total Calculated Need: Routine and Campaign</b>	<b>5,857,736</b>	<b>5,221,089</b>	<b>2,100,570</b>
<b>Partner Contributions</b>			
	(FY14 ITNs)	(FY15 ITNs)	(FY16 ITNs)
PMI (estimated contributions by year)	2,000,000	1,350,000	1,400,000
Global Fund Round 6 and 10	4,861,720		TBD
Other donors: GOM	-	500,000	500,000
<i>Estimated Total Partner Contributions</i>	6,861,720	1,850,000	

<sup>2</sup> Population estimates are obtained from the NMCP

<sup>3</sup> ITN are given at the final measles vaccination at 9 months, so the population of children under 1 is used for quantification purposes for this distribution effort.

Surplus/Carried over ITNs from previous year	1,710,239	2,714,223	
<b>Total ITNs available in calendar year</b> <i>(Total Contributions + Total Surplus)</i>	8,571,959	4,564,223	1,900,000
<b>Total ITN Surplus (Gap)</b> <i>(Total Need-Total ITNs Available)</i>	2,714,223	(656,866)	(200,570)

### ***Plans and justification***

With FY 2015 funds, PMI will continue its strong support of Mali’s universal coverage strategies through both mass campaigns and routine services. PMI will procure 1.4 million nets, of which 450,000 will be used for the second round campaign distribution in the five districts of Mopti that were covered in 2012-2013 and the remaining 950,000 nets will contribute to routine distribution through immunization and ANC clinics. During routine supervisory visits, partners will ensure that providers are distributing nets according to policy, and will verify existing stock and logistics records.

PMI will continue the implementation of an operational research study of combination-insecticide-treated nets that began in 2014 (with FY 2013 Funds). PMI will continue to evaluate the survivorship and physical integrity of a subset of the four types of bed nets, distributed in the ongoing dual insecticide operations research study. The third year of the study will include bio-efficacy monitoring. This study will inform future national LLIN strategies in Mali.

### ***Planned activities with FY 2015 funding (\$6,363,738)***

**LLIN procurement:** PMI will procure 1,400,000 LLINs to support the NMCP’s universal coverage objectives. Of the total contribution, 950,000 will be provided to children under the age of one year of age and pregnant women through routine services nationwide and 450,000 will be used to conduct the second round campaign in the five initial districts in Mopti region to replace nets distributed in 2012/2013. (\$4,963,738)

**Distribution of LLINs:** PMI will support the distribution of free LLINs through the mass campaign in Mopti Region and through routine ANC and immunization services at the CSCOM level for infants and pregnant women. PMI will also support steps to ensure that LLINs reach the targeted populations (ensure that health workers are distributing LLINs according to national guidance, verifying stocks, and comparing data for nets distributed versus physical stock). (\$1,400,000)

## **INDOOR RESIDUAL SPRAYING**

### ***NMCP/PMI objectives***

The Strategic Plan envisions an integrated vector control program that includes: LLINs, IRS, larval control, and environmental management. IRS is considered to be most effective in areas of the country where malaria transmission is perennial (with seasonal peaks that vary in duration from three to six months), such as the Sudanese Zones shown in Figure 2 and Table 3.

### ***Progress since PMI was launched***

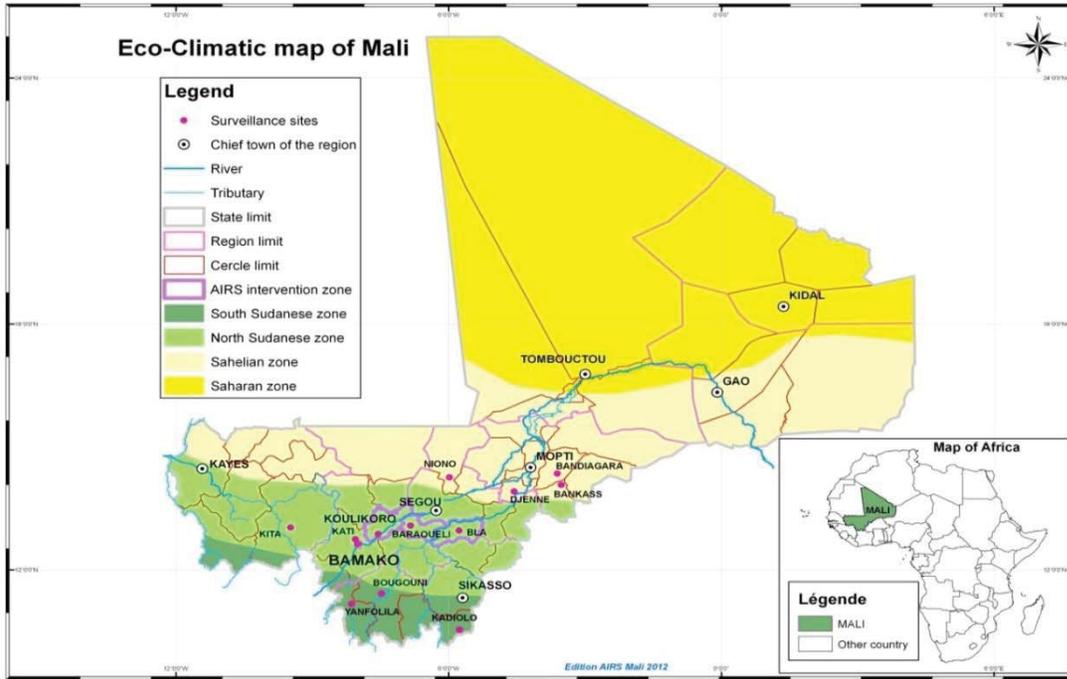
PMI has supported spraying in two (initially), and currently (2014-2015) three, contiguous districts (Bla, Baraoueli and Koulikoro) (Figure 3). While PMI remains the only large-scale IRS partner (beginning in 2008), private mining companies continue to conduct smaller-scale IRS in villages surrounding their mining concessions. AngloGold and Rand Gold Resources report the use of organophosphates for IRS of structures in their mining centers.

PMI relied on pyrethroids from 2008-2010 and then responded to emerging resistance to pyrethroids (2010) by shifting to the carbamates. While bendiocarb (a carbamate compound) was effective in the short-term, its residual effect was observed to be too short-lived to provide protection during the seasonal malaria peak. Therefore, beginning in 2014, organophosphates were used in two IRS districts. With FY 2015 funds, the IRS program will exclusively use organophosphates.

### ***PMI/IRS country progress in the last 12 months***

Routine surveillance of vector insecticide resistance, as well as other indicators such as vector taxonomy, density, and biting behavior, reviewed by the NMCP and PMI, continues to inform decisions about IRS operations (e.g. selection of IRS insecticides). During the 2013 IRS campaign, there were 229,000 structures sprayed with a population of approximately 850,000 protected. Taking into consideration population growth, the size of the 2014 operation, shown in Figure 3, and programmed for August, will, most likely, be larger.

**Figure 2. Mali eco-climatic map. IRS targets three contiguous districts, Bla, Baraoueli and Koulikoro, located in the North Sudanese Zone (light green), where transmission is perennial, with seasonal peaks**



**Figure 3. IRS target districts (2014 spray round)**



**Table 3. Types of malaria transmission in Mali. Districts in the year round (with seasonal peaks) transmission area are targeted for IRS.**

<b>Transmission type</b>	<b>Geographic areas</b>	<b>Additional comment</b>
Year round	Sudano-Guinean in the south of Country	Seasonal peaks (June –November)
Year round	Niger River Delta, areas near dams and rice cultivation; urban areas (e.g. Bamako, Mopti)	Low but endemic Lower than surrounding area
Short transmission	Sahelian Zone in north of country	3-4 month/year (July - October)
Epidemic	Dry northern Regions: Tombouctou, Gao, and Kidal Northern districts of following regions: of Kayes, Koulikoro, Segou and Mopti Regions)	

In 2013, IRS coverage increased slightly from preceding years.

- Intervention area : Koulikoro, Bla and Baraoueli districts
- Insecticide: carbamate class
- Sprayed structures: 228,985
- Total population covered: 850,104
- Number of pregnant women: 18,561
- Children under 5 years: 145,953
- Supervisors and spray operators trained 769
- Community volunteers (*relais*) trained in BCC 1,172

**Table 4: PMI-Supported IRS Spray Rounds (2008-2016)<sup>4</sup>**

Date	Insecticide (class)	Target districts	Structures Sprayed	Population Protected
July - August 2008	λ-cyhalothrin (pyrethroid)	Bla Koulikoro	108,000	420,580
May - July 2009	λ-cyhalothrin (pyrethroid)	Bla Koulikoro	127,000	497,122
May - June 2010	deltamethrin (pyrethroid)	Bla Koulikoro	127,000	441,000
June - July 2011	bendiocarb (carbamate)	Bla Koulikoro Baraoueli	203,000	700,000
July - August 2012	bendiocarb (carbamate)	Bla Koulikoro Baraoueli	206,295	762,147
August – September 2013	bendiocarb (carbamate)	Bla Koulikoro Baraoueli	228,985	850,104
August-September 2014	bendiocarb (carbamate) and Organo-phosphate	Bla Koulikoro Baraoueli	TBD	TBD
July-August 2015	Organo-phosphate	Bla Koulikoro Baraoueli	TBD	TBD
July-August 2016	Organo-phosphate	Koulikoro Baraoueli	TBD	TBD

Vector-insecticide susceptibility data collected at six monitoring sites in the IRS target area (Figure 4), plus seven additional locations outside of the IRS area (for regional susceptibility mapping), informed the decision to continue IRS with a carbamates in 2014 and most likely in 2015.

In 2013, PMI conducted an IRS capacity assessment in Mali. The purpose of the assessment was to evaluate overall capability and capacity of host-government and independent local entities to carry out the technical, operational, monitoring, and management functions for implementing an IRS program. Based on the results of the capacity assessment, PMI and its partners, together with the NMCP and National Directorate for Sanitation and Pollution Control (DNACPN), identified specific areas where the project can assist the NMCP and DNACPN to strengthen their capacities, including improved management of the program and greater advocacy to increase donor support.

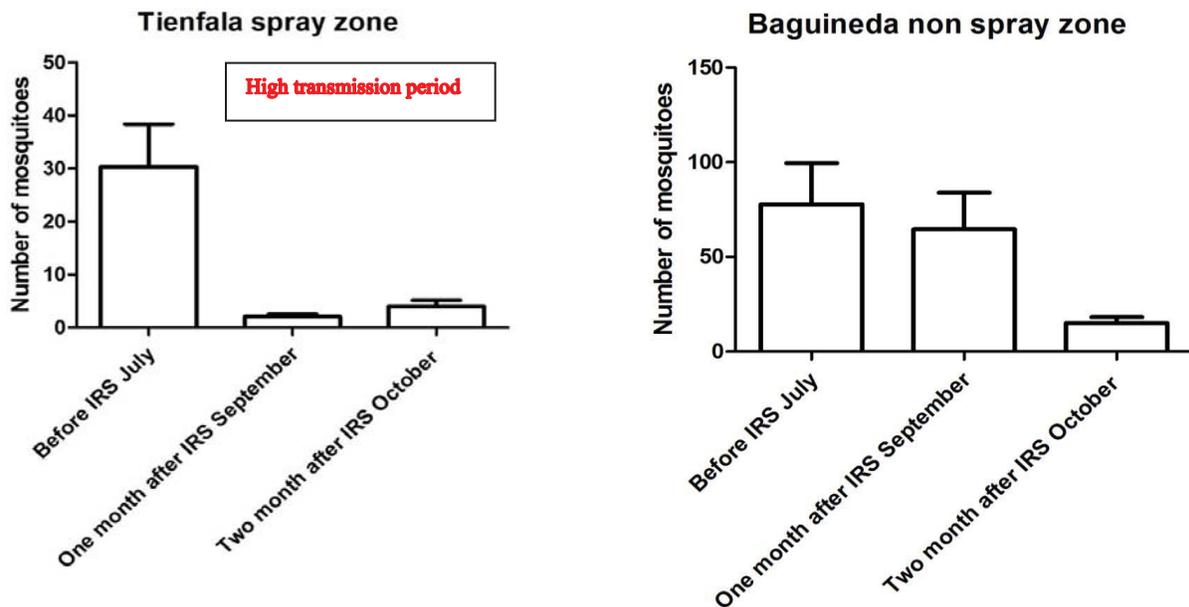
<sup>4</sup> Data from PMI IRS partner end of spray season reports.

