

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 2018 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.



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U.S. PRESIDENT'S MALARIA INITIATIVE



PRESIDENT'S MALARIA INITIATIVE

BURKINA FASO

Malaria Operational Plan FY 2018

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ABBREVIATIONS and ACRONYMS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
ANC	Antenatal care
AS/AQ	Artesunate-amodiaquine
CAMEG	<i>Central d'Achats des Medicaments Essentiels Generiques</i> (Central Medical Supplies Store)
CDC	Centers for Disease Control and Prevention
CHW	Community health worker
CNRFP	National Research and Training Center for Malaria
CSPS	<i>Centre de santé et de la promotion social</i> (Health Center)
DPPSA	<i>Direction de la Politique Pharmaceutique et de la Securisation des Approvisionnements</i> (Pharmaceutical Policy and Health Commodity Security Direction)
DGPML	<i>Direction General de la Pharmacie, Medicine et Laboratoire</i> (General Directorate of Pharmacies, Medicines and Laboratories)
DGOS	<i>Direction General des Offres de Soins</i> (Direction General of Health Care Delivery)
DHS	Demographic and Health Survey
DMRH	Division of national and reproductive health
EIR	Entomological inoculation rate
EPI	Expanded program on immunizations
EUV	End use verification
FY	Fiscal year
GHI	Global Health Initiative
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GoBF	Government of Burkina Faso
HMIS	Health management information system
IEC	Information, education, communication
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
IRSS	<i>Institut de Recherche en Sciences de la Sante</i> (Research Institute of Health Sciences)
ITN	Insecticide-treated mosquito net
LMIS	Logistic management information system
MIP	Malaria in pregnancy
MIS	Malaria indicator survey
MoH	Ministry of Health
MOP	Malaria Operational Plan
NGO	Non-Government Organization
OR	Operational research
NMCP	National Malaria Control Program
NPRA	National Pharmaceutical Regulatory Agency
PADS	<i>Programme d'appui au développement sanitaire</i> (Support program for health sector development)
PMI	President's Malaria Initiative
QA/QC	Quality assurance/quality control
RA	Resident Advisor

RDT	Rapid diagnostic test
SBCC	Social and behavior change communication
SM&E	Surveillance, monitoring, and evaluation
SMC	Seasonal malaria chemoprevention
SP	Sulfadoxine-pyrimethamine
SP/AQ	Sulfadoxine-pyrimethamine amodiaquine
TRaC	Tracking results continuously
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

I. EXECUTIVE SUMMARY

When it was launched in 2005, the goal of the President's Malaria Initiative (PMI) was to reduce malaria-related mortality by 50 percent across 15 high-burden countries in sub-Saharan Africa through a rapid scale-up of four proven and highly effective malaria prevention and treatment measures: insecticide-treated mosquito nets (ITNs); indoor residual spraying (IRS); accurate diagnosis and prompt treatment with artemisinin-based combination therapies (ACTs); and intermittent preventive treatment of pregnant women (IPTp). With the passage of the Tom Lantos and Henry J. Hyde Global Leadership against HIV/AIDS, Tuberculosis, and Malaria Act in 2008, PMI developed a U.S. Government Malaria Strategy for 2009–2014. This strategy included a long-term vision for malaria control in which sustained high coverage with malaria prevention and treatment interventions would progressively lead to malaria-free zones in Africa, with the ultimate goal of worldwide malaria eradication by 2040-2050. Consistent with this strategy and the increase in annual appropriations supporting PMI, four new sub-Saharan African countries and one regional program in the Greater Mekong Subregion of Southeast Asia were added in 2011. The contributions of PMI, together with those of other partners, have led to dramatic improvements in the coverage of malaria control interventions in PMI-supported countries, and all 15 original countries have documented substantial declines in all-cause mortality rates among children less than 5 years of age.

In 2015, PMI launched the next six-year strategy, setting forth a bold and ambitious goal and objectives. The PMI Strategy for 2015-2020 takes into account the progress over the past decade and the new challenges that have arisen. Malaria prevention and control remains a major U.S. foreign assistance objective and PMI's Strategy fully aligns with the U.S. Government's vision of ending preventable child and maternal deaths and ending extreme poverty. It is also in line with the goals articulated in the Roll Back Malaria Partnership's (RBM) second generation global malaria action plan, *Action and Investment to defeat Malaria (AIM) 2016-2030: for a Malaria-Free World* and WHO's updated *Global Technical Strategy: 2016-2030*. Under the PMI Strategy 2015-2020, the U.S. Government's goal is to work with PMI-supported countries and partners to further reduce malaria deaths and substantially decrease malaria morbidity, towards the long-term goal of elimination.

Burkina Faso was selected as a PMI focus country in FY 2017.

The FY 2018 Malaria Operational Plan presents a detailed implementation plan for Burkina Faso, based on the strategies of PMI and the National Malaria Control Program (NMCP). It was developed in consultation with the NMCP and with the participation of national and international partners involved in malaria prevention and control in the country. The activities that PMI is proposing to support fit in well with the National Malaria Control strategy and plan and build on prior investments by other partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) malaria grants. This document briefly reviews the current status of malaria control policies and interventions in Burkina Faso, describes progress to date, identifies challenges and unmet needs to achieving the targets of the NMCP and PMI, and provides a description of activities that are planned with FY 2018 funding.

The proposed FY 2018 PMI budget for Burkina Faso is \$25 million. PMI will support the following intervention areas with these funds:

Entomologic monitoring and insecticide resistance management:

Burkina Faso has strong entomological capacity and history of malaria vector research including insecticide resistance monitoring. Resistance to DDT and pyrethroids is widespread and reduced susceptibility to bendiocarb has been detected in two sites. PMI plans to support monitoring at

entomological sentinel sites to assess the species composition, density, behavior and infection rates, insecticide susceptibility testing, as well as IRS quality and residual efficacy of insecticides. In addition, PMI will assist the country to implement a comprehensive plan for resistance monitoring.

Insecticide-treated nets (ITNs):

The national strategy for Burkina Faso uses ITNs as the principal tool for malaria prevention and employs three approaches for ensuring that ITNs are available to the entire population: free distribution of ITNs via nationwide campaigns, free distribution of ITNs through routine antenatal care and expanded program on immunization at all public health facilities, and the sale of ITNs by the private sector. Burkina Faso has benefitted from three mass campaigns in 2011, 2013, and 2016. PMI will procure 120,000 ITNs and provide technical assistance for the next mass campaign that will occur in 2019.

Indoor residual spraying (IRS):

Burkina Faso's National Strategy includes IRS, along with ITNs and larval source management, as vector control interventions to prevent malaria. USAID supported a pilot IRS program in the district of Dieboungou from 2010 to 2012, covering ~35,000 structures and protecting ~115,000 people annually. Aside from this pilot, the Government of Burkina Faso (GoBF) has not been able to secure additional resources to support IRS. FY 2017 funding will re-start IRS in Burkina Faso in three districts. With FY 2018 funds, PMI will continue to support IRS in up to three high-burden districts, in an effort to mitigate resistance and drive down the burden of malaria.

Malaria in pregnancy (MIP):

The current Ministry of Health (MoH) policy is to provide, free-of-charge, all antenatal care (ANC) services to pregnant women, including provision of an ITN as well as three or more doses of sulfadoxine-pyrimethamine (SP) for IPTp, and iron-folate to prevent anemia. The NMCP strategy has been updated based on WHO revised guidance and register updates and training of health workers on these revisions has been completed. Concerning treatment of malaria in pregnancy, women in their first trimester are given oral quinine, while women in their second and third trimesters are prescribed ACTs. With FY 2018 funds, PMI will continue support for training and supervision for malaria in pregnancy services, as well as scale-up of community IPTp.

Case management:

PMI is committed to supporting NMCP's goal of providing universal timely diagnostic testing for all cases of fever and ensuring that all confirmed malaria cases are treated promptly with efficacious antimalarials. With the ongoing nationwide rollout of the community healthcare worker (CHW) program, PMI will support the expansion of diagnosis and treatment to the community level. To help NMCP meet its case management goals, PMI will procure rapid diagnostic tests (RDTs), ACTs, rectal artesunate for pre-referral of severe cases, and severe malaria treatments. PMI will also support training and supervision of health care workers and community health care workers to promote adherence to national case management guidelines. To ensure a sufficient supply of malaria commodities, PMI will strengthen the pharmaceutical management system, focusing on capacity building at the district level. To improve the quality of malaria case management, PMI will support diagnostic quality control and quality assurance and will monitor the efficacy of antimalarials.

Seasonal Malaria Chemoprevention (SMC):

Burkina Faso has been gradually expanding SMC implementation, with a goal to cover all children between 3 and 59 months of age in all districts. USAID support for SMC began with FY 2016 funds in 2 districts, and will expand to cover up to 12 districts with FY 2017 and FY 2018 PMI funds.

Health systems strengthening and capacity building:

Burkina Faso's National Strategy focuses on reinforcing the NMCP's management capacity to effectively oversee all malaria activities in country. In FY 2018, PMI will direct resources to strengthen all levels of the health system. Specific courses and learning opportunities will be selected to address key gaps in knowledge with the aim of strengthening the NMCP after its elevation to a higher level within the MoH, to more effectively lead malaria control efforts. In an effort to strengthen not only the NMCP core staff, but also the entire malaria program at all its levels, regional malaria focal points will be funded in each of the 13 health regions to decentralize malaria specific knowledge and oversight. The malaria focal points will be fully integrated into the regional health office under the Regional Director of Health and will serve as the main point of contact for malaria programming. The malaria focal points will fill the need for a focused malaria position that responds to the many and diverse program activities of the national malaria control program. Monitoring availability and utilization of key anti-malarial commodities at the health facility level will also be conducted. At the community level, PMI will support national policy development and validation, and develop training guidelines and job aids for community level IPTp distribution roll out.

Social and behavior change communication (SBCC):

According to the 2014 MIS in Burkina Faso, 90 percent of households report owning an ITN, but 69 percent of the population reported actually sleeping under one. With FY 2018 funds, PMI will continue working with the NMCP communication unit to implement both mass communication campaigns as well as inter-personal communication with an emphasis on the importance/correct use of nets for the 2019 mass ITN campaign. Through capacity building and information sharing, PMI will also support the MoH to reach scale-up of interpersonal communication for the 17,000 CHWs and community leaders to promote malaria prevention strategies (ITNs and IPTp) and early treatment seeking (RDTs and ACTs). Besides more general SBCC messaging noted above, PMI will work specifically to inform the population about SMC and IRS campaigns and the importance of prevention and early care-seeking behavior.

Surveillance, monitoring and evaluation (SM&E):

PMI will work with NMCP to strengthen the quality of malaria data and improve data use at all levels. To that end, PMI will support periodic data review activities at the district level to allow health facility and district staff to meet and jointly analyze malaria data collected using the health management information system (HMIS). This will further be complemented by quarterly end use verification (EUV) surveys to monitor health facility stocks of key malaria commodities. In addition to support for the routine monitoring system, with FY 2018 funds, PMI will also support the next large population-based survey in Burkina Faso.

Operational research (OR):

PMI will support a vector control study to investigate the impact of next generation ITNs and IRS in areas of high resistance. This multi-year study will examine entomological and epidemiological outcomes from various prevention activities conducted in four districts in Burkina Faso. Overall, it is expected that these results will guide the NMCP as to selection of prevention activities that best impact the malaria burden and mitigate insecticide resistance.

II. STRATEGY & BACKGROUND

1. Introduction

When it was launched in 2005, the goal of PMI was to reduce malaria-related mortality by 50 percent across 15 high-burden countries in sub-Saharan Africa through a rapid scale-up of four proven and highly effective malaria prevention and treatment measures: insecticide-treated mosquito nets (ITNs); indoor residual spraying (IRS); accurate diagnosis and prompt treatment with artemisinin-based combination therapies (ACTs); and intermittent preventive treatment of pregnant women (IPTp). With the passage of the Tom Lantos and Henry J. Hyde Global Leadership against HIV/AIDS, Tuberculosis, and Malaria Act in 2008, PMI developed a U.S. Government Malaria Strategy for 2009–2014. This strategy included a long-term vision for malaria control in which sustained high coverage with malaria prevention and treatment interventions would progressively lead to malaria-free zones in Africa, with the ultimate goal of worldwide malaria eradication by 2040-2050. Consistent with this strategy and the increase in annual appropriations supporting PMI, four new sub-Saharan African countries and one regional program in the Greater Mekong Subregion of Southeast Asia were added in 2011. The contributions of PMI, together with those of other partners, have led to dramatic improvements in the coverage of malaria control interventions in PMI-supported countries, and all 15 original countries have documented substantial declines in all-cause mortality rates among children less than five years of age.

In 2015, PMI launched the next six-year strategy, setting forth a bold and ambitious goal and objectives. The PMI Strategy for 2015-2020 takes into account the progress over the past decade and the new challenges that have arisen. Malaria prevention and control remains a major U.S. foreign assistance objective and PMI's Strategy fully aligns with the U.S. Government's vision of ending preventable child and maternal deaths and ending extreme poverty. It is also in line with the goals articulated in the Roll Back Malaria Partnership's (RBM) second generation global malaria action plan, *Action and Investment to defeat Malaria (AIM) 2016-2030: for a Malaria-Free World* and WHO's updated *Global Technical Strategy: 2016-2030*. Under the PMI Strategy 2015-2020, the U.S. Government's goal is to work with PMI-supported countries and partners to further reduce malaria deaths and substantially decrease malaria morbidity, towards the long-term goal of elimination.

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2. General Description of Public Health System and Malaria Control Efforts

Burkina Faso is a landlocked Sahel country located in the center of West Africa and covers an area of approximately 272,960 km². It is bordered to the north and west by Mali, to the northeast by Niger, to the southeast by Benin, and to the south by Togo, Ghana, and the Ivory Coast. In 2017, the population of Burkina Faso is estimated, using numbers from the 2006 census, to be 19,632,147, with a natural growth

rate of 3.1 percent. Twenty percent of the population lives in urban areas. Women represent 51.8 percent, and children under five years of age represent 18.14 percent of the population. Expected pregnancies account for 5.49 percent of the total population according to the same estimates.

Data from the 2015 Tracking Results Continuously (TRaC) survey show that the infant mortality rate has decreased from 65 deaths per 1,000 live births in 2010 to 45 deaths, while the maternal mortality rate has dropped from 341 deaths to 330 deaths per 100,000 live births during the same period.

