The following document is an abbreviated malaria operational plan. The principles guiding development of this document—country-led, inclusive, consultative with a broad audience, and transparent —are consistent with best practices that the U.S. President's Malaria Initiative (PMI) has instituted since its inception. While an in-depth background of malaria in this country can be found in the detailed FY 2018 malaria operational plan on pmi.gov, this abbreviated document provides a high-level overview of PMI's program in this country, including key strategic updates, country data and progress updates, and a detailed list of activities to be supported with FY 2019 U.S. Government PMI funding.

This abbreviated 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 2019 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

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

PRESIDENT'S MALARIA INITIATIVE

MALI

Abbreviated Malaria Operational Plan FY 2019

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ABBREVIATIONS and ACRONYMS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
aMOP	abbreviated malaria operational plan
ANC	Antenatal care
AS/AQ	Artesunate-amodiaquine
CDC	Centers for Disease Control and Prevention
CNIECS	National Center for Information, Education, and Communication
DHS	Demographic and Health Survey
DHIS2	District Health Information System
DQA	Data quality assessment
EPI	Expanded program on immunization
EUV	End use verification
FY	Fiscal year
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
iCCM	Integrated community case management
IEC	Information, education, communication
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
MIP	Malaria in pregnancy
MIS	Malaria indicator survey
MOH	Ministry of Health
MOP	Malaria Operational Plan
NMCP	National Malaria Control Program
OR	Operational research
OTSS	Outreach training and support supervision
PMI	President's Malaria Initiative
RDT	Rapid diagnostic test
SBCC	Social and behavior change communication
SMC	Seasonal Malaria Chemoprevention
SM&E	Surveillance, monitoring, and evaluation
SP	Sulfadoxine-pyrimethamine
SP/AQ	Sulfadoxine-pyrimethamine and amodiaquine
TDY	Temporary duty (technical assistance visit)
TES	Therapeutic efficacy study
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

I. INTRODUCTION

The following document is an abbreviated malaria operational plan (aMOP). The principles guiding development of this MOP—country-led, inclusive, consultative with a broad audience, and transparent—are consistent with best practices that the U.S. President's Malaria Initiative (PMI) has instituted since inception. While an in-depth background of malaria in Mali can be found in the FY 2018 MOP,[1] this aMOP provides a high-level overview of PMI's program in Mali, including key strategic updates, country data and progress updates, and a detailed list of activities to be supported with FY 2019 U.S. Government PMI funding.