### Plans and justification

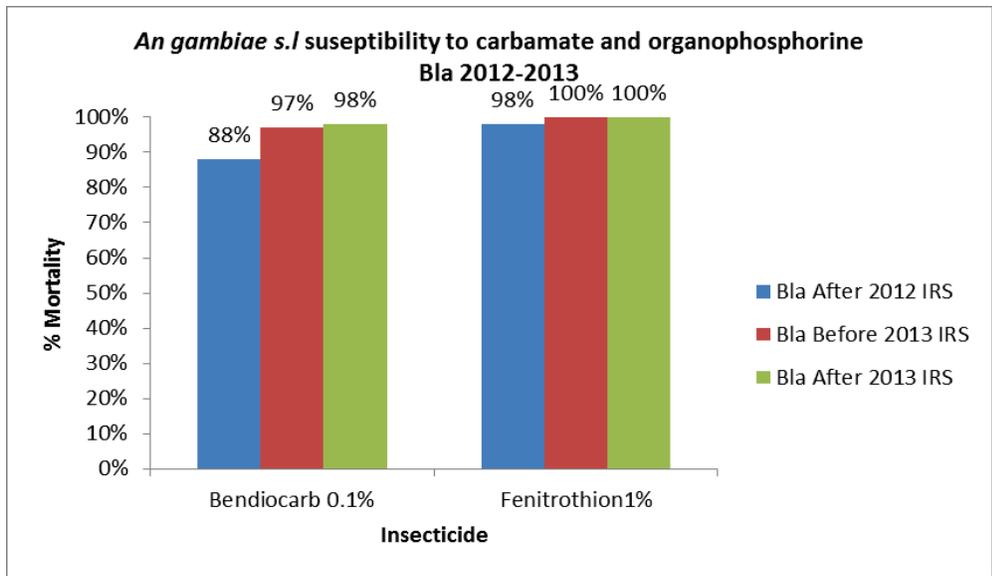
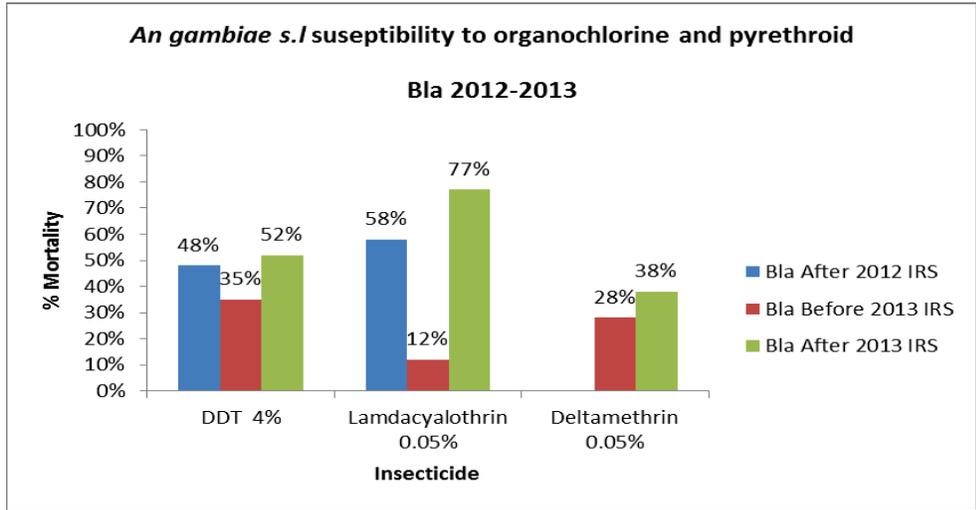
PMI will support IRS with organophosphates with FY 2015 funds based on the following technical justification: First, while carbamates remain mostly effective based on the most recent vector-insecticide susceptibility surveillance data (Figure 5), their residual effect does not cover the entire transmission season of June-November (Figure 4), and delaying IRS until July results in weather-related problems that reduce IRS coverage. Second, there is evidence for reduced susceptibility to carbamates – as well as pyrethroids –when compared to organosphosphates.

IRS entomological monitoring and evaluation results (see Figure 4) confirm a relatively short residual effect of IRS with carbamates. During the early transmission season (June-July), vector-biting densities are generally lower (less standing water for breeding during the early rainy season). Therefore, by delaying IRS operations until July, it is possible to somewhat compensate for the short-acting residual effect of the insecticide.

**Figure 4. IRS entomological monitoring and evaluation results (2013)**



**Figure 5. Vector-insecticide resistance surveillance data for *An. gambiae s.l.* populations in IRS target area.**



With FY 2015 funding, PMI proposes continued support to the NMCP IRS strategy. However, only two districts will be targeted for IRS in 2016. IRS in Bla will end and the district will be prioritized for the full package of malaria control interventions, including LLIN distribution and SMC, as described elsewhere. Bla which is located in Segou region will benefit from a mass LLIN campaign in 2015. A refresher training in case management will be undertaken in Bla and malaria surveillance will be strengthened to mitigate the possibility of a malaria rebound in the wake of IRS withdrawal.

PMI will continue to monitor entomological indices in Bla, focusing on sporozoite ELISA rates to assess the impact of the proposed changes on transmission rates in Bla. Additionally, PMI will

continue to support IRS and entomological monitoring to inform program decisions, as described in the PMI Mali entomology surveillance work plan. PMI will support: vector collection and testing at the 13 entomological surveillance locations; transfer and use of new vector-insecticide susceptibility testing methods (to identify mechanisms of vector insecticide resistance) as well as distribution and levels of phenotypic resistance.

***Planned activities with FY 2015 funding (\$4,334,000)***

**IRS implementation:** PMI will support one round of IRS with organophosphates (unless there is a change in insecticide resistance profiles) in two target districts. PMI will procure the necessary quantities of insecticide to cover the two districts, but reduction in geographic coverage may be considered due to the cost of rotation to organophosphate insecticide class. PMI will procure spray pumps and personal protective equipment, and will support IRS operational costs including: selection, training and supervision of spray operators, environmental compliance activities, and communications efforts to promote acceptance and compliance with IRS prior to the spray round. (\$4,000,000)

**Technical assistance for vector control activities:** A CDC entomologist will conduct two technical assistance visits: one to assist the PMI entomology monitoring partner to evaluate IRS insecticidal activity and to conduct operations research on dual-insecticide LLINs; and a second trip to design and supervise expanded entomological surveillance to evaluate vector insecticide resistance using CDC testing methods. (\$24,000)

**Entomological supplies:** Procure and ship specialized supplies from CDC/Atlanta to Mali for the entomological monitoring activities. (\$10,000)

**Entomological monitoring:** PMI will support: (1) Annual vector insecticide susceptibility monitoring at 13 sites (throughout the country and including the PMI IRS districts) to inform selection of IRS insecticides, and map trends in vector-insecticide susceptibility; evaluate the impact of resistance management strategies and of combined IRS and LLIN activities; (2) Conducting IRS-related entomological assessments at 10 sites: 6 in IRS districts (two per district) plus four non-IRS (comparison) sites. This will include also capacity building to the NMCP entomologist and the Division of Hygiene and Sanitation within the National Directorate of Health in entomological monitoring related to IRS. (\$300,000)

## **MALARIA IN PREGNANCY**

### ***NMCP/PMI Objectives***

Mali's malaria in pregnancy (MIP) strategy applies WHO's three-pronged approach: providing three doses of IPTp with SP, promoting the use of LLINs distributed free at the first ANC visit, and effective case management of malarial illness. The NMCP has set ambitious goals for MIP through the National Strategic Plan. The program aims to provide 100% of pregnant women living in stable transmission zones three doses of SP for IPTp at ANC services as per the national guidelines. The NMCP also has a goal of universal coverage with LLINs and, as part of that policy, intends to provide mosquito nets to 100% of pregnant women through ANC clinics, as a supplement to the mass campaign distribution. In 2006, the MOH issued directives ensuring free

provision of SP for IPTp (although women do pay a small fee – approximately \$1 – for their ANC card). In October 2012, WHO changed its recommendations for IPTp to administering a dose of SP at every ANC visit after quickening. Much of the original research behind this policy change occurred in Mali, so Mali became an early adopter of the new recommendations and revised the national policy in November 2012.

Utilization of ANC services by pregnant women is moderate but increasing. In 2001, only 57% of women attended ANC at least once. As of 2012, approximately 74% of women attended ANC at least once during their most recent pregnancy, with 41.2 % making 4+ visits. Urban women access care more frequently than rural women. Two-thirds (67%) of urban women attend ANC four or more times during their pregnancies, as compared to 35% of rural women. At the same time, 25% of women do not attend ANC at all, according to the 2012 DHS. Women in Mali tend to seek antenatal care late in their pregnancies, with the average gestational age for the first ANC consultation being 4.2 months. IPTp use is low, as the 2012 DHS showed that only 20% of women received two doses of SP at ANC visits (up from 4% in the 2006 DHS). Health facilities also collect and report information quarterly through the national SLIS on the number of ANC visits (including early ANC visits), postnatal consultations, SP doses administered, and assisted deliveries by a skilled birth attendant. In 2007, the MOH released revised ANC visit cards that included IPTp and LLIN information. The use of bed nets in general is very high in Mali and data from the DHS 2012 show that approximately 73% of pregnant women slept under an ITN the night before the survey.

For case management in pregnancy, the national policy is to use quinine in the first trimester and the first-line ACT (artemether-lumefantrine) (AL) in the second and third trimesters. Treatment of severe malaria follows the same protocols as with nonpregnant adults: injectable artesunate (preferred) and if not available, quinine. Details on PMI's support to the overall case management program, including drug procurement and supply chain issues, are available in the case management section of this MOP.

Integration and coordination between the NMCP and the MOH's Reproductive Health Unit is critical in ensuring effective MIP programs and high IPTp coverage. Since 2006, the NMCP and the Reproductive Health Unit have developed a revised in-service training module for focused antenatal care (FANC), which includes MIP and IPTp.

The National Center for Information, Education, and Communication for Health (*Centre National d'Information Education et Communication pour la Santé*), which is tasked with creating BCC materials and strategies, is addressing barriers to increasing uptake of IPTp by improving providers' interpersonal communication skills and encouraging early ANC visits by pregnant women.

### ***Progress since PMI was launched***

PMI has been a principal supporter of malaria in pregnancy activities since the beginning of its program in Mali. PMI has supported in-service training and supervision of health providers, in collaboration with the Reproductive Health Unit, NMCP, and Midwives Association to facilitate the implementation of the MIP guidelines as well as the training of health providers on interpersonal communication, an area cited by the MOH as a challenge.

PMI has traditionally been the sole procurer of SP for IPTp programs, filling the needs for all pregnant women since the initiative started in Mali. Mali has been the site of some of the key research on malaria in pregnancy and thus was an early adopter of IPTp. In 2006, Mali announced that IPTp would be free for women attending ANC. Following the change in WHO recommendations to IPTp at every ANC visit, Mali revised its national policy accordingly and has been working to roll out refresher training to providers nation-wide.

To explore the reasons for the low uptake of IPTp in Mali, PMI supported an assessment of the barriers to implementation of IPTp in ANC clinics. The assessment indicated that, in general, women knew about IPTp and had favorable opinions about taking SP to prevent complications of MIP. At the same time, the assessment highlighted a number of misconceptions regarding IPTp on the part of both providers and pregnant women. Among the findings was the pervasive belief that SP cannot be taken on an empty stomach, nor can it be taken after the seventh or eighth month of pregnancy. The most recent policy recommendations from WHO address many of these issues directly, but these barriers still need to be addressed in many parts of Mali. The assessment report was finalized in early 2012 and the findings are being incorporated into provider training activities in order to dispel outdated concepts around IPTp delivery.

