

PMI

U.S. PRESIDENT'S MALARIA INITIATIVE

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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 funding available to support the plan outlined here is pending finalization of the FY 2020 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.

U.S. PRESIDENT'S MALARIA INITIATIVE

MALI

Malaria Operational Plan FY 2020

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ABBREVIATIONS

ACPR	Adequate clinical and parasitological response
ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
ANC	Antenatal care
AS/AQ	Artesunate-amodiaquine
ASC	<i>Agents de Santé Communautaire</i>
BMGF	Bill and Melinda Gates Foundation
CDC	Centers for Disease Control and Prevention
CHW	Community Health Worker
CPS	<i>Cellule de Planification et de Statistiques du Secteur Santé</i>
CY	Calendar year
DHIS2	District Health Information System
DHS	Demographic and Health Survey
DNP	<i>Direction Nationale de la Population</i>
EA&P	<i>Enquete sur la Prevalence de l'Anemie et de la Parasitemie Palustre (MIS)</i>
EIPM	<i>Enquête sur les Indicateurs du Paludisme (MIS)</i>
FY	Fiscal year
G2	Interceptor® G2 - LLIN coated with a mixture of chlorfenapyr and alpha-cypermethrin
GHI	Global Health Initiative
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HCW	Healthcare workers
HMIS	Health Management Information System
iCCM	Integrated Community Case Management
IEC	Information, education, communication
INRSP	<i>Institut National de Recherche en Santé Publique</i>
INSTAT	<i>Institut National de la Statistique</i>
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
LLIN	Long-lasting insecticide net
LBMA	<i>Laboratoire de Biologie Moleculaire Appliquee</i>
LMIS	Logistics Management and Information System
MDRT	Malaria diagnostic refresher training
MIP	Malaria in pregnancy
MIS	Malaria indicator survey
MoH	Ministry of Health
MOP	Malaria Operational Plan
MRTC	Malaria Research and Training Center

MSF	<i>Médecins sans Frontiers</i>
NMCP	National Malaria Control Program
OTSS	Outreach Training and Supportive Supervision
PARMA	PMI-supported Antimalarial Resistance Monitoring in Africa
PMI	U.S. President's Malaria Initiative
PPM	<i>Pharmacie Populaire du Mali</i>
PQM	Promoting the Quality of Medicines program
PSM	Procurement and Supply Chain Management
QA/QC	Quality assurance / quality control
RDT	Rapid diagnostic test
SARA	Service Availability and Readiness Assessment
SBC	Social and behavior change
SLIS	<i>Système Local d'Information Sanitaire (HMIS)</i>
SM&E	Surveillance, monitoring, and evaluation
SP	Sulfadoxine/pyrimethamine
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization
WB	World Bank

I. INTRODUCTION

The U.S. President's Malaria Initiative (PMI)—led by the U.S. Agency for International Development (USAID) and implemented together with the U.S. Centers for Disease Control and Prevention (CDC)—delivers cost-effective, lifesaving malaria interventions alongside catalytic technical and operational assistance to support Mali to end malaria. PMI has been a proud partner of Mali since 2007, helping to decrease child death rates by 47 percent [2019 PMI annual report] and reducing malaria prevalence among children from 47 percent in 2012-2013 to 19 percent in 2018 [DHS] through investments totaling almost \$266.7 million total through FY 2018.

The proposed PMI fiscal year (FY) 2020 budget for Mali is \$ 23 million. This Malaria Operational Plan (MOP) outlines planned PMI activities in Mali for FY 2020. Developed in consultation with the National Malaria Control Program (NMCP) and key stakeholders, proposed activities reflect national and PMI strategies, draw on best-available data, and align with the country context and health system. Proposed PMI investments support and build on those made by the Government of Mali as well as other donors and partners.

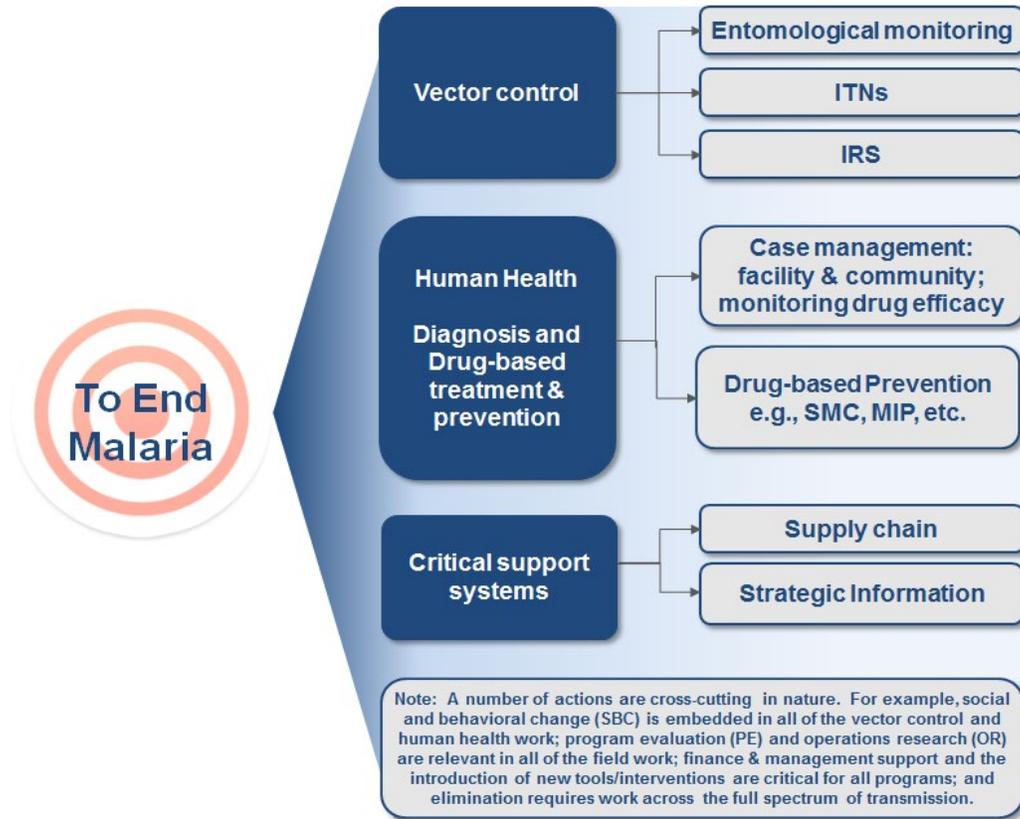
Mali at a glance

- **Geography:** Mali is a vast, semi-arid, landlocked country in the Sahelian belt.
- **Climate:** Malaria is endemic to the central and southern regions, where about 90 percent of Mali's population lives and it is epidemic in the north due to the limited viability of Anopheles species in the desert climate. Malaria transmission varies in Mali's five geo-climatic zones. It occurs year-round in the Sudano-Guinean zone in the south, with a seasonal peak between June and November. The transmission season is shorter in the northern Sahelian zone, lasting approximately three to four months (July/August to October). Malaria transmission is endemic in the Niger River Delta and areas around dams with rice cultivation, and is endemic with low transmission in urban areas including Bamako and Mopti. Epidemics occur in the north (Gao, Kidal, and Tombouctou Regions).
- **Population in 2019:** 19,658,031 (INSTAT/DNP)
- **Population at risk of malaria:** 19,658,031 (PSM Mali Gap Analysis 2019)
- **Principal malaria parasites:** *Plasmodium falciparum* (PNLP)
- **Principal malaria vectors:** *Anopheles gambiae* (*An. gambiae coluzzi*) (PNLP)
- **Malaria incidence per 1000 population in 2017:** 386.2/1,000 population at risk (2018 WHO Annual Report)
- **Under-five mortality rate:** 101 deaths per 1,000 live births (DHS 2018)
- **World Bank Income Classification & GDP:** Low income, 830 USD GDP/capita in 2018 (<https://data.worldbank.org/country/mali>)

- **Political system:** Semi-presidential republic. President directly elected by absolute majority popular vote for a 5-year term. Prime Minister and cabinet members appointed by the president. The president chairs the Council of Ministers which adopts proposals for laws submitted to the National Assembly for approval. The National Assembly is the sole legislative arm of the government. Representation is apportioned according to the population of administrative districts. Election is direct and by party or independent list. The term of office is 5 years. Administratively, Mali is divided into regions which are each under the authority of an appointed Governor.
- **Trafficking in Persons designations, 2016-2018: Tier 2** (DOS 2019 Trafficking in Persons Report)
- **Malaria funding and program support partners include (but are not limited to):**
 - Global Fund to Fight AIDS, Tuberculosis and Malaria (GF)
 - U.S. President’s Malaria Initiative (PMI)
 - The World Health Organization (WHO)
 - UNICEF
 - World Bank (WB)
- **PMI Support of National Malaria Control Strategy:** The National Malaria Control Strategy aligns well with PMI-supported key intervention areas. The long-term goal of the NMCP/MOH is to eliminate malaria by 2030. National objectives include the reduction of malaria mortality and malaria incidence by 50 percent between 2015 and 2022. (See III. Overview of PMI’s support of Mali’s Malaria Control Strategy for additional details)
- **PMI Investments:** Mali began implementation as a PMI focus country in FY 2007. The proposed FY 2020 PMI budget for Mali is \$23 million; that brings the total PMI investment in Mali to nearly \$314.7 million.

PMI organizes its activities and planning levels around the activities in Figure 1, in line with the national malaria strategy.

Figure 1. PMI's Approach to End Malaria



PMI's approach is both consistent with and contributes to USAID's Journey to Self-Reliance framework. Building and strengthening the capacity of Mali's people and institutions – from the central level to communities – to effectively lead and implement evidence-based malaria control and elimination activities remains paramount to PMI. As denoted in Table 2 (the budget table), nearly all of PMI/Mali will continue to consider working on private sector PMI's planned support for FY 2020 is in the areas of vector control, human health, supply chain and strategic information contains elements of capacity building and system strengthening. PMI/Mali will continue to rely on and engage with local partners and is expanding its local partner base. Finally, PMI/Mali will continue to consider working on private sector partnerships.

To accelerate the journey to self-reliance, PMI developed a programmatic inventory to assess the strengths and persistent challenges of Mali's program (see Annex B). The activities proposed in this MOP are tailored to draw on these strengths and address the weaknesses, which will be monitored to evaluate the effectiveness of capacity building efforts. In addition, while PMI is cognizant that it will take time before Mali is capable of fully financing its development priorities, PMI will work with other partners (e.g., the Global Fund) to jointly track Mali's funding commitments across the malaria portfolio.

II. MALARIA SITUATION AND MALARIA CONTROL PROGRESS IN MALI

Malaria is the primary cause of morbidity and mortality in Mali, particularly for children less than five years old. In 2018, the national health information system (*Système Local d'Information Sanitaire* or [SLIS]) reported 2,345,481 million clinical cases of malaria in health facilities. A total of 1001 fatal malaria cases were reported. According to the 2018 Demographic and Health Survey, the prevalence of malaria among children under five years of age was 19 percent based on rapid diagnostic tests (RDTs). Malaria prevalence varies across regions, from a minimum of 1 percent in Bamako to a maximum of 30% in Sikasso region.