Burkina Faso currently ranks 185 out of 190 according to the Human Development Index (Human Development Report 2016, UNDP). The national poverty line was estimated at \$263 (154,061 FCFA) per adult per year in 2014 (early warning indicators, Ministry of Economic and Finance of Burkina Faso, 2014), which is almost three times lower than the threshold of two dollars per day per individual set by the World Bank Group. The percentage of the population living below that threshold is 40.1 percent (EMC report, INSD 2014). There are clear links between poverty and health status. Burkinabe living in rural areas are, in general, at greater risk of poverty as well as poor health status compared to their urban counterparts.

Malaria remains a major public health issue and is endemic throughout the country, with a seasonal upsurge from June through October. Burkina Faso's NMCP has been targeting malaria interventions based on a map developed by the Research Institute of Health Sciences (IRSS) and *Centre Muraz*, which dates back more than ten years. However, recent disease reporting patterns are not completely consistent with the old malaria transmission zone map. The country requested assistance from the Global Fund to update this map to ensure that targeted interventions are aligned with the country's epidemiological profile.

In Burkina Faso, the rainy season duration varies across the country with corresponding variances in seasonal malaria transmission based on geographic zones. In the North, the rainy season is short (up to three months), in the central zone it lasts up to six months, and in the South, it can last up to nine months. Important components for reducing the burden of malaria morbidity and mortality include systematic use of diagnostic tools for suspected malaria cases and effective use of antimalarial medicines for confirmed cases, along with prevention strategies, such as the prevention of malaria in pregnancy (MIP), seasonal malaria chemoprevention (SMC) and vector control interventions such as promoting consistent use of ITNs, and IRS. The malaria control approach includes these components, along with improvements in tracking of human illness and parasite surveillance, and effective resource delivery. Significant efforts have been made to stabilize the antimalarial commodity situation. The increased availability of rapid diagnostic tests (RDTs), ACTs, and injectable artesunate for severe malaria treatment has helped to improve malaria case management in health facilities, which combined with preventive measures has contributed to reduce significantly the malaria death rate from 3.3 percent of malaria cases in 2011 to 0.9 percent of malaria cases in 2016 (annual health statistics of the Ministry of Health, 2016).

According to the annual national health statistics published by the Directorate for Health Statistics of the Ministry of Health (MoH), the situation in 2016 was as follows:

- There were 9,785,822 confirmed cases of malaria (with a reported diagnostic confirmation rate of 94.1 percent) compared to 8,285,251 cases in 2015 (with 77.5 percent confirmed cases).
- There were 3,974 deaths linked to malaria in comparison with 5,379 deaths in 2014, a decrease of 26 percent.
- Deaths due to malaria among children under five years of age decreased significantly, with 2,370 deaths being reported, compared to 4,005 in 2015, which represents a 41 percent decrease.

The proportion of children infected with malaria parasites has decreased from 65.9 percent (MIS, 2010) to 45.7 percent (MIS, 2014). It was estimated to be 53.8 percent in rural areas, which is 3 times the level of 17.7 percent found in urban areas.

Figure 1: 2016 Malaria incidences by district per 1,000 inhabitants in Burkina Faso (Source: NMCP)

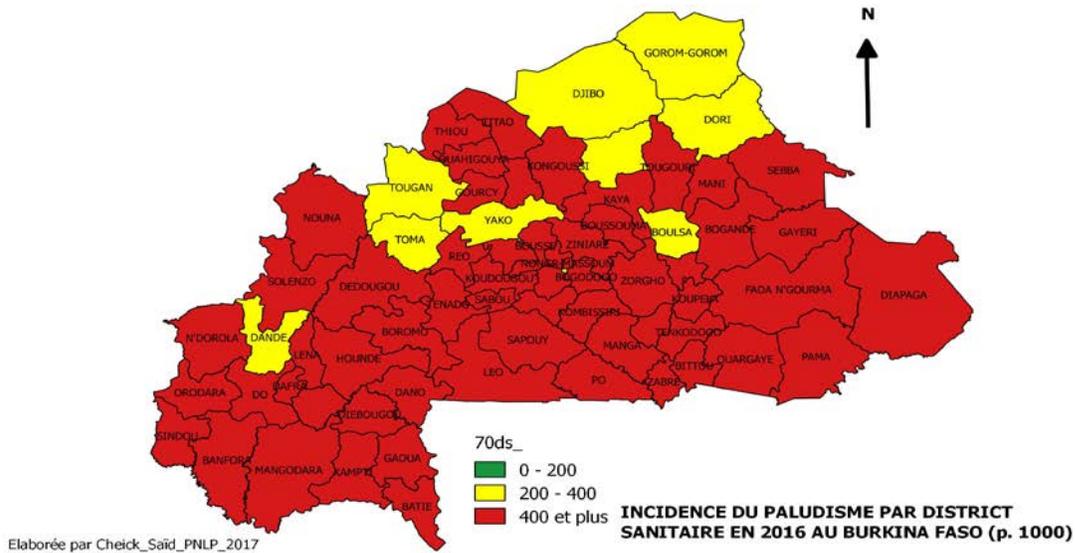
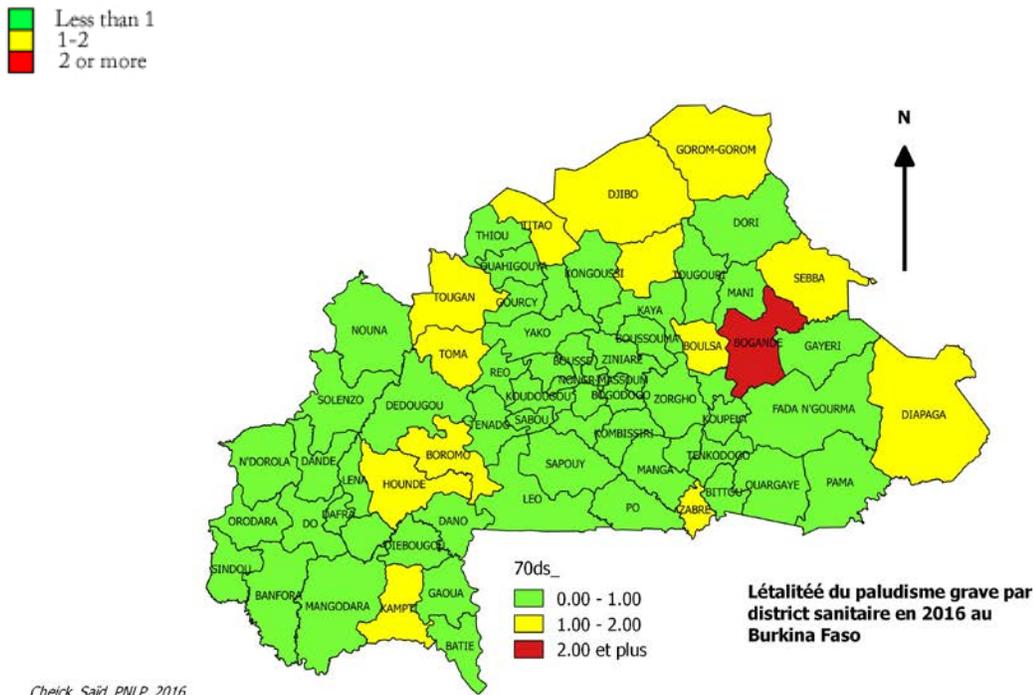


Figure 2: 2016 Malaria case fatality rates by district in Burkina Faso (Source: NMCP)



The principal vectors of malaria in Burkina Faso include three members of the *Anopheles gambiae* complex (*An. gambiae* s.s., *An. coluzzii*, and *An. arabiensis*) and *An. funestus*. Their relative abundance depends on location and time of year. *Plasmodium falciparum* (in 90 percent of cases, responsible for serious and fatal forms of malaria) infection is widespread across the country and throughout the period of the year, while *P. malariae* and *P. ovale* individually culminate at the end of the rainy season.¹

According to entomological data available, the vector complex is dominated by members of *An. gambiae* s.l. complex with a large predominance of *An. gambiae* s.s. and *An. coluzzi* in the Central and the Central East regions of the country. *An. arabiensis* is best established in most areas, except in the West where it is relatively uncommon. The Sahel zone is characterized by a strong presence of *An. coluzzi* in suburban areas due to permanent or semi-permanent water collections. *Anopheles funestus* is the second vector group after *An. gambiae* s.l. that transmits in the late rainy season.²

Concerning resistance of malaria vectors and especially *An. gambiae* in West Africa and particularly in Burkina Faso, studies conducted by IRSS, *Centre Muraz*, and *Centre National de Recherche et de Formation sur le Paludisme* (CNRFP) indicate that resistance is increasing every year, which could be a medium-term limiting factor in the use of insecticides for vector control.

- The resistance of *Anopheles gambiae* s.l. to DDT and major pyrethroid insecticides is evident in many parts of the country, but the level is variable according to the location. The resistance level is still acceptable in term of operational view in central and eastern areas for deltamethrin. Bendiocarb is potentially still effective in several areas except in the western part of the country. The most effective insecticides in all parts of the country are fenitrothion and especially pirimiphos methyl. However, susceptibility data from IRSS suggests possible resistance to pirimiphos-methyl at some proposed spray sites: Kampti District (South West region), Solenzo District (Boucle du Mouhoun region) and Kongoussi District (Central North region). Two rounds of susceptibility testing on different species were conducted in June and September 2017 and gave similar results, however IRSS is currently conducting additional tests to further confirm this status.

Major partners in malaria control

The next **Global Fund** malaria grant will start on January 1, 2018 and will end on December 31, 2020. Total funding is about 84 million Euros: 68,117,558 Euros for malaria, and 14,745,751 Euros for health system strengthening (HSS).

The public sector, civil society, and HSS components of the malaria grant have all been awarded to *Programme d'appui au développement sanitaire* (PADS). Three secondary recipients will assist with implementation under PADS' leadership: the NMCP, which is the secondary recipient for the public sector; *Progetto Mondo Mlal*, an Italian NGO, the secondary recipient for civil society; with the third recipient still under procurement. Major areas of intervention include procurement of ITNs for the 2019 mass distribution campaign; case management; malaria treatment at the community level, resilient and

¹ Gneme A, et al. (2015) Equivalent susceptibility of *Anopheles gambiae* M and S molecular forms and *Anopheles arabiensis* to plasmodium falciparum infection in Burkina Faso. *Malar J.* 2013 June 14; 12:204

² IRSS, Centre Muraz 2012, Statut de sensibilité des populations d'*Anopheles gambiae* s.l. Dans les zones pilotes du PNLP au Burkina Faso

sustainable health systems; human resources for health including community health workers; health information management systems; and monitoring and evaluation.

The Global Fund will procure more than 12 million nets for the mass distribution campaign, which represents over 40 percent of the Global Fund malaria grant budget.

The recent recruitment by the MoH of 17,668 new community health workers (CHWs)—two per village—was supported through the Global Fund’s HSS grant. The Global Fund’s support for CHWs includes an integrated training package: prevention, diagnosis, and treatment of malaria, pneumonia, and diarrhea. The Global Fund will finance a quarter of the \$34 CHW monthly stipend, while the Government of Burkina (GoBF) will pay the rest. The Global Fund, through its civil society malaria grant, is also providing nationwide coverage to support 252 community-based organizations: promoting sensitization of communities on malaria prevention and treatment through group discussions, plays, and videos.

UNICEF provides technical support, including the hiring of consultants, through their country health team. UNICEF provided technical assistance to the NMCP during the creation of the Global Fund malaria concept note and has also provided limited financial assistance for the procurement of routine ITNs, SMC, and campaign implementation.

WHO provides technical assistance in setting standards and norms and supports studies on vector resistance to insecticides and on therapeutic efficacy. WHO’s support also includes limited resources provided for social behavior change communication (SBCC) in particular for the celebration of World Malaria Day; monitoring and evaluation; program management and operational research (OR). WHO has also provided assistance for the evaluation and the development of the NMCP’s 2016-2020 National Strategic Plan through technical assistance provided by the malaria advisor.

The World Bank is providing financial assistance to the GoBF through a \$37 million loan that supports Neglected Tropical Diseases, including malaria. The project started in January 2015 and will end in December 2019. Malaria resources have been focused on SMC interventions in 22 health districts located at the borders with Niger and Mali. Other types of support include financial resources provided for the procurement of ACTs to fill gaps, SBCC, program management and technical assistance.

Malaria consortium provides support for commodities procurement and the implementation of SMC campaigns, program management, and technical assistance. Malaria Consortium, with funding from UNITAID, has provided financial and technical assistance for SMC commodities procurement and campaign implementation in 11 health districts in 2015, 31 health districts in 2016, and 39 health districts in 2017 (of which 8 districts were financially supported by Give Well, a British based donor). UNITAID funding ends in 2017 and negotiations are currently ongoing as to how many health districts Give Well can cover in the future.

Italian cooperation through their malaria training and research program, provides support for monitoring and evaluation, program management, OR, and technical assistance. The estimated total budget for this 3 year project is over \$5 million.

Terre des hommes, a Switzerland-based NGO provides support for SMC, purchase of ACTs, and SBCC, as part of the integrated case management of child illnesses at health facility levels.

Government of Burkina Faso provides support through the procurement of sulfadoxine-pyrimethamine (SP) for IPTp, ACTs, and microscopy tests, and support for malaria case management at the community level, pharmaceutical management, severe malaria case management, SBCC, and program management. However, the government commitment is not easy to track or monitor with shifting priorities and commitments (transitional government, new free health care program for children under five years of age, and pregnant and lactating women, etc.).

Existing mechanisms for coordination of malaria prevention and control activities

Roll Back Malaria Partnership (RBM) does not have a strong physical presence in Burkina Faso. The RBM focal point in country, the NMCP Coordinator, chairs partner meetings on a quarterly basis.

The Country Coordinating Mechanism (CCM) includes representatives from public and private sectors, multilateral or bilateral agencies, governments, NGOs, private business, and academic institutions. The CCM is central to the Global Fund's structure and commitment to local ownership. The CCM assists with initial grant creation and oversight of progress during grant implementation. In 2014, after a CCM assessment to determine eligibility for Global Fund financing in Burkina Faso, it was decided that a redrafting of the CCM constitution was needed. The changes made to the CCM constitution in 2015 left financial partners (USAID, the European Union, and the French Cooperation) with one voting seat on a rotating basis. USAID is currently the Second Vice President of the CCM, providing technical assistance to revitalize the CCM and ensure its Global Fund eligibility. In 2015 and 2016, USAID provided support to the CCM, through technical assistance provided by Global Management Solutions, to the primary grant recipients in drafting and updating grant monitoring tools for implementation. PMI continues to coordinate regularly with the Global Fund Portfolio Manager regarding grant implementation issues and exploring ways to best leverage funds.

Malaria Steering Committee provides directives and guidance to the NMCP and implementing partners, and also works to strengthen partnerships and coordination. (See integration, collaboration, and coordination for more information).