In the past, Mali experienced stockouts of SP due to procurement and supply chain management issues. In April 2011, the end use verification survey found that 85% of health facilities were stocked out of SP. Subsequently, PMI has undertaken to fund the procurement of enough SP to cover the anticipated needs for 2012 and 2013. Subsequent EUVs found a stockout rate of 28% in September 2012 and 18% in February 2014, indicating that efforts to improve the supply chain are having a positive effect. PMI will continue to procure 100% of the national need for SP in 2015 and is working very closely with local authorities and implementing partners to address remaining supply chain issues.

Other PMI-supported partners have promoted the provision of free LLINs to pregnant women at their first ANC visit; in practice, LLINs are often not given until the third or fourth month of pregnancy due to late initiation of ANC. PMI supported a multi-channel BCC strategy targeting pregnant women, women of childbearing age, and men, focusing on knowledge and perceptions related to MIP, women's awareness of risks of malaria during pregnancy, early and frequent ANC attendance at health facility, early use of IPTp in the second trimester, completion of the recommended two treatment courses of IPTp, provision of a free LLIN at the first ANC visit, and increasing demand for proper treatment of MIP.

### ***Progress during the last 12 months***

As noted above, Mali has experienced severe stockouts of SP in the past and this year PMI and its supply chain partners worked to improve procurement and distribution issues. At the central level, efforts were made to ensure sufficient quantities of SP were ordered and delivered in a timely fashion. Within Mali, supply chain partners worked to improve the distribution system down to the CSCOM level (see details in the pharmaceutical management section). The end result was a noticeable improvement in the availability of SP at the CSCOM level. The February 2014 EUV survey showed 18% of health facilities were stocked out of SP, down from 85% in

2011. However, supply chain issues continue to be a concern in Mali and PMI will work through its partners to address observed weaknesses.

During the MOP planning visit in June 2014, the PMI team convened a meeting of all MIP stakeholders in Mali. Participants included the NMCP, the Division of Reproductive Health, MRTC, NGOs, and donors. The focus of the meeting was the new WHO recommendations regarding IPTp dosing which were largely based on studies done by Malian researchers. The participants discussed the implications for Mali and developed an action plan to roll out the new recommendations and increase coverage of ANC and IPTp. This joint NMCP/RH working group has continued to collaborate over the past year (4 meetings in the past year) on training and supervisory activities. A second large stakeholders meeting was held in conjunction with the MOP Planning meeting in June 2015.

The major focus for MIP activities this year was the implementation of the action plan to roll out the new policy. Working through its implementing partners, PMI provided technical and financial support for the overhaul of the training modules (developed jointly by the NMCP and RH Division). Over the course of the year 161 trainers and 246 providers were trained in FANC (including MIP). In addition, 1,500 job aids for IPTp and 500 copies each of the Trainers Guide for FANC, reference manual, participant's notebook, and national training schedule were produced and disseminated nation-wide.

**Table 4: SP Gap Analysis Table**

<b>SP Needs and Contributions</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Estimated population of pregnant women (5% of total)	865,409	890,957	917,062
Total number of potential pregnant women attending ANC	571,170	712,766	733,650
Total SP needs	5,397,556	6,735,638	6,932,991
<b>TOTAL SP requirement for procurement (tablets)</b>	5,400,000	12,334,000*	7,159,000
<b>TOTAL SP requirement for procurement (Value)</b>	<b>\$163,842</b>	<b>\$374,227</b>	<b>\$217,212</b>
SP from other sources (MOH, Global Fund)	0	0	0
SP from PMI ( Quantity)	<b>5,400,000</b>	<b>6,000,000</b>	<b>6,000,000</b>
SP from PMI ( Value)	<b>\$163,842</b>	<b>\$270,000</b>	<b>\$250,212</b>

Assumptions: Approximately 5% of the population could become pregnant. The NMCP bases SP needs on three doses for each pregnant woman attending ANC. Assumption that 60%, 80%, and 80% (in 2014, 2015, 2016) of women in Mali will attend ANC sufficient number of times to receive 3 doses of SP. Total requirement factors in pipeline and 5% wastage rate.

\*The increased requirements for 2015 represent a request to ‘backfill’ the supply pipeline. PMI will only cover the doses actually needed, not this additional request.

### ***Plans and justification***

PMI will support the NMCP and MOH with its multipronged approach to MIP, including contributing to annual MIP commodity needs (LLINs and SP), improving facility-level FANC services and health provider practices through training and supervision, and promoting coverage of MIP interventions through community mobilization and BCC messages. PMI will continue to support dissemination of revised guidelines on IPTp and folic acid use in accordance with WHO recommendations and the refresher training of health care providers in this area. PMI will support early and frequent attendance of pregnant women at ANCs, and work with the MOH and other donors to ensure SP is available, used correctly, and provided free to pregnant women for IPTp. Through training of health providers in FANC to address barriers to implementation of IPTp and strengthening of the commodity system, PMI will continue to improve MIP services and increase IPTp rates. PMI will also support engagement and mobilization of pregnant women and the promotion of MIP services at the community level through traditional leaders, midwives, and coordinated and harmonized BCC activities.

### ***Planned activities with FY 2015 funding (\$700,000)***

**SP Procurement:** PMI will procure 2 million SP doses to cover the annual need for the estimated 900,000 pregnant women attending ANC in 2016, including handling and distribution costs. (\$250,000)

**Enhanced monitoring of IPTp3 rollout:** PMI will work with the NMCP and the Division of Reproductive Health to address the barriers to increased IPTp coverage that were identified in the 2012 assessment. This activity will include refresher training and supportive supervision, as

well as enhanced monitoring of the recording data on the new ANC cards, to provide evidence of increased uptake of ANC and IPTp3 following the interventions. (\$100,000)

**Strengthen FANC and MIP services:** PMI will continue to work with the NMCP and partners to roll out updated national guidelines that correspond with WHO's revised recommendations for IPTp administration at every ANC visit after the first trimester. PMI will support training of health providers to provide quality services to pregnant women at ANC visits including ensuring the provision of free SP for IPTp. PMI will work with partners, including the MOH Reproductive Health Division and the Midwives Association, to expand use of the in-service FANC training module and increase supportive supervision during IPTp implementation nationally through facility and community outreach activities. (\$350,000)

## CASE MANAGEMENT

### Diagnostics

#### *NMCP/PMI objectives*

Mali's case management policy is in line with WHO guidelines requiring that every malaria case should be laboratory confirmed before administering ACTs and that RDTs should be used to confirm the diagnosis where microscopy is not available. Microscopic diagnosis is performed in 4 national, 6 regional, and 60 district hospitals at a cost ranging between \$0.75-\$5 per blood smear. In addition to hospitals providing microscopy, some privately operated CSCOMs staffed with physicians and/or laboratory technicians also perform malaria microscopy. However, most CSCOMs do not have the capacity to do microscopy and rely on RDTs for malaria diagnosis. The RDTs are provided free of charge to children under five years of age and pregnant women and highly subsidized for other groups. However, RDTs will likely become free for all patients in the near future, following PMI-supported advocacy by the NMCP to make RDTs free. It is anticipated that the MoH will sign the new policy in mid-2014.

The National Institute of Public Health Research (*The Institut National de Recherche en Santé Publique* [INRSP]) is responsible for QC of all diagnostic services. With PMI funding, the institute has developed and finalized a QA/QC plan for malaria microscopy and RDTs. However, implementation of the plan was suspended after the military *coup* in March 2012.

#### *Progress since PMI was launched*

With FY 2013 funding, PMI procured more than 2 million RDTs for use at health facilities and by CHWs testing febrile children under five in the community. Since PMI's bilateral service delivery implementing partner finished operations in September 2013 and there was no implementing partner for most of FY 2012, no PMI-funded health worker training on RDTs took place from September 2013 to September 2014. Nonetheless, a recent end-use verification (EUV) survey conducted at 86 facilities in southern Mali in February 2014 found that 83% of health workers were trained in RDTs and 80% of lab technicians had been trained in microscopy.

At the time of the survey, 89% of health facilities had RDTs in stock, and 38% had a stockout of more than three days in the last three months.

Diagnostic confirmation of suspected malaria cases has increased substantially in the last few years: routine data show that 18% of suspected malaria cases were tested by microscopy or RDT in 2010, increasing to 32% in 2011, 52% in 2012, and 80% in 2013, according to weekly NMCP malaria data. A 2012 health facility survey found that about half of suspected malaria cases were diagnostically confirmed: 63% of children under five with suspected malaria were tested with either microscopy or RDT, while 47% of over-five patients with suspected malaria were tested at these facilities. The February 2014 EUV survey found that 57.9% of patients diagnosed with simple malaria were tested with RDTs before diagnosis. With the removal of fees for RDTs for all age groups and planned malaria case management refresher training supported by the Global Fund (see below), the percent of malaria cases that are diagnostically confirmed is anticipated to further increase.

### ***Progress in the past 12 months***

With reprogrammed FY 2014 funding, PMI is supporting the INRSP implement its QA/QC plan for microscopy and RDTs. PMI's implementing partner will work in close collaboration with NMCP staff to provide refresher training for microscopists and laboratory technicians on diagnostics and carry out supportive supervision at regional and district levels. PMI will support district-level staff in efforts to conduct supervision at CSCOMs below the district level. The Global Fund is also planning to support implementation of the QA/QC plan in late 2014, but the timing of their support is not yet clear.

### ***Gap analysis***

In spring 2014, malaria stakeholders convened in Bamako to carry out a gap analysis of key malaria commodities, including RDTs and ACTs. The Global Fund Round 10 grant, originally developed in 2009 but on hold due to fund mismanagement, was signed in 2013 and the Global Fund is now purchasing RDTs and other malaria commodities. It is anticipated that over the next several years, 86–98% of suspected malaria cases will be diagnostically confirmed, 18% by microscopy and 82% by RDT. The Global Fund is planning to finance all microscopy needs in 2015 and 2016.

The Global Fund has recently purchased a different brand of RDTs than is currently being used in country, due to miscommunication between the NMCP and Global Fund. Partners, including PMI, the Global Fund, and the NMCP are currently in discussions to try and determine the best way to proceed with orders for two different RDTs for Mali. During the quantification exercises, the Mali team anticipated that there would be a surplus of RDTs from 2014 that would carry forward to 2015 given the relatively long shelf life of the product.

**Table 5: RDT gap analysis, 2014-2016**

	<b>2014</b>	<b>2015</b>	<b>2016</b>
Malaria tests required at health facilities and in the community	3,033,756	3,726,257	4,086,541
Coverage of diagnostic tests	86%	97%	98%
% covered by microscopy	19%	18%	18%
% covered by RDTs	81%	82%	82%
Number of microscopy tests required*	592,641	685,708	788,119
<b>Number of RDTs required</b>	<b>2,592,803</b>	<b>3,226,862</b>	<b>3,502,749</b>
<b>Number of RDTs required, factoring in minimum stock requirements**</b>	<b>3,768,850</b>	<b>3,916,400</b>	<b>3,893,100</b>
RDTs covered by Global Fund (Round 10)	1,768,850	2,000,000	TBD
RDTs covered by PMI	2,000,000	2,000,000	2,000,000
<b>Surplus from previous year</b>		1,176,047	1,259,647
<b>Total RDTs planned</b>	<b>3,768,850</b>	<b>5,176,047</b>	<b>3,259,647</b>
<b>RDT gap (-)/surplus (+)</b>	<b>0</b>	<b>+1,259,647</b>	<b>- 633,453***</b>

\* Microscopy needs planned to be covered in entirety by the Global Fund.

\*\* The national guidelines recommend a minimum of 10 months of stock nationally (i.e., 6 months Central + 1 month regional + 2 months district + 1 month health facility). This was the minimum used for calculations.

\*\*\* This gap will be covered by the Global Fund New Funding Model.