II. OVERVIEW OF PMI IN MALI

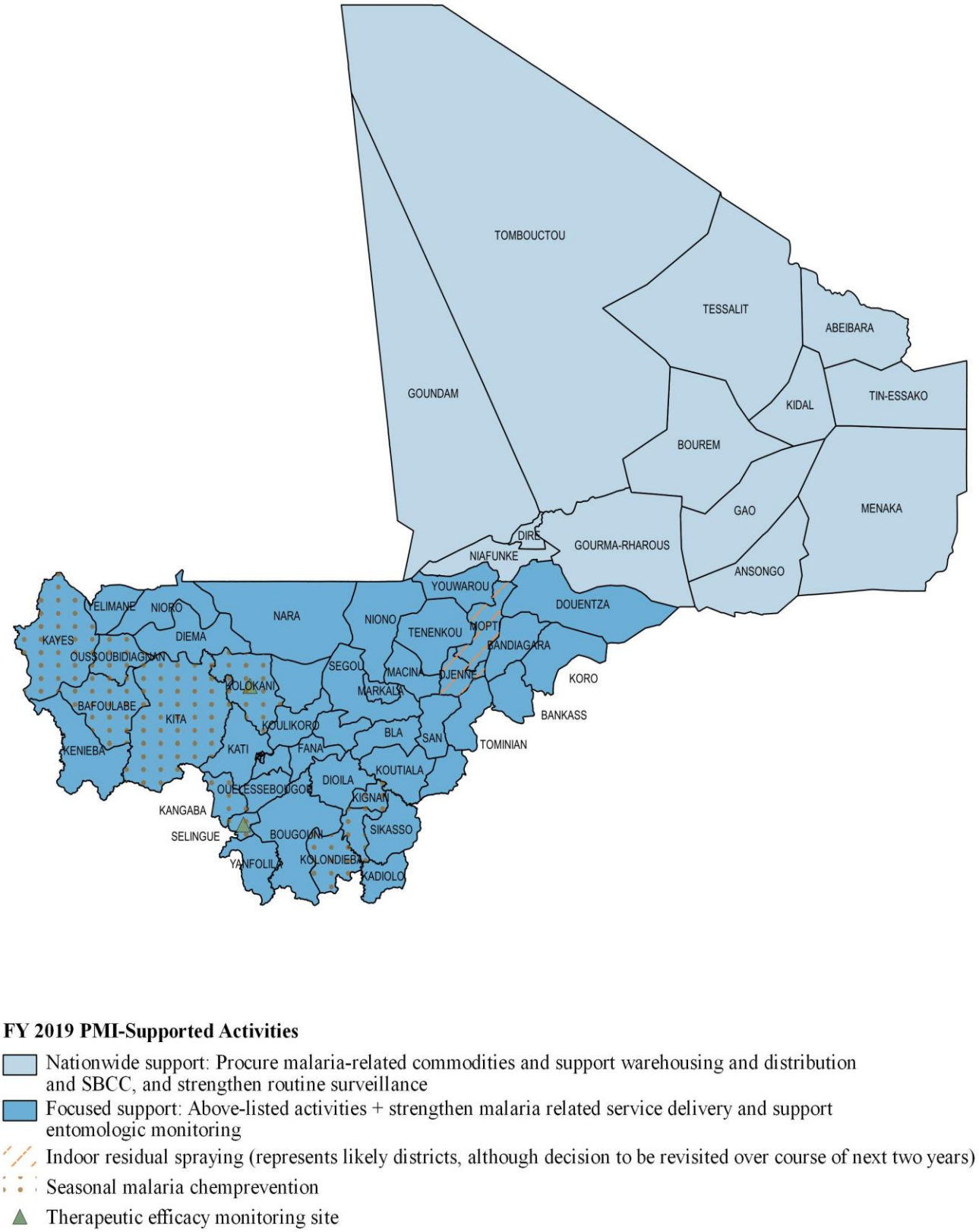
Mali began implementation as a PMI focus country in FY 2007. The proposed FY 2019 PMI budget for Mali is $23 million. PMI will continue to support the National Malaria Control Program (NMCP) to implement the national malaria control strategy through:

- Procurement and distribution of PMI commodities: insecticide-treated nets (ITNs), artemisinin-based combination therapy (ACTs), rapid diagnostic test (RDTs), sulfadoxine-pyrimethamine and amodiaquine (SP), sulfadoxine-pyrimethamine and amodiaquine (SP/AQ), and injectable artesunate nationwide. Estimated quantities of commodities are noted in each technical section.
- Training and supervision of health workers in malaria case management and malaria in pregnancy (MIP) in southern and central Mali (where 90 percent of the population lives).
- Support to the NMCP to implement seasonal malaria chemoprevention (SMC), which has been implemented in all 65 districts of Mali since 2016.
- Support to the NMCP to conduct indoor residual spray (IRS) activities in the Mopti region of Mali, where the malaria burden is highest per the Malaria Indicator Survey (MIS) 2015.
- Support for an integrated approach for social and behavior change communication (SBCC) activities focusing on the promotion of prompt diagnosis and treatment, the correct and consistent use of ITNs, and the uptake of intermittent preventive treatment in pregnancy (IPTp) by pregnant women.
- Support for monitoring and evaluation, a key component of Mali's national strategy. PMI continues to support the NMCP to implement its national monitoring and evaluation strategy through the strengthening of the national health information system.

Global Fund and PMI have been coordinating their support to the NMCP to implement the national malaria control strategy. To date, the Global Fund has been supporting Mali to implement mass ITN distribution campaigns throughout the country and SMC in 25 districts. However, Global Fund financial support for malaria recently decreased. During 2019-2021, the Global Fund will only support four of the seven planned ITN distribution campaigns and will not support SMC in 2021. Stakeholders in Mali, including the NMCP, are mobilizing resources to fill these gaps.