Current status of malaria operational research activities

There are four national research institutions that are working in the areas of malaria OR, with three of them overseen by the MoH: *Centre Muraz*, CNRFP, and the Center for Health Research in Nouna. The fourth center, IRSS is overseen by the Ministry of Education. These centers receive limited resources from the GoBF and therefore tend to rely on additional external resources from partnerships with European and North American research institutions.

3. Country Health System delivery structure and Ministry of Health Organization

As per the new MoH organogram adopted in September 2017, the NMCP now falls under the technical secretariat for the elimination of priority infectious diseases, which includes malaria, HIV/AIDS, tuberculosis and neglected tropical diseases. This new structure is set to report directly to the Minister of Health and will include an office dedicated to the malaria program. Malaria activities are organized at all three levels of the public health system:

- The central level is responsible for developing strategies, mobilizing resources, coordinating partners as well as monitoring implementation and evaluating performance.
- The intermediate level is comprised of 13 health regions with nine regional hospitals, which serve as referral centers.

- The peripheral level is comprised of 70 health districts with a total of 46 district hospitals, 25 medical centers, and 1,760 health facilities.

In addition to public sector facilities, the private sector includes about 98 hospitals, 352 medical and nursing centers, 45 health facilities run by NGO or faith-based organizations, and 140 biomedical laboratories. There are about 255 private pharmacies, with private drug sellers numbering around 542 countrywide. These private health facilities are mainly found in Ouagadougou and Bobo-Dioulasso. The private sector is integrated into the health system—participating in regular meetings with the MoH, ensuring at least some compliance with technical guidelines. The NMCP is considering providing private sector staff trainings on malaria prevention and treatment guidelines, and the creation of a memorandum of understanding to further engage the private sector in malaria control activities.

The traditional medicine sector is also gradually being incorporated into the health system and organized under the directorate for medicine and traditional medicine at the MoH. Healers provide health care for certain diseases including the use of traditional medicinal plants for malaria. As part of the fight against malaria, the government budget will train traditional medicine practitioners to recognize signs of severe malaria in order to refer these cases to the appropriate health facility. The MoH recommends that serious cases of disease be referred to health facilities for treatment.

In 2014, the MoH adopted a policy to formalize CHW status including their monthly stipend (CFA 20,000 or \$34), job description, and hiring criteria. The Global Fund is supporting the MoH with the recent recruitment of 17,668 new CHWs (two per village) through the Global Fund's HSS grant. This support will also include an integrated training package - prevention, diagnosis, and treatment of malaria, pneumonia, and diarrhea—for each CHW. Training was completed in 2017. According to an agreement with the government, only one quarter of the CHWs monthly stipend will be borne by the Global Fund, while three quarters will be supported by the government budget. Additionally, UNICEF financed toolkits for data collection and reporting which have recently been distributed by the MoH.

The Global Fund, through its civil society malaria grant, is also providing nationwide coverage to support 252 community-based organizations promoting sensitization of communities on malaria prevention and treatment through group discussions, plays, and videos

The civil society is very active and supports the GoBF in implementation and resource mobilization. The civil society brings together several stakeholders including associations and other NGOs, including an advocacy network and mobilization of funds for maternal and child health. Services include: social mobilization, promotion of essential family practices, patient monitoring, location of “lost” HIV and TB patients, orientation of patients to health facilities, family planning services, and treatment of malaria, diarrhea, etc.

4. National Malaria Control Program Strategy

In order to accommodate the Global Fund's work, parts of the 2011-2015 NMCP National Strategic Plan were revised and extended through 2017, while the remainder of the strategy ended in 2015. A new 2016-2020 strategy was recently finalized, in line with the long-term vision of eliminating malaria in Burkina Faso by 2030, and will be validated by the end of 2017. The NMCP's strategic objectives align with the Global Fund's Technical Strategy, and PMI's Strategy for 2015-2020 and include:

- Reduce malaria death rate by 40 percent in Burkina Faso by 2020 from 2015 levels
- Reduce malaria incidence rate by 40 percent in Burkina Faso by 2020 from 2015 levels

- Reinforce NMCP malaria program management capacities in Burkina Faso by 2020

The NMCP's new strategic plan is comprised of 10 focus areas:

- Parasitological diagnosis of malaria at public and private health facilities, and community levels; and also through quality control/assurance of laboratories
- Treatment of malaria cases at public and private health facilities, and community levels
- Vector control through universal access to ITNs, implementation of IRS in targeted areas, and the management of insecticide resistance
- Prevention of malaria in pregnant women using ITPs with SP and by providing ITNs through routine distribution channels
- Seasonal malaria chemoprevention for children aged 3-59 months
- Strengthening of communication through advocacy, social mobilization, and SBCC
- Securing commodity supply chain management
- Monitoring, evaluation and research
- Epidemic control and emergency management
- Strengthening malaria program management

The NMCP's strategic approach will continue to fall within the following major areas: prevention through malaria vector control, SMC for children under five years of age, IPTp, case management including diagnosis, and SBCC.

The malaria vector control goals are to protect individuals against infective malaria mosquito bites and reduce the intensity of malaria transmission at the community level. The key interventions in this plan include ITN distribution, IRS, and larval source control including environmental management.

In order to protect both mother and fetus from the impact of malaria infections during pregnancy, the NMCP policy is to administer IPTp using SP during each antenatal care visit (ANC) starting in the second trimester of pregnancy. Each treatment is administered with direct observation by a health care worker and continues at monthly intervals until delivery.

In 2014, SMC was piloted with two NGOs —*Terre des Hommes* and *Alima*—in seven health districts. Financial support was provided by the European Union (ECHO) and the World Bank. The study found:

- High acceptability by the people living in the areas targeted by the intervention with high coverage of the target population (over 90 percent coverage achieved).
- A reduction of the number of cases of malaria among children under five years of age by 15 percent in 2014 compared to 2013; and by 31 percent during the intervention period.
- A reduction of the number of severe cases of malaria among children under five years of age by 16 percent compared to 33 percent in 2013.
- A reduction of the number of deaths by 45 percent in 2014 compared to 36 percent in 2013.

As a result, the MoH started scaling up implementation of SMC to cover 17 health districts in 2015 and 54 health districts in 2016. SMC coverage was expanded to 63 of the 70 total health districts in 2017. Malaria Consortium provided financial and technical assistance in 11 health districts from three regions in 2015, with expansion to 31 health districts in 2016 and 39 health districts in 2017. The World Bank provided assistance in 4 health districts in 2015 and expanded to 18 districts in 2016 and 2017. The World Bank has committed to supporting 22 districts in 2018 and 2019. UNICEF provided operational costs for 2 of the 39 districts supported by Malaria Consortium. The Global Fund supported 3 health

districts in 2016 with a commitment to support 9 districts in 2018, 17 districts in 2019, and 39 districts in 2020. In 2016, SMC campaign areas had an average 45 percent malaria incidence reduction in children under five years of age. In 2017, PMI provided financial support for SMC implementation, including drug procurement, in two health districts.

Since 2012, the NMCP has strengthened case management, requiring the use of microscopy or RDTs to diagnose all suspected malaria cases presenting in health facilities. A primary difficulty has been ensuring an uninterrupted supply of RDTs at the health facility level. Beginning in 2013, a pilot study on the administration of RDTs by CHWs was conducted in three health districts. Plans for national scale-up are now in process. As part of the national free health care program, community-based testing and treatment is expected to be operational in 2018.

5. Integration, collaboration, and coordination

The NMCP actively coordinates both financial and technical programmatic collaboration among financial and technical partners. The most formal presentation of this collaboration is the bi-yearly malaria steering committee meeting that brings together government ministries, donors, and implementing partners to review and coordinate malaria prevention and control activities. Under the steering committee, five working groups are tasked with different components of malaria prevention and control and include partners engaged in both financial and technical collaboration. The five groups are: partnership and communications; planning, monitoring, evaluation and research; vector control; drug-based case management and medical prevention; and finance and resource mobilization. In the soon-to-be-validated 2016-2020 National Strategic Plan, the NMCP will reach out to the private sector for increased funding opportunities. The relationships between the above-mentioned malaria stakeholders are both collegial and collaborative with genuine interest in complementing one another and seeking information sharing and harmonization of strategies and action plans.

6. PMI goal, objectives, strategic areas, and key indicators

Under the PMI Strategy for 2015-2020, the U.S. Government's goal is to work with PMI-supported countries and partners to further reduce malaria deaths and substantially decrease malaria morbidity, towards the long-term goal of elimination. Building upon the progress to date in PMI-supported countries, PMI will work with NMCPs and partners to accomplish the following objectives by 2020:

- Reduce malaria mortality by one-third from 2015 levels in PMI-supported countries, achieving a greater than 80 percent reduction from PMI's original 2000 baseline levels;
- Reduce malaria morbidity in PMI-supported countries by 40 percent from 2015 levels;
- Assist at least five PMI-supported countries to meet the World Health Organization's (WHO) criteria for national or sub-national pre-elimination.³

These objectives will be accomplished by emphasizing five core areas of strategic focus:

- Achieving and sustaining scale of proven interventions
- Adapting to changing epidemiology and incorporating new tools
- Improving countries' capacity to collect and use information
- Mitigating risk against the current malaria control gains
- Building capacity and health systems towards full country ownership

³ http://whqlibdoc.who.int/publications/2007/9789241596084_eng.pdf

To track progress toward achieving and sustaining scale of proven interventions (area of strategic focus #1), PMI will continue to track the key indicators recommended by the RBM Monitoring and Evaluation Reference Group (MERG) as listed below:

- Proportion of households with at least one ITN
- Proportion of households with at least one ITN for every two people
- Proportion of children under five years of age who slept under an ITN the previous night
- Proportion of pregnant women who slept under an ITN the previous night
- Proportion of households in targeted districts protected by IRS
- Proportion of children under five years of age with fever in the last two weeks for whom advice or treatment was sought
- Proportion of children under five years of age with fever in the last two weeks who had a finger or heel stick
- Proportion receiving an ACT among children under five years of age with fever in the last two weeks who received any antimalarial drugs
- Proportion of women who received two or more doses of IPTp for malaria during ANC visits during their last pregnancy

7. Progress on coverage/impact indicators to date

Table 1: Evolution of Key Malaria Indicators in Burkina Faso from 2010 to 2015

Indicator	2010, DHS	2014, MIS	2015, TRaC
% Households with at least one ITN	65.5	89.8	not available
% Households with at least one ITN for every two people	not available	49.2	86.7
% Children under five years of age who slept under an ITN the previous night	53.1	75.3	85.6
% Pregnant women who slept under an ITN the previous night	52.6	77.1	not available
% Households in targeted districts protected by IRS	N/A 2010 IRS district not covered by this survey	N/A	N/A
% Children under five years of age with fever in the last two weeks for whom advice or treatment was sought	20.6	61.4	76.7
% Children under five years of age with fever in the last two weeks who had a finger or heel stick	5.3	30.3	43
% Children receiving an ACT among children under five years of age with fever in the last two weeks who received	35.1 ACT was not only	30.4	not available

Indicator	2010, DHS	2014, MIS	2015, TRaC
any antimalarial drugs	treatment in 2010		
% Women who received two or more doses of IPTp during their last pregnancy in the last two years	38.5	47.6	not available

III. OPERATIONAL PLAN

1. Vector monitoring and control

NMCP/PMI objectives

Malaria vector control is one of three major prevention interventions within the NMCP's strategic approach with the following goals: to protect individual people against infective malaria mosquito bites and to reduce the intensity of malaria transmission at the community level. The key vector control interventions in the NMCP's strategic plan include ITN distribution, IRS and larval source control, including environmental management.

a. Entomologic monitoring and insecticide resistance management

Intervention overview/Current status

Burkina Faso has three institutions with a history of conducting entomological work: CNRFP and *Centre Muraz*, within the MoH, and IRSS, a part of the Ministry of Education. The CNRFP laboratories, including an insectary, are located in Ouagadougou. The *Centre Muraz* laboratories and insectary are located in Bobo-Dioulasso and the entomologists employed by IRSS essentially work in the *Centre Muraz* laboratories. Both the CNRFP and IRSS house colonies of members of the *Anopheles gambiae* complex, as well as *An. funestus*.

Entomologists of IRSS and *Centre Muraz* have provided technical assistance and oversight to entomological monitoring activities related to the USAID funded IRS campaigns conducted from 2010 to 2012 in Diébougou health district, using Dano health district as a control unsprayed area. A follow-up entomological study was conducted in the Diébougou and Dano health districts in 2015. The most abundant vector in these districts were *An. gambiae* s.s. and *An. coluzzii*. The vectors remained strongly endophagic and endophilic even in the area where spraying had been conducted indicating that IRS should continue to be effective. Insecticide resistance testing at both sites revealed that less than 20 percent of wild caught *An. gambiae* s.l. are susceptible to DDT, less than 40 percent to deltamethrin, less than 80 percent to bendiocarb, but all are fully susceptible to the organophosphate pirimiphos-methyl. Molecular tests for the L1014F mutation in the sodium channel gene that is associated with knock down resistance to pyrethroids and DDT was found in the majority of the *An. coluzzii* and *An. gambiae* s.s. in both Dano and Diébougou. Alleles for the Ace-1 119S that strongly associated with carbamate and organophosphate resistance were also found but in much lower frequencies.

The entomologist of the CNRFP, and the Integrated Vector Control Consortium have been conducting insecticide susceptibility monitoring in various parts of the country. In Bama, they conducted testing annually from 2011-2013. In all the years the percentage of mosquitoes susceptible to DDT, deltamethrin, and permethrin remained below ten percent. The susceptibility to bendiocarb was around 85 percent and the mosquitoes were fully susceptible to fenitrothion.

The sentinel sites for entomological monitoring were selected in early 2017, upon a comprehensive review of the country's plan for resistance monitoring with key stakeholders, including PMI.

In February 2017, a committee of key stakeholders, including PMI, met in Bobo-Dioulasso to review the insecticide resistance monitoring plan and to select four districts as potential IRS sites, four control comparison districts, and eight additional sites for insecticide resistance monitoring. Therefore, with FY 2016 funds, USAID supported entomological monitoring in villages in 16 districts throughout Burkina Faso. Four districts (Mangodara, Kampti, Solenzo, and Kongoussi) were selected as potential IRS sites

to be sprayed in 2018 with FY 2017 PMI funds and four adjoining districts (Tiefora, Gaoua, Nouna, and Seguenega, respectively) to serve as comparison districts. Starting June 2017, these districts received the full package of monthly entomological monitoring activities including human landing catches, pyrethrum spray catches, parity testing, species identification, sporozoite detection, blood meal analyses, and insecticide resistance testing.