### *Plans and justification*

To support the NMCP and sustain the trend of increasing malaria diagnostic confirmation, PMI plans to procure 2 million RDTs in FY 2015 to contribute to health facility and iCCM needs for the period of 2015-2016. It is anticipated that the remaining 1.9 million RDTs will be purchased by Global Fund, although PMI will remain flexible should the situation with Global Fund-purchased RDTs change.

PMI will allocate funding for refresher trainings and supportive supervision for laboratory technicians and clinicians so that INRSP's QA/QC plan for malaria diagnostics can continue to be supported. Staff from the NMCP will conduct joint supervision visits with INRSP staff to CSRef facilities and will work with CSRef staff to ensure they are adequately supervising CSCOM staff on malaria diagnostics (primarily RDTs).

### *Planned activities with FY 2015 funding (\$1,412,000)*

**Procurement of RDTs:** PMI will procure approximately 2 million RDTs to contribute to RDT needs at CSCOMs and to supply ASCs as part of the national iCCM strategy. The Global Fund

will also be contributing to RDT needs to fulfil the estimated 3.9 million RDTs needed in 2016. (\$1,000,000)

**Quality assurance/quality control for diagnostics:** PMI will support the NMCP and INRSP to implement QA/QC for microscopy and RDT diagnostics, including refresher trainings and regular supervisory visits.

The plan will support regular trainings of two technicians per CSRef (district-level hospital) for a total of approximately 146 microscopy technicians. The plan will also include QA/QC for the CSCOM and the CHW level as well to ensure good quality malaria diagnostics at all levels of the health system (\$400,000)

**Technical assistance on diagnostics:** A CDC laboratory technician or epidemiologist will provide technical assistance to assist in implementation of the QA/QC plan throughout the health system down to the community level and recommend best practices for the plan's implementation. (\$12,000)

## **Treatment**

### ***NMCP/PMI objectives***

The MOH revised the national policy for the treatment of uncomplicated malaria to make AL the first-line drug in 2010. As per national directive, ACTs are free to children under five years of age and pregnant women in the second and third trimesters. Mali's malaria case management guidelines were recently updated to specify injectable artesunate as the first-line treatment for severe malaria, with intravenous quinine and injectable artemether as alternatives. In practice, however, health centers typically use whatever severe malaria medication is available.

### ***Progress since PMI was launched***

The NMCP and MRTC initiated supervision of malaria case management practices in 2010 starting with Bamako and transitioning to other regions. These visits cover district referral health centers (CSRefs), where the team provides training of trainers to district health leads to provide supervisory support in their specific district. The team uses supervisory tools developed in collaboration with NMCP, PMI, MRTC, and malaria partners to focus on the proportion of suspected malaria cases tested, adherence to test results when prescribing ACTs, and improving care of patients with severe febrile disease. Malaria supervision guidelines were updated in February 2012 and include supervision of outpatient consultations at health facilities, antenatal consultations, and CHW visits.

With PMI funding, the malaria case management guidelines were recently updated, including changing the first-line drug for severe malaria to injectable artesunate, although health workers have not yet been trained on these. A 2012 health facility survey showed poor performance of health workers on treatment of severe malaria, and problematic routine data given an implausibly high percentage of severe malaria cases diagnosed. Training and supervision of health workers at facilities have been slow in the last few years due to temporary suspension of activities after a

military coup in March 2012 and a gap in PMI case management activities at the health facility due to a lag between implementing programs close-out and start-up. The Global Fund has committed to funding malaria case management refresher training of health workers nationwide, although it is unclear when this training will begin.

A PMI-supported national health facility assessment in 2012 found good availability of ACTs at health facilities, with 92% of facilities surveyed having ACTs in stock. However, an EUV survey from February 2014 found that facilities had on average 70–80% of various AL doses in stock. The EUV also found that only 69% of uncomplicated malaria cases were correctly treated with an ACT, with quinine tablets (4%), injections (15%), and monotherapy (6%) making up the largest percentage of incorrectly treated patients.

Poor access to care – due to geographic and economic constraints – is a major challenge for malaria treatment in Mali. The 2012 DHS showed that only 21% of children under five years of age with fever were treated the same day or the day following symptom onset. With approximately 1,301 CSCOMs in the country in 2013, about 90% of the population has geographic access to public health services according to WHO standards (living within 15 km of a first-line health facility) but only 57% live within 5 km of a health facility. All patients must pay consultation fees and patients five years and older must pay fees for malaria diagnostics and drugs, though these are subsidized. A health financing task force has been set up to examine issues related to user fees for primary care in Mali, a complex issue with a long history dating back to the Bamako Initiative in 1987 that set up revolving drug funds at CSCOMs. An updated national health financing policy and strategy was adopted in February 2014, which outlines a strategy to increase the proportion of the population covered by insurance from 6% in 2011 to 45% in 2023, primarily through expanding *mutuelle* insurance for the informal sector.

To overcome geographic barriers to health services, the MOH adopted an integrated community case management (iCCM) package in February 2010 that includes treatment for malaria, diarrhea, pneumonia, and malnutrition; essential newborn care; and family planning. Free malaria treatment for children under five is provided by trained ASCs (though patients must pay a consultation fee) and includes malaria diagnosis with RDTs and treatment with ACTs, although diarrhea and pneumonia medications are not free. Severe cases are referred to CSCOMs. ASCs are paid a salary of approximately \$100 per month, and various donors are currently supporting ASC salaries in different regions. One of the NMP's major concerns is securing continued donor funding for ASC salaries. In 2014, the Global Fund committed to paying 50% of the salary costs of the iCCM program through its agreement with the government of Mali. In addition, the GOM is also revising its community strategy (called 'SEC' locally), to reduce donor costs and to incorporate cost recovery into the program with a goal of sustainability over the long term. Mali currently has about 2,300 trained ASCs who are functional in five of the eight regions of the country in the south, where more than 90% of the population lives. However, there is a need for additional ASCs and many posts are currently unfilled. ASCs work in collaboration with volunteer *relais*, community members who assist in community mobilization and behavior change communication. An external evaluation completed in May 2014 found that iCCM was well integrated into the health system of Mali and effectively coordinated by partners, although utilization was still low, due in part to financial barriers.

The total population in the three regions for iCCM in 2016 is projected to be 9,080,060, of which 1,539,978 will be children under five (the targeted group for iCCM). The number of children treated for malaria by the CHWs was 54,967 in 2012 and 43,267 in 2013. In 2016, PMI will contribute to cover more regions and districts through the mission's integrated program with financial supports from other health programs including Maternal and Child Health, Family Planning and nutrition/water, sanitation, and hygiene.

In the new 2013–2017 Malaria Strategic Plan, Mali introduced SMC (providing four rounds of SP and amodiaquine for children under five years of age) as a key malaria control intervention. Following a successful pilot of SMC in Koutiala District (in the Kayes Region) by MSF in 2012, which showed a 42% reduction in malaria cases, the NMCP has developed a plan to implement SMC in all districts of Mali, although scale-up will depend on donor funds and may likely be piecemeal. In 2013, 5 of Mali's 60 districts were covered by SMC, and 10 are slated to have SMC in the 2014 transmission season, including 6 districts covered by UNICEF, 1 by PMI, 1 by World Vision and 1 by MSF. The NMCP has purchased enough SMC drugs for use in more than 20 districts, although partners have funding for implementation in only 10 districts in 2014. Over the next several years, SMC will likely be scaled up, as CRS was recently awarded a large 3-year grant from UNITAID to implement SMC in Mali, starting with implementation in more than 20 districts in 2015.

#### ***Progress during the last 12 months***

In the past year, PMI procured 1.5 million ACTs and 400,000 vials of injectable artesunate (enough for about 50,000–70,000 severe malaria treatments, depending on the age group). PMI has been supporting iCCM implementation, including initial and refresher trainings and regular supervision, in all districts of Kayes, Koulikoro, and Sikasso Regions. In the last year, PMI supported training for 426 ASCs in these regions. From May 2013 – April 2014, ASCs treated approximately 43,267 children with malaria. According to a recent assessment conducted by MCHIP in four PMI-supported districts, caregivers cited financial barriers as a primary deterrent to using ASCs, and as a result, ASCs in MCHIP areas reduced consultation prices, the money from which goes to community oversight committees, from 300 CFA (~ \$0.62) to 100 CFA.

PMI will support a therapeutic efficacy study (TES) in 2014-2015 using FY 2014 funding. PMI guidance recommends performing a TES every two years for each site, and thus TES funding is not included in this FY 2015 MOP. TES will be funded again in the FY 2016 MOP.

In 2014, PMI funded the implementation of SMC in district of Kita in the Kayes region, which has approximately 100,000 children ages 3–59 months (eligible for SMC). With FY 2014 funding, PMI will support SMC in three districts in the region of Kayes. PMI is also supporting an operations research project to evaluate the effectiveness of routine roll-out of SMC in Kita district, including estimates of SMC coverage, adherence, costs of implementation, and impact on parasitemia and malaria morbidity and drug resistance. The study will cover two years of SMC implementation beginning in 2014.

## Gap analysis

In spring 2014, malaria stakeholders in Mali, including the NMCP, Global Fund, PMI, and others met to conduct a quantification exercise for malaria commodities. Based on this exercise, the group determined needs and commitment for ACTs. Funding for ACTs will be provided by the Global Fund and PMI. The exercise did not include quantification of drugs for severe malaria. The number of cases of severe malaria reported in the SLIS in 2013 was 700,733. However, these cases were not systematically confirmed with malaria diagnostics and likely represent an overestimate of the true number of cases of severe malaria. No other donors have committed to funding drugs for severe malaria.

**Table 6: ACT gap analysis, 2014-2016**

	2014	2015	2016
<b>Number of cases of uncomplicated malaria</b>	<b>1,747,309</b>	<b>1,693,275</b>	<b>1,643,874</b>
Proportion of cases treated at:			
Health centers	94%	94%	94%
Community level	6%	6%	6%
Private sector	0	0	0
Number of cases at:			
Health centers	1,642,471	1,591,678	1,545,242
Community level	104,839	101,596	98,632
Private sector	0	0	0
<b>ACTs needed (including wastage*</b>	<b>2,577,641</b>	<b>2,219,533</b>	<b>2,014,017</b>
<b>ACTs needed, factoring in pipeline requirements**</b>	<b>3,879,348</b>	<b>2,272,510</b>	<b>1,905,839</b>
ACTs covered by Global Fund	2,354,388	1,410,994	TBD
ACTs covered by PMI	1,500,000	1,200,000	1,500,000
Surplus from previous year			+338,484
<b>Total ACTs planned</b>	<b>3,854,388</b>	<b>2,610,994</b>	<b>1,838,484</b>
<b>Gap (-) or Surplus (+)</b>	<b>-24,960</b>	<b>+338,484</b>	<b>- 67,355***</b>

\* ACT needs for facility and iCCM are based gap analysis exercise led by SIAPS in spring 2014 with input from malaria partners.

\*\* Preferred level of 19 months of stock nationally was used to calculate ACT needs. This 19-month pipeline factors in minimum and maximum desired stock levels at central, regional, district, and health facility levels, along with a six-month interval shipping from the central warehouse.

\*\*\* This gap will be covered by the surplus from 2015 and the Global Fund New Funding Model.

## Plans and justification

With FY 2015 funding, PMI will continue to procure ACTs for malaria case management at health facility and community levels. In addition, PMI will procure sufficient quantities of injectable artesunate for meeting national severe malaria treatment needs. Although routine data

estimate about 700,000 cases of severe malaria per year treated at health facilities, this is likely vastly overestimated (due to inconsistent definitions across reporting mechanisms) and is probably no more than 150,000, given the 1.6 million cases of uncomplicated malaria treated at facilities annually.) PMI will continue to provide support for refresher trainings and supervision on malaria case management at the health facility level, continuing support initiated with FY 2014 funds.

PMI will continue to support implementation of the full package of iCCM in three regions: Sikasso, Kayes, and Koulikoro, including support for training and supervision. PMI will also support implementation of SMC in 10 districts in these regions, covering an estimated 800,000 children with four rounds of treatment with SP+amodiaquine during the high-transmission season. Funding will cover purchase of SMC drugs as well as implementation. Additional funding has been set aside in the M&E section to enhance monitoring in SMC districts. Finally, PMI will support strengthening of pharmaceutical quantification and management in Mali through support to the NMCP and close coordination with the Pharmacie Populaire du Mali (PPM). PMI will also support two end-use verification surveys to monitor commodity stocks at health facility levels.