Data from the recent MIS 2015 indicate that *Plasmodium falciparum* accounts for 95 percent of all malaria infections, while *P. malariae*, *P. vivax* and *P. ovale* together account for 5.2 percent. A 2004 study conducted by the Malaria Research and Training Center (MRTC) in Menaka, an epidemic-prone region in the north, indicated a prevalence of *P. vivax* of 8 percent, which was confirmed by polymerase chain reaction.

Malaria is endemic to the central and southern regions, where about 90 percent of Mali's population lives, and it is epidemic in the north due to the limited viability of *Anopheles* species in the desert climate. Malaria transmission varies in Mali's five geo-climatic zones. It occurs year-round in the Sudano-Guinean zone in the south, with a seasonal peak between June and November. The transmission season is shorter in the northern Sahelian zone, lasting approximately three to four months (July/August to October). Malaria transmission is endemic in the Niger River Delta and areas around dams with rice cultivation, and is endemic with low transmission in urban areas including Bamako and Mopti. Epidemics occur in the north (Gao, Kidal, and Tombouctou Regions) and in the northern districts of Kayes, Koulikoro, Mopti, and Ségou Regions; there was a recrudescence of malaria cases in Kidal, Northern Mali in October 2015.

Figure 2. Trends in Malaria Prevalence, Percent of Children Age 6-59 Months Who Tested Positive for Malaria by Microscopy and RDT

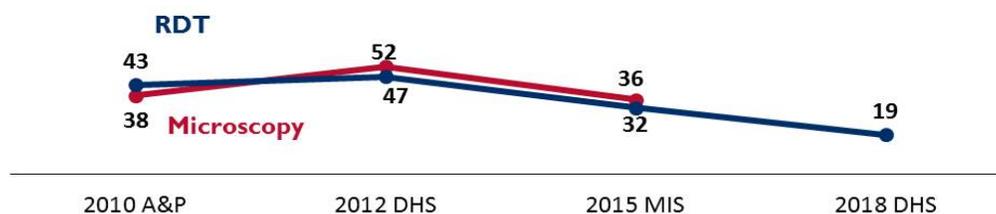


Figure 3. Trends in Prevalence of Low Hemoglobin, *Percent of Children age 6-59 months with moderate-to-severe anemia (hemoglobin <8.0 g/dl)*

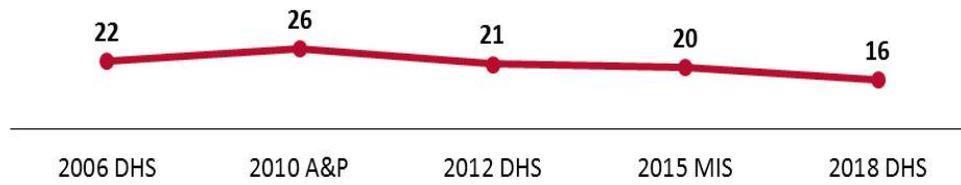
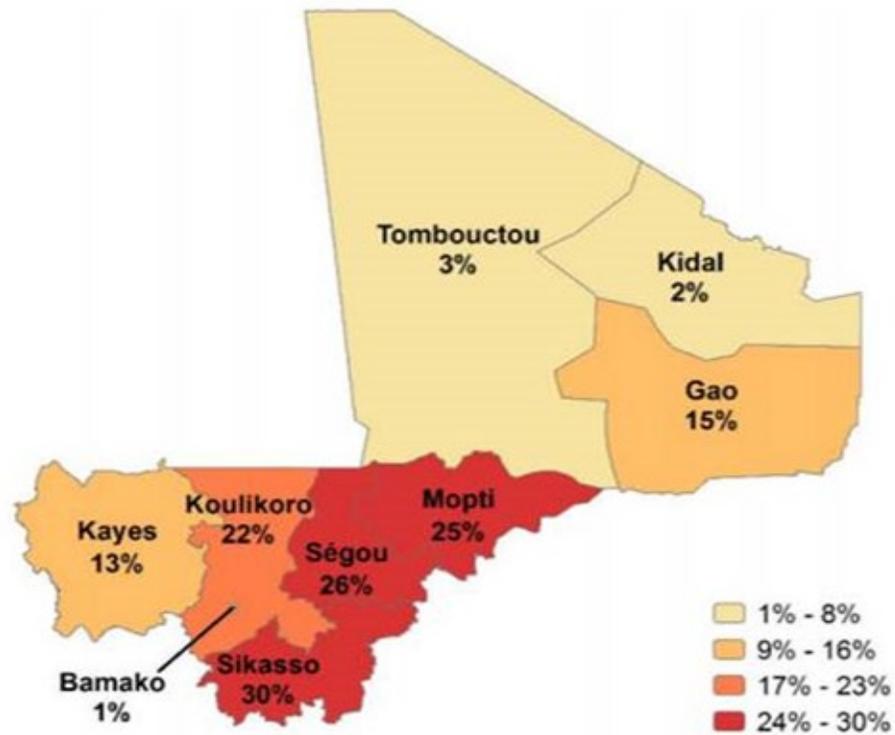
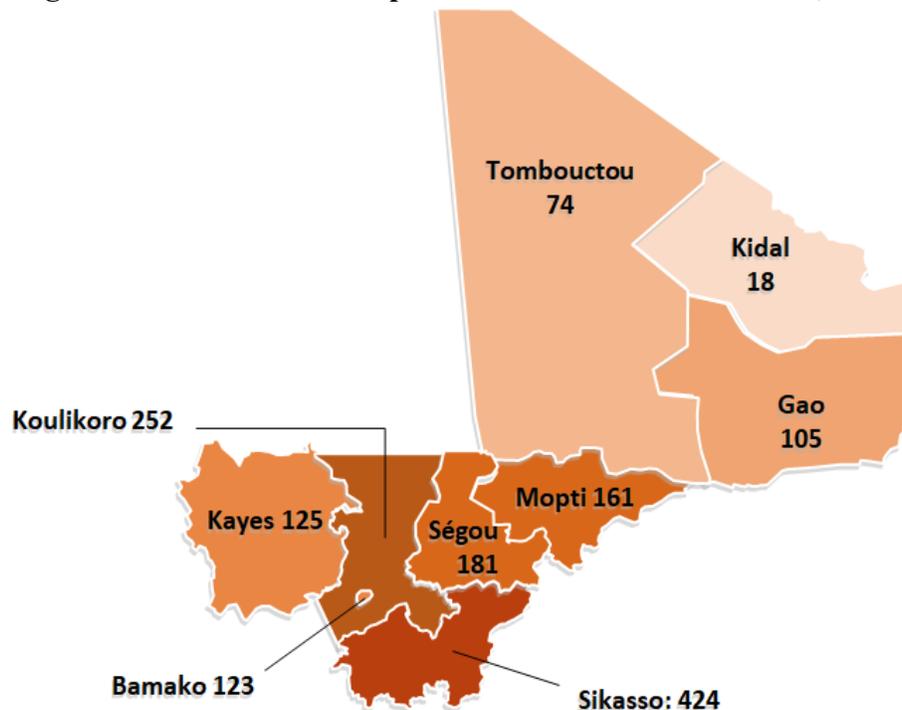


Figure 4. Malaria Parasite Prevalence among Children Under Five Years of Age by Geographic Area



Source: 2018 DHS

Figure 5. Malaria Incidence per 1000 Children < 5 Years Old, 2018



Source: DHIS2/ VectorLink

Figure 6. Key Indicators for Malaria Prevention and Treatment Coverage and Impact Indicators from Demographic Health Surveys (DHS) and Malaria Indicator Surveys (MIS) from 2006-2018.

Indicator	2006 DHS	2010 A&P	2012 DHS	2015 MIS	2018 DHS
% Households with at least one ITN	50	85	84	93	90
% Households with at least one ITN for every two people	16	n/a	42	39	55
% Population with access to an ITN	30	62	65	70	75
% Population that slept under an ITN the previous night*	21	n/a	61	64	73
% Children under five years old who slept under an ITN the previous night*	27	70	69	71	79
% Pregnant women who slept under an ITN the previous night*	29	n/a	73	78	84
% Children under five years old with fever in the last two weeks for whom advice or treatment was sought ¹	56	59	47	49	53
% Children under five with fever in the last two weeks who had a finger or heel stick	n/a	4	12	14	16
% Children receiving an ACT among children under five years old with fever in the last two weeks who received any antimalarial drugs	n/a	22	19	29	31

Indicator	2006 DHS	2010 A&P	2012 DHS	2015 MIS	2018 DHS
% Women who received two or more doses of IPTp during their last pregnancy in the last two years ²	10	n/a	29	38	55
% Women who received three or more doses of IPTp during their last pregnancy in the last two years ²	6	n/a	12	21	28
Under-five mortality rate per 1,000 live births	191	n/a	98	n/a	101
% Children under five years old with parasitemia (by microscopy , if done)*	n/a	38	52	36	n/a
% Children under five years old with parasitemia (by RDT , if done)*	n/a	43	47	32	19
% Children under five years old with severe anemia (Hb<8gm/dl)	22	26	21	20	16

*Recently DHS and MIS surveys have been fielded in Mali during the wet season. In Mali, the 2012-2013 and 2018 DHS and the 2015 MIS were conducted during the high transmission season.

¹Note that this indicator has been recalculated according to the newest definition, at the specified number of doses of SP/Fansidar from any source, wherever possible

²Note that this indicator has been recalculated according to the newest definition, care or treatment from any source excluding traditional practitioners, wherever possible

Figure 7. Evolution of Key Malaria Indicators Reported through Routine Surveillance Systems

Indicator	2014	2015	2016	2017	2018
# Suspect malaria cases ¹	N/A	N/A	N/A	2,910,831	3,572,794
# Patients receiving diagnostic test for malaria ²	2,692,773	3,086,897	3,038,150	2,535,213	3,457,267
Total # malaria cases³ (confirmed and presumed)	2,590,615	2,455,920	2,311,098	2,097,797	2,345,481
# Confirmed cases ⁴	2,036,993	2,229,611	2,311,098	2,097,797	2,345,481
# Presumed cases ⁵	553,622	226,309	n/a	n/a	n/a
% Malaria cases confirmed ⁶	79%	91%	100%	100%	100%
Test positivity rate (TPR) ⁷	76%	72%	70%	66%	68%
Total # <5 malaria cases⁸	981,207	1,057,620	985,452	905,282	790,613
% Cases under 5 ⁹	38%	43%	43%	43%	34%
Total # severe cases¹⁰	N/A	N/A	N/A	667,268	750,973
Total # malaria deaths¹¹	1,750	1,978	1,344	1,050	1,001
# Facilities reporting ¹²	N/A	N/A	N/A	1357	1376
Data form completeness (%) ¹³	76%	91%	95%	96%	97%

Data sources and comments:

N/A = not available

Definitions:

¹ Number of patients presenting with signs or symptoms considered to be possibly due to malaria (e.g., this could be the number of patients presenting with fever or history of fever in the previous 24 or 48 hours)

² Number of patients receiving a diagnostic test for malaria (RDT or microscopy). All ages, outpatient, inpatient

³ Total # cases: Total number of reported malaria cases. All ages, outpatient, inpatient, confirmed and unconfirmed cases.