Anopheles gambiae s.l. was the predominant vector in the human landing catches representing 95.9 percent of the anophelines captured. The other 4.1 percent were composed of *An. pharoensis*, *An. nili*, *An. funestus* and *An. coustani*. The members of the *An. gambiae* complex identified were *An. gambiae* s.s., *An. coluzzi* and *An. arabiensis*, and their relative abundance with respect to each other varied based on month and district. *An. coluzzi* was the predominant species in the four northern districts. In the more southern districts, *An. coluzzi* was predominant in June but *An. gambiae* s.s. became more and more predominant as the months progressed. Biting rates varied by month and district but in general the greatest number of mosquitoes were collected in September. Approximately the same numbers were collected outdoors as indoors. Interestingly, peak collection period was between 4 am and 5 am, the time when people were waking to go to the fields. Blood meal analyses revealed that approximately 90 percent of the *An. gambiae* s.l. had fed on humans. The other blood sources included goats, sheep, pigs and bovines. In the southern districts, *P. falciparum* infected *An. gambiae* s.l. were found as early as June, whereas infected mosquitoes were found in only one of the northern districts in June. By August, infected mosquitoes were found in all districts. The average infection rates in these vectors were higher in the southern districts (Mangodora, 7.3%; Tiefora, 7.3%; Kampti 11.7%; Gaoua, 6.7%) than in the other districts (Solenza, 1.3%; Nouna, 2.0 %; Kongoussi, 3.3%; Seguenega, 4.7 %).

Insecticide resistance testing with the WHO tube test was carried out twice (in June and in September, 2017) in the four potential IRS districts and their comparison districts. The second round in September coincided with highest agricultural use of insecticides, which may contribute to resistance selection. In all eight districts during both the June and September testing, less than 30 percent of the *An. gambiae* s.l. were susceptible to the three pyrethroids tested (alpha-cypermethrin, deltamethrin and permethrin). Susceptibility to bendiocarb ranged from approximately 45 percent in Mangodora to almost 80 percent in Seguenega and Solenzo. Possible resistance to the organophosphate pirimiphos-methyl was detected in multiple districts (Kampti, Gaoua and Mangodara) in June. Mortality rates in tests ranged from 45 to 65 percent where in the other five districts very little resistance detected (susceptibility to the insecticide approximately 95 percent or more). The situation was worse in September but data from November showed increased susceptibility to this insecticide in some districts. Only in Kongoussi were more than 90 percent of the mosquitoes susceptible to the insecticide. Insecticide resistance data from other sites was not available at the time of this writing.

Plans and justification

Because PMI plans to continue to fund IRS with FY 2018 funds, PMI will also fund entomological monitoring activities associated with IRS. These activities include cone bioassays on walls to ensure quality of spraying in each of the spraying districts. In addition, the following entomological indicators will be monitored monthly in sprayed and matched control districts: density and identity of vectors, biting and resting behavior, parity rates, blood meal analyses, and infection rates. Lastly, insecticide resistance monitoring will be carried out in the sprayed and control districts as well as in eight other sentinel sites within the country.

Proposed activities with FY 2018 funding: (\$464,500)

1. *Entomological Monitoring*: PMI plans to support the national program for entomological monitoring of the vector population (entomological indicators: densities, identification, behavior, parity and infection rates, etc.) along with monitoring of resistance to insecticides. Additionally, in the districts where IRS is conducted, cone bioassays on walls will be carried out at monthly intervals, after spraying, to assess spray quality. Molecular analyses of the mosquitoes collected will include identification to species level of the members of the *An. gambiae* and *An. funestus* complexes and identification of insecticide resistance genes. The full package of monitoring will take place in four to five sites in the sprayed districts, vector density and dynamics monitoring in three sites outside of the IRS area, and insecticide resistance monitoring in 12 additional sites. PMI will also support the development and implementation of an insecticide resistance management plan in collaboration with the NMCP and in country entomological partners. (\$450,000)
2. *Technical assistance*: An entomologist from CDC will provide one technical assistance visit for the planning and implementation of all PMI-funded entomologic monitoring activities. (\$14,500)

b. Insecticide-treated nets

Intervention overview/Current status

The 2016-2020 National Malaria Control Strategy for Burkina Faso uses ITNs as the principal tool for malaria prevention. This strategy employs three approaches for ensuring that ITNs are available to the entire population: (1) free distribution of ITNs via nationwide campaigns, with one ITN made available for every 1.8 persons; (2) free distribution of ITNs through ANC and expanded program on immunization (EPI) services provided at all public health facilities, ensuring that pregnant women and infants are protected; and (3) the sale of ITNs by the private sector.

The 2010 Demographic and Health Survey (DHS) shows that 44 percent of pregnant women and 45 percent of children under five years of age slept under an ITN the night prior to the survey. These results are up from the 2003 DHS, where only two percent of pregnant women and three percent of children under five years of age slept under an ITN the night prior to the survey. Data from the Malaria Indicator Survey (MIS) conducted in 2014, shows that 77 percent of pregnant women and 75 percent of children under five years of age slept under an ITN the night prior to the survey, both significant increases from the 2010 DHS.

Burkina Faso conducted its first, nationwide, universal coverage ITN campaign in 2010. Approximately 7.5 million ITNs were distributed, which was about 600,000 less than the projected need. The next universal coverage campaign was carried out from July through early November 2013. As in the 2010 campaign, multiple donors contributed, including the Global Fund, USAID and the GoBF. In total, 9,267,584 nets were distributed, covering 95 percent of all households that were identified during the pre-campaign census. The reason that the remaining five percent of households were not reached is that they did not come to collect their nets on the designated distribution day. The most recent universal coverage campaign was carried out in 2016. Almost 11 million nets were purchased and distributed, with Global Fund resources covering most of the costs. USAID contributed 400,000 nets to the 2016 campaign. The estimates for the nets needed for the campaign was based on a population estimate of 19 million, but the inflated pre-campaign census estimated the population at 22 million since households often want to take advantage of additional free nets, meaning universal coverage was not fully achieved.

Health facilities in all districts are supposed to provide ITNs free of charge to pregnant women during their first ANC visit and to children less than one year of age as a part of EPI services. During 2015, due to the late arrival of Global Fund procured nets, an estimated 1.7 million were needed for these vulnerable populations but only 529,836 were distributed, with all districts reporting a stockout at some point from October 2015 through September 2016. Nets are delivered to districts via Central Medical Supplies Store (CAMEG). Each health facility is supposed to obtain their nets from the district depot.

Another emerging issue is regarding ITN durability, with preliminary information from other countries indicating that net life expectancy is less than three years. The NMCP is already leading discussions to consider additional approaches to extend the life of an ITN. As ITN durability data becomes available throughout Africa, and in the West Africa region in particular, the NMCP will continue to review their national strategy and make changes if needed. PMI will monitor the situation, and participate in country-level discussions, keeping the NMCP and other stakeholders informed on the latest information regarding best approaches for extending the life of a net that may lead to policy revisions.

Late arrival of ITNs in the country limited the routine (ANC and EPI) distribution of nets during 2017. One estimate was that 61 percent of pregnant women received nets from April to June 2017. In August and September, CAMEG distributed approximately one million ITNs to the district depots where the health facilities obtain their supply of nets. However, due to shortages in storage space at the district level, in late 2017, CAMEG had 995,864 ITNs in stock. According to the NMCP and CAMEG, stocks of ITNs currently in country are sufficient for routine distribution in 2018. In 2018, (with FY 2017 funds), PMI will fund technical assistance to assess the routine distribution system in Burkina Faso.

Table 2: ITN Gap Analysis

Calendar Year	2017	2018	2019
Total Targeted Population	19,632,147	20,244,079	20,875,085
Continuous Distribution Needs			
Channel #1: ANC (4.4 % of population)	880,343	883,425	886,517
Channel #2: EPI (4% of the population)	762,074	777,145	792,134
<i>Estimated Total Need for Continuous</i>	1,642,417	1,660,570	1,678,651
Mass Distribution Needs			
2019 mass distribution campaign	0	0	12,174,202
<i>Estimated Total Need for Campaigns</i>	0	0	12,174,202
Total ITN Need: Routine and Campaign	1,642,417	1,660,570	13,852,853
Partner Contributions			
ITNs carried over from previous year	1,658,837	1,721,020	996,967*
ITNs from MoH	0	0	792,134
ITNs from Global Fund	1,298,600	-	12,054,202
ITNs from USAID funding	406,000	886,517	-
ITNs planned with PMI funding	-	50,000	120,000
Total ITNs Available	3,363,437	2,657,537	12,966,336

Total ITN Surplus (Gap)	1,721,020	996,967	110,450

*The NMCP considers there to be 0 ITNs carried over in 2019, to avoid underestimating of needs.

Plans and justification

The Global Fund will purchase more than 12 million ITNs to cover estimated number required for the 2019 mass campaign. PMI will purchase 120,000 ITNs, a portion of which will be next generation nets to be distributed to one of the IRS districts where spraying will not continue, as a part of an OR study (see OR section). The distribution of these nets will occur at the time of the 2019 mass distribution campaign. PMI will also provide support technical assistance of the mass campaign activities.

Proposed activities with FY 2018 funding: (\$395,600)

1. *Procure ITNs.* PMI will procure about 120,000 ITNs for the mass campaign. A portion of these ITNs will be next generation ITNs to be used in conjunction with vector control operations research in conjunction with the IRS program. It is anticipated that the catalytic funds will contribute to the procurement of the next generation ITNs. (\$345,600)
2. *Technical Assistance for mass campaign.* PMI will provide funds to support technical assistance for the planning and implementation of the 2019 mass campaign. (\$50,000)

c. Indoor residual spraying

Intervention overview/Current status

Burkina Faso’s 2016-2020 National Strategic Plan, which was adopted in 2016, calls for the re-introduction of IRS in high transmission regions of the country. IRS would be in addition to the universal coverage of ITNs and would not be implemented in regions where larval source management is proposed. The NMCP objective is to cover 100 percent of areas that are selected for IRS, with the idea of utilizing long lasting or new insecticide formulations to combat the insecticide resistance that is quite prevalent in Burkina Faso.

Currently, IRS is not being implemented in Burkina Faso. USAID/Burkina Faso supported an IRS pilot in the District of Diebouyou from 2010 to 2012, however USAID support for IRS ceased due to other funding priorities highlighted by the NMCP. During the IRS pilot, NMCP staff, along with Regional and District health officials, were involved during key activities of the IRS campaign: training of trainers and training of spray teams, supervision of spray teams, and monitoring progress. Indoor residual spraying equipment, which was previously procured with support from USAID, has since been donated to the NMCP, and has not been used or serviced since the last campaign. Burkina Faso has quite a robust, in-country, entomological capacity to monitor the residual efficacy of IRS, so partners should be able to conduct monthly cone bio assays to monitor the duration of the intervention.

Table 3: USAID funded IRS activities 2010-2012, and Future PMI IRS Plans

Calendar Year	Number of Districts Sprayed	Insecticide Used	Number of Structures Sprayed	Coverage Rate	Population Protected
2010	1 (Diebouougou)	Carbamate	33,897	98.9%	118,691
2011	1 (Diebouougou)	Carbamate	33,832	99.31%	110,064
2012	1 (Diebouougou)	Carbamate	36,870	99.3%	115,638
2018*	~ 3 districts (Kampti, Kongoussi, Solenzo)	Organophosphate and clothianidin (Solenzo)	~200,000	TBD	TBD
2019*	~ 2 districts	Organophosphate or new long lasting formulation	~100,000	TBD	TBD
2020*	~ 2 districts	Organophosphate or new long lasting formulation	~100,000	TBD	TBD

*Represents projected targets based on discussions with the NMCP.

Plans and justification

With FY 2017 funds, PMI plans to re-start IRS in up to three high burden districts in Burkina Faso, as requested by the NMCP. The districts were selected by the NMCP, PMI, and relevant stakeholders after reviewing health management information system (HMIS) and entomological data. The final number of districts to be covered is dependant on the UNITAID-funded NgenIRS Project, of which Burkina Faso is a candidate country for 2018. This market intervention project includes a short term co-payment to accelerate the reduction of price for long-lasting IRS insecticides. The price reduction will facilitate Burkina Faso’s ability to re-start the IRS program, significantly expanding from the previous IRS pilot from 2010-2012.

With FY 2018 funds, PMI will continue to support IRS in three initial districts. The insecticide selection for IRS will be made based on susceptibility data, WHO recommended new insecticides on the market, and in alignment with Burkina Faso’s insecticide resistance management plan.

Proposed activities with FY 2018 funding: (\$3,035,000)

- 1. IRS Implementation:* PMI will support the implementation of IRS in up to three high burden districts in Burkina Faso. Implementation will include procurement of insecticide and personal protective equipment, training, operations, environmental compliance mitigation, SBCC and mobilization activities in IRS areas, and overall monitoring. (\$3,000,000)
- 2. Environmental Compliance monitoring visit:* PMI will support an independent environmental compliance field monitoring visit of the IRS campaign. (\$35,000)

Table 4. Insecticide susceptibility test results listed as percent mortality from WHO Tube Bioassays for various insecticides in eight districts of Burkina Faso. (n)=number tested

Districts	Pirimiphos-methyl 0.25%	Bendiocarb 0.1% (n)	Deltamethrin 0.05%	Permethrin 0.75%	Alphacypermethrin 0,05%
Kampti 1 st round (July/Aug) 2 nd round (Sep/Oct) 3 rd round (Nov)	52.30% (65) 83.49% (103) 77.35% (106)	70.52% (95) 63.24% (117) -	37.62% (101) 12.50% (112) -	31.06% (103) 4.67% (107) -	27.69% (65) 0.97% (103) -
Gaoua 1 st round (July) 2 nd round (Sep/Oct) 3 rd round (Nov)	41.41% (99) 87.71% (114) 60.81% (74)	78.57% (98) 60.52% (114) -	21.51% (79) 5.26% (114) -	24.65% (73) 0.93% (107) -	2.29% (87) 2.70% (111) -
Mangodara 1 st round (July/Aug) 2 nd round (Sep/Oct) 3 rd round (Nov)	62.24% (98) 61.19% (67) 61.19% (67)	52.72% (110) 49.54% (109) -	11.62% (86) 10.47% (105) -	15.73% (89) 9.70% (103) -	9.25% (108) 3.33% (90) -
Tiefora 1 st round (July/Aug) 2 nd round (Sep/Oct) 3 rd round (Nov)	96.33% (109) 71.57% (95) 63.15% (114)	24.25% (99) 53.03% (66) -	21.59% (88) 14.95% (107) -	5.35% (112) 6.48% (108) -	00% (112) 12.26% (106) -
Solenzo 1 st round (July/Aug) 2 nd round (Sep/Oct) 3 rd round (Nov)	94% (100) 36.36% (99) 96.34% (86)	74.41% (106) 54.94% (91) -	15.31% (111) 10.37% (106) -	26% (100) 16.16% (99) -	6.89% (116) 12.63% (95) -
Nouna 1 st round (July/Aug) 2 nd round (Sep/Oct) 3 rd round (Nov)	97.87% (94) 88.99% (109) 98.24% (114)	46.60% (103) 89% (100) -	23.28% (73) 10.30% (97) -	20.66% (121) 14.85% (101) -	2.97% (101) 3.03% (99) -
Kongoussi 1 st round (July/Aug) 2 nd round (Sep/Oct) 3 rd round (Nov)	100% (103) 93.16% (117) 97.10% (69)	50.96% (104) 94.33% (106) -	1.76% (113) 3.09% (97) -	10.25% (117) 2.10% (95) -	0.86% (115) 6.74% (89) -

Seguenega					
1 st round (July/Aug)	97% (100)	73.58% (106)	5.66% (106)	18.27% (93)	28.72% (94)
2 nd round (Sep/Oct)	69.29% (114)	93.85% (114)	14.52% (117)	15.38% (130)	1.80% (111)
3 rd round (Nov)	100% (110)	-	-	-	-

2. Malaria in Pregnancy

NMCP/PMI objectives

The NMCP updated their national strategy for IPTp in 2017 to align with the new WHO guidance for the prevention of MIP. The current policy recommends administration of a treatment dose of SP under direct observation of a health worker, at each ANC visit, starting in the second trimester (16th week of amenorrhea), at four-week intervals, with at least three treatments provided before delivery. The policy includes provision of an ITN at the time of the first ANC visit, and 30 tablets (60mg/0.25mg per tablet) per month of iron/folate (taking one per day) to manage anemia. Women attending ANC receive all services free of charge including those related to case management.