[1] https://www.pmi.gov/docs/default-source/default-document-library/malaria-operational-plans/fy-2018/fy-2018-mali-malaria-operational-plan.pdf?sfvrsn=5

Figure 1: Geographic Distribution of FY 2019 PMI-Supported Activities



FY 2019 PMI-Supported Activities

- Nationwide support: Procure malaria-related commodities and support warehousing and distribution and SBCC, and strengthen routine surveillance
- Focused support: Above-listed activities + strengthen malaria related service delivery and support entomologic monitoring
- Indoor residual spraying (represents likely districts, although decision to be revisited over course of next two years)
- Seasonal malaria chemprevention
- Therapeutic efficacy monitoring site

III. STRATEGY UPDATES

The NMCP recently finalized the 2018-2022 National Malaria Control Strategy and the 2018- 2022 National Monitoring and Evaluation Strategy. The overall goal of the malaria control strategy is to reduce malaria mortality and morbidity by 50 percent from 2016 levels. Key malaria control interventions in Mali remain the same as in the 2013-2017 strategy and include the provision of IPTp; SMC for children under five years of age; accurate diagnosis and appropriate treatment of malaria cases; IRS in targeted areas; and universal access to ITNs.

The USAID Health Team in Mali is developing a new integrated health project for the period 2018-2023. This new project will impact the geographic and technical scope of its bilateral activities. Distribution of PMI activities between bilateral and core-funded partners will be finalized once the new project is awarded.

IV. DATA UPDATES AND EVIDENCE OF PROGRESS

Figure 2: Coverage of Select Major Interventions and Parasite Prevalence by Region, 2016

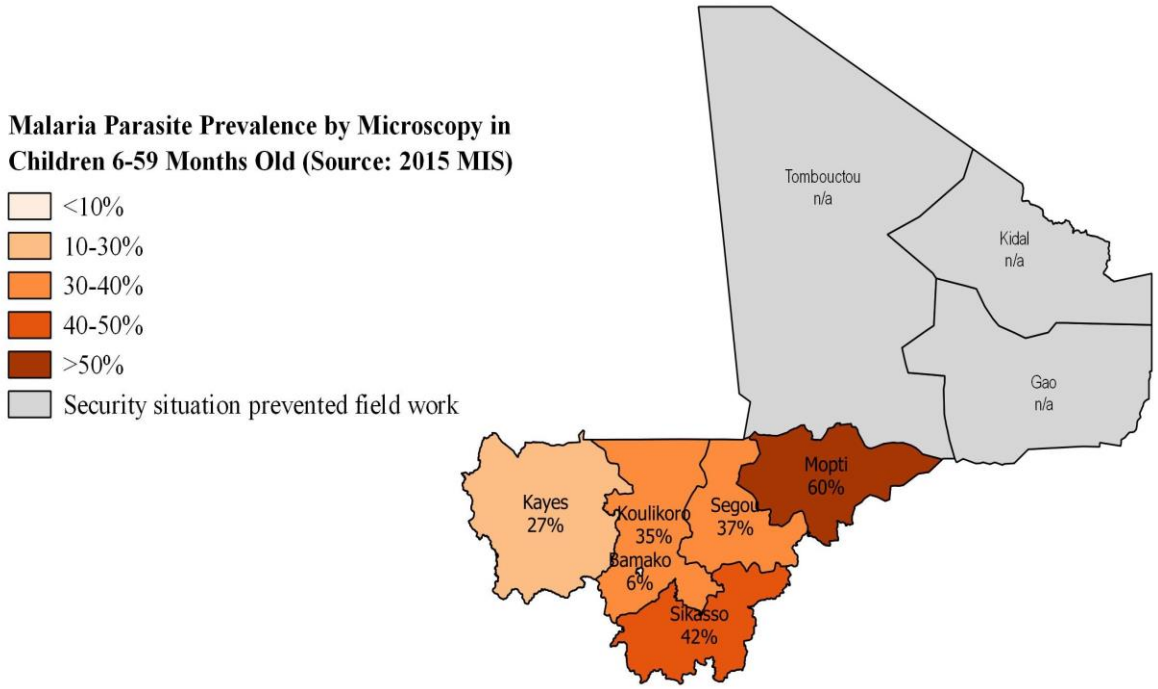


Table 1: Evolution of Key Survey-Based Malaria Indicators in Mali from 2006 to 2016