***Planned activities with FY 2015 funding (\$7,030,000)***

**Treatment for uncomplicated malaria:** PMI will procure 1.5 million AL treatments to contribute towards treatment needs at health facilities and for iCCM. (\$1,500,000)

**Treatment for severe malaria:** PMI will procure 125,000 treatments of injectable artesunate for treatment of patients with severe malaria at CSRef (and selected CSCOM) levels. The estimated annual need is for more than 600,000 cases of severe malaria, according to routine reporting, but this is likely a large overestimate given over-diagnosis of severe malaria in Mali (\$1,000,000)

**Training and supervision for malaria case management:** After training health personnel at all levels in case management, PMI will continue to support the NMCP to conduct quarterly supervisory visits in order to maintain and strengthen the quality of services at multiple levels of the health delivery system. Particular emphasis will be placed on training and supervision for severe malaria case management. PMI will support improved and increased malaria diagnosis and case management in collaboration with the NMCP at national, regional, district and community levels. Both supervision and training on diagnosis and case management are provided in an integrated fashion, targeting about 1,620 out of 4,300 health workers nationwide. (\$750,000)

**iCCM implementation:** PMI will support iCCM implementation in all districts in Sikasso, Kayes, and Koulikoro Regions; while other donors, including UNICEF, Global Fund as well as the GOM, will provide support for iCCM activities in the other targeted regions. PMI support for iCCM includes continued support to the malaria/fever component of the iCCM package, with new and refresher trainings at district levels, supportive supervision, training in appropriate RDT use, evaluating ASC performance with RDTs, monitoring and evaluation, and provision of ASC materials and supplies. PMI will support ASCs to provide appropriate health communications

and BCC messages to encourage understanding and adherence to current treatment algorithms. PMI will continue to support the NMCP to coordinate all community health implementing partners to ensure that community health materials (e.g., training modules, job aids, motivation/incentive packages, per diem rates, supervision protocols, and key messages) are reviewed and standardized across partners. (\$1,000,000)

**Implementation of SMC:** PMI will support the implementation of SMC in 10 districts of Kayes region, expanding from three PMI-funded districts with FY 2014 funding. PMI will procure SP and amodiaquine for four rounds of treatment for children under five as well as cover additional implementation costs, including ASC training, supervision, and other support. Depending on the districts chosen, the SMC will cover approximately 800,000 children under five. (\$2,780,000)

## **Pharmaceutical Management**

### *NMCP/PMI objectives*

*Supply chain management:* The People's Pharmacy of Mali (*Pharmacie Populaire du Mali* [PPM]) manages medicines for Mali's primary health care system and plans to grow and cover more of Mali; reach more users; and reach international standards of warehousing, supply chain, and medicine provision. The PPM procures drugs through international tender from qualified suppliers and distributes them to the nine administrative regions. The PPM has five regional warehouses in the regions of Kayes, Koulikoro, Sikasso, Segou, and Mopti and three offices in Koutiala, Tombouctou, and Gao. An office is planned for Kidal, but is delayed due to high insecurity. PPM delivers all commodities from the central level to the regional level but does not have the capacity to ensure reliable transportation of commodities to the community level.

The supply chain system is a combination of push and pull as the central level pushes down to the regions, the community health center staff pulls health commodities from the district pharmacies, and CHWs obtain their health commodities from the community health centers (CSCOMs). Although the districts are responsible for collecting commodities from the regional level, at times PMI has asked PPM to deliver directly to the districts for immediate supply at lower levels. The regions order monthly from the central level, whereas hospitals are on an automatic system of quarterly ordering. The district pharmacies purchase drugs from regional depots based upon monthly orders from health facilities (CSREFs and CSCOMs) and on the average number of drugs expected to be distributed within the district's catchment area. The PPM distributes malaria commodities per the distribution plan developed by the NMCP with the assistance of partners. However, the development and timeliness of distribution plans and coordination with the PPM still needs improvement as commodities often sit at the central level for long periods of time without a distribution plan while regional and district levels remain low on or out of stock.

If a drug is unavailable in the regional PPM stores, private pharmaceutical warehouses can fill orders. Ideally, the CSOMs keep one month of buffer stock and the regional drug depot (*dépôt répartiteur des cercles*) keep minimum two months and maximum four months. However, there are significant problems with drug storage at district depots related to storage capacity, humidity, security, and drug classification in warehouses. While CSCOMs must collect all required drugs

from the district pharmaceutical depots, there is no central funding to support the transportation and logistics and often the districts are stocked out or waiting for their request to be filled. The pull portion of the system still proves to be a great challenge, and commodities often do not reach the lowest levels of the health system.

Multiple problems plague the Malian supply chain system and hamper the ability to maintain adequate supply. There is a lack of communication informing the district and community levels of the arrival of commodities at the central or regional level. At the CSCOM level there is limited funding to pay for transportation to pick up needed commodities, leading to stockouts, even when there is available stock in country. A key problem at the foundation of supply chain management is an overall weak understanding of how to develop proper quantifications, order stock, and hold stock at the lower levels. Finally, the Bamako Initiative has created a governance issue that directly affects the provision of malaria commodities by creating disincentives. Pregnant women and children under five are supposed to receive ACTs for free under the Bamako Initiative; however adult medicines and other malaria medicines require payment to create a profit that is intended to support the supply chain system. Unfortunately, this has led to a disincentive for providers to order or offer free medicines as there is no financial gain. The negative incentive to request or prescribe free drugs has led to real and artificial stockouts. The MOH and partners have begun discussions around the financial incentives issue to find a way to address the unintended consequences.

*Regulation and drug quality:* Several ministerial decrees provide guidelines for the management of pharmaceuticals in Mali. These include the formation of a national committee to oversee pharmacy retailers responsible for QC, inspection, and licensure and ensuring a basic package of pharmaceutical products. New standard operations procedures for pharmaceutical management were developed, but they need to be adhered to as there still appears to be minimal capacity, particularly at the lower levels of the health system. The National Essential Drug List is reviewed biannually. Laws are in place to ensure QC for imported drugs. The Directorate of Drugs and Pharmacies (*Direction de la Pharmacie et du Médicament* [DPM]) issues visas and imports licenses only after the exporter meets certification and other requirements. The National Health Laboratory (*Laboratoire National de la Santé* [LNS]) samples drugs, verifies quality, and has regulatory authority to monitor pre- and post-market quality of drugs and other products, including insecticides and bed nets. The LNS checks the quality of all commodities that arrive at the PPM (except PMI commodities which have already gone through independent QA testing). Expired or poor quality medicines are destroyed at the national level, however there is no adequate incinerator and medicines are still burned out in the open, but far from population. DPM, the National Health Laboratory, and customs meet quarterly to discuss regulations and importation or donation of medicines.

*Pharmacovigilance:* Pharmacovigilance remains a priority of the NMCP and the MOH. The Pharmacovigilance Department at the DPM has developed an action plan, adverse events notification form, and timetable. The plan has been implemented and trainings on adverse events notification and reporting have been conducted up to district level in all the regions except for Kidal Region. Adverse events reporting forms have been distributed to all public health facilities.

### *Progress during the last 12 months*

During the past year PMI continued to provide a majority of malaria commodities, however the Global Fund grant was reinstated and some Global Fund commodities have begun to flow into the country. The delay in the procurement and arrival of the previously planned Global Fund commodities resulted in some issues with coordination and accurate quantification that will need to be improved. To facilitate regular distribution of commodities, PMI supported the PPM to improve distribution of malaria commodities to the district level. The Essential Medicines Supply and Distribution Plan was fully disseminated at the central and regional levels while assistance continued to the NMCP and MOH in the areas of strategic plan preparation and review, the development of commodity distribution plans and quantification and forecasting. As a follow-up to the previous logistics management information system (LMIS) assessment and recommendations there was a redesign of the LMIS with new standard operating procedures; 7 managers, 24 trainers, and 228 users were trained in the new system. In addition, 12 members of the quantification working group were trained in the quantification software Quantimed and PipeLine. The national technical coordination committee, started in the previous year, is now a functioning body. The EUV survey revealed some weaknesses in the supply chain system and pharmaceutical management capacity as there were high stockouts or overstocks, poor reporting, and little knowledge of the area of work required. However, some adjustments in procurement plans were made accordingly to redistribute commodities and take corrective actions to swap areas with overstock to those stocked out.

There are still many persistent problems plaguing the Malian supply chain system and management of pharmaceuticals. Data quality and analysis is poor, storage guidelines are not followed, and proper storage amenities or capacity is lacking at most levels. Distribution plans are often late or not well communicated between the different levels and transportation abilities between the district and community level is minima. In combination, these factors lead to frequent stockouts. Monitoring stock closely and continuing to improve stock availability at all distribution levels remains a key challenge and area for improvement.

### *Plans and justification*

PMI will continue to strengthen supply chain, logistics and pharmaceutical management including forecasting, quantification, training, supervision and monitoring stocks and malaria commodity needs/gaps. PMI will work with the NMCP, MOH, and appropriate partners for improved coordination to ensure that essential life-saving drugs, including ACTs and RDTs, reach the end user. Support to the PPM in delivering malaria drugs and commodities to the regional depots will continue. PMI will continue to support the coordinating committee led by the DPM with the participation of the NMCP, PPM, and supply chain partners to improve the quantification and distribution of malaria commodities. PMI will also contribute to strengthening the LMIS system for better data availability and use for decisions making.

### *Planned activities with FY 2015 funding (\$600,000)*

**Logistics strengthening:** PMI will continue to facilitate distribution of PMI-funded RDTs and ACTs and provide technical assistance for pharmaceutical management, including forecasting

commodity needs; distribution at central and district levels; and improved coordination between the NMCP and PPM, through organizations such as the national medicines body. Pharmaceutical and supply chain strengthening activities will include training and supervision in pharmaceutical management, national guidelines, quantification and monitoring of key antimalarial commodity availability at the national, district, facility, and community levels. At the national level, the EUV tool and the Procurement Planning and Monitoring Report of Malaria will continue to be tools for decision making. (\$500,000)

**End-use verification survey:** PMI will conduct two EUV surveys to track essential commodities at the health facility level (\$100,000)

## **BEHAVIOR CHANGE COMMUNICATIONS**

### ***NMCP/PMI objectives***

PMI supports harmonization of the national BCC strategy, ensuring consistency of messages and appropriate use of all communication channels and target audiences. An updated national BCC strategy for the period of 2014- 2018 was finalized in February 2014. The new strategy aims to support the key malaria control interventions through targeted messaging around appropriate behaviors. It has a set of core indicators focused on targeting behaviors. The current national strategy specifically mentions BCC messages targeted to vulnerable groups including pregnant women and children under five, as well as families and caretakers of children, CHW[ASCs], and the *relais*. The strategy also mentions key delivery channels for disseminating BCC messages such as radio, TV, mass media, social marketing and interpersonal communications. Mali's communication strengths lie in established networks of traditional members of the community who deliver messages, and the ASC network and radios are widely used. The PMI-supported partners will coordinate their BCC activities with the NMCP and the National Center for Information, Education, and Communication for Health and will work with these partners to implement the new BCC strategy. The national BCC strategy also benefits from the support of the Global Fund, UNICEF, MSF, and other partners.

Mali has high levels of ITN ownership and use. According to the 2012-13 DHS, 84.4% of households own at least one ITN. Among people living in those households with an ITN, 70.6% slept under the ITN the night before the survey. This can be further broken down to 78% of children under five and 83.8% of pregnant women who lived in a house with an ITN, slept under an ITN the night before the survey.