⁴ # confirmed cases: Total diagnostically confirmed cases. All ages, outpatient, inpatient.

⁵ # presumed cases: Total clinical/presumed/unconfirmed cases. All ages, outpatient, inpatient.

⁶ % Malaria Cases confirmed: # confirmed cases (#4 above) / Total # cases (#3 above)

⁷ Test Positivity Rate (TPR): Number of confirmed cases (#4 above)/Number of patients receiving a diagnostic test for malaria (RDT or microscopy) (#2 above)

⁸ Total #<5 cases: Total number of <5 cases. Outpatient, inpatient, confirmed, and unconfirmed.

⁹ Total # <5 cases (#8 above) / Total # of cases (# 3 above)

¹⁰ As there may not be a standard definition across countries, please specify if there is such a variable available and the definition that is used; if “severe malaria” is not used or collected but “hospitalized for malaria” is a standard in the country, please insert that label and the relevant data by year.

¹¹ Total # Malaria Deaths Reported: All ages, outpatient, inpatient, confirmed, and unconfirmed.

¹² Total # of health facilities reporting data into the HMIS/DHIS2 system for that year.

¹³ Data completeness: 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).

III. OVERVIEW OF PMI’S SUPPORT OF MALI’S MALARIA CONTROL STRATEGY

In 2018, the NMCP published the 2018-2022 National Strategy for Malaria Control. The National Strategy aligns well with PMI-supported key intervention areas. It has three objectives to be reached by 2022: reducing malaria mortality and malaria incidence by 50 percent relative to 2015 levels, and strengthening NMCP coordination and management capacities at all levels of the health system. A longer-term goal of the NMCP/MOH is to eliminate malaria by 2030.

The National Strategy for Malaria Control includes the following specific objectives:

- At least 80 percent of the population at risk of malaria is using ITNs, including pregnant women and children under five years old;
- At least 80 percent of pregnant women have received three Sulfadoxine/pyrimethamine (SP) doses as IPTp during their pregnancy;
- At least 90 percent of children under five received the four full courses of SMC in selected zones;
- 100 percent of suspected malaria cases are confirmed using microscopy or RDTs before treatment, at all levels of the health system including the community level by community health workers (*Agents de Santé Communautaire-ASC*);
- 100 percent of confirmed malaria cases receive appropriate malaria treatment both for severe and uncomplicated cases as indicated in the national guidelines;
- At least 80 percent of the population is protected by IRS in IRS target zones;
- At least 90 percent of the general population knows which interventions are recommended to prevent malaria;
- At least 90 percent of emergency cases and malaria epidemics are detected within two weeks and receive an appropriate response.

PMI and Global Fund work closely together to coordinate support to the NMCP to achieve its malaria prevention and control goals and objectives throughout Mali.

The Global Fund has a budget of 55,314,550 Euro for a three-year malaria grant (2019-2021), of which 26 percent is budgeted for a national ITN mass distribution campaign, 30 percent for SMC in 19 districts, 10 percent for case management, and 6.3 percent for incentives/compensation for healthcare workers. PMI supports provision of malaria commodities nationally (ACTs, RDTs, SPs, and ITNs for distribution through routine channels). Additionally, PMI supports SMC in 9 districts, IRS in 3 districts, and case management and MIP in all southern regions. The World Bank covers 20 districts for SMC and contributes toward the purchase of malaria commodities such as ACTs, injectable artesunate, and RDTs. However, the World Bank project (MTN) ends this year.

Figure 8. PMI Intervention Support

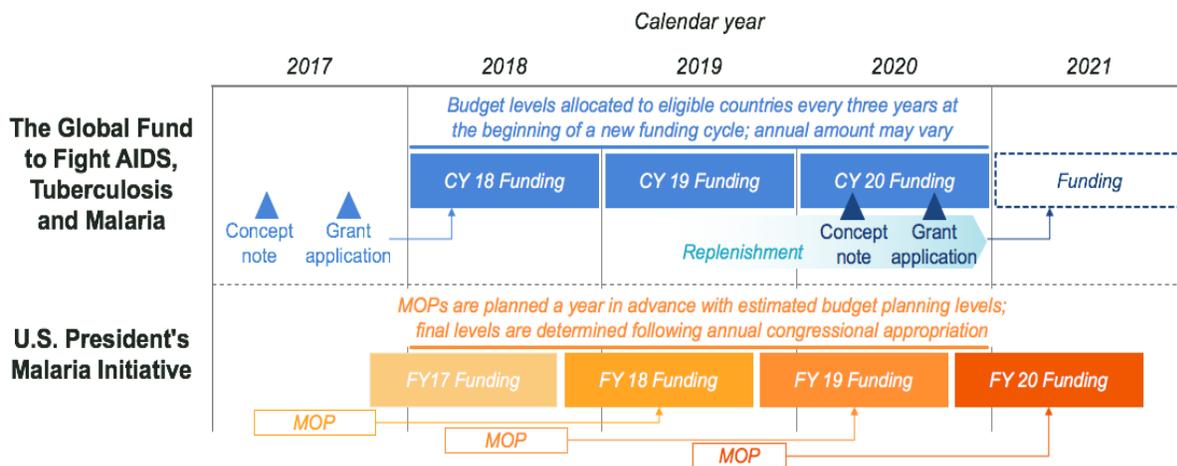
Interventions	Nationwide	Regional	Comments
ITN (distribution through routine channels)	x		ITN mass campaign done by Global Funds (GF)
Drug distribution (ACTs, RDTs, SP)	x		World Bank and GF (See gap analysis)
IRS		Mopti (3 districts)	
SMC		Segou and Mopti (9 districts)	World Bank and GF (See gap analysis)
Case management, MIP, iCCM and SBC		All southern regions (Kayes, Koulikoro, Sikasso, Mopti, Segou, and Bamako)	
Health Information System (HIS)	x		GF, UNICEF, and other donors

IV. PARTNER FUNDING LANDSCAPE

PMI emphasizes the importance of partner alignment on malaria control. With the recognition that each of the agencies emphasizes complementary funding support for the national malaria control effort in a given country, over the last year, PMI, Global Fund, and the Bill and Melinda Gates Foundation (BMGF) set out to harmonize financial, supply chain, and programmatic data, and this effort remains ongoing as of the time of this MOP. A harmonized financial taxonomy has been developed for PMI and Global Fund (i.e., mapping cost categories across organizations).

Figure 9 visualizes the annual cycle of PMI funding and the MOP implementation year. As the figure illustrates, any given FY MOP funds activities that take place during the next FY. For example, a FY 2018 MOP funds implementation during FY 2019. In contrast, Global Fund funding (and often, other partners and host country governments) is based on a three-year grant cycle on a calendar year (CY) timeframe during which activities were implemented. Annual PMI country budget allocations depend largely on the U.S. Congress' total overall malaria funding appropriation to USAID in a given fiscal year, as well as other considerations (e.g. previous funding levels, activity and program pipelines, other donor contributions, known commodity needs/gaps, progress on ongoing PMI-supported activities, clear evidence of continued government commitment to malaria control).

Figure 9. PMI and Global Fund Funding Cycle Alignment



Footnote: In some cases, Global Fund's funding may come in partway through the calendar year. Funding levels in "Section IV - Partner Funding Landscape" and commodity procurement amounts listed in "Annex A - Intervention Specific Data" may differ given the lag between the year that funding was planned and the year when procurement orders were placed. Differences may be a reflection of timing and/or based on changes in commodity consumption levels at country level, changes in commodity costs, or other donor orders.

The tables below summarize contributions by external partners and host country government in calendar years 2018-20, with the goal of highlighting total country investments. For Mali, data are available for PMI (FY 2017) and Global Fund (CY 2018-20). As the Global Fund 2021-23 grant funding cycle was not yet underway at the time this PMI FY 2020 MOP was written, Global Fund country investments for the 2021 implementation period and beyond are not available. Note that the host country government invests substantial funding into the national-to-local infrastructure and service delivery for malaria and many other programs. However, there has not been a standardized method for attributing those investments to malaria specifically. Thus, it may not yet be possible in the FY 2020 MOP cycle to attribute funding from the host country government. Other partners may face similar challenges.

Figure 10. Annual Budget by Level 1 Category

Year ¹	Funder	Vector Control	Case Management	Drug-Based prevention ²	Supply Chain ³	Monitoring, Evaluation & Research	Other Cross-Cutting and Health Systems Strengthening	Total
FY17/CY18	PMI	\$10.1M	\$6.2M	\$4.1M	\$1.7M	\$1.0M	\$2.1M	\$25.2M
	Global Fund	-	-	-	-	-	-	-
	Host Gov ⁴	-	\$5.6M	-	-	-	-	\$5.6
	Total	\$10.1M	\$11.8M	\$4.1M	\$1.7M	\$1.0M	\$2.1M	\$30.8M
FY18/CY19	PMI	\$10.6M	\$5.4M	\$4.1M	\$0.6M	\$1.7M	\$2.6M	\$25.0M
	Global Fund	\$4.4M	\$1.8M	\$4.2M	\$0.1M	\$1.1M	\$6.1M	\$17.7M
	Host Gov ⁴	-	\$4.7M	-	-	-	-	\$4.7
	Total	\$15.0M	\$11.9M	\$8.3M	\$0.7M	\$2.8M	\$8.7M	\$47.4M
FY19/CY20	PMI	\$10.0M	\$5.3M	\$4.0M	\$0.6M	\$1.2M	\$1.9M	\$23.0M
	Global Fund	\$19.6M	\$0.9M	\$4.6M	-	\$0.9M	\$6.4M	\$32.4M
	Host Gov ⁴	-	-	-	-	-	-	-
	Total	\$29.6M	\$6.2M	\$8.6M	\$0.6M	\$2.1M	\$8.3M	\$55.4M

¹ Each year's figures represent the FY for PMI and CY for GFATM that most closely align. Global Fund budget data accurate as of July 1, 2019.

PMI budget data accurate as of Sept 1, 2019.

² Drug-based prevention, including SMC and MIP where relevant;

³ Covers management of in-country warehousing & distribution of malaria commodities, except for ITNs which are separately captured under "Vector Control"

⁴ GHSC-PSM quantification. the majority of that amount for FY18-19 if World Bank's loan to the government of Mali. There is a planned amount for FY19-20, which needs to be determined.

Note: Categories shown reflect the harmonized financial taxonomy (Levels 1-3) developed by BMGF, Global Fund, and PMI in 2019, as part of a broader data harmonization initiative; potential for categories to continue to evolve through FY 2020 MOP process, as well as for additional donors and host country governments to adopt and reflect funding using same categories.