Indicator	DHS 2006	A&P 2010	DHS 2012-13	MIS 2015-16
% Households with at least one ITN	50	85	84	93
% Population with access to an ITN	30	62	65	70
% Children under five who slept under an ITN the previous night	27	70	69	71
% Pregnant women who slept under an ITN the previous night	29	N/A	73	78
% Population that slept under an ITN the previous night	21	N/A	61	64
% Children under five with fever in the last two weeks for whom advice or treatment was sought	55	N/A	47	50
% Children under five with fever in the last two weeks who had a finger or heel stick	N/A	N/A	12	14
% Children receiving an ACT among children under five years old with fever in the last two weeks who received any antimalarial drugs	N/A	8	19	29
% Women who received two or more doses of IPTp during their last pregnancy in the last two years	10	N/A	29	38
% Women who received three or more doses of IPTp during their last pregnancy in the last two years	5	N/A	11	21
Under-5 mortality rate per 1,000 live births	215	N/A	104	N/A
% Children under five with parasitemia (by **microscopy,** if done)	N/A	38	52	36
% Children under five with parasitemia (by **RDT**, if done)	N/A	N/A	47	32

Table 2: Evolution of Key Malaria Indicators Reported through Routine Surveillance Systems in Mali from 2012 to 2017

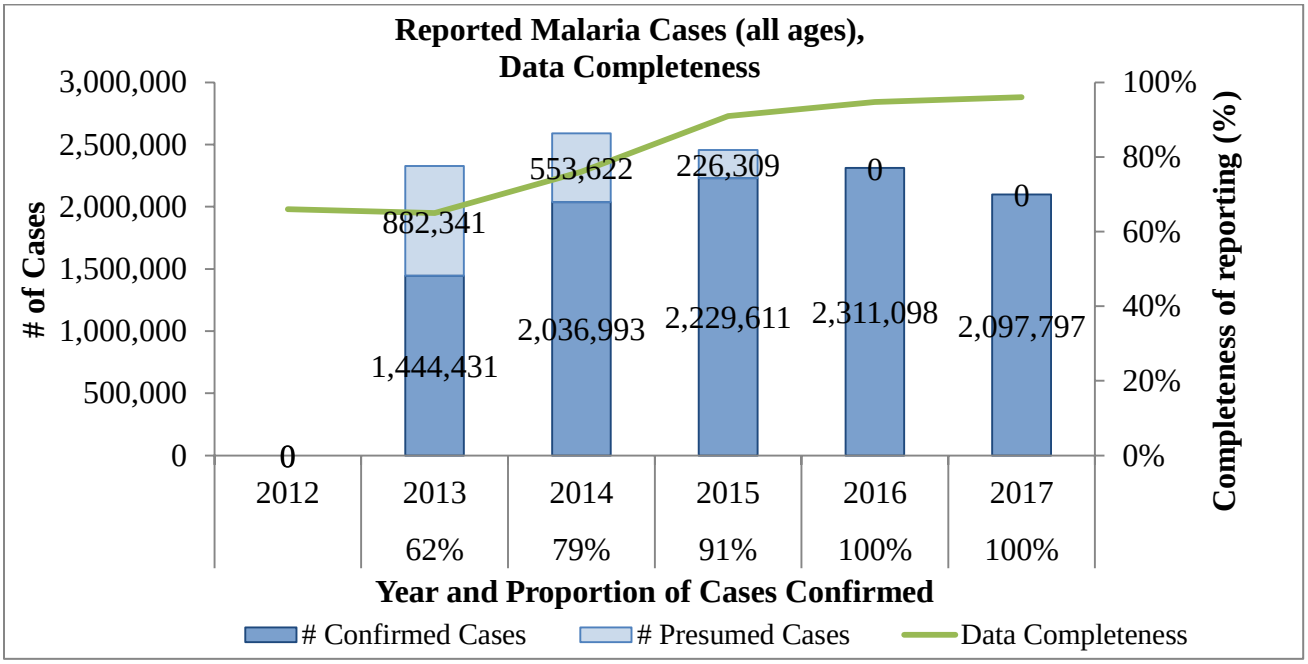
	2012	2013	2014	2015	2016	2017
Total # Cases[1]	2,171,739	2,326,772	2,590,615	2,455,920	2,311,098	2,097,797
# Confirmed Cases[2]	N/A	1,444,431	2,036,993	2,229,611	2,311,098	2,097,797
# Presumed Cases[3]	N/A	882,341	553,622	226,309	N/A	N/A
Total # <5 Cases[4]	762,714	875,016	981,207	1,057,620	985,452	905,282
Total # Malaria Deaths[5]	1,883	1,680	1,750	1,978	1,344	1,050
Data Completeness[6]	66%	65%	76%	91%	95%	96%
Test Positivity Rate[7]	N/A	74%	76%	66%	68%	67%