### ***Progress during the last 12 months***

In addition to finalizing a new harmonized, nation BCC strategy PM continued to target BCC activities at community level through the *relais* and ASCs. These community cadres disseminate malaria prevention and control messages, conduct door-to-door health promotion visits, check the status of LLIN use, and target IPTp messages to pregnant women. According to the 2012 DHS, LLIN use is quite high (70% of children under five and 75% of pregnant women slept under an ITN the previous night). PMI continued to support the dissemination of a variety of pre-

tested counseling materials and radio spots in local languages, as well as facilitated interpersonal communication through community groups.

Mass media: National Television (ORTM) and community Radios; a network of 115 local radios all over 8 regions and Bamako. From October 2012 to September 2013, 23,271 radio messages were delivered via radio and TV.

Mid-media (SMS messages): From October 2012 to September 2013, 8 million Orange customers received 3 times mobile messages focused on LLIN and malaria prevention supporting the National Malaria Day sensitization activities.

Inter-personal communications (hotlines): Keneyako (80 00 28 28) is a dedicated free hotline available Monday through Friday via which rural and urban populations are informed on malaria prevention strategies and referred to health facilities for assistance. From October 2012 to September 2013, 392 malaria related calls have been recorded.

Innovative approaches/promising practices based on the implementation of BCC activities in the past year: A real improvement has been made to design mass media messages. The integration of innovative mobile SMS messages into the traditional channels list is a good thing. Through this technology, malaria related information is basically disseminated to the large number of targets all over the country.

PMI targeted BCC approaches through various channels to reach different populations (e.g., women's groups, community leaders, traditional healers etc.) and SMS technology. During the annual World Malaria Day, PMI partners disseminated malaria BCC messages on consistent net use, necessity of malaria diagnostic confirmation using RDT or microscopy, and IPTp.

### *Plans and justification*

PMI will support harmonization of messages and BCC activities at all levels to ensure consistency in technical messages and appropriate targeting of audiences. PMI will ensure that BCC activities for LLINs, MIP, and case management are implemented as an integrated approach under one program. PMI will work with other partners to explore ways to promote desired behavioral outcomes in alignment with the new National BCC strategy and new National Malaria Control Strategy and the new USAID integrated health BCC program. PMI and partners will support alternative delivery channels for targeted BCC activities and messages including youths and schools, women's groups, community leaders, and traditional healers while reviewing which approaches prove the most successful. PMI also intends to assist implement the new national BCC strategy, working closely with the NMCP and the National Center for Information, Education, and Communication for Health.

### *Planned activities with FY 2015 funding (\$625,000)*

**BCC for LLINs:** Support for BCC activities will reinforce the correct use of mosquito nets throughout the year. While reported net usage is high during the high transmission season, efforts are needed to sustain usage during the low transmission season. Continuing to address the

remaining barriers to correct hanging, use, and maintenance of nets and promoting year-round use is important to help meet NMCP and PMI goals. PMI will support targeted BCC messages to those who still do not use nets or are using nets seasonally, as well as encourage net repair and proper care and washing of a net. PMI will support multichannel strategies to communicate this information, including door-to-door messages disseminated by ASCs and *relais* in their communities. BCC coordination among PMI and implementing partners at the national and community levels is critical in order to ensure correct and consistent use of nets, uniformity of messages, regular monitoring, and subsequent reorientation as needed which will be more easily implemented under the new strategic plan and under the new USAID/Mali BCC program. PMI will support BCC activities following the rolling LLIN distribution campaigns to increase the use of newly distributed nets by all age groups. (\$200,000)

**BCC for MIP:** PMI will support a multichannel strategy targeting pregnant women, women of child bearing age, and men, focusing on knowledge and perceptions related to MIP, women's awareness of risks of malaria during pregnancy, early and frequent ANC attendance at the CSCOMs, early use of IPTp in the second trimester, routine dosing with IPTp at every ANC visit, ensuring that LLINs are given free to pregnant women at their first ANC visit, and creating demand for proper treatment of MIP. These BCC activities will also include messaging for direct observation of SP administration for both health workers and pregnant women. PMI will continue to link BCC activities with other health sector messaging where appropriate. PMI will also support implementation of the new national BCC strategy, working closely with NMCP and the National Center for Information, Education, and Communication for Health, to reflect the new WHO IPTp policy recommendations. (\$225,000)

**BCC for case management:** PMI will continue to support the dissemination of BCC messages related to case management through mass media and interpersonal communication and to harmonize malaria prevention and treatment messages. The strategy will promote early care-seeking for febrile children and compliance with treatment regimens. The ASCs and *relais* will also educate caregivers on signs of severe malaria that require prompt referral. PMI will support implementation of the new national BCC strategy, working closely with NMCP and the National Center for Information, Education, and Communication for Health to develop and implement communication approaches and messaging on malaria case management. (\$200,000)

## MONITORING AND EVALUATION

### *NMCP/PMI objectives*

Monitoring and evaluation is a key component of Mali's national malaria strategy, and the NMCP is focused on ensuring there is a coordinated plan for malaria data capture to inform programmatic interventions and measure outcomes and impact. A national malaria M&E plan covering the years 2007-2011 was developed, costed, and adopted in 2008, and an updated M&E plan for 2013-2017 has been developed. The current plan includes routine data collection and analysis through the national health information system, or SLIS; a system for epidemic surveillance and response (still in development), a re-invigorated sentinel surveillance system; and periodic national surveys to evaluate malaria prevention and treatment activities. PMI

supports the NMCP's M&E strategy through its continued support for routine system strengthening, ESR, cross-sectional surveys, and internal M&E capacity building. While the general strategy itself has not changed, with the recent political events there is an increased emphasis on improving epidemic surveillance in the northern regions of the country and improving the quality and timeliness of routine data across the country.

The NMCP's Planning and Statistical Unit oversees all M&E activities, in close collaboration with health training and research institutions. Within the NMCP, the Division of Planning and Monitoring & Evaluation is tasked with developing operational plans and monitoring and evaluating program implementation. A second NMCP unit, the Division of Epidemiological Surveillance and Research, is in charge of promoting research on malaria, establishing an early warning system to detect and respond to malaria epidemics, and supporting operational units in epidemic response.

### ***Progress since PMI was launched***

*Routine System Strengthening:* Mali's M&E system relies on malaria data collected routinely through the SLIS, but the quality of these data is variable and feedback is not delivered in a timely manner to assist program planning and management. SLIS data are compiled every three months and reported annually. These data theoretically include both confirmed and unconfirmed cases, but diagnostics are not systematically implemented. The 2013 data from the SLIS, shows that on average 80% of malaria cases are confirmed in Mali, with the highest rate of confirmation in Segou Region (93%). The NMCP with support from the MOH has made a number of small-scale efforts to collect the number of confirmed malaria cases on a weekly basis; however, these efforts are not comprehensive and the data cannot currently be used to generate national-level indicators for malaria prevalence. In some cases the data are used at the local level for program monitoring efforts such as tracking the effectiveness of IRS campaigns. The NMCP hopes to increase the health system's capacity to collect, analyze, report, and use these data for programmatic decisionmaking.

PMI has supported enhancements to the malaria portion of the routine information system for several years to increase the timeliness and quality of the malaria component of the SLIS. These enhancements included revisions to the reporting forms for the malaria sections, conducting training and supervisory activities, improving the technology infrastructure, and implementing an SMS reporting system in selected districts. In the most recent 6 months for which data are available, more than 95% of targeted facilities reported each month, and facilities using tally sheets decreased their compilation time from 15 hours to 4 hours per month. In FY 2013 and FY 2014, the system was expanded to two new provinces, and a mobile data transmission system (using SMS) was implemented in selected districts. The system allows the NMCP to have access, via a website, to monthly data on epidemiologic indicators for each of the implementation districts. In the upcoming year, the NMCP plans to expand this system to other districts and eventually to other disease areas as an enhancement to the SLIS system. The emphasis will be on IRS and SMC districts in order to better monitor the reductions in morbidity and mortality brought about by those interventions.

*Household Surveys:* Population-based surveys currently provide the most accurate data on malaria intervention coverage and malaria biomarkers (i.e., anemia and parasitemia). Following

a DHS in 2006, a national anemia and parasitemia (A&P) survey conducted with PMI support in 2010 during the peak transmission period (Sept.-Oct.) provided the first parasitemia measures in Mali (see below for national estimates of anemia and parasitemia). A DHS including parasitemia biomarkers was conducted in 2012, and a health facility survey, which provided data on the quality of malaria case management and antenatal care, was also conducted in the high transmission season in 2012. The final results of the 2012 DHS show that 84% of households own at least one ITN and 69% of children under five slept under an ITN the previous night, roughly the same coverage levels as in seen in the 2010 A&P survey. Among women who had given birth in the last two years, 20% had received at least two doses of IPTp during their pregnancy. The proportion of children under five with fever in the last two weeks who received ACT treatment within 24 hours was quite low at 9%. While ITN coverage remained very high in Mali, the survey results for biomarkers of malaria and anemia were disappointingly high as well. Results reflect high transmission season estimates and showed that 52% of children 6-59 months of age were parasitemic by microscopy and 9% had severe anemia (hemoglobin <7g/dL). The high levels of both parasitemia and anemia, despite high intervention coverage, are concerning. It is possible that these high rates are related to factors outside of the malaria control program such as the higher than usual rainfall in the year of the survey and the influx of displaced persons from the north.

#### ***Progress during the last 12 months***

In 2014, PMI supported an evaluation of the SLIS system using the PRISM method. The focus of the assessment was to evaluate the quality of the data and the degree to which it is used at various levels for decision-making purposes. The findings are intended to contribute to the ongoing efforts to improve the SLIS as a data collection and reporting system. The final report listed a number of recommendations for both the short and long term, which are being used to make adjustments in the existing system and to inform plans to enhance the routine reporting system nation-wide.

PMI also supported the expansion of the enhanced routine reporting system from 10 districts in the center of the country, to an additional 8 districts in the region of Mopti. Mopti was chosen for this expansion due to the influx of displaced persons from the north and the potential for outbreaks as the move into a malaria endemic area. PMI also supported an initial assessment visit to develop the epidemic and response capacity in the Mopti Region. Taken together, the improved routine reporting and the epidemic surveillance system, when it is functional, will allow for more rapid outbreak detection and response in this critical region.

The table below shows the main sources of data and sequence of surveys for malaria program monitoring and impact evaluations.

**Table 7: Data Sources for Monitoring and Evaluation in Mali, 2006 – 2016**

Data Source	2006-2009	2010	2011	2012	2013	2014	2015	2016
Household Surveys	DHS (2006)	MICS		DHS (preliminary results available, final pending)			MIS	
		A&P Survey						
Other surveys			RTI IRS Coverage Survey	EUV	EUV	EUV	EUV	EUV
				ATN Coverage survey	ATN Health Facility Survey 2013			
Surveillance and Routine Support	HMIS	HMIS (incl: enhanced reporting from 10 districts)	HMIS (incl: enhanced reporting from 10 districts)	HMIS (incl: enhanced reporting from 10 districts)	HMIS (incl: enhanced reporting)			
					ESR pending for North			
OR/Other data sources		IRS Study on transmission delays	Barriers to IPTp Study	Culture of net use study	Dual insecticide study	SMC Evaluation	SMC Evaluation	
		Larviciding study	Health financing for case management study			Net durability study	Net durability study	

DHS = Demographic and Health Survey; MICS = Multiple Indicator Cluster Survey; A&P = Anemia and parasitemia; MIS = Malaria Indicator Survey; EUV = End use verification; ATN = Assistance Technical National, bilateral nongovernmental organization; HMIS = health management information system

***Plans and justification***

Following democratic elections in Mali, the PMI program has rapidly regained ground that was lost during the crisis. M&E activities play an integral role in responding to established PMI needs for program monitoring and impact assessment. The major focus of M&E activities in 2015 will be the continuation of the enhanced routine information system in existing sites and an expansion to IRS and SMC districts. An improved HMIS in these districts will allow the NMCP to monitor trends in epidemiologic indicators in these zones of high intensity interventions. The routine system strengthening activity will also expand the use of SMS for more timely and accurate reporting of data. To further understand the results of IRS and SMC implementation at district level, PMI will support an assessment of key program and HMIS data from selected districts as the interventions are rolled out. The findings from this assessment will serve to inform both the IRS strategy and the national rollout of SMC activities.