Figure 11. Annual Budget by Level 3 Category, Detailed Breakdown for PMI and Global Fund

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund	PMI	Global Fund	PMI	Global Fund
Vector Control	Procure ITNs for Continuous Distribution	\$3.8M	-	\$5.0M	-	\$4.0M	-
	Distribute ITNs via Continuous Distribution	\$0.8M	-	\$1.2M	-	\$0.8M	-
	Procure ITNs for Mass Campaigns	-	-	-	\$1.7M	\$0.9M	\$14.2M
	Distribute ITNs via Mass Campaigns	-	-	-	\$2.2M	-	\$3.2M
	Other ITN Implementation*	-	-	-	-	-	-
	IRS Implementation ⁴	\$5.0M	-	\$4.0M	-	\$3.7M	-
	Procure IRS Insecticide	-	-	-	-	-	-
	Other IRS*	-	-	\$0.04M	-	-	-
	Entomological Monitoring	\$0.5M	-	\$0.5M	-	\$0.4M	-
	SBC for Vector Control ⁵	-	-	-	-	-	-
	Other vector control measures	-	-	-	\$0.005M	-	\$0.005M
	Removing human rights- and gender-related barriers to vector control programs**	-	-	-	-	-	-
Case Management	Active Case Detection**	-	-	-	-	-	-
	Community-based case management	-	-	-	\$0.1M	-	\$0.02M
	Facility-based case management	-	-	-	-	-	-
	Private-sector case management	-	-	-	-	-	-
	Procure ACTs	\$2.0M	-	\$1.1M	\$1.1M	\$1.1M	\$0.4M
	Procure Drugs for Severe Malaria	\$0.4M	-	\$0.4M	-	\$0.4M	-

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund	PMI	Global Fund	PMI	Global Fund
	Procure Other Diagnosis-Related Commodities	-	-	\$0.1M	-	\$0.0M	-
	Procure Other Treatment-Related Commodities	-	-	-	\$0.002M	-	\$0.002M
	Procure RDTs	\$1.9M	-	\$2.1M	-	\$2.1M	-
	Therapeutic Efficacy	-	-	\$0.1M	-	-	-
	SBC for Case Management ⁵	-	-	-	\$0.1M	-	\$0.1M
	Other Case Management	\$1.9M	-	\$1.7M	\$0.1M	\$1.7M	\$0.1M
Drug-Based Prevention²	Procure SMC-Related Commodities	\$1.6M	-	\$1.3M	\$2.2M	\$1.3M	\$1.4M
	SMC Implementation	\$1.7M	-	\$1.7M	\$1.3M	\$1.8M	\$2.7M
	Prevention of Malaria in Pregnancy Implementation	\$0.7M	-	\$1.0M	\$0.1M	\$0.7M	\$0.1M
	Procure IPTp-Related Commodities	\$0.1M	-	\$0.1M	-	\$0.1M	-
	IPTj**	-	-	-	-	-	-
	SBC for Drug-Based Prevention ⁵	-	-	-	\$0.1M	-	\$0.1M
	Other Prevention**	-	-	-	-	-	-
Supply Chain³	In-Country Supply Chain ³	-	-	-	-	-	-
	Supply Chain Infrastructure	-	-	-	-	-	-
	Ensuring Quality	-	-	-	-	-	-
	Pharmaceutical Management Systems Strengthening	\$1.7M	-	\$0.6M	-	\$0.6M	-
	Supply Chain System Strengthening	-	-	-	\$0.1M	-	-

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund	PMI	Global Fund	PMI	Global Fund
Monitoring, Evaluation & Research	Reporting, Monitoring, and Evaluation	\$0.5M	-	\$1.0M	\$0.6M	\$0.7M	\$0.6M
	Program and data quality, analysis and operations research	\$0.5M	-	\$0.4M	\$0.4M	-	\$0.3M
	Surveys	-	-	\$0.4M	\$0.0M	\$0.5M	\$0.01M
	Other Data Sources**	-	-	-	-	-	-
	Support for FETP*	-	-	-	-	-	-
Other Cross-Cutting and Health Systems Strengthening	Integrated service delivery, quality improvement, and national health strategies**	-	-	-	-	-	-
	Financial management systems**	-	-	-	-	-	-
	Community responses and systems**	-	-	-	-	-	-
	Support for PCV and SPAs*	-	-	-	-	-	-
	Cross-Cutting Human Resources for Health**	-	-	-	\$1.2M	-	\$1.3M
	Central and Regional Program management ⁶	\$0.2M	-	\$0.1M	\$1.7M	\$0.3M	\$1.5M
	In-Country Staffing and Administration*	\$1.6M	-	\$2.2M	-	\$1.4M	-
	Other Program Management**	-	-	-	\$3.3M	-	\$3.7M
SBC Unspecified ⁵	\$0.3M	-	\$0.3M	-	\$0.3M	-	
Total		\$25.0M	-	\$25.0M	\$17.6M	\$23.0M	\$32.3M

Footnotes:

¹ Each year's figures represent the FY for PMI and CY for Global Fund that most closely align. Global Fund budget data accurate as of July 1, 2019. PMI budget data accurate as of Sept 1, 2019;

² Drug-based prevention, including SMC and MIP where relevant;

³ Covers management of in-country warehousing & distribution of malaria commodities, except for ITNs which are separately captured under "Vector Control";

⁴ May include cost of IRS insecticides if full cost of IRS implementation including commodities was bundled within single line in prior year's Table 2;

⁵ SBC was not historically split in the PMI budget across intervention areas, hence the row "SBC (unspecified)" for the FY2020 MOP cycle. Going forward, SBC proposed activities will be categorized across vector control, case management, and prevention (new categories).

6. PMI Proposed Activity "National-level support for case management" rolls up under "Case Management" Level 1

Note: Categories shown reflect the harmonized financial taxonomy (Levels 1-3) developed by BMGF, Global Fund, and PMI in 2019, as part of a broader data harmonization initiative; potential for categories to continue to evolve through FY 2020 MOP process, as well as for additional donors and host country governments to adopt and reflect funding using the same categories.

* Category currently funded by PMI only

** Category currently funded by Global Fund only

Figure 12. Annual Budget, Breakdown by Commodity

Year ¹	Funder	ITNs for Continuous Distribution	ITNs for Mass Distribution	IRS Insecticide ⁴	ACTs	RDTs	Severe Malaria	SMC-Related	IPTp-Related	Total
FY17/ CY18	PMI ²	\$3.8M	-	-	\$2.0M	\$1.9M	\$0.4M	\$1.6M	\$0.1M	\$9.7M
	Global Fund ³	-	-	-	-	-	-	-	-	-
	Host Gov ⁵	-	-	-	\$0.57m	\$1.0m	\$4.07M	-	-	-
	Total	\$3.8M	-	-	\$2.0M	\$1.9M	\$0.4M	\$1.6M	-	\$9.7M
FY18/ CY19	PMI ²	\$5.0M	-	-	\$1.1M	\$2.1M	\$0.4M	\$1.3M	\$0.1M	\$9.8M
	Global Fund ³	-	\$1.7M	-	\$1.1M	-	-	\$2.2M	-	\$5.0M
	Host Gov ⁵	\$0.2M	-	-	\$0.7M	\$1.3M	\$2.4M	-	-	-
	Total	\$5.0M	\$1.7M	-	\$2.2M	\$2.1M	\$0.4M	\$3.5M	-	\$14.8M
FY19/ CY20	PMI ²	\$4.0M	\$0.9M	-	\$1.1M	\$2.1M	\$0.4M	\$1.3M	\$0.1M	\$9.8M
	Global Fund ³	-	\$14.2M	-	\$0.4M	-	-	\$1.4M	-	\$16.0M
	Host Gov ⁵	-	-	-	-	-	-	-	-	-
	Total	\$4.0M	\$15.2M	-	\$1.5M	\$2.1M	\$0.4M	\$2.7M	-	\$25.9M

Footnotes:

¹ Each year's figures represent the FY for PMI and CY for Global Fund that most closely align. Global Fund budget data accurate as of July 1, 2019. PMI budget data accurate as of Sept 1, 2019 ;

² PMI commodity costs are fully loaded, including costs for the ex-works price of the commodity, quality control, freight, insurance, and customs.

³ Global Fund commodity costs in table above only include ex-works commodity value in a given year. Additional costs, including quality control, freight, insurance, and customs totaled \$4.1 million over the CY2018-2020 period;

⁴ IRS insecticide; for PMI, IRS insecticide commodity costs may be inextricable from IRS implementation costs in historical data – field left blank where this is the case.

⁵ GHSC-PSM quantification. the majority of that amount for FY18-19 if World Bank's loan to the government of Mali. There is a planned amount for FY19-20, which needs to be determined.

Note: Categories shown reflect the harmonized financial taxonomy (Levels 1-3) developed by BMGF, Global Fund, and PMI in 2019, as part of a broader data harmonization initiative; potential for categories to continue to evolve through FY 2020 MOP process, as well as for additional donors and host country governments to adopt and reflect funding using the same categories.

V. ACTIVITIES TO BE SUPPORTED WITH FY 2020 FUNDING

Please see the FY 2020 budget tables (Tables 1 and 2) for a detailed list of activities PMI proposes to support in Mali with FY 2020 funding. Please refer to www.pmi.gov/resource-library/mops for the latest tables. Key data used for decision-making can be found in Annex A.

ANNEX A: INTERVENTION-SPECIFIC DATA

1. VECTOR CONTROL

<p>NMCP objective</p>
<p>The strategic plan emphasizes nationwide universal coverage of key malaria interventions for prevention and control of malaria, as well as specific interventions such as epidemic and entomological surveillance and targeted operational research in areas with unstable malaria transmission:</p> <ul style="list-style-type: none"> • Entomological monitoring for data-driven decision making, including susceptibility evaluations throughout the country, in IRS and non-IRS areas • Universal ITN coverage for all age groups (defined as one ITN for every two people) • Targeted IRS in select high-risk areas.
<p>NMCP approach</p>
<ul style="list-style-type: none"> • The MoH supports the provision of free ITNs distributed to target populations through two main delivery channels: 1) phased (region-by-region) mass distribution campaigns every 3 years, aiming for a coverage of one net for every two persons; 2) routine distribution through antenatal care (ANC) and Expanded Program for Immunization clinics targeting pregnant women and infants. To sustain coverage, the MoH provides free nets to pregnant women at their first ANC visit and to infants when they complete their national immunization series. There is an ongoing discussion about changing the implementation strategy of the mass distribution campaigns from phased to country-wide starting in 2022. • Following the targeted IRS strategy, the NMCP requested that the PMI-supported IRS program be moved to the Mopti Region as of 2016, based on the strategic decision that Mopti had consistently had the highest prevalence of malaria in the country during DHS/MIS surveys, and given that many people with no natural immunity to malaria migrate from the north to Mopti. The NMCP is very invested in the success of IRS in Mopti Region, heavily involved in IRS implementation and in decisions regarding the choice of districts. .
<p>PMI objective, in support of NMCP</p>
<ul style="list-style-type: none"> • Support entomological monitoring, including susceptibility evaluations in representative sites, especially in IRS intervention sites. • Procure and support ITN distribution through routine health services and contribute to the purchase of additional nets for mass distribution campaigns. • Support targeted IRS implementation in areas prioritized in collaboration with the NMCP

- Support national capacity building by training and hiring local personnel for entomological activities implementation. Strengthen local research institutions by supporting their implementation of entomological monitoring activities.