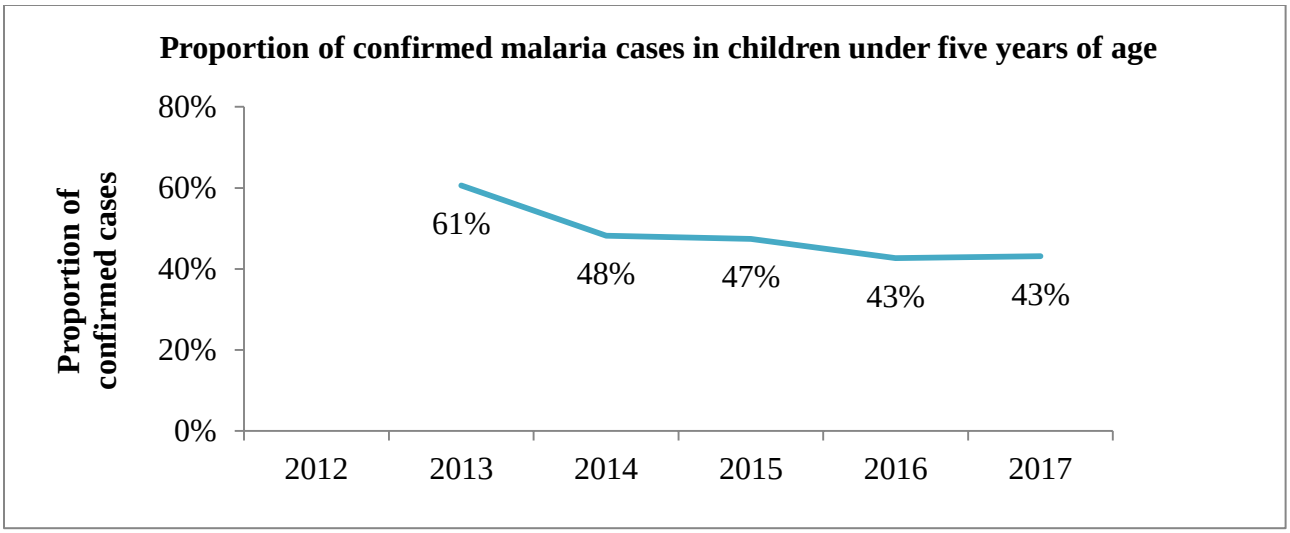
[1]Total number of reported malaria cases. All ages, outpatient, inpatient, confirmed and unconfirmed cases. Mali began reporting confirmed cases (only) to WHO in 2016.
[2]Total diagnostically confirmed cases. All ages, outpatient, inpatient.
[3]Total clinical/presumed/unconfirmed cases. All ages, outpatient, inpatient.
[4]Total number of <5 cases. Outpatient, inpatient, confirmed, and unconfirmed.
[5]All ages, outpatient, inpatient, confirmed, and unconfirmed
[6]Number of monthly reports received from health facilities/Number of health facility reports expected (i.e., number of facilities expected to report multiplied by the number of months considered)
[7]Number of confirmed cases (#2 above)/Number patients receiving a diagnostic test for malaria (RDT or microscopy)

Presumed cases have not been reportable in Mali since 2016. The numbers of suspected, tested, and confirmed malaria cases are reported. The proportion of suspected cases tested for malaria has remained high and fairly stable (92 percent in 2015, 96 percent in 2016, and 94 percent in 2017) since RDTs became widely available.