In addition to the improvements to the HMIS, PMI will continue support the development of an Epidemic Surveillance and Response system in Mopti and the Northern Provinces. The civil unrest in the north of the country has forced a large number of the population to move into the

Mopti region, where exposure to malaria is much greater than they experiences in their home districts. This influx of displaced persons creates a need for a strong epidemic surveillance and response system in Mopti. The political issues in the north have also destabilized the health system in those provinces as health care providers have fled south and basic commodities are not able to arrive at northern facilities. PMI aims to ensure that malaria outbreaks in these regions will be detected quickly and that staff and commodities for an immediate response are available.

With 2015 funds, PMI countries are encouraged to conduct ITN durability assessments linked to nets distributed through mass campaigns. In Mali, PMI has been supporting an OR study of the effectiveness of dual-insecticide treated nets for the past two years. With 2015 funds PMI proposes to add a component to assess the durability of the four types of nets used in the OR study. These data will provide additional information to the NMCP and PMI regarding replacement strategies for different types of nets in the future.

In 2015, PMI is planning a malaria indicator survey (MIS) to assess progress in key monitoring and impact indicators.

***Planned activities with FY 2015 funding (\$1,462,000)***

**Support for 2015 national household survey:** PMI recommends that countries track coverage and impact through national-level population-based surveys every two years. Mali conducted a DHS in late 2012 to measure coverage of major interventions. This DHS also included parasitemia and anemia measurements to assess impact. The next household survey, an MIS, is planned for calendar year 2015. Funding for the survey is split between FY 2014 and FY 2015. (\$500,000)

**Routine system strengthening:** PMI supports improvements in the M&E system at the CSCOM and CSREF levels in Mali to improve malaria data quality and use. In FY 2015, PMI intends to build on accomplishments in improved routine reporting from health facilities by continuing to support the existing sites, and expanding the revised system to SMC and IRS districts. This activity will support training and quality control/timeliness for completion of routine SLIS reporting forms, assist in analysis and feedback on malaria indicators and promote use of findings at all levels to improve program performance. This activity will continue to support the mobile data transfer system (SMS) in the Mopti Region to facilitate timely malaria surveillance. (\$600,000)

**Review of key program data for IRS and SMC sites:** Conduct a review of key program (e.g., partner data, entomological data, etc.) and HMIS data from IRS and SMC districts to review what these programs have achieved in terms of coverage and impact, thereby informing the NMCP's strategic direction on IRS and the further expansion of SMC. Facilitate a workshop to share results with key stakeholders. (\$100,000)

**CDC TDY:** Technical assistance to analyze M&E data to support the development of a new IRS strategy. (\$12,000)

**Strengthening epidemic surveillance and response:** Through training and supportive supervision, build capacity of local and regional health system staff to collect, analyze, and report weekly surveillance data in a timely manner for epidemic detection and responding to epidemics in Mopti and the Northern Regions. (\$150,000)

**Net durability study:** This activity will evaluate the survivorship and physical integrity of a subset of the four types of ITNs distributed in the ongoing dual insecticide operations research study. The third year of the study will include bioefficacy monitoring. (\$100,000)

## **OPERATIONS RESEARCH**

### ***NMCP/PMI objectives***

The NMCP and PMI share a common goal of conducting operations research to answer specific questions regarding improving the implementation and effectiveness of critical interventions. The OR studies proposed for support by PMI are identified jointly and designed to respond to key information needs in the NMCP's National Strategic Plan.

### ***Progress since PMI was launched***

PMI has supported several OR activities in Mali (see table below).

**Table 8: Operations Research Summary**

<b>Completed OR Studies</b>	<b>Start date</b>	<b>End date</b>	<b>Budget</b>
Development of a pilot dry season vector control strategy		Completed	
Integrated vector management: Interaction of larval control and IRS on <i>Anopheles gambiae</i> density and vectorial capacity for human malaria		Completed	
Monitoring SP resistance and the effectiveness of IPTp for the control of malaria in pregnancy		Completed	
A mixed-methods evaluation of the EPI contact method		Completed	
The financial implications of removing user fees for malaria treatment for under five (U5) children in Mali		Completed	
<b>Ongoing OR Studies</b>	<b>Start date</b>	<b>End date</b>	<b>Budget</b>
A field study comparing the impact of new ‘combination’ long-lasting insecticidal (mosquito) net products on entomological measures of malaria transmission: Olyset Plus® and PermaNet 3.0® versus their conventional LLIN analogues: Olyset® and PermaNet 2.0®	June 2013	December 2014	\$343,000
<b>Planned OR Studies FY15</b>	<b>Start date (est.)</b>	<b>End date (est.)</b>	<b>Budget</b>
SMC evaluation	July 2014	April 2016	\$314,000

***Progress in the last 12 months***

In the past 12 months, the PMI/Mali team has made progress on two OR studies:

1. The dual insecticide-treated ITN study began in June 2013 when, vector populations from candidate study villages were screened to confirm the presence of elevated mixed function oxidases (the resistance mechanism targeted by the ‘combination’ nets.) Additional 2013 activities included: selection, mapping, and enumeration of field study villages and monthly vector collections (beginning in October 2013) to establish baselines. ITNs were distributed in February – March of 2014, and monthly vector collections continue. However, collections will have few vectors until seasonal rains, beginning in June-July, increase breeding / vector density.
2. The protocol for the evaluation of SMC was developed and approved by the OR committee and submitted to both the CDC IRB and the Malian IRB for final approvals. In addition, the contracts for the evaluation were completed and signed by the date of the MOP planning visit in June 2014. The drugs have been procured and are warehoused in country pending the launch of the activity. Currently the baseline household survey is

slated to be conducted in July 2015, just prior to the official launch of the SMC implementation in August 2014.

### *Plans and justification*

The SMC evaluation was funded with FY 2013 and FY 2014 funds which will cover two years of SMC data collection (2013-14 and 2014-15), as well as the data analysis and report writing. No FY 2015 funds are planned for this activity.

## **HEALTH SYSTEM STRENGTHENING / CAPACITY BUILDING**

### *NMCP/PMI objectives*

In 2007, the NMCP was elevated to directorate level, and it is now responsible for overseeing all malaria control activities conducted in Mali. The NMCP has four technical divisions which are Prevention and Case Management, Monitoring and Evaluation, Epidemic Surveillance and Operational Research, and Communication and Social Mobilization, as well as one administrative and financial division. The malaria focal point persons at regional and district levels are responsible for ensuring adherence to the national malaria guidance and implementation of the strategic plans. PMI contributed substantially to building capacity of the NMCP and other GOM entities through direct funding of specific activities and technical assistance from implementing partners.

### *Progress during the last 12 months*

In FY 2012, due to the post-coup restrictions, all mission assistance to the GOM was suspended including PMI planned activities to provide capacity building to the NMCP and to strengthen the Malian health system. Most of the Mission's health projects and PMI activities were reauthorized in 2013 with a focus on the community level. In FY 2013, PMI supported the revision of case management and malaria in pregnancy guidelines. PMI also facilitated forecasting and quantification for malaria commodities and supported the training of MOH managers in logistic management information systems.

### *Plans and justification*

PMI will focus on building technical and managerial capacity at all levels of the health care system, both through implementing partners and direct support to the NMCP and other government partners through the government-to-government mechanism. Most inputs in training, supervision, and operational support are described elsewhere in the MOP.

**Planned activities with FY 2015 funding** (\$50,000 plus additional costs referenced in other sections)

**Strengthening NMCP functions:** To help the NMCP reach its coverage targets for key malaria interventions, PMI will continue collaboration with other partners to support NMCP structure

and staff, specifically to increase capacity at all levels to plan, implement, supervise, and forecast commodity needs; improve distribution systems; coordinate with partners; and monitor and evaluate malaria prevention and control activities. Strengthening NMCP managerial capacity will be critical as PMI supports scale-up of all interventions. In-country and headquarters PMI staff and implementing partners will continue to provide on-the-job training and mentoring and support to improve NMCP management and coordination capacity. (A total of \$150,000 referenced in other sections)

**Direct support to the NMCP for operations:** Assist NMCP's day-to-day operations and ability to work closely with PMI and implementing partners, includes support for continuously functioning database and server for malaria indicators and communication means. (\$50,000)

**Direct support to the NMCP and other government entities:** Support will continue in assisting the NMCP and Global Fund FY 2015 to conduct training and supportive supervision for all malaria program interventions supported by PMI. In FY 2015, PMI will continue training and mentoring NMCP staff to increase their skills in data analysis, interpretation, and reporting of findings both from routine supervision and other data sources such as household and health facility surveys. Scopes of work for implementing partners will include provision, whenever feasible, for collaborating with the NMCP in building staff managerial and technical capacity. PMI will support the MOH Division of Public Hygiene and Health to conduct IRS-specific supervision and related environmental monitoring. In FY 2015 PMI will continue to support the work with INRSP to conduct district-level refresher training, supervision in diagnostics, and perform QA/QC for malaria diagnostic in the 61 district health centers and the 1,134 community health centers. (A total of \$800,000 referenced in other sections)

The table below illustrates the proposed activities through direct support to the NMCP and other government entities:

**Table 9: PMI Capacity Building Support**

<b>Malian Government entity</b>	<b>Proposed activity</b>
National Malaria Control Program	<ul style="list-style-type: none"> <li>-Strengthen LLIN logistics and supervise LLIN distribution</li> <li>-Support NMCP entomologist in monitoring IRS operations and related entomological monitoring activities,</li> <li>-Support training and supervision visits to health workers at all levels and refresher trainings as needed</li> <li>-Support the day-to-day operations of the NMCP including the functioning of the malaria indicator database and server.</li> </ul>
Division of Public Hygiene and Health	-Strengthen the capacity of DHPS to coordinate with the NMCP on district-level IRS operations and entomological monitoring.
Directorate of Reproductive Health /Midwives Association	-Engage the Reproductive Health Unit and midwives to increase awareness about MIP and free SP and strengthen and respond to barriers elucidated by recent assessment on MIP.
Malaria Research and Training Center	-Conduct evaluation of the SMC.
National Institute of Public Health Research in coordination with partners	-Implement the QA/QC plan for RDTs and microscopy, including supervisions, and provide technical assistance to the refinement of the QA/QC plan and best practices for implementation.

**STAFFING AND ADMINISTRATION*****Planned activities with FY 2015 funding (\$2,423,262)***

Two health professionals serve as resident advisors to oversee PMI in Mali, one representing CDC and one representing USAID. In addition, one Foreign Service National works as part of the PMI team while two additional FSNs support PMI and the USAID/Mali Health Team. All PMI staff members are part of a single interagency 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 work 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, reporting of results, and providing guidance to PMI partners.

The PMI lead in country is the USAID Mission director. The two PMI resident advisors, one from USAID and one from CDC, report to the Senior USAID Health Officer for day-to-day leadership, and work together as a part of a single interagency team. The Mali Health Officer position was recently filled after being vacant for some time, but the new Health Officer will not arrive in country until September 2014. In the meantime the current USAID RA is the acting Health Team Lead. Contingency funds are designated in the event key positions are not filled in a timely fashion. The technical expertise housed in Atlanta and Washington guides PMI programmatic efforts and thus overall technical guidance for both resident advisors falls to the PMI staff in Atlanta and Washington. Since CDC resident advisors are CDC employees (CDC USDD—38), responsibility for completing official performance reviews lies with the CDC country director who is expected to rely upon input from PMI staff across the two agencies that work closely day in and day out with the CDC resident advisor and thus best positioned to comment on the resident advisor's performance.

The two PMI resident advisors are based within the USAID health office and are expected to spend approximately half their time sitting with and providing technical assistance to the national malaria control programs and partners.

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 addition to the USG Global Malaria Coordinator.

*Proposed activities with FY 2015 funding (\$2,423,262)*

These funds are slated to be used for coordination and management of all in-country PMI activities including support for salaries and benefits for two resident advisors and local staff, office equipment and supplies, and routine administration and coordination expenses.