Regarding case management of MIP, pregnant women who are diagnosed with uncomplicated malaria should receive quinine in the first trimester and ACTs in the second and third trimesters. Treatment for those diagnosed with severe malaria follow national protocols (see section on Treatment). The strategy also follows WHO guidance regarding pregnant women who are HIV positive.

Previously the NMCP used population data to calculate quantification for SP and routine ITN distribution. However, the country has now shifted methodologies and is using ANC attendance numbers for this calculation.

The national strategy articulates a target of 100 percent of pregnant women receiving at least three SP treatments (IPTp3) throughout their pregnancy. PMI will work with the NMCP and partners to achieve progress towards IPTp uptake and ITN distribution targets. The NMCP collaborates with the Division of Maternal and Reproductive Health through the National Coordinating Committee for Malaria. A case management and medical prevention technical group, which includes malaria in pregnancy, is housed under the Malaria Control Steering Committee and meets regularly to work on relevant technical issues.

Intervention overview/Current status

The MoH policy (as described in the NMCP strategy) is to provide all ANC services, free-of-charge, to pregnant women, including provision of an ITN as well as three or more doses of IPTp. This policy is based on the current WHO recommendations for IPTp. In general, MIP services are well-integrated into ANC services as all health workers are trained on an integrated platform, which includes provision of correct malaria prevention and treatment services including those related to management of both uncomplicated and severe malaria cases and pregnant women who are HIV positive. All pregnant women who attend ANC have an ANC card, which records updates of all the services they receive at each visit. ANC registers also have been updated allowing for monitoring of IPTp1-3 uptake.

Available, population-based data show improvement in IPTp uptake and ITN use by pregnant women. For instance, IPTp2 improved from 11 percent (2010 DHS) to 47 percent (2014 MIS), and that the first, national-level measure of IPTp3+ found 22 percent coverage (2014 MIS). Additionally, ITN use by

pregnant women improved from 44 percent (2010 DHS) to 77 percent (2014 MIS). Overall, 95 percent of pregnant women make at least one ANC visit, while 57 percent make two to three visits and 34 percent make four or more visits (2010 DHS). The next MIS is scheduled to take place during the peak transmission season in 2017.

The GoBF is the sole provider of SP, and, until this year, consistently met all national-level needs. However, with the political upheaval that occurred in 2014, budget constraints were imposed on all ministries and the \$4 million plus in funding that had been attributed to malaria in previous years was not available in 2016. This led to sporadic facility level stock-outs of SP as procurement did not reach previous year levels. According to the NMCP and MoH, the GoBF plans to resume full support of SP in 2017, to meet 100 percent of the national need. All GoBF-funded commodities, including SP, are procured by CAMEG, and the MoH, through the General Directorate of Pharmacies, Medicines and Laboratories (DGPML) ensures quality.

The NMCP works closely with the Division of Maternal and Reproductive Health (DMRH) and engaged them during the recent revision of the National Malaria Control Strategy.

Since 2010, USAID has been supporting the NMCP to strengthen and improve the provision of MIP services by facilitating integrated training and supervision of health workers, including those responsible for delivery of ANC services. The USAID support includes work with the national school of public health to update their malaria modules and train teachers to ensure that new cadres of health workers will graduate with current knowledge and skills for malaria prevention, diagnosis, and case management. In addition, USAID support facilitates supervision to ensure that malaria guidelines are followed. Supervision is carried out by a team at the district level, although funding and time constraints limit the frequency of supervisory visits. Supervision is performed in an integrated fashion whereby a facility is visited and monitored for the entire package of health services they provide, including treatment and prevention of malaria, with input from all levels within the MoH. USAID has found that specific, on-the-job follow up has been an effective manner to ensure that health care workers are adhering to national malaria guidelines, including those related to MIP.

Regarding support for MIP services, USAID has been working to ensure that cups and clean drinking water for direct administration of IPTp by a health worker are available at ANCs. Quantification and commodity distribution issues related to SP are being addressed by USAID as well. However, SP and ITNs reach ANCs via the national CAMEG commodity distribution system that delivers supplies to the district level, from which individual facilities are responsible for obtaining stock replenishments. With USAID support, ANC cards and registers were updated following the initial revision of the IPTp policy in 2013. A second revision was completed in 2017 and adopted WHO guidance recommending eight ANC contacts instead of four.

Table 5: Status of IPTp Policy in Burkina Faso

Policy updated to reflect new WHO ANC guidance	2017
Status of training on updated IPTp policy	Completed
Number of health care workers trained on new policy in the last year	772 (475 at health facilities and 297 at regional hospitals)*
Are the revised guidelines available at the facility level?	Yes
ANC registers updated to capture 3 doses of IPTp-SP?	Yes
HMIS/ DHIS updated to capture 3 doses of IPTp-SP?	Yes

*Includes 63 trainers/supervisors

Commodity gap analysis

Table 6: SP Gap Analysis for Malaria in Pregnancy

Calendar Year	2017	2018	2019
Total Population	19,632,147	20,244,079	20,870,060
SP Needs			
Total number of pregnant women attending ANC	880,343	883,425	886,517
Total SP Need (in treatments)	5,282,060	5,300,547	5,319,099
Partner Contributions			
SP carried over from previous year	-	5,012,136	3,933,761*
SP from MoH	10,294,452	2,288,323	1,385,338
SP from Global Fund	-	-	-
SP from Other Donors	-	-	-
SP planned with PMI funding	167,000		-
Total SP Available	10,294,452	7,467,459	5,319,099
Total SP Surplus (Gap)	5,012,392	2,166,912	0

Footnotes: *Includes 2018 surplus plus buffer stock. (1) The total number of pregnant women expected in one year is calculated based on 4.5% annual pregnancy rate; (2) Total SP Need (in treatments) are calculated by the NMCP and MoH to reflect ANC4, or 4 times the number of all pregnant women plus a buffer stock of 6 months (half of annual need based on ANC4) starting in 2017 due to stock outs in 2016; (3) PMI contributions for SP will be used only for scale-up of community IPTp delivery.

Plans and justification

Using FY 2018 funding, PMI will provide funds to support the development and dissemination of the newly updated national policy that reflects updated WHO ANC guidelines as well as the elaboration of training guidelines and job aids for the implementation of community level IPTp distribution. PMI will also continue to support activities aimed at enhancing the provision of effective MIP services in public health facilities in Burkina Faso. This will include support for integrated training and supervision as well as activities aimed at improving awareness and facilitating behavior change related to malaria prevention. PMI will also support the scaling up of community IPTp, provided results of the two-year OR activity that started in 2016 are favorable. If scale-up is advised within country, WHO would have to update its policy guidance on delivery of IPTp to include community level delivery before scale-up could actually take place. PMI will engage with WHO to discuss endorsement if the IPTp study results are favorable. PMI support for scale-up will include training and supervision of CHWs in districts targeted for initial scale-up.

Proposed activities with FY 2018 funding: (\$75,000)

1. *Community level IPTp implementation planning*: These funds will support national policy development and validation, and the development of training guidelines and job aids for community level IPTp distribution roll out. (\$75,000)
2. *Training of health care workers on MIP*: Costs covered under integrated training case management activities. (\$0)
3. *Supervision of health care workers and CHWs on MIP*: Costs covered under integrated supervision case management activities. (\$0)

3. Case management

NMCP/PMI objectives

PMI is committed to helping NMCP reach its objective of testing 100 percent of suspected cases of malaria and treating 100 percent of confirmed cases with an appropriate antimalarial in all settings, including public health facilities, the community, and the private sector. NMCP's strategy is to provide SMC for children 3 to 59 months of age throughout the country.

Table 7. Status of Case Management Policy in Burkina Faso according to the National Malaria Control Program Care and Treatment Guidelines	
What is the first-line treatment for uncomplicated <i>P. falciparum</i> malaria*?	AL
What is the second-line treatment for uncomplicated <i>P. falciparum</i> malaria*?	ASAQ, DHA PPQ
What is the first-line treatment for severe malaria?	Injectable artesunate
In pregnancy, what is the first-line treatment for uncomplicated <i>P. falciparum</i> malaria in the first trimester*?	Quinine
In pregnancy, what is the first-line treatment for uncomplicated <i>P. falciparum</i> malaria in the second and third trimesters*?	ACT
In pregnancy, what is the first-line treatment for severe malaria?	Injectable quinine in the first trimester, injectable artesunate in the second and third trimesters
Is pre-referral treatment of severe disease recommended at peripheral health facilities? If so, with what drug(s)?	Yes, rectal artesunate
Is pre-referral treatment of severe disease recommended for community health workers? If so, with what drug(s)?	Yes, rectal artesunate is being piloted
If pre-referral rectal artesunate is recommended, for what age group? (note: current international guidelines do not recommend administering to those ≥ 6 years)	Under five years of age

*Provide recommended treatments for *P. vivax* if these are also in a country's guidelines.

Intervention Overview/Current status

Malaria case management in Burkina Faso occurs at all levels of the health system. Malaria case management is conducted by an estimated 21,196 healthcare workers and by 8,000 of Burkina Faso's 17,668 CHWs that work in villages further than 5 km from the nearest health facility. The scale-up of malaria care delivery by CHWs was formalized by the nationwide identification and training of CHWs in integrated management of childhood illness in late 2016.

According to the 2014 MIS, the majority of fever cases in children (56.4 percent) sought care in the public sector, compared to 3.5 percent in the private sector, 1.1 percent at CHWs, and 3.5 percent at traditional healers and other sources. However, with the scale-up of the CHW program, the NMCP aims to increase the proportion of malaria care delivered at the community level.

Burkina Faso began SMC in children 3 to 59 months of age with SP+AQ in seven districts in 2014, expanding to 17 districts in 2015, 54 in 2016, and 63 in 2017. The campaigns occur during a four-month period corresponding to the peak malaria transmission period and rely on the network of CHWs for distribution of the medication. To date, most funding has come from UNITAID, complemented with additional funds from the World Bank, Global Fund, and UNICEF. UNITAID funding is ending in 2018 and will not be available for the 2018 SMC campaign. The NMCP is thus requesting that PMI, Global Fund, and Give Well fill this gap.

Table 10: SMC Coverage by District from 2017 - 2020*

	2017	2018	2019	2020
PMI	2	12**	12**	12?***
UNITAID	31	0	0	0
Global Fund	0	13***	19	39
World Bank	22	22	22	Unknown
Give Well	8	Unknown	Unknown	Unknown

* Burkina Faso did not become a PMI country until 2018. In 2017 SMC was funded through USAID.

** From 2018-2020 each year PMI will cover about 405,000 children with SMC.

***UNICEF will implement SMC in two of the Global Fund districts, but will not procure SP+AQ

There is continuing discussion in-country regarding SMC eligibility, especially in the Southwest region of the country. While the NMCP has included full nationwide coverage of SMC in all 70 districts in the 2016-2020 National Strategic Plan, PMI can only support districts WHO deems eligible: where clinical malaria cases occur during a short period of about four months, and 60 percent of the average annual rainfall falls within three months.

a. Diagnosis and treatment

Diagnosis

Obligatory laboratory testing of suspected malaria cases is done by either microscopy or RDT. Microscopy is largely restricted to Burkina Faso's nine district hospitals and four university hospitals, and in 2016 accounted for 1.59 percent of all malaria testing in the country. The remaining 98.41 percent of malaria testing was done by RDTs, which are available at the hospital, health facility (CSPS), and the community level. The expansion of RDT testing to the community level was implemented in 2016 following a successful pilot program in three districts from 2012 to 2014. In 2016, according to HMIS data, 98.41 percent of reported malaria cases were confirmed by diagnostic testing.

Treatment

National treatment guidelines prescribe the use of one of two ACTs: artemether-lumefantrine (AL) or artesunate-amodiaquine (ASAQ), as first-line treatment of uncomplicated malaria. However, with the large-scale expansion of SMC, the NMCP recently modified the guidelines to recommend the use of AL as the first-line treatment for uncomplicated malaria, beginning in 2018, to minimize the selection pressure on parasites resistant to AQ. Pregnant women are to be treated with oral quinine in the first trimester, and an ACT in the second and third trimesters.

Treatment of severe malaria is performed at the hospital and CSPS level. The NMCP plans to pilot the use of pre-referral rectal artesunate by CHWs in 2018, focusing on the North and Sahel regions, where malaria mortality is the highest. The first-line treatment for severe malaria in public health facilities is intravenous artesunate; in its absence, injectable quinine may be used. The NMCP recommends the use of intramuscular artemether in private health facilities capable of providing severe malaria treatment. In 2015, according to HMIS data, 4.3 percent of malaria cases seen at health facilities were severe.

Due to the presence of multiple malaria-focused research centers, Burkina Faso has been the site of a substantial number of clinical trials aimed at measuring ACT efficacy. In contrast, routine therapeutic efficacy monitoring has been limited to only two published studies from the central site of Nanoro, conducted first in 2008–2010 and then in 2010–2012. Unusually, both therapeutic efficacy studies were explicitly designed to measure effectiveness rather than efficacy, without supervised administration of the ACTs. The table below summarizes the published ACT efficacy results from Burkina Faso, dating to the initial introduction of ACTs in Africa.