Community health workers have been using RDTs to test suspected malaria cases since 2013. Around 10 percent of the annual number of reported confirmed cases is reported by community health workers.

Figures 3 and 4: Trends in Key Malaria Indicators Reported in Routine Surveillance Systems





V. NEW OR EXPANDED ACTIVITIES AND KEY CHANGES

1. Vector control

a) Entomologic monitoring and insecticide resistance management

No new activities or significant changes are proposed. Entomological surveillance will continue to be conducted in 15 sites, including Bamako.

b) Insecticide-treated nets

PMI will continue to procure and pay for the distribution of ITNs provided through routine health services including antenatal care (ANC) and expanded program on immunization (EPI). The Global Fund will continue to support mass ITN campaigns in 2019 and 2020. In 2020, PMI will procure 1,645,714 ITNs for routine distribution (via ANC and EPI) and 379,941 for mass campaigns. PMI will purchase additional nets for the mass distribution campaigns planned for 2020 and 2021 to avoid any gaps at the end of the Global Fund grant.

Mali is on the list of pilot G2 countries and expects to pilot next generation ITNs once they are made available from UNITAID.

The ITN durability study, which is being conducted according to PMI guidance, started in January 2018 in two health districts in Kayes Region (Kita and Kenieba). ITNs being studied are Yorkool and Permanet 2.0; both have Deltamethrin coating on polyester. The second year will be funded with FY 2018 MOP funds and the third year will be funded with FY 2019 MOP funds. The results for the first year will not be available until September 2018. This activity will be conducted through the *Laboratoire de Biologie Moléculaire Appliquée* at the University of Bamako.

c) Indoor residual spraying

PMI has supported IRS in Mali since 2006, initially in two to three districts in Segou and Koulikoro provinces. However, in 2015 data showed that the highest burden of malaria was in the province of Mopti, so the NMCP asked PMI to move the IRS program to that region as of 2016. This was a strategic decision given that Mopti has consistently had the highest prevalence of malaria in the country (based on

DHS data) and given that many internally displaced people from the north come into that area with no natural immunity to malaria.

By placing IRS in Mopti, PMI is supporting the strategic decision of the NMCP to place an effective, though costly, intervention in the area of highest need. The NMCP was heavily involved in scoping visits and decisions regarding the choice of districts and they are very invested in the success of the project in that region. IRS was successfully conducted in Mopti in 2017. PMI will procure insecticide sufficient to cover a target population of 650,000 with IRS.

2. Malaria in pregnancy

Progress in MIP has moved slowly over recent years, but some gains have been recorded. The proportion of pregnant women receiving IPTp during ANC visits has been increasing. Between 2014 and 2016, IPT3 coverage among women attending ANC increased from 12 percent to 41 percent (National Malaria Control Strategy 2018-2022). PMI Mali continues to support efforts to increase ANC coverage and to achieve universal coverage of at least three doses of IPTp. In 2017, the NMCP estimated that 61 percent of pregnant women who attended ANC had received at least two doses of SP and 40 percent had received at least three doses of SP (2017 Draft NMCP Annual Report).

PMI Mali has been continually supporting the NMCP to implement MIP. PMI has been collaborating with the Reproductive Health Division, NMCP, and Midwives Association to implement in-service training and supervision of health providers to ensure high-quality ANC/MIP services. Technical training based on current IPTp recommendations has accelerated in recent years to ensure that all new providers are trained, and that existing providers receive refresher training every two years. PMI is supporting an operational research study to examine the impact of an enhanced package of training and SBCC activities on ANC and IPTp uptake; results are expected in 2020. The Global Fund is also supporting an operational research study on approaches for improving IPTp coverage. Findings of these studies will be used to reinforce training and SBCC work in this technical area.