**TABLE 1**

**President's Malaria Initiative - Mali  
Planned Malaria Obligations for FY 2015: Budget Breakdown by Partner**

<b>Partner</b>	<b>Geographical Area</b>	<b>Activity</b>	<b>Budget (\$)</b>	<b>%</b>
TBD (New commodity/ supply chain project)	Nationwide	Procurement of LLIN, SP, RDTs, and drugs for SMC to fill gaps	7,493,738	30.0%
TBD (New commodity/ supply chain project)	Selected region	Distribution and follow up of LLIN mass campaign in Mopti	1,400,000	5.6%
IRS 2 TO6	2 districts	Procure IRS equipment, supplies, and technical assistance for spraying. Conduct annual entomological monitoring	4,300,000	17.2%
CDC-IAA	Nationwide	In-country staff and administration, technical assistance for diagnostics, M&E, entomological monitoring, equipment and supplies for entomological monitoring,	481,262	1.9%
TBD-Service Delivery Bilateral	Nationwide	Strengthening delivery of case management, MIP, and iCCM (3 regions); including training, supervision, implementation of SMC (10 districts)	3,500,000	14.0%
NMCP	Nationwide	Routine operation support, training and supervision for case management. Subcontract to Reproductive Health Program to disseminate new MIP guidelines	250,000	1.0%
INRSP	Nationwide	Support to QA/QC plan for diagnostics including supervision	50,000	0.2%
MalariaCare	Nationwide	Support to QA/QC plan for diagnostics including supervision	350,000	1.4%
TBD (New commodity/ supply chain project)	Nationwide	Procure AL and injectable artesunate to fill gaps	2,500,000	10.0%

<b>Partner</b>	<b>Geographical Area</b>	<b>Activity</b>	<b>Budget (\$)</b>	<b>%</b>
SIAPS	Nationwide	Strengthen pharmaceutical management and supply chain system, and track commodities down to community level including EUV survey	600,000	2.4%
TBD-BCC Bilateral	Nationwide	Support BCC strategy including development of messages, and communications activities for LLIN, MIP, and case management	625,000	2.5%
DHS Project	Nationwide	Support planning and implementation of 2015 MIS	500,000	2.0%
TBD-M&E Project	Nationwide	Support to routine health information systems strengthening, including SMS applications, and improvements in the SLIS. Review of program data for IRS and SMC	700,000	2.8%
WHO	Nationwide	Strengthen capacity to conduct epidemic surveillance and response	150,000	0.6%
TBD (New Malaria Vector Control Project)	Nationwide	Support net durability assessment activities	100,000	0.4%
USAID	Nationwide	In-country staff and administration	2,000,000	8.0%
<b>Total</b>			<b>25,000,000</b>	<b>100%</b>

**TABLE 2**  
**President's Malaria Initiative - Mali**  
**Planned Obligations for FY 2015**

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total \$	Commodity \$		
<b>PREVENTIVE ACTIVITIES</b>					
<b>Insecticide Treated Nets</b>					
LLIN procurement	TBD (New commodity/supply chain project)	4,963,738	4,963,738	Mass campaign (Mopti)	Procure 1.4 million LLINs for a universal distribution campaign in Mopti, as well as routine distribution through ANC/EPI
Distribution of LLINs	TBD (New commodity/supply chain project)	1,400,000	1,400,000	Nationwide specific regions	Distribution and follow-up of LLINs for mass campaign (in Mopti Region) and routine distribution.
<b>SUBTOTAL ITNs</b>		<b>6,363,738</b>	<b>6,363,738</b>		
<b>Indoor Residual Spraying</b>					
Indoor residual spraying	IRS 2 TO6	4,000,000	1,500,000	2 Districts	Procure IRS equipment (insecticide, sprayers, etc.), training, implementation, data collection, protocols, guidelines, BCC, logistic assessment, technical assistance for spraying/entomological assessment (CDC IAA). Technical assistance from CDC entomologist for monitoring IRS implementation.
	CDC IAA	24,000	0		
Procurement of supplies for entomological monitoring	CDC IAA	10,000	0	Nationwide	Procure and transport specialized entomological equipment from CDC to Mali for entomological monitoring of IRS

Entomological monitoring	IRS 2 TO6	300,000	0	2 Districts, Nationwide	Conduct annual entomological monitoring. Support the NMCP entomologist in conducting IRS-related entomological monitoring. Strengthen capacity of DHPS to participate in the monitoring of IRS operations, training of spray operators and to provide coordination with NMCP on district IRS operations. Mapping insecticide resistance and mosquito biting behavior nationwide.
<b>SUBTOTAL IRS</b>		<b>4,334,000</b>	<b>1,500,000</b>		
<b>Malaria in Pregnancy</b>					
SP procurement	TBD (New commodity/supply chain project)	250,000	250,000	Nationwide	Procure 2 million doses of SP to contribute to annual needs for all pregnant women.
Enhanced monitoring in two districts to evaluate roll-out of IPTp-3 interventions	New service delivery bilateral	100,000	0	New service delivery bilateral areas (2 districts)	Since 2014, Mali is implementing IPTp-3 roll-out, building on findings from a comprehensive assessment in 2012. The new bilateral will put specific emphasis on addressing barriers identified, and this activity will monitor the progress toward improving IPTp uptake.
Strengthen FANC and MIP services at the facility level	New service delivery bilateral	300,000	0	Nationwide (and specific region)	Continue to roll-out new WHO IPTp recommendations and respond to barriers elicited during the recent assessment on IPTp barriers. Coordinate on FANC and MIP activities with the Reproductive Health Program and Midwives Association in the process. The latter will help with formative supervision, training, guideline development, and dissemination of guidelines.
	DSR/Midwives Assoc.(through NMCP)	50,000	0		
<b>SUBTOTAL MIP</b>		<b>700,000</b>	<b>250,000</b>		
<b>SUBTOTAL PREVENTIVE</b>		<b>11,397,738</b>	<b>8,113,738</b>		

Case Management						
Diagnosis						
Procurement of RDTs	TBD (New commodity/supply chain project)	1,000,000	1,000,000	1,000,000	Nationwide	Procure approximately 2 million RDTs. (Gap of 1.8 million to be covered by Global Fund NFM.)
Quality assurance/quality control for diagnostics	INRSP	50,000	0	0		Continue support of implementation of QA/QC plan for RDT and microscopy diagnostics, including supervision. Provide technical assistance on refinement of QA/QC plan and best practices for implementation.
	MalariaCare	350,000	0	0	Nationwide	
CDC TDY for diagnostics	CDC IAA	12,000	0	0		
<b>SUBTOTAL Diagnosis</b>		<b>1,412,000</b>	<b>1,000,000</b>	<b>1,000,000</b>		
Treatment & Pharmaceutical Management						
Procurement of malaria drugs for uncomplicated malaria	TBD (New commodity/supply chain project)	1,500,000	1,500,000	1,500,000	Nationwide	Procure 1.5 million treatments of AL for health facilities, community case management and pregnant women.
Treatment for severe malaria (injectable artesunate)	TBD (New commodity/supply chain project)	1,000,000	1,000,000	1,000,000	Nationwide	Procure 125,000 treatments of injectable artesunate (based on request from NMCP and HGIS estimate of 600,000 cases per year).
Training and supervision for case management	New service delivery bilateral	600,000	0	0	Nationwide	Training includes diagnostics, case management for simple and severe malaria, and supervision on all aspects of case management.
Training and supervision for case management	NMCP	150,000	0	0	Nationwide	Training includes diagnostics, case management for simple and severe malaria, and supervision on all aspects of case management.

Implementation of iCCM	New service delivery bilateral	1,000,000	0	All districts in Kayes, Koulikoro, and Sikasso Regions	Contribute to the implementation of the integrated community case management activities in 3 regions
Implementation of SMC (training, supervision, distribution)	TBD (New commodity/supply chain project)	1,280,000	1,280,000	10 districts in PMI areas	Cover approximately 800,000 children < 5 years with four rounds of SMC. Assumes cost of \$0.40 per treatment per child (x 4 rounds).
	New service delivery bilateral	1,500,000	0	10 districts in PMI areas	Implement SMC in 10 districts of PMI regions
Logistics strengthening	SIAPS	500,000	0	Nationwide	Strengthen pharmaceutical management and supply chain system at the national, district and community levels
End-use verification study	SIAPS	100,000	0	Nationwide	Tracking of malaria commodities down to the community level, end-use verification study with an emphasis on follow-up of findings.
<b>SUBTOTAL - Treatment &amp; Pharmaceutical Management</b>		<b>7,630,000</b>	<b>3,780,000</b>		
<b>SUBTOTAL CASE MANAGEMENT</b>		<b>9,042,000</b>	<b>4,780,000</b>		
<b>Behavior Change Communication</b>					
BCC for LLINs	New BCC bilateral	200,000	0	Nationwide	Support BCC strategy harmonization and message design, including development of new national BCC plan.
BCC for MIP interventions	New BCC bilateral	225,000	0	Nationwide	Support efforts to harmonize strategies and design focused messages to promote SP IPTp uptake and MIP targeting pregnant women. Special focus

						on presenting for second and third ANC visits
BCC for case management	New BCC bilateral	200,000	0	Nationwide	Continued support of messages and communications approaches for case management; implement through <i>relais</i> , train on referral systems at the community level with a focus on early care seeking behaviors. Support the National Center for Information, Education, and Communication for Health (CNI ECS) capacity to develop and implement communications approaches and messaging for case management.	
<b>SUBTOTAL BCC</b>		<b>625,000</b>	<b>0</b>			
<b>Monitoring and Evaluation</b>						
Support 2015 MIS	DHS Project	500,000	0	Nationwide	In addition to FY 2014 funds to complete support of Malaria Indicator Survey implementation and expenses in 2015; survey will include biomarkers.	
Routine system strengthening (all levels)	TBD (M&E Field support)	600,000	0	Nationwide	Continue and expand routine system strengthening efforts with an emphasis at the CSCOM level, including data collection by SMS in existing areas and new SMC areas and IRS areas. Support training and quality control/timeliness for completion of routine SLIS reporting forms, assist in analysis and feedback on malaria indicators and promote use of findings at all levels to improve program performance. Continue to	

						support SMS system in all of Mopti.
Review of key program data to inform IRS strategy for Mali	TBD (M&E Field support)	100,000	0			Review and analyze key program data on IRS and SMC and write a report to inform the NMCP's strategic direction on IRS. Facilitate a workshop to share results with key stakeholders.
CDC TDY to support M&E for new IRS strategy		12,000	0			
Strengthening of ESR	WHO	150,000	0	Nationwide		Strengthen capacity for conducting ESR in epidemic-prone districts
Net durability monitoring	TBD (New Malaria Vector Control Project)	100,000	0			Evaluate the survivorship and physical integrity of a subset of the four types of ITNs distributed in the ongoing dual insecticide operations research study. Third year of the study will include bioefficacy monitoring.
<b>SUBTOTAL - M &amp; E</b>		<b>1,462,000</b>	<b>0</b>			
<b>Capacity building</b>						
Support day-to-day operations of NMCP	NMCP	50,000	0	National level		Assist NMCP's day-to-day operations and ability to work closely with PMI and implementing partners. Includes support for continuously functioning database and server for malaria indicators and server communication means.
<b>SUBTOTAL Capacity Bldg</b>		<b>50,000</b>	<b>0</b>			
<b>In-country Staffing and Administration</b>						

In-country staff; Program Administration Expenses	USAID	2,000,000	0	Nationwide	Support for USAID PMI staff (1 PSC/1 FSN) with salaries, benefits, contribution to salaries and benefits of Mission support staff, IT support costs, office space, vehicles, other Mission program support costs, local costs for CDC PMI Advisor.
In-country staff; Admin. Expenses	CDC IAA	423,262	0	Nationwide	Support for CDC PMI Resident Advisor (1) with salary and benefits.
<b>SUBTOTAL - In-Country Staffing</b>		<b>2,423,262</b>	<b>0</b>		
<b>GRAND TOTAL</b>		<b>25,000,000</b>	<b>11,652,738</b>		