PMI-supported recent progress (past ~12-18 months)

- Conducted entomological evaluation and susceptibility monitoring in 6 regions, in 14 sites (see table and map).
- LBMA implemented a 3-year ITN durability study starting in January 2018 in two health districts (Kita and Kenieba) in Kayes Region. ITNs being studied are Deltamethrin-based (Yorkool and Permanet 2.0). Results from the first year of the study are shown in the section below.
- With FY 2018 funding, procured 1.4 million nets for routine distribution to children and pregnant women in 2019.
- Targeted IRS to 3 Districts in Mopti Region. Security threats in the region limited the accessibility to certain areas. More supervision than in previous years was implemented in 2019, thus higher efficiency of insecticide use, and improved reporting were achieved. Refusal rates were lower than in previous years but were still significant; additional SBC will be planned and implemented next year.
- Provided various insecticides in different doses for susceptibility evaluation bioassays, primers for molecular identification of species, and ELISA reagents for parasite detection and determination of blood meal sources in mosquitoes.
- Supported the acquisition of a portable HPLC for determining the surface insecticide content of ITNs. PMI helped set up, calibrate, and validate the equipment at the LBMA and trained personnel to operate it. Standardized procedures for using this equipment for ITN durability monitoring are being developed in-country.

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

- Continue entomological susceptibility evaluation in 6 regions (14 sites) and entomological monitoring in Mopti before and after IRS.
- In 2020, PMI will procure 1,645,714 ITNs for routine distribution via ANC and EPI services. PMI might purchase additional nets for the mass distribution campaigns planned for 2020 or 2021 to avoid any gaps at the end of the Global Fund grant.
- Conduct years 2 and 3 of ITN durability study.
- Support the performance evaluation of G2 nets in Mali. Mali will receive Global Fund-procured next-generation ITNs when they become available.
- Continue supporting social and behavior change communication (SBC) implemented during the past 12-18 months to maintain or increase the level of net use and proper care. Additional SBC support will be provided in areas receiving G2 ITNs.
- Implement IRS in Mopti.

- Technical assistance to complete molecular processing of entomological samples.
- 8,097 women in Kayes, Koulikoro and Bamako received phone calls through information technology about SP and the use of LLINs.
- 15,000 SMS were sent to sensitize pregnant women and their spouses to encourage them to sleep under insecticide treated nets every night and in every season.
- 60,000 voice messages were sent to pregnant women through interactive voice response (IVR) on IPTp, LLINs, malaria, seeking care and treatment during pregnancy
- 5000 LLINs Job aids have been printed and distributed.

1.A. ENTOMOLOGICAL MONITORING

Key Goal

Determine the geographic distribution, bionomics, and insecticide resistance profiles of the main malaria vectors in the country to inform vector control decision-making.

Do you propose expanding, contracting, or changing any entomological monitoring activities? If so, why and what data did you use to arrive at that conclusion?

The funding level for entomological monitoring will remain the same for FY2020. The high levels and the complex, heterogeneous pattern of insecticide resistance observed in Mali underline the importance of continuously monitoring the susceptibility profiles and vector population bionomics, especially in areas with higher selective pressure, such as where IRS and bednet distribution take place.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

Where is entomological monitoring taking place, what types of activities are occurring, and what is the source of funding?

Supporting Data

Sites where entomological monitoring and other activities carried out in 2019 by PMI or other partners are shown in the following map and table. Longitudinal monitoring is carried out during July-September in the three sites where IRS is implemented in Mopti and in one control site in the Segou Region.

Figure A1. Entomological Monitoring Sites Supported by PMI in 2019

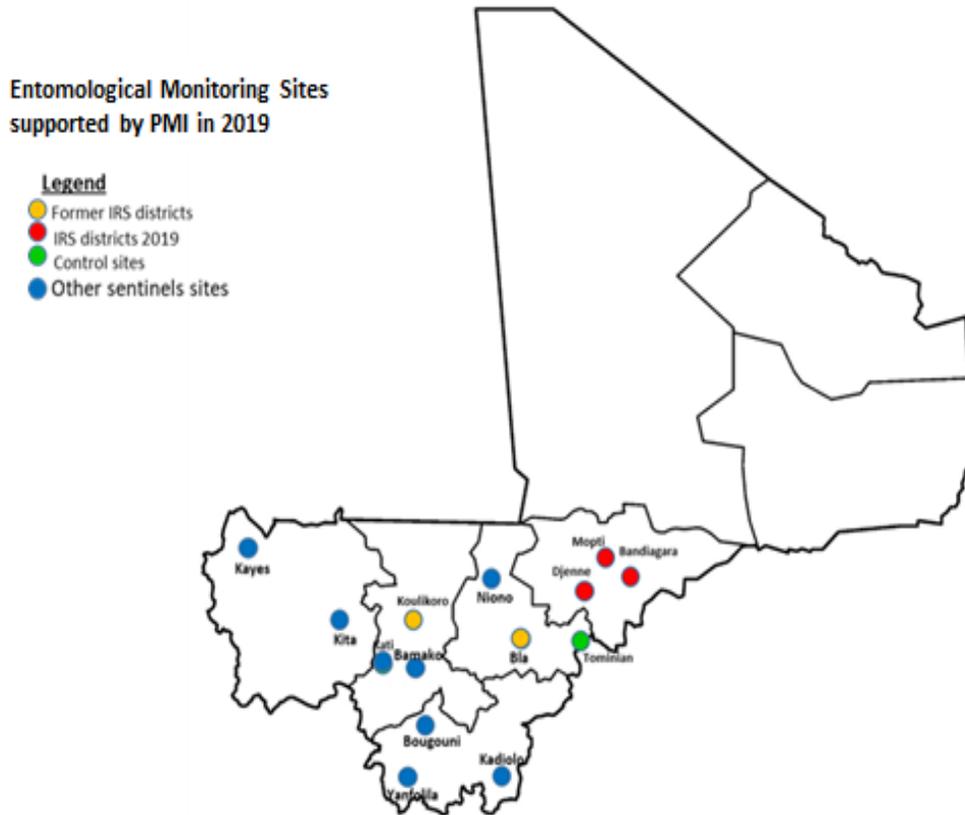
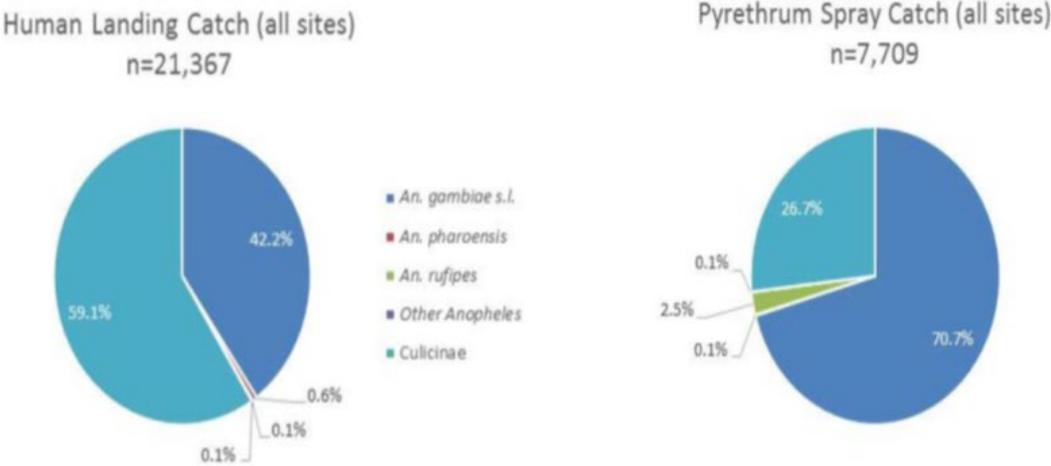


Figure A2. Entomological Monitoring by Region

Region	Site (District)	Supported By	Activity	IRS
Kayes	Kita	PMI (VL)	Susceptibility	no
	Kita	PMI (LBMA)	ITN Durability	no
	Kenieba	PMI (LBMA)	ITN Durability	no
	Kenieba (6 sites)	LBMA (goldmine)	Ento and Parasito Monitoring - baseline (Nov 2018)	yes 2019
	Kayes	PMI (VL)	Susceptibility	no
Koulikoro	Koulikoro	PMI (VL)	Susceptibility	no
	Segou	MRTC	Ento Monitoring	no
	Kati (6 sites)	MRTD	Ento Monitoring	no
	Kati	PMI (VL)	Susceptibility	no
Segou	Niono	PMI (VL)	Susceptibility	no
	Tominian	PMI (VL)	Ento Monitoring pre-post IRS / Susceptibility	Control IRS
	Bla	PMI (VL)	Susceptibility	no
Sikasso	Boudouni	PMI (VL)	Susceptibility	no
	Yanfolila	PMI (VL)	Susceptibility	no
	Kadiolo	PMI (VL)	Susceptibility	no

Region	Site (District)	Supported By	Activity	IRS
	Fougatie (3 sites)	LBMA (goldmine)	Ento and Parasito Monitoring - baseline (Nov 2018)	yes 2020
Mopti	Mopti	PMI (VL)	Ento Monitoring pre-post IRS / Susceptibility	IRS 2018 - 2019
	Bandiagara	PMI (VL)	Ento Monitoring pre-post IRS / Susceptibility	IRS 2018 - 2019
	Bankass	PMI (VL)	Dropped because of security concerns	IRS 2018
	Djenné	PMI (VL)	Ento Monitoring pre-post IRS / Susceptibility	IRS 2018 - 2019
Bamako	Commune IV	PMI (VL)	Susceptibility	no

Figure A3. Mosquito Species Identification by Collection Methods in All 7 Sites (June – December 2018)



The evaluations from 2018, recorded in 7 monitoring sites in Mopti, Segou and Koulikoro Regions, reported six different *Anopheles* species (*An. gambiae s.l.*, *An. funestus s.l.*, *An. pharoensis*, *An. nili*, *An. ziemanni* and *An. rufipes*). *An. gambiae s.l.* was by far the most frequently sampled, accounting for 97.5 percent of *Anopheles* collected (14,033/14,390). Preliminary molecular analysis of species performed on *An. gambiae s.l.* sampled from June to August in Koulikoro and Kati showed that *An. coluzzii* was the major species (>90%) in both sites. Preliminary sporozoite data for Koulikoro and Kati showed relatively low sporozoite rates of 1.8 percent and 0.3 percent, respectively. Full entomological inoculation rate calculations will be reported after completion of molecular analysis by *Laboratoire de Biologie Moléculaire Appliquée*, expected later in 2019.

Figure A4. Sporozoite Rate June – September 2018

Sites	Parameters	Jun	Jul	Aug	Sep	Total	95% CI
Koulikoro (former IRS Site)	Number Tested	62	200	200	200	662	0.8 - 2.8
	Number Positive	1	6	4	1	12	
	Sporozoite Rate %	1.6	3	2	0.5	1.8	
Kati (Unsprayed)	Number Tested	25	200	197	300	722	0.1 -0.7
	Number Positive	0	0	1	1	2	
	Sporozoite Rate %	0	0	0.5	0.3	0.3	

The results from 2019 evaluations indicate that *An. gambiae* s.l. (n= 7,865) remains the main (99.18 percent) malaria vector in Mopti Region and in Tominian, followed by *An. pharoensis* (n=54; 0.69%) and *An. rufipes* (n= 11; 0.14%), although the latter was captured exclusively in Bandiagara. The mean human biting rate and the indoor resting density were higher in the unsprayed district than in the IRS districts. The peak of *An. gambiae* s.l. biting rates and resting densities were in September in all sites, and peak biting times were between midnight and 5a.m.