PMI-supported partners take every opportunity to strengthen the capacity of the national health system to implement national ANC and MIP policies and guidelines. PMI partners support health providers to provide IPTp and ITNs to pregnant women and to diagnose and treat pregnant women with malaria. PMI also supports a multi-channel SBCC strategy targeting pregnant women, women of childbearing age, and men. SBCC campaigns focus on women's knowledge and awareness of the risks of MIP, the importance of early and frequent ANC attendance, and the associated demand for and use of at least three SP treatments for IPTp and ITNs, respectively. The integrated supervision approach supported by PMI provides an opportunity to work with providers to improve ANC and MIP services.

PMI provides technical assistance to the National Drug Stores with commodity management and supporting the NMCP with the purchase of SP commodities. Mali has not experienced any stockouts of SP at the national level since 2014 (NMCP Internal Evaluation 2018). SP stock availability has improved down to the health facility level, thereby contributing to some of the progress in IPTp services. Previous persistent stockouts of SP in Mali have been resolved through smoothing of SP order timing, improved distribution, and efforts by the NMCP to pay greater attention to stock levels and make appropriate decisions. Mali has not had an SP stockout at the facility level greater than 12.9 percent in two years; stockouts remain closer to 6-8 percent or less, showing greater improvement in stock availability of SP. PMI has been supporting integration of NMCP data into the national District Health Information System and routine program monitoring by the NMCP has improved with the addition of an IPTp3 variable in this system.

PMI provides support through its partners to revise and implement the national protocols and guidance documents and to facilitate coordination of MIP activities through the MIP Technical Working Group. This working group has been debating the barriers women face to receiving ANC and IPTp, the benefits of combining ANC/IPTp services with EPI outreach activities, and the possible roles of outreach and community health workers in increasing IPTp coverage without compromising ANC attendance.

PMI and USAID maternal and child health staff are working closely together to support the Ministry of Health (MOH) to revise the national ANC guidelines to include the additional four contacts recommended by the World Health Organization (WHO), which will give health providers more opportunities to improve IPTp-SP coverage. The USAID Health Office, including PMI, is revising the USAID Health Strategy to improve access to health services through the promotion and the provision of services at the community level. Formative assessments are being planned to explore family and community perceptions and experiences related to existing ANC and MIP services, and to identify community-level approaches for improving maternal and child health.

No new activities or significant changes are proposed. PMI will procure 1 million treatments of SP for use in IPTp nationwide.

3. Drug-based prevention

a) Seasonal malaria chemoprevention

No new activities or significant changes are proposed. SMC is being implemented in all 65 districts in the country. The NMCP, World Bank, Global Fund, UNICEF, and PMI all support implementation of SMC in specific districts. There is no change in the number of regions or districts where SMC has been implemented by PMI since 2016. Mali PMI supports 12 districts in 3 regions (Kayes, Sikasso, and Koulikoro). SMC in the six communes of Bamako are supported by other partners.

PMI will procure SP/AQ for SMC: 4 rounds for 666,202 children in 12 districts

An SMC operational research study is in its second and final year of implementation. Final results are expected by May 2019. The NMCP and stakeholders will use the study results to make policy and financial decisions on the feasibility and effectiveness of expanding SMC to children 5-10 years of age. Once the NMCP makes a policy decision, PMI will revisit its budget and quantification to determine possible levels of support from PMI. Findings will also be widely circulated among PMI SMC-implementing countries, and at scientific fora such as the American Society of Tropical Medicine and Hygiene Annual Meeting.

Mali will conduct SP resistance monitoring activities as recommended by WHO, which is essential given that SP is being used nationwide through the implementation of SMC. These resistance monitoring activities will be done in the off years between the therapeutic efficacy study (TES) years.

4. Case management

No new activities or significant changes are proposed. The case management activities will be divided between the USAID bilateral (in USAID focus districts) and the centrally funded projects (in non-USAID focus districts) to ensure support across all regions of Mali.