Table 8: Past ACT Efficacy and Effectiveness Results from Burkina Faso

Year	Site	PCR-uncorrected 28-day Efficacy			PCR-corrected 28-day Efficacy ¹		
		AL	ASAQ	DP	AL	ASAQ	DP
2004-2006	Koupela		92.8			95.7	
2005 ²	Bobo-Dioulasso	84.9			98.1		
2006 ³	Nouna		65.6			82.0	
2006-2007 ²	Bobo-Dioulasso	70.9		97.8	95.4		97.8
2007–2009	Nanoro	39.4	68.6	85.4	82.1	95.7	95.9
2008–2010 ⁴	Nanoro	46.1	58.4		81.9	85.1	
2009	Comoé	66.7			87.5		
2010–2012 ⁴	Nanoro	43.3	63.1		64.5	77.4	
2010–2013 ⁵	Data unavailable	43.5	65.4		86.0	95.4	
2011	Nouna		55.4			80.0	

¹calculated using the WHO per-protocol definition. Might differ from the published results due to non-standard use of definitions by study authors

²Assessed in participants of all ages

³Assessed in children 6-10 years of age

⁴Unsupervised treatment

⁵Assessed in pregnant women

USAID funded a therapeutic efficacy study for 2016 that started in 2017 and will be finalized in 2018. PMI plans to support biennial efficacy monitoring, with the next therapeutic efficacy study scheduled to occur in 2019. PMI will continue monitoring trends in ACT efficacy, and will decide in conjunction with NMCP, which ACT to procure for Burkina Faso based on efficacy results and availability of ACTs to be procured.

Training, Supervision, and Quality Control/Quality Assurance

Doctors and nurses receive instruction on malaria case management during their regular pre-service training. Over the past year, PMI funds supported re-training and on the job supervision on malaria case management, which is seen when comparing end-use verification studies (EUV) conducted in May 2016 and July 2017: only 22 percent of interviewed health care workers reported being trained in malaria case management guidelines in May 2016, compared to 70 percent of interviewed health care workers in 2017.

Health care workers at the CSPS level are supervised by district health authorities. In turn, the head nurse of each CSPS is tasked with the supervision of all the CHWs attached to his or her CSPS. Supervision of laboratory technicians conducting malaria microscopy falls under the purview of the DGPMML.

Commodity gap analysis

Table 9: RDT Gap Analysis

Calendar Year	2017	2018	2019
RDT Needs			
Total country population	19,632,147	20,244,079	20,870,060
Population at risk for malaria	19,632,147	20,244,079	20,870,060
PMI-targeted at-risk population	19,632,147	20,244,079	20,870,060
Total number of projected suspect cases of malaria¹	14,569,118	-	-
Number of cases tested with RDTs²	-	15,676,371	16,068,280
Percent of fever cases tested with an RDT	82%	-	-
Total RDT Needs³	14,569,118	23,514,556	24,102,402
Partner Contributions			
RDTs carried over from previous year	3,136,559	6,137,854	7,838,185
RDTs from Government	-	3,052,689	2,695,955
RDTs from Global Fund	7,591,742	5,468,713	4,687,280
RDTs from Other Donors (World Bank)	1,480,204	855,300	881,000

RDTs planned with PMI funding	7,550,000	8,000,000	8,000,000
Total RDTs Available	19,758,505	23,514,556	24,102,420
Total RDT Surplus (Gap)	5,189,387	-	-
¹ Back-calculated by dividing the expected number of malaria cases (see following table) by an average treatment rate (conflation of testing rate, positivity rate, and adherence to test result rate) of 87% in 2016			
² Number calculated using service statistic data (2016 data and number of RDT tests conducted at health facilities)			
³ Including a 9 month buffer in 2016, and a 6 month buffer in 2017 and 2018			

Table 10: ACT Gap Analysis

Calendar Year	2017	2018	2019
ACT Needs			
Total country population	19,632,147	20,244,079	20,870,060
Population at risk for malaria	19,632,147	20,244,079	20,870,060
PMI-targeted at-risk population	19,632,147	20,244,079	20,870,060
Total projected number of malaria cases¹	10,136,378	10,641,077	11,173,131
Total ACT Needs²	15,204,567	15,961,616	16,759,696
Partner Contributions			
ACTs carried over from previous year	5,592,282	9,211,442	5,320,538
ACTs from Government	4,389,470	252,803	2,052,847
ACTs from Global Fund	3,973,720	2,726,924	2,172,686
ACTs from Other Donors (World Bank)	2,049,806	763,625	763,625
ACTs planned with PMI funding	4,800,000	6,300,000	6,450,000
Total ACTs Available	20,805,278	19,254,794	16,759,696
Total ACT Surplus (Gap)	5,600,711	3,293,179	-
¹ Assuming a 449/1000 base annual incidence (from 2015 HMIS data), an 15% increase in access to health services, an 8% decrease due to better malaria control, and a decrease due to better diagnostics of 13% in 2016, 14% in 2017, and 15% in 2018			
² Including a 9 month buffer in 2016, and a 6 month buffer in 2017 and 2018			

Plans and justification

PMI will procure roughly 33.2 percent of the RDT needs and 38.5 percent of the ACT needs in 2019. Additionally, PMI will procure an estimated 590,000 ampules of injectable artesunate for severe malaria

treatment, and 58,000 rectal artesunate suppository capsules as pre-referral treatment by CHWs in the pilot districts. PMI will support the CAMEG to store and distribute these commodities.

From 2014 to 2017, USAID supported the training of 1,918 health providers in malaria case management, while the Global Fund supported the training of 17,668 CHWs in malaria case management in 2017. Refresher training of CSPS staff in 2019 has been included in the New Funding Model 2 Global Fund grant. Therefore, PMI will support the supervision and refresher training of CHWs in case management (including MIP and ANC referral) with FY 2018 funds. PMI plans to support an evaluation of the pre-referral rectal artesunate pilot that the NMCP will lead in 2018. Assuming a positive evaluation of the rectal artesunate pilot, PMI will also support the updating of the national policy and training guidelines to include rectal artesunate.

PMI will support four rounds of SMC for roughly 405,000 children between 3 and 59 months of age. According to UNITAID's 2016 costing study, the full cost of SMC per child, per round, in Burkina Faso is about \$3.36 for door-to-door distribution, of which \$.50 are commodity costs. PMI will support both the procurement of SP+AQ, as well as costs related to the distribution campaign itself, including supervision, training, and transport.

Proposed activities with FY 2018 funding: (\$16,972,616)

1. *Procure RDTs:* Procure approximately 8 million RDTs. (\$4,240,000)
2. *Procure ACTs:* Procure approximately 6.45 million ACTs. The breakdown by AL bandwidth will be adjusted based on updated quantification in country. (\$7,740,000)
3. *Procure injectable artesunate for treatment of severe malaria:* Procure approximately 590,000 ampules of injectable artesunate. (\$1,486,800)
4. *Procure rectal artesunate:* Procure approximately 58,000 rectal artesunate suppository capsules of 50mg for pre-referral of severe malaria cases by CHWs (\$27,000)
5. *Evaluation of rectal artesunate pilot:* Support the NMCP to evaluate the rectal artesunate pilot in the Sahel and North regions. Assuming a positive outcome of the pilot, funds will also support the scale-up planning, including revision of national guidelines, updating of training manuals, and development of job aids for CHWs. (\$50,000)
6. *Support supervision and refresher training of CHWs for integrated malaria activities:* Support the integrated supervision visits of CHWs conducted by health facility workers. The funding will compliment Global Fund funded training and supervision visits. (\$217,826)
7. *Procure SP+AQ:* Procure roughly 389,000 treatments of SP+AQ for ages 3 to 11 months at \$.47 per treatment and 2,016,000 treatments of SP+AQ for 12 to 59 months at \$.51 per treatment to cover 12 districts with SMC. (\$1,210,990)
8. *Implement SMC campaign:* Support the full implementation of a SMC campaign in 12 districts targeting 405,000 children between 3 and 59 months of age, including SBCC mobilization and messaging, distribution, training, supervision, and evaluation. (\$2,000,000)

b. Pharmaceutical management

NMCP/PMI objectives

PMI and NMCP recognize that universal confirmation and treatment of malaria cases can only be achieved in the context of a well-functioning pharmaceutical supply chain that minimizes the risk of stockouts.

Intervention overview/Current status

Management of malaria commodities in Burkina Faso is a collaboration between three government entities: NMCP, Direction de la Politique Pharmaceutique et de la Sécurisation des Approvisionnements (DPPSA), and the CAMEG. In general terms, the NMCP coordinates the effort, while the Agence Nationale de Règlementation Pharmaceutique (ANRP) is responsible for quality assurance/quality control (QA/QC) of commodities and quantification needs; and the CAMEG is responsible for storage and distribution of the commodities. Because the majority of malaria commodities are donor contributions, donor-funded partners provide technical assistance to the three government institutions in the context of malaria commodity storage and distribution.

Malaria commodities arriving in Burkina Faso are received in Ouagadougou by CAMEG, which has large, modern and well-equipped warehouses in the capital. They are then pre-positioned at ten regional CAMEG depots, each staffed by at least one pharmacist and with adequate storage and distribution conditions. CAMEG is responsible for transporting supplies to the district level, but it does not have staff or facilities at the district level, and management of commodities is the responsibility of the district health staff. For certain commodities like ACTs, district health staff must submit orders to the regional CAMEG depots (a pull system); for other commodities like RDTs and ITNs for routine distribution, a fixed quantity is transported by CAMEG to the district (a push system). At the final stage, health facility staff typically must travel to the district capital in order to pick up malaria commodities. Districts often do not have adequate conditions for storage and distribution of commodities.

CAMEG has a functioning Logistics Management and Information System (LMIS), running the Sage 1000 software. There is, however, no unified LMIS system that is used at the district level. In addition to the LMIS system, Burkina Faso is in the process of incorporating data on health facility consumption and stocks of malaria commodities into the HMIS system.

The former General Directorate of DGPMML is being restructured to become the National Pharmaceutical Regulatory Agency (NPRA). As part of the restructuring, the Directorate of Medicine Control, which was previously under the former National Laboratory of Public Health (LNSP), will serve as the national medicine quality control laboratory, and in such capacity will provide quality control services under the new agency. Restructuring is still at an early stage, but the new structure will allow direct reporting of findings within the NPRA.

Post-market surveillance of pharmaceutical product quality remains a challenge for the national regulatory authority. Currently, all post-market surveillance activities conducted rely on funding from donors (Global Fund, WHO, and WAHO). Hence the surveillance has been limited to the products of interest for the donors with an annual budget for these activities estimated to be around \$230,000 for an average of 270 samples of select products (antimalarials, ARVs, anti-TB, family planning products, and maternal and child health medicines). The budget has included cost of sampling, testing, reporting, and dissemination of results. There is no actual post-market surveillance program that is fully planned and implemented by the regulatory authority. Since the NPRA is currently being established, there is

now an opportunity to also establish a functional post-market surveillance program. One priority area would be to develop a guidance/protocol for the implementation of a risk-based post-market surveillance that can be applied to all types of medicines. This approach would reduce the cost of surveillance activities and would allow testing of larger number of samples; including medicine types that are not currently covered by donors. In addition, there is currently no quality control of RDTs in Burkina Faso; therefore, such activities could be included in a new surveillance program.

The national laboratory has been intimately involved in post-market surveillance activities. Since the regulatory authority does not have enough human resources, laboratory analysts have been participating in the sampling of medical products. Although the laboratory has made progress in adopting good laboratory practices, its performance still needs improvement, with targeted support towards attaining compliance with international standards.

The laboratory is seeking ISO 17025 accreditation that will allow the laboratory to test samples for the malaria program. Currently these samples are being sent to WHO prequalified laboratories outside of the country. However, becoming ISO 17025 accredited or WHO prequalified will not address all the challenges the laboratory faces, and development of human resources and technical qualification of analysts are needed to strengthen its capacity. The laboratory has a limited number of technical staff and faces challenges in providing testing results in timely manner, which in the past has prevented or delayed taking action in the case of non-compliant products.

Plans and justification

PMI will support the DPPSA and the NMCP to improve national-level capacity in forecasting country needs of malaria commodities. Given current capacity at the national and regional levels for management of malaria commodities, the focus of PMI will be on strengthening district-level capacity to store and distribute malaria commodities.

Given the incorporation of stock and consumption data into the HMIS system, PMI will support the job training and supervision of regional, district, and health facility staff on the reporting and use of malaria commodity data to better maintain appropriate stock levels at health facilities.

PMI will support ANRP in routine quality control testing of ACTs and RDTs at all levels of the supply chain to ensure good quality is maintained until the moment of administration to the end-user.

Proposed activities with FY 2018 funding: (\$966,000)

1. *Supply chain strengthening*: Improve district-level capacity to store and distribute malaria commodities, including renovation and outfitting of district warehouses and training of district health staff, and improve national-level capacity for quantification of commodity needs through training and support of quantification activities. (\$650,000)
2. *On-the-job training of regional, district, and health facility staff on malaria stock management and reporting*: Support supervision and on-the-job training of health facility, district, and regional staff in integrated HMIS, which includes commodity data, and training of health facility staff in stock management and reporting of malaria commodity data. (\$216,000)

3. *Quality control of malaria commodities:* Support ANRP for quality control of ACTs and RDTs, to ensure that all commodities in country are of good quality, and that their quality is maintained through distribution to the lowest level. (\$100,000)

4. Health system strengthening and capacity building

NMCP/PMI objectives

PMI supports a broad array of HSS activities that cut across intervention areas, such as training of health workers, supply chain management, health information system strengthening, drug quality monitoring, and NMCP capacity building. PMI works to enable countries to implement their own programs rather than building parallel or stand-alone systems. This approach allows countries to possess appropriately-skilled human resources and the necessary infrastructure to plan, implement, and monitor progress of their malaria control activities.

In Burkina Faso, HSS and capacity building are represented in the NMCP’s validated 2016-2020 National Strategic Plan. Objective three focuses directly on capacity building: reinforce the NMCPs management capacity to effectively oversee all malaria activities in country, while other objectives incorporate HSS and capacity building into their activities. These fall under the objectives of reducing malaria morbidity and mortality by 40 percent by 2020. Under objective three, the NMCP strives to strengthen the capacity of communication, commodity security, evaluation and research, response to epidemics and emergency situations, and NMCP program management. Capacity building objectives will be obtained through a variety of approaches including trainings, workshops, advocacy, procurement, and evaluation.