Conclusion

An. gambiae s.l., most likely *An. coluzzi*, is the main vector found in all monitoring sites. Lower mosquito abundance was found in IRS sites compared to the unsprayed control site, but abundance and biting rates were still high across monitoring sites. Because of its high cost, IRS can only be implemented in a few districts in one region, and entomological monitoring is a key component of evaluating the impact of vector control implementation.

While the sample described above presented a fairly low infection rate, the high human biting rates during the peak transmission period will likely result in a high chance of people in Koulikoro and Kati becoming infected with malaria unless protected. The peak biting times between midnight and 5 am suggest that sleeping under bed nets is still a good prevention method.

In addition, the MOP team is interested to determine if the infection prevalence among vectors changes after large-scale interventions such as SMC, so the parasite data collected from mosquitos will be further analyzed to test that hypothesis.

Key Question 2

What is the current insecticide resistance profile of the primary malaria vectors?

Supporting Data

Figure A5. Results of Insecticide Susceptibility Evaluation in 2019.

Districts	Deltamethrin		Permethrin		Alpha-Cypermethrin		Pirimiphos-methyl
	Alone	with PBO	Alone	With PBO	Alone	With PBO	
Yanfolia	18%	75%	27%	33%	2%	58%	100%
Bougouni	47%	84%	41%	58%	22%	46%	100%
Kaiolo	50%	97%	34%	99%	16%	93%	100%
Mopti	23%	49%	16%	57%	5%	72%	100%
Djenné	28%	65%	43%	62%	13%	57%	100%
Bandiagara	7%	35%	6%	28%	3%	22%	100%
Kati	97%	99%	20%	90%	4%	80%	100%
Koulikoro	0%	32%	94%	100%	1%	8%	100%
Bamako	8%	34%	10%	44%	17%	29%	100%
Bla	2%	18%	3%	25%	0%	12%	100%
Niono	6%	26%	4%	12%	4%	21%	100%
Kayes	67%	92%	90%	92%	27%	78%	100%
Kita	18%	38%	26%	34%	35%	41%	100%

Note: Insecticide Susceptibility >99% >90% <90%

Conclusion

The susceptibility evaluation shows resistance (or possible resistance) to all three pyrethroid insecticides evaluated in all of the 14 sentinel sites. Susceptibility to pirimiphos-methyl was recorded in all sites. Pre-exposure to PBO resulted in a substantial increase in mortality in most sites for all three pyrethroids; however, full susceptibility was only restored in Sikasso and Koulikoro for permethrin. The increase in mortality using PBO indicates the important role of metabolic resistance mechanisms in Mali. Moreover, there is a long history of insecticides used in agriculture which could further jeopardize vector control interventions.

These results indicate that distribution of PBO bednets might not justify the extra cost of the nets compared to standard pyrethroid based ITNs as a mass intervention. Continuous susceptibility monitoring, evaluating the performance of G2 nets, and a closely monitored rotation of insecticides for IRS are recommended in the context of an integrated insecticide resistance management strategy.

Key Question 3

Are there any other considerations that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

Not applicable.

Conclusion

Security concerns in Mali continue to impact performance of entomological monitoring and IRS activities, particularly in the northern part of the country. The entomological teams engage with local leaders and community members to keep informed about the security concerns in areas of planned interventions and re-assess the work plan if necessary, to avoid exposing workers to danger.

Overall, capacity for entomological and susceptibility monitoring in Mali is good and PMI will continue to support the NMCP and local institutions to strengthen local capacity and sustainability of monitoring activities.

The complex pattern and high intensity of insecticide resistance observed in the different monitoring sites, calls for careful and integrated management of resistance, including deploying next-generation ITNs, rotating insecticides in IRS areas, and continuous monitoring of susceptibility patterns in vector populations, particularly in intervention areas. In this context, it is key that vector data being collected by different projects are integrated into one database and that NMCP personnel and other stakeholders get trained to interpret the vector data to inform their programmatic decisions.

1.B. INSECTICIDE-TREATED NETS (ITNs)

PMI Goal

Achieve high ITN coverage and use of effective nets in endemic PMI-supported areas (in the context of the current insecticide resistance); maintain high coverage and use with consistent ITN distribution (via campaigns and/or continuous channels in a combination that is most effective given country context). Determine the geographic distributions, bionomics, and insecticide resistance profiles of the main malaria vectors in the country to inform vector control decision-making

Do you propose expanding, contracting, or changing any ITN activities? If so, why and what data did you use to arrive at that conclusion?

The Mali MOP team decided to maintain the same funds amount allocated in FY2019 for the procurement and distribution of ITNs through routine distribution channels. PMI-Mali proposes increasing funding for SBC related to ITN distribution, including distribution of next-generation ITNs (please see SBC section). However, no contribution for a mass campaign was included in the FY2020 MOP because Global Fund will procure all the ITNs for mass campaigns.

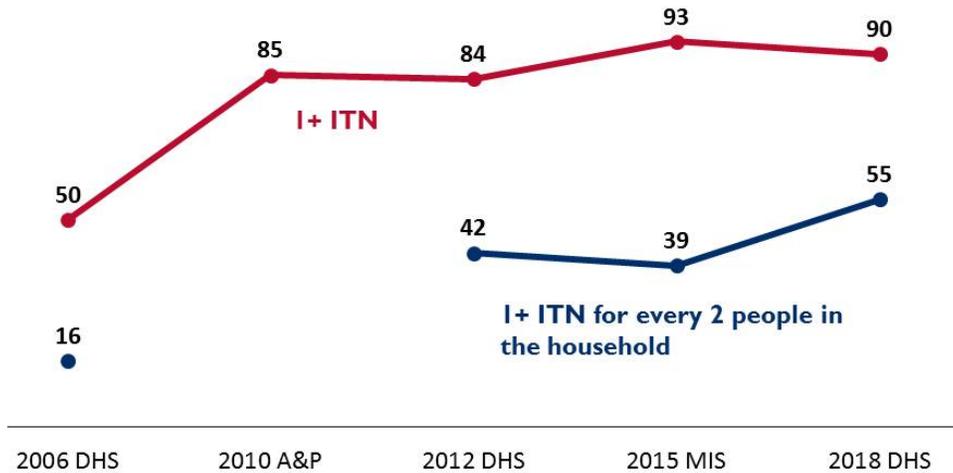
Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

How has net ownership evolved since the start of PMI in the country? Are households fully covered?

Supporting Data

Figure A6. Trends in ITN Ownership, *Percent of Households*



Conclusion

Despite the increase in proportion of households that own a bednet, there is still a need to increase ITN coverage levels within households. PMI allocated funds to support ITN distribution through routine services.

Key Question 2

What proportion of the population has access to an ITN? In contrast, what proportion of the population reports using an ITN? What is the ratio between access and use? Does it vary geographically?

Figure A7. Trends in ITN Access and Use

Percent of household population with access to an ITN and who slept under an ITN the night before the survey

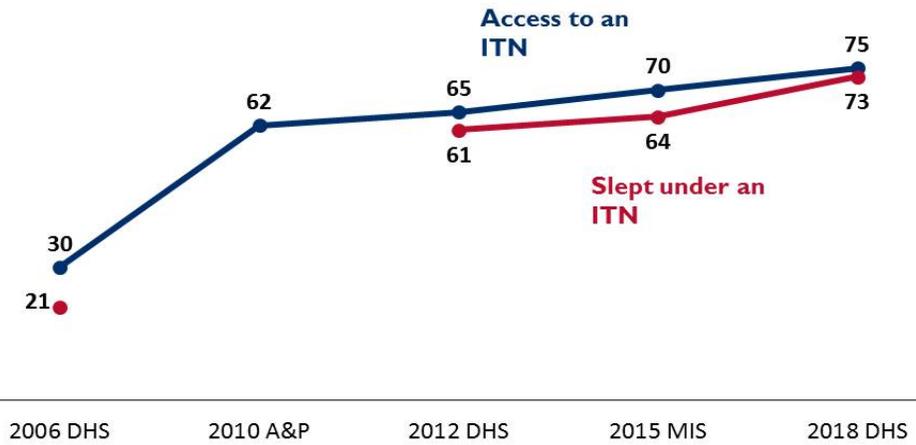
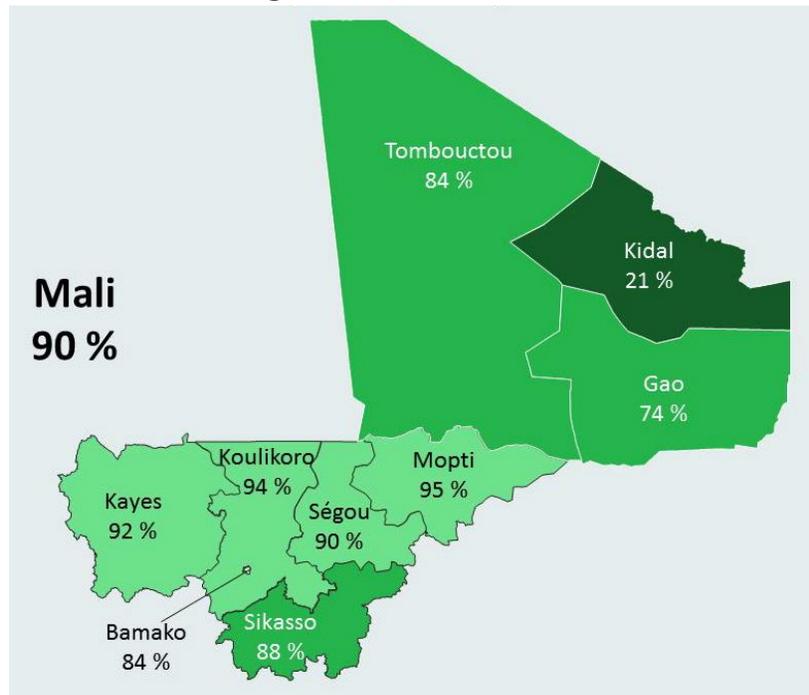
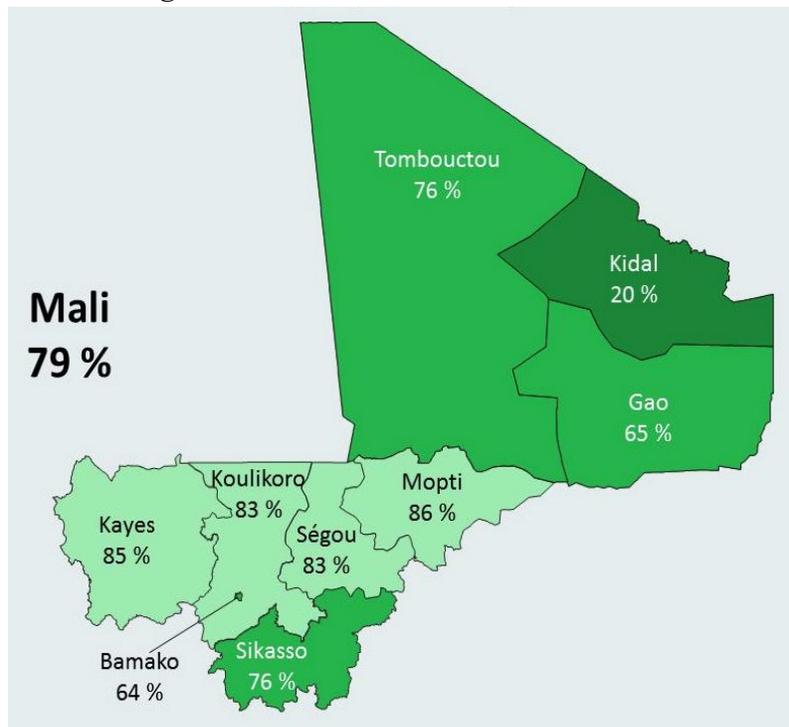


Figure A8. Mali ITN Access



(Source: DHS 2018)

Figure A9. Mali ITN Use for Kids<5 Years



(Source DHS 2018)

Conclusion

Mali continues to have high access to (90 percent) and high use (79 percent) of ITNs. Given the high ITN utilization rates in Mali, interventions to increase ITN effectiveness, such as using next-generation ITNs, could have a large impact. DHS data indicate that ITN use in Mali is highly seasonal, peaking during transmission season and declining in the hot dry season.