Mali has scaled up access to diagnosis and treatment in the past decade by expanding access to RDTs and ACTs in the public health system, and by extending services through community case management. In 2017, 94 percent of suspected malaria cases were tested (by RDT or microscopy) and 94 percent of

confirmed uncomplicated cases of malaria were treated with ACTs. Community health workers have been testing suspected cases since 2013. Approximately 10 percent of the annual number of reported confirmed cases is reported by community health workers.

PMI will procure 3.5 million RDTs, 1 million ACTs, and 160,000 vials of injectable artesunate for severe malaria in children for use in 2020.

The Global Fund, MOH, and other stakeholders are procuring limited quantities of rectal artesunate for use at the community level. The use of rectal artesunate prior to the transfer of patients with severe malaria to a higher level of healthcare has been recommended by the NMCP since 2009, and was included in the National Malaria Control Policy in 2011. Both the 2009 NMCP training modules and the national training materials on integrated management of childhood illness include sessions on the treatment of patients with severe malaria with rectal artesunate before their transfer.

5. Crosscutting and other health systems strengthening

a) Pharmaceutical management

No new activities or significant changes are proposed.

b) Social and behavior change communication

No new activities or significant changes are proposed.

PMI uses radio and television spots, posters, mobile communications, and internet-based media (e.g., websites, YouTube, webTV, WebRadio, Viber, Twitter, etc.) to reach its target populations (pregnant women, youth, health services providers, etc.) In addition, PMI, through its partners, has developed a communication platform called Jigisigi that broadcasts voice messages and SMS via an interactive voice server. It has several platforms including family planning; maternal, newborn and child health; malaria (IPTp uptake, SMC sensitization, sleeping under ITNs, etc.); and HIV. PMI SBCC support is complemented by other USAID health programs and the Global Fund.

PMI works closely with the National Center for Information, Education, and Communication for Health (CNIECS), the MOH structure responsible for the centralized production of information, education, and communication materials and harmonization of SBCC messages to develop and implement communication approaches and messaging. PMI also supports CNIECS to support regions and districts to implement community mobilization activities. PMI-funded activities are in the regions of Kayes, Koulikoro, Sikasso, Mopti, and Gao. PMI also supports implementation of district-level SBCC for SMC using funds from the SMC budget in the 12 PMI districts.

c) Surveillance, monitoring, and evaluation

PMI will support the District Health Information System to improve malaria data quality and use at all levels, including district level. This activity will continue to support training, data quality assessment activities, analysis and production of monthly malaria bulletins, and use of data for program improvement. This funding supports measurement and evaluation training of NMCP and MOH staff at national and subnational levels.

PMI will also provide support to the early planning of the 2020 MIS.

Table 3. Surveillance, Monitoring, and Evaluation Data Sources

Data Source	Survey Activities	Year								
		2012	2013	2014	2015	2016	2017	2018	2019	2020
Household surveys	DHS	X						X		
	MIS				X					X
	Multiple Indicator Cluster Survey				X					
Malaria Surveillance and Routine System Support	Support to parallel malaria surveillance system									
	Support to Health Management Information System	X	X	X	X	X	X	X	X	X
	Support to Integrated Disease Surveillance and Response	X	X	X	X	X	X	X	X	X
Other Surveys	EUV	X	X	X	X	X	X	X	X	X
TES Monitoring*	In vivo efficacy testing of first/second line drugs					X	X	X	X	X
Entomology Monitoring	Entomological surveillance and resistance monitoring	X	X	X	X	X	X	X	X	X
Other data source	Malaria Impact Evaluation					X				

*TES program rotates through 3 different sites each year. Two sites are PMI-supported and an additional site is supported by NIH. These sites will also conduct molecular surveillance for SP resistance per WHO guidelines in areas with SMC.

d) Operational research

No new activities or significant changes are proposed.

e) Other health systems strengthening

No new activities or significant changes are proposed.

6. Staffing and administration

PMI Mali supports staffing and administration that follows PMI policy, as articulated in the FY 2018 MOP.