Intervention overview/Current status

Recent appointments at the NMCP have decreased staff shortages; however, the NMCP still does not have an epidemiologist, and relies on support from a MoH supported research center for epidemiologic support. Due to these new appointments and high staff turnover, yearly trainings and refresher trainings of staff are still required to maintain technical and management capacity. Health system strengthening and capacity building in Burkina Faso remain crucial for the country to take ownership and lead malaria control efforts. The capacity to obtain high quality data is low as is the ability to make data driven programmatic changes.

Recent elevation of the NMCP in the new MoH organogram, to being part of a technical secretary directly under the MoH will allow for more direct interaction with the MoH and shorten the time it takes for important malaria program decisions to be made.

In the past year, capacity building has been a key focus of USAID malaria funds in Burkina Faso and has included: improving skills and performance of health care providers and supervisors on malaria control guidelines especially at referral centers; increasing capacity of NMCP to effectively manage malaria programs; and improving supply chain effectiveness and data quality.

Table 12: Health Systems Strengthening Activities

HSS Building Block	Technical Area	Description of Activity
Health Services	Case Management	PMI will procure RDTs, ACTs, and injectable artesunate to fill commodity gaps. PMI will support integrated supervision visits and on the job refresher training in malaria care

		management for CHWs. PMI will purchase rectal artesunate and will support and evaluation of the rectal artesunate pilot study and scale-up planning. PMI will support the procurement of SP+AQ and the implementation of SMC.
Health Workforce	Health Systems Strengthening	PMI will build health workforce capacity by providing training (SM&E, budget/financial management, and entomology) and support for staff. PMI will continue to support 13 regional-level malaria focal points, to coordinate and oversee all malaria activities in coordination with the NMCP.
Health Information	Monitoring and Evaluation	PMI will support the new <i>Generale des Offres de Soins</i> (DGOS) with quality control of ACTs. PMI will support quarterly malaria data review meetings at each district to ensure data quality control. PMI will monitor the availability and utilization of key anti-malarial commodities at the health facility level.
	Operational Research	PMI will support a vector control study to investigate the impact of NextGen ITNs and IRS in areas of high resistance.
Essential Medical Products, Vaccines, and Technologies	Case Management	PMI will improve district-level capacity to store and distribute malaria commodities and improve national-level capacity for quantification of commodity needs. PMI will fund supportive supervision and on the job training of regional, district and health facility staff in integrated HMIS, which includes commodity date, and training of health facility staff in stock management and reporting of malaria commodity data.
Health Finance	Health Systems Strengthening	PMI will work with the Global Fund and other partners to ensure coverage of key program areas and commodities.
Leadership and Governance	Health Systems Strengthening	PMI will work with the NMCP to build leadership and governance capabilities.

Plans and justification

Specific courses and learning opportunities will be selected to address key gaps in knowledge with the aim of strengthening the NMCP to more effectively lead malaria control efforts. With the NMCP's new elevated level within the MoH organogram, courses will focus on increasing management capacity of NMCP staff and their ability to use data for decision-making. National dissemination and information sharing of malaria-related research in Burkina Faso will also be funded. In an effort to strengthen the entire malaria program at all its levels, regional malaria focal points will be supported in each of the 13 health regions to decentralize malaria specific knowledge and oversight. The malaria focal points will be fully integrated into the regional health office under the Regional Director of Health and will serve as the main point of contact for malaria programming including: information sharing, coordination, data quality controls, trainings, and commodity quantification needs. Currently malaria issues are delegated to one of the regional staff members such as the pharmacist or the logistics officer. The malaria focal points will fill the need for a focused malaria position that responds to the many and diverse program activities of the national malaria control program. They will serve as an extension of the NMCP and PMI resident advisors, routinely reporting back to the NMCP and PMI through monthly phone calls and twice-yearly participation in the national malaria steering committee.

Proposed activities with FY 2018 funding: (\$360,000)

1. *Reinforce the capacity of the NMCP by providing training and support for staff:* Support NMCP's staff for training needs, including participation of more national/regional/district staff in the M&E training held annual in Burkina Faso. This will also support professional development, including national dissemination and information sharing of malaria-related research in Burkina Faso. (\$100,000)
2. *Support regional-level malaria focal points:* Regional malaria focal points in 13 health regions will provide valuable support to the NMCP in disseminating malaria information and helping to ensure higher data quality standards. PMI's support of the malaria focal points will be term-limited and will be reviewed after three years with the expectation that the MoH absorbs the position. (\$260,000)

5. Social and behavior change communication (SBCC)

NMCP/PMI objectives

Social and behavior change communication falls under the third objective of the NMCP's 2016-2020 National Strategic Plan: By 2020, strengthen the capacity of the NMCP to effectively manage the fight against malaria. The strategy emphasizes the key areas of advocacy, social mobilization, and behavior change communication, and serves as a guideline for all malaria partners in Burkina Faso. Through advocacy, the NMCP will build malaria support from administrators, traditional and religious leaders, media organizations, and public and private companies. Social mobilization will strengthen the skills of those relaying SBCC messages such as CHWs, community-based organizations, traditional healers, teachers, and media professionals with the aim of increasing malaria knowledge and care seeking behavior. The NMCP will conduct SBCC using both interpersonal behavior as well as mass media campaigns.

A new National 2016-2020 Communication Strategy was finalized in February 2017. Communication strategy objectives now include SMC, IPTp, and the administration of rectal artesunate pre-transfer at the community level. Activities to advance these new strategies include: advocacy with community leaders; interpersonal communication with CHWs; development of new SBCC tools; and mass communication campaigns.

The NMCP has identified the following SBCC indicators:

- 60 percent of mothers and caregivers can identify the signs and symptoms of severe malaria in children under five years of age
- 90 percent of the population knows the cause of malaria
- 100 percent of the population knows three signs of malaria
- 100 percent of the population knows two methods of malaria prevention
- 90 percent of the population knows the advantages of receiving malaria treatment in the first 24 hours of illness
- By 2020, 100 percent of fathers, mothers, and caregivers adhere to the SMC campaign
- By 2020, 80 percent of eligible pregnant women receive three doses of IPTp

PMI supports a range of SBCC activities to increase the uptake of malaria interventions and contribute to reductions in malaria morbidity and mortality. Key areas of PMI support for SBCC include developing or revising national malaria SBCC strategies; capacity building and strengthening for SBCC;

implementing SBCC to target improvement in intervention uptake; monitoring and evaluation of SBCC; and SBCC OR.

Intervention overview/Current status

According to the 2014 MIS in Burkina Faso, 80 percent of women aged 15-49 know fever is a principal symptom of malaria, 49 percent of women know mosquito bites transmit malaria, and 84 percent of women know sleeping under an ITN helps prevent malaria infection. Although 90 percent of households report owning an ITN, 69 percent of the population reported actually sleeping under one. While IPTp information is widely disseminated, coverage of pregnant women with SP remains fairly low. Sixty eight percent of pregnant women reportedly received IPTp1, 48 percent IPTp2, and 22 percent IPTp3. In Burkina Faso, knowledge of how to prevent and treat malaria is higher than the actual prevention and care-seeking behavior itself. A new MIS is currently under way and will provide updated malaria indicator data.

In the past year, USAID supported the NMCP to develop a new integrated 2016 to 2020 communication plan. Throughout the year a mass communication campaign to promote malaria prevention strategies: ITN use, IPTp, and early care-seeking was developed and executed. USAID again supported interpersonal communication by providing stipends and supervision support to 416 CHWs at 208 health facilities to promote malaria prevention strategies through educational talks, home visits, microfilm projections, and theater. The GoBF with the support of the Global Fund has recently recruited and trained 17,000 new CHWs. With this shift, PMI will no longer support individual CHW stipends and will instead support the MoH to strengthen CHW capacity to plan and carry out malaria interpersonal communication activities. This support will include financing a national workshop on scale-up of interpersonal communication, the creation of tools to reinforce CHWs communication activities, and CHW data collection follow-up. PMI will also support the NMCP to embark on a new initiative this year with the organization of a primary school student competition to develop messages for malaria prevention with an emphasis on ITN use and the importance of early care-seeking behavior.

Plans and justification

With FY 2018 funds, PMI will continue working with the NMCP communication unit and will focus on tailored messaging to address barriers impeding effective behavior change. With low numbers of IPTp3 uptake, PMI focus will include IPTp for pregnant women and early care-seeking for pregnant women and children under five years of age. PMI will support mass media and interpersonal communication on the importance/correct use of ITNs for the 2019 mass ITN campaign. This will complement the Global Fund's SBCC funding.

PMI will work specifically to inform the population about SMC and IRS campaigns. Community sensitization and mobilization for SMC will be done prior to and during the July to October SMC campaign season and will inform the population of the prevention benefits of SMC. Special emphasis will be placed on direct communication with mothers and caregivers to reduce behavior barriers and ensure high adherence rates. IRS messaging will be done pre-spray and will inform beneficiaries of the health benefits of IRS and what to expect during spray campaigns. SBCC messaging will seek to address population concerns and ensure high IRS acceptance.

Proposed activities with FY 2018 funding: (\$500,000)

1. *Support malaria SBCC activities:* Provide technical assistance and support to the NMCP to ensure SBCC messaging targets specific behavior change needed to increase malaria awareness, prevention, and early care-seeking behavior. Funding will also compliment Global Fund SBCC support of the 2019 ITN mass distribution campaign. (\$500,000)

6. Surveillance, monitoring, and evaluation

NMCP/PMI objectives

PMI is committed to supporting NMCP in collecting high-quality, complete, and timely data on malaria morbidity, mortality, and commodity stocks from health facilities and CHWs. In addition, PMI will work with NMCP to support household surveys, health facility surveys, and efficacy studies to complement the routine surveillance data.

Intervention overview/Current status

Malaria surveillance, monitoring, and evaluation activities are led by the M&E team at NMCP, which oversees the data sources providing routine malaria data, as well as coordinating surveys and other studies aimed at monitoring NMCP interventions.

Routine Data

Prior to 2016, NMCP relied on a monthly parallel routine malaria information system, BD-malaria. However, with the adoption of the district health information system 2 platform (DHIS2), for the country's HMIS (known by its French acronym ENDOS), the parallel malaria database was phased out in early 2016, and the HMIS became the national and primary source for routine malaria data for NMCP. The HMIS is digitized in all 70 districts but is still paper-based at all of the health-facilities. It is able to record and report data on malaria case management performed at the community level and is in the process of being adapted to also be able to record and report data on malaria commodity stocks and consumption. Supervision and control of the data quality by NMCP has been limited due to lack of funding and MoH staff dedicated to malaria at the regional or district levels. However, the NMCP is still able to produce weekly malaria reports from the HMIS data, which are shared among malaria stakeholders.

In addition to HMIS, there is a functioning, WHO-supported Integrated Disease Surveillance and Response system in country, which includes malaria as one of the notifiable diseases. This weekly, telephone-based surveillance system serves as a secondary source for routine malaria data.

Surveys

The last nationwide DHS was conducted in 2010, with the last MIS conducted in 2014. A 2017 MIS is currently underway, which is being funded primarily by Global Fund, with additional support from USAID malaria funds. Data collection is currently ongoing with preliminary analysis expected in 2018.

To provide detailed information on the quality of malaria case management and health facility readiness, FY 2017 PMI funds will support a malaria-specific, nationally representative, health facility survey. The results of the survey will allow NMCP and its partners to identify strengths and weaknesses in malaria care delivery, and better design training and supervision activities.

Since 2015, USAID has been sponsoring quarterly EUVs, which provide a snapshot of malaria commodity stock situations in a sampling of health facilities. In 2017, three rounds of EUV activities

were completed. The EUV reports assist the MoH and the NMCP to improve commodity availability and use at the health facility level.

With an emphasis on long-term sustainability of quality health supply chain data, the DGPML, with financial support from the international organization “France Expertise,” has designed and developed an integrated supply chain for priority programs (reproductive health, malaria, HIV-TB, nutrition) and essential medicines. The standard operating procedures (SOPs) for integrated LMIS were developed during 2015–2016. The commodity stock and LMIS data management software GESDIS has been developed and is currently being piloted in 18 sites throughout the country. The DGPML’s priority for the next few years is to implement the integrated LMIS SOPs nationwide and to deploy GESDIS in all districts to support the functioning of the integrated LMIS. This is to ensure that the LMIS data reported in paper form from the health facility is compiled at the district level using GESDIS.

Demographic surveillance sites (DSS)

Burkina Faso is the site of four established DSS: Nouna since 1993 (run by the *Centre de Recherche en Santé de Nouna*), Ouhritenga since 1993 (*Centre National de Recherche et de Formation sur le Paludisme*), Nanoro since 2009 (*Centre de Recherche en Santé de Nanoro*), and Ouagadougou since 2008 (University of Ouagadougou). Although most of these sites perform malaria research, it is not clear if the data is shared with the NMCP, or if data from these sites inform NMCP policy.

Table 13: Surveillance, Monitoring, and Evaluation Data Sources

Data Source	Survey Activities	Year								
		2010	2011	2012	2013	2014	2015	2016	2017	2018
Household surveys	Demographic Health Survey (DHS)	X*								
	Malaria Indicator Survey (MIS)					X*			X	
Health Facility and Other Surveys	Health facility survey									(X)
	EUV survey						X	X	X	(X)
Malaria Surveillance and Routine System Support	Support to malaria surveillance system									(X)
	Support to HMIS								X	(X)
Therapeutic efficacy monitoring	In vivo efficacy testing	X*	X*	X*					X	
Entomology	Entomological surveillance and resistance monitoring	X	X	X	X	X	X	X	X	(X)

* Not USAID or PMI-funded activity

Parentheses denote planned activities and non-parentheses denote completed activities

Table 14: Routine Surveillance Indicators for 2016

Indicators	Value	Comments
1. Total number of reported malaria cases Data source: HMIS	9,785,822	
Total diagnostically confirmed cases	9,879,154	This figure is higher than total number of reported malaria cases due to repeat tests on the same patient
Total clinical/presumed/unconfirmed cases	N/A	Data was not collected in 2016, but will be collected starting in 2017
Outpatient number of reported malaria cases	9,362,608	
Diagnostically confirmed	N/A	Outpatient malaria cases not stratified by confirmed/non confirmed
Clinical/presumed/unconfirmed	N/A	Outpatient malaria cases not stratified by confirmed/non confirmed
Inpatient number of reported malaria cases	423,214	
Diagnostically confirmed	N/A	Inpatient malaria cases not stratified by confirmed/non confirmed
Clinical/presumed/unconfirmed	N/A	Inpatient malaria cases not stratified by confirmed/non confirmed
2. Total number of reported malaria deaths Data source: HMIS	4,440	
Diagnostically confirmed	N/A	Malaria deaths not stratified by confirmed/not confirmed
Clinical/presumed/unconfirmed	N/A	Malaria deaths not stratified by confirmed/not confirmed
3. Malaria test positivity rate (outpatients) Data source: HMIS	82.4%	
Numerator: Number of outpatient confirmed malaria cases	9,879,154	
Denominator: Number of outpatients receiving a diagnostic test for malaria (RDT or microscopy)	11,986,018	
4. Completeness of monthly health facility reporting Data source: HMIS	93.7%	
Numerator: Number of monthly reports received from health facilities	31,749	
Denominator: Number of health facility reports expected (i.e., number of facilities expected to report multiplied by the number of months considered)	33,876	

Plans and justification

PMI will support NMCP's goal of improving routine malaria data quality by the implementation of periodic data quality monitoring activities. These data quality monitoring visits will focus on assessing data quality, troubleshooting any issues, and conducting data analysis by health facility and district staff. These visits will involve all levels of the health system, and will allow the NMCP, district, and health facility staff to jointly review malaria data collected and reported at the health facility level. PMI will continue to advocate with other malaria partners to share the cost of this activity and strengthen malaria data quality nationwide.