PMI will continue to support routine ITN distribution for pregnant women attending ANC and for children attending EPI, and will continue to support SBC to maintain high use throughout the year and to promote access and appropriate net care.

ITN coverage appears slightly lower in Sikasso, perhaps because the 2018 DHS survey was conducted immediately before the mass ITN distribution campaign in that region at the end of 2018. A mass distribution campaign is planned for 2020 in Sikasso; approximately 50 percent of the ITN to be distributed there will be G2 nets (purchased with GF funds). In 2020, PMI will support procurement and distribution of G2 nets to pregnant women and children attending EPI in the districts in Sikasso where G2 nets are distributed during the mass campaign.

ITN coverage in northern Mali is lower than in the rest of the country because the last mass distribution campaign there was conducted in 2016. A mass distribution campaign was conducted in October - November 2019 in the north (Kidal, Tombouctou and Gao).

Key Question 3

In areas where ITN access is high but use is low, what is known about the key barriers and facilitators to use?

Supporting Data

Figure A10. Key Barriers and Facilitators to ITN Access and Use

Facilitator	Type of Factor	Data Source	Evidence
Existing social norms around ITN use	Social	DHS, MIS surveys	Persistently high ITN use rates
Barrier	Type of Factor	Data Source	Evidence
Some preference for applying insecticides rather than using ITNs in urban areas	Social	Mali SBC strategic plan 2018	Lower ITN use in urban areas
ITN use in Mali is highly seasonal, peaking during transmission season and declining in the hot dry season.		Draft DHS Malaria Report (to be published in 2020)	Lower ITN use during dry season
Population may believe it is more important for women/children than men to use ITNs or may be more likely for men (15-40 years) to sleep outside the home	Social	Mali SBC strategic plan 2018	Higher ITN use among men target populations than other demographic groups

Conclusion

The past few household surveys indicate that use of ITNs has been very high, given access, throughout Mali. Efforts to increase access will likely increase use.

However, residents of urban areas report slightly lower use/access as well as some prefer using insecticides rather than ITNs for malaria prevention. In addition, ITN use in Mali is highly seasonal, peaking during malaria transmission season and declining during the hot dry season.

Recent household surveys indicate that men (15-40yrs of age) tend to have slightly lower use/access rates. This could be because other groups such as children and pregnant women receive ITNs at health facilities because they are at higher risk for severe malaria. Also, it might be because men in that age group do not sleep in the home at all times (work related, etc.) and/or they don't have access to ITNs.

Key Question 4

What percent of pregnant women and children under 5 report sleeping under an ITN?

Supporting Data

Figure A11. Trends in ITN Use among Children and Pregnant Women

Percent of children under 5 and pregnant women age 15-49 who slept under an ITN the night before the survey

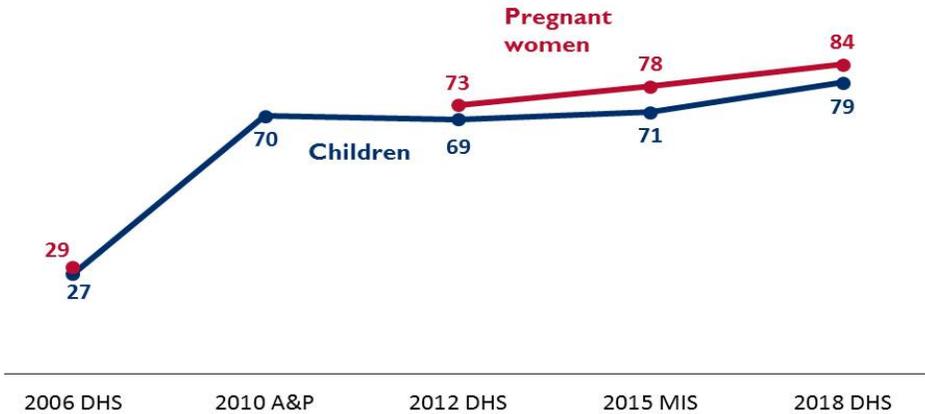
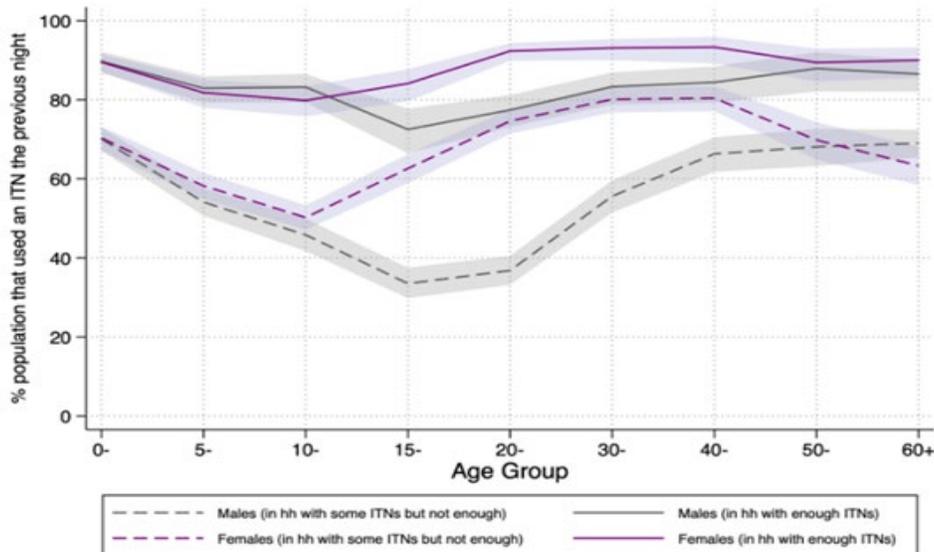


Figure A12. Mali MIS 2015



Source: Breakthrough Action (<https://breakthroughactionandresearch.org/itn-use-and-access-report/mali/>)

Conclusion

The proportion of young children and pregnant women sleeping under an ITN increased at the time of nearly every household survey since 2006 and is currently high. An analysis of the MIS2015 data shows that young children use ITNs at higher rates than older children, and women of child-bearing age use ITNs at higher rates than men.

Key Question 5

What channels are used to distribute ITNs?

Supporting Data

Figure A13. ITN Distribution Channels

Channel	2015	2016	2017	2018	2019	2020	2021
EPI	998,725	700,000	624,975	512,133	367,529	658,710	691,646
ANC	998,726	700,000	624,975	512,133	367,529	658,710	691,646
Schools	X	X	X	X	X	X	X
Community	X	X	X	X	X	X	X
Mass Campaign	3,383,337	823,250	3,085,651	3,838,782	3,043,735	7,856,676	0

Conclusion

PMI will continue to procure ITNs for routine distribution (via ANC and EPI) and Global Fund will support the procurement of ITNs for mass campaigns. The vast majority of ITNs in Mali are distributed through mass campaigns.

Key Question 6

What was the estimated need for ITNs during calendar year 2019? What are the estimated ITN needs over calendar years 2020 and 2021? What volume of ITNs are available from partners and the public sector for the next three calendar years?

Supporting Data

Figure A14. Estimated ITN Needs 2019 - 2021

Calendar Year	2019	2020	2021
Total Targeted Population ¹	19,658,031	20,251,000	20,838,279
Continuous Distribution Needs			
Channel #1: ANC ²	793,202	847,504	903,339
Channel #2: EPI ³	783,766	807,407	830,822
Channel #3:			
Channel #4:			
<i>Estimated Total Need for Continuous Channels (Morbidity Method)</i>	1,576,967	1,654,912	1,734,162
<i>Estimated Total Need for Continuous Channels (consumption method) ⁴</i>	1,309,933	1,375,430	1,444,201
Mass Campaign Distribution Needs ⁵			
2019/2020/2021 mass distribution campaign(s)	3,043,740	7,856,689	0
<i>Estimated Total Need for Campaigns</i>	3,043,740	7,856,689	0
Total ITN Need: Routine and Campaign	4,353,673	9,232,119	1,444,201
Partner Contributions			
ITNs carried over from previous year	831,866	1,196,928	1,807,155
ITNs from MOH	100,000	200,000	200,000

Calendar Year	2019	2020	2021
ITNs from Global Fund	3,043,735	7,856,691	0
ITNs from other donors	0	0	0
ITNs planned with PMI funding ⁶	1,575,000	1,785,655	1,485,000
Total ITNs Available	5,550,601	11,039,274	3,492,155
Total ITN Surplus (Gap)	1,196,928	1,807,155	2,047,954

¹⁾ General Population is coming from 2009 projections by INSTAT/DNP.

²⁾ Target Pregnancy 5% of general population. Percentage of pregnant women attending ANC1 is 80.7% (2019), 83.7% (2020) and 86.7% (2021). The target set by the national malaria control program is to reach 90% in 2022.

³⁾ Children < 1 year represents 4.43% of general population. Immunization coverage is 90%.

⁴⁾ The malaria quantification technical working group decided to use the consumption method for the forecast of LLINs for the continuous distribution rather than the morbidity/demographic method. The forecast was based on approximately 5% of increase each year from the consumption in 2018.

⁵⁾ According to NMCP strategic plan, the plan for the mass campaign is as follows: 2019 (Segou, Gao, Tombouctou, Kidal), 2020 (Mopti, Kayes, Koulikoro, Sikasso). No campaign in 2021. The number of LLINs for campaign is estimated by dividing the population of areas to cover by 1.8. Then a wastage rate of 10% is applied to get the total needs for campaign.

⁶⁾ PMI contributions: in 2019 the data is the actual procurement and receipts in 2019; in 2020, the data is the sum of procurement in 2019 but will arrive in 2020 (475000+60000) and the planned quantity in MOP19 (1645714 and 79941); the data for 2021 is the projected quantity to be procured.

Conclusion

The Global Fund supported mass distribution campaigns in 2019 in the following regions: Segou, Gao, Tombouctou, Kidal, Menaka and Taoudenit. In 2020, mass ITN distribution campaigns will be supported in the rest of the country: Mopti, Kayes, Koulikoro, and Sikasso. No campaigns are planned for 2021.

For the 2020 mass campaign in Sikasso, 900,000 G2 nets have been procured by GF and PMI is contributing 60,000 G2 ITNs for routine distribution after the campaign.

Key Question 7

What is the current status of durability monitoring?

Supporting Data

Figure A15. Summary ITN Monitoring Evaluation Data Points

Campaign Date	Sites	Brands	Baseline	12-month	24-month	36-month
2018	Kenieba	Permanet 2.0 and YORKOOL	x	x		
2018	Kita		x	x		

Figure A16. Durability Monitoring

		6 months (baseline)	12 months
Kenieba		N=785	N=465
Attrition	Given away	40.00%	2.30%
	Discarded (wear & tear)	0.00%	1.70%
	Unknown	0.00%	26.60%
	Total	40.00%	30.60%
Survival estimate		n=471 99.1% (IC: 97.9-99.7)	n=245 84.9% (IC: 75-91.4)
Serviceable Insecticide content		80.6% (69.3±88.3)	2.5 years or less
Kita		N=644	N=511
Attrition	Given away	5.40%	0.00%
	Discarded (wear & tear)	0.00%	0.00%
	Unknown	14.70%	30.90%
	Total	20.10%	30.90%
Survival estimate		n = 514 100.00%	n=305 95.4% (IC: 91.6-97.6)
Serviceable Insecticide content		95.3% (82.4±92.4)	3 years or less

Conclusion

Monitoring ongoing - conclusions will be presented at the end of the monitoring activity at 36 months.

Key Question 8

Are there any other considerations that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here

Supporting Data

Not applicable

Conclusion

PMI will be supplementing the Global Fund-supported ITN campaign in Sikasso with some G2 nets for routine distribution, given the high malaria incidence and high levels of pyrethroid resistance in Sikasso. PMI will also support the performance evaluation of G2 nets in Sikasso.

1.C. INDOOR RESIDUAL SPRAYING (IRS)

Key Goal

Ensure high spray coverage, with an appropriate insecticide, in targeted endemic PMI-supported areas.

Do you propose expanding, contracting, or changing any IRS activities? If so, why and what data did you use to arrive at that conclusion?

Although prevalence and reported incidence in Mopti Region have decreased since IRS activities began there in 2016, the malaria burden there remains among the highest in Mali. PMI will continue to support IRS in targeted communities in three districts in Mopti Region.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

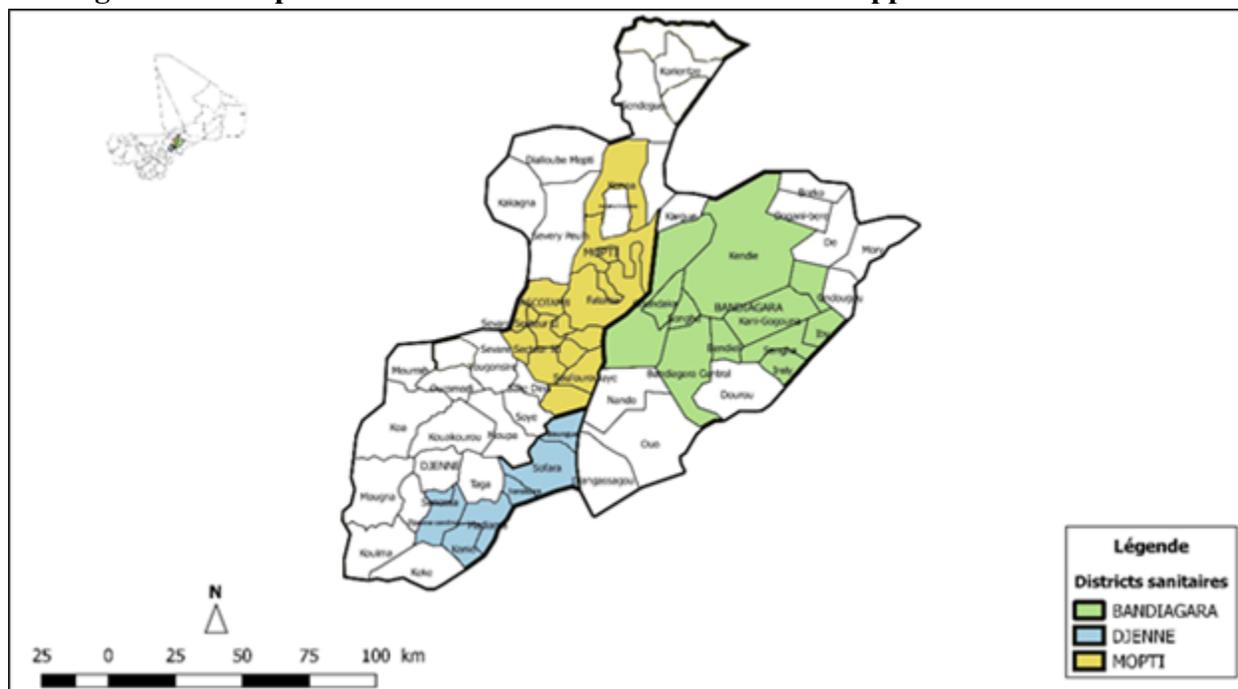
What areas are targeted for IRS and why?

Supporting Data

PMI conducted the 2019 IRS campaign from July 1 to August 4, 2019. The project aimed to spray eligible structures in 35 geographically contiguous health areas in three districts in Mopti Region: Bandiagara, Djenné, and Mopti. (The IRS targeted sites within Mali are shown in the map and table in the entomological monitoring section).

IRS is also implemented by private stakeholders supported by gold-mine companies in various districts in Mali. The coverage is not officially reported, and the IRS evaluations are carried out by independent stakeholders not related to PMI.

Figure A17. Map of the 35 Health Areas in the Three PMI-Supported Districts in Mali:



Project achievements during the 2019 spray campaign included:

- 148,198 structures out of 153,191 structures found by spray operators (SOPs), were sprayed resulting in 96.7 percent spray coverage and 98.9 percent progress. (According to VectorLink, spray coverage is defined as the proportion of structures sprayed out of structures found during the campaign and spray progress is defined as the proportion of structures sprayed out of structures targeted.)
- Protected 690,793 people, including 98,217 children under 5 years and 35,484 pregnant women.
- Used Actellic 300CS (the organophosphate pirimiphos-methyl) insecticide in Bandiagara and Mopti, and SumiShield 50WG (the neonicotinoid clothianidin) in Djenné.
- Conducted wall bioassays 24 to 48 hours after spraying and recorded 100% mortality of susceptible *An. gambiae* (Bandiagara, Djenné, and Mopti) on all wall surface types sprayed with both insecticides, indicating high spray quality.
- Initiated safe disposal of all IRS insecticide-contaminated wastes, including 51,347 empty Actellic bottles, 10,269 empty SumiShield sachets, and 22,560 used masks.
- Trained 616 individuals to deliver IRS in three districts.

Conclusion

According to the Mali Demographic and Health Survey 2018, the national prevalence of malaria has decreased from 35.7 percent in 2016 to 18.9 percent in 2018 (and from 59.8 to 24.9 percent in Mopti). The significant reduction in prevalence of malaria, particularly in areas that have received IRS, suggests that IRS remains a key intervention for malaria control in Mali. However, the costly implementation of IRS limits its application to a few Health Districts in the country, prompting considerations for alternative malaria control strategies such as next-generation LLINs and/or SMC.

Key Question 2

In PMI-supported areas, what spray coverage rates have been achieved in the past 5 years?

Supporting Data

Figure A18. PMI-Supported

Calendar Year	Number of Districts Sprayed	District Names**	Number of Structures Sprayed	Coverage Rate	Population Protected
2016	3	Baroueli, Koulikoro, Fana	228,672	97%	788,922
2017	4	Bandiagara, Bankass, Djenne, Mopti	227,646	95%	823,201
2018	4	Bandiagara, Bankass, Djenne, Mopti	160,723	96%	665,581
2019	3	Bandiagara, Djenne, Mopti	148,198	97%	690,793
2020*	3	Bandiagara, Djenne, Mopti	*158,547	*95%	*712,201

*Denotes targets **If more than 15 districts, list regions/provinces.

Conclusion

During the 2019 campaign, insecurity concerns prevented the team from reaching target coverage in Bandiagara District. For security reasons, the mayor advised against spray teams going to five villages in the Kendie Health Area accounting for approximately 1,765 targeted structures and 6,155 people. Inter-ethnic attacks and violence also prevented coverage of a village (Nianangali) and two hamlets (Oure Sa and Dendily) in the Soufroulaye Health Area accounting for another 56 targeted structures.

Finally, approximately 5,000 IRS-eligible structures were not sprayed for other reasons. Of the 4993 unsprayed structures, 27.6 percent were locked, 12.6 percent had inhabitants in the

structure were ill and in 12.3 percent of structures there was no space in compound for inhabitants to store their belongings during spraying.

Key Question 3

What is the residual efficacy of the insecticides used for IRS in PMI-supported areas?

Supporting Data

Figure A19. Monthly IRS residual Efficacy Monitoring by Cone Bioassay with *An. coluzzii* (Insectary Strain) in Districts Sprayed with Actellic 300CS in July 2019.

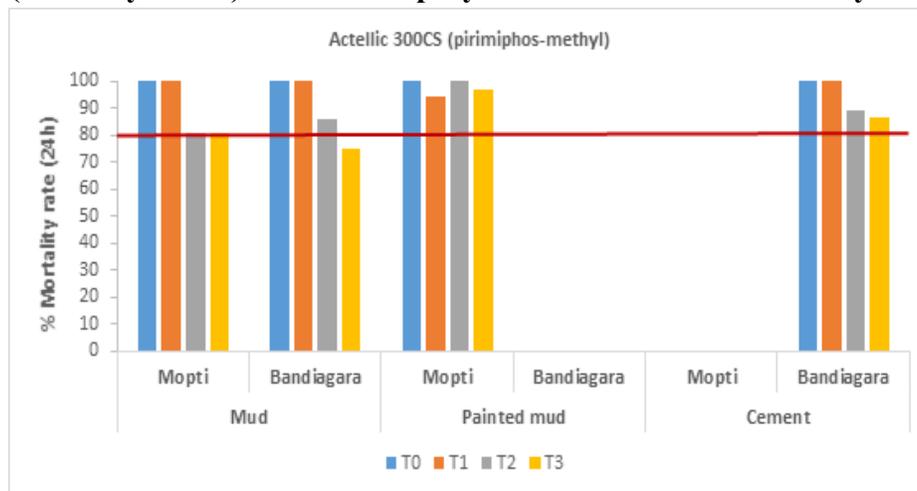