With FY 2018 funds, PMI will support the next population-based survey, either a DHS with a malaria module or another MIS, which will either take place in 2019 or 2020. The 2017 MIS analysis is still underway therefore the country has not yet decided the timing of future surveys. In addition, PMI will support quarterly EUVs to provide timely data on the availability and utilization of key anti-malarial commodities at the health facility level. PMI will monitor the commodity data available from the HMIS and will compare the quality and timeliness of the HMIS commodity data to the EUV results to assess the utility of future support for EUVs.

Finally, PMI will support one TDY for CDC staff to travel to Burkina Faso to provide technical assistance in supporting NMCP M&E activities.

Proposed activities with FY 2018 funding: (\$760,000)

1. *Support data quality assurance missions:* Support periodic malaria data review missions to improve data quality and analysis across all levels of the health system. (\$250,000)
2. *Support the next large survey:* Provide funding to support the next large population-based survey – either a DHS and malaria module, or another MIS. Funds will compliment Global Fund and other donors. (\$400,000)
3. *Support EUV:* Monitor the availability and utilization of key anti-malarial commodities at the health facility level. (\$100,000)
4. *Provide technical assistance for SM&E:* One CDC TDY to provide technical support for SM&E activities. (\$10,000)

7. Operational research

NMCP/PMI objectives

The NMCP strategy contains a description of the importance of OR and their collaboration with various research institutions that conduct OR related to malaria in Burkina Faso. The principal research institutions with whom they work include: CNRFP, *Centre Muraz*, IRSS and CRSN. These research institutes have past, current, or future plans to conduct OR, in partnership with the NMCP, in the following areas: insecticide resistance, therapeutic efficacy of antimalarial drugs, SBCC, morbidity/mortality due to malaria, MIP (including IPTp), and case management in health facilities and at the community-level.

Table 15: PMI-funded Operational Research Studies

Ongoing OR Studies			
Title	Start date (est.)	End date (est.)	Budget
Community IPTp	September 2016	September 2018	\$415,000 ¹

¹Includes FY2015 and FY2016 core-funding plus FY2016 and FY2017 country-level funding

Intervention status/Current status

There is currently one OR activity that PMI is supporting in Burkina Faso, which is a study to determine whether utilization of CHWs for delivery of IPTp in three districts can increase coverage of three or more IPTp doses compared to IPTp delivery only at ANC, and without having a negative impact on ANC attendance. This study began in September 2016, and focuses on rural areas, which was determined based on data gathered from the 2010 DHS indicating that around 44 percent of rural women never attend ANC during their pregnancy. The study was core funded although some country level funds were included in FY 2016 and FY 2017 to help support this study. The expectation is that results will inform whether it would be advisable to scale-up delivery of IPTp at the community level, particularly in more rural areas where access to ANC is limited. The plan of this OR study is to conduct research for two years and then assess and advise on next steps.

Proposed activities with FY 2018 funding: (\$0)

8. Staffing and administration

Two health professionals serve as Resident Advisors (RAs) to oversee PMI in Burkina Faso, one representing CDC and one representing USAID. In addition, one or more Foreign Service Nationals (FSNs) work as part of the PMI team. All PMI staff members are part of a single interagency team led by the USAID Mission Director or his/her designee in country. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, managing collaborating agencies and supervising day-to-day activities. Candidates for RA 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 interagency 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 and direction to PMI implementing partners.

The PMI lead in country is the USAID Mission Director. The day-to-day lead for PMI is delegated to the USAID Health Office Director and thus the two PMI RAs, one from USAID and one from CDC, report to the USAID Health Office Director for day-to-day leadership, and work together as a part of a single interagency team. Technical expertise housed in Atlanta and Washington complements PMI programmatic efforts.

The two PMI RAs are physically based within the USAID health office but are expected to spend approximately half of their time with and providing TA to the NMCPs and implementing partners, including time in the field monitoring program implementation and impact.

The number of locally-hired staff and necessary qualifications to successfully 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 U.S. Global Malaria Coordinator.

Proposed activities with FY 2018 funding: (\$1,471,284)

1. *Staffing and administration-CDC:* Funding will support the salary of one CDC resident advisor. (\$400,000)
2. *Staffing and administration-USAID:* Funding will support the salaries of one USAID resident advisor and one local staff malaria specialist and will also include ICASS costs. (\$1,071,284)

Table 1: Budget Breakdown by Mechanism

**President's Malaria Initiative – BURKINA FASO
Planned Malaria Obligations for FY 2018**

Mechanism	Geographic Area	Activity	FY 2018 Budget (\$)	%
PMI VectorLink Project	Nationwide	Entomological monitoring	450,000	14%
		Technical assistance for mass ITN distribution campaign	50,000	
	Up to 3 Districts	Implementation of IRS	3,000,000	
TBD – Environmental Management	Up to 3 Districts	Environmental Compliance Monitoring Visit	35,000	0%
CDC/IAA	Nationwide	Technical assistance for entomology	14,500	2%
		Provide technical assistance for SM&E	10,000	
		Staffing & Administration	400,000	
PSM	12 Eligible SMC Districts	Procure SP/AQ	1,210,990	64%
	Nationwide	Procurement of ITNs	345,600	
		Procure RDTs	4,240,000	
		Procure ACTs	7,740,000	
		Procure injectable artesunate for treatment of severe malaria	1,486,800	
		Procure rectal artesunate	27,000	
		Supply chain strengthening	650,000	
		On the job training of regional, district and health facility staff on malaria stock management & reporting	216,000	
		Support End-Use Verification	100,000	
IMC	12 Eligible SMC Districts	Implement SMC campaign	2,000,000	

	Nationwide	Community level IPTp implementation planning	75,000	14%
		Evaluation of rectal artesunate pilot and scale up planning	50,000	
		Supervision & refresher training of CHWs	217,826	
		Reinforce the capacity of the NMCP by providing training and support for staff	100,000	
		Support regional-level malaria focal points	260,000	
		Data quality assurance missions at regional, district and health facility levels	250,000	
		Support malaria SBCC activities	500,000	
PQM	Nationwide	Quality control of malaria commodities	100,000	0%
TBD – Survey Contract	Nationwide	Support DHS/MIS	400,000	2%
USAID	Nationwide	Staffing & Administration	1,071,284	4%
Total			25,000,000	100%

Table 2: Budget Breakdown by Activity

**President’s Malaria Initiative – BURKINA FASO
Planned Malaria Obligations for FY 2018**

Proposed Activity	Mechanism	Budget (\$)		Geographic Area	Description
		Total \$	Commodity \$		
PREVENTIVE ACTIVITIES					
VECTOR MONITORING AND CONTROL					
Entomologic Monitoring and Insecticide Resistance Management					
Entomological monitoring	PMI VectorLink Project	450,000	0	Nationwide	Support comprehensive nationwide vector surveillance and insecticide resistance testing in a representative sample of entomological sentinel sites (TBD). This activity will also support the development and implementation of an Insecticide Resistance Management (IRM) Plan, in collaboration with the NMCP and in country entomology partners.
Technical assistance for entomology	CDC/IAA	14,500	0	Nationwide	One CDC TDY to provide technical support for vector control implementation and entomological monitoring.
Subtotal Entomology monitoring		464,500	0		

Insecticide Treated Nets						
Procurement of ITNs	PSM	345,600	345,600	Nationwide	Procure ~120,000 ITNs for the mass campaign. A portion will be NexGen ITNs inconjunction with the catalytic funding.	
Technical assistance for mass ITN distribution campaign	PMI VectorLink Project	50,000	0	Nationwide	Support technical assistance for the mass ITN distribution campaign.	
Subtotal ITNs		395,600	345,600			
Indoor Residual Spraying						
Implementation of IRS	PMI VectorLink Project	3,000,000	750,000	Up to 3 Districts	Conduct blanket IRS with a susceptible insecticide covering approx. 100k structures in 3 districts. Districts will be selected based on previous IRS implementation, and will take into account other vector control activities.	
Environmental Compliance Monitoring Visit	TBD	35,000	0	Up to 3 Districts	Conduct an independent environmental compliance monitoring visit for IRS activities.	
Subtotal IRS		3,035,000	750,000			
SUBTOTAL VECTOR MONITORING AND CONTROL		3,895,100	1,095,600			

Malaria in Pregnancy					
Community level IPTp implementation planning	IMC	75,000	0	Nationwide	Support national policy development & validation, and develop training guidelines and job aids for community level IPTp distribution roll out.
Training of healthcare workers on MIP	IMC	0	0	Nationwide	Costs covered under integrated training Case Management activities.
Supervision of healthcare workers and CHWs on MIP	IMC	0	0	Nationwide	Costs covered under integrated supervision Case Management activities.
Subtotal Malaria in Pregnancy		75,000	0		
SUBTOTAL PREVENTIVE		3,970,100	1,095,600		
CASE MANAGEMENT					
Diagnosis and Treatment					
Procure RDTs	PSM	4,240,000	4,240,000	Nationwide	Procure approximately 8 million RDTs, including overhead, freight, insurance, and customs clearance.
Procure ACTs	PSM	7,740,000	7,740,000	Nationwide	Procure approximately 6.45 million ACTs, including overhead freight, insurance, and customs clearance.
Procure injectable artesunate for treatment of severe malaria	PSM	1,486,800	1,486,800	Nationwide	Procure approximately 590,000 ampules of injectable artesunate, including overhead, freight, insurance, and customs clearance.
Procure rectal artesunate	PSM	27,000	27,000	Nationwide	Procure approximately 58,000 rectal artesunate suppository capsules for pre-referral of severe malaria cases by CHWs.

Evaluation of rectal artesunate pilot and scale up planning	IMC	50,000	0	3 Districts	Evaluate the rectal artesunate pilot in 3 district, and support national policy development, training guidelines and job aids.
Supervision & refresher training of CHWs	IMC	217,826	0	Nationwide	Conduct integrated supervision visits and on the job refresher training malaria case management by CHWs.
Procure SP/AQ	PSM	1,210,990	1,210,990	12 Eligible SMC Districts	Procure approximately 389k tx for 3-11 months and 2,016,000 tx for 12-59 months, to cover approximately 405,000 children. Costs include procurement overhead.
Implement SMC campaign	IMC	2,000,000	0	12 Eligible SMC Districts	Support the full implementation of a SMC campaign targeting ~405,000 children between 3 and 59 months of age, including distribution, training, supervision, and evaluation.
Subtotal Diagnosis and Treatment		16,972,616	14,704,790		
Pharmaceutical Management					
Supply chain strengthening	PSM	650,000	0	Nationwide	Improve district-level capacity to store and distribute malaria commodities and improve national-level capacity for quantification of commodity needs.
On the job training of regional, district and health facility staff on malaria stock management & reporting	PSM	216,000	0	Nationwide	Supportive supervision and on the job training of regional, district and health facility staff in integrated HMIS, which includes commodity data, and training of health facility staff in stock management and reporting of malaria commodity data.

Quality control of malaria commodities	PQM	100,000	0	Nationwide	Support DGPML and LNSP for quality control of ACTs, to ensure that all commodities in country are of good quality, and that their quality is maintained through distribution to the lowest level.
Subtotal Pharmaceutical Management		966,000	0		
SUBTOTAL CASE MANAGEMENT		17,938,616	14,704,790		
HEALTH SYSTEM STRENGTHENING / CAPACITY BUILDING					
Reinforce the capacity of the NMCP by providing training and support for staff	IMC	100,000	0	Nationwide	Support to NMCP's staff for training needs, including participation of more national/regional/district staff in the M&E training held annually in Burkina Faso. This will also support professional development, including national dissemination & information sharing of malaria-related research in Burkina Faso.
Support regional-level malaria focal points	IMC	260,000	0	Nationwide	Establish 13 regional-level malaria focal points, to coordinate and oversee all malaria activities, in coordination with the NMCP. Focal points will be seconded and integrated into the existing MoH structure at the regional level. Estimates 1 focal point for all 13 regions of the country.
SUBTOTAL HSS & CAPACITY BUILDING		360,000	0		

SOCIAL AND BEHAVIOR CHANGE COMMUNICATION					
Support malaria SBCC activities	IMC	500,000	0	Nationwide	Support the NMCP to implement targeted SBCC activities to increase awareness of malaria, early care seeking behavior, and the uptake of quality malaria prevention and treatment interventions. Funding will complement Global Fund SBCC support for ITNs, including the mass campaign.
SUBTOTAL SBCC		500,000	0		
SURVEILLANCE, MONITORING, AND EVALUATION					
Data quality assurance missions at regional, district and health facility levels	IMC	250,000	0	Nationwide	Conduct data quality assurance missions at all levels of the health systems.
Support DHS/MIS	TBD - M/DHS	400,000	0	Nationwide	Support implementation of either the DHS with malaria module or MIS. Activity will be co-funded with the Global Fund.
Support End-Use Verification	PSM	100,000	0	Nationwide	Monitor the availability and utilization of key anti-malarial commodities at the health facility level.
Provide technical assistance for SM&E	CDC/IAA	10,000	0	Nationwide	One CDC TDY to provide technical support for SM&E activities.
SUBTOTAL SM&E		760,000	0		
OPERATIONAL RESEARCH					
N/A		0	0		

SUBTOTAL OR		0	0		
IN-COUNTRY STAFFING AND ADMINISTRATION					
Staffing & Administration	CDC/IAA	400,000	0	Nationwide	Support for CDC annual staffing and administration.
	USAID	1,071,284	0	Nationwide	Support for USAID annual staffing and administration, including ICASS and PD&L.
SUBTOTAL IN-COUNTRY STAFFING		1,471,284	0		
GRAND TOTAL		25,000,000	15,800,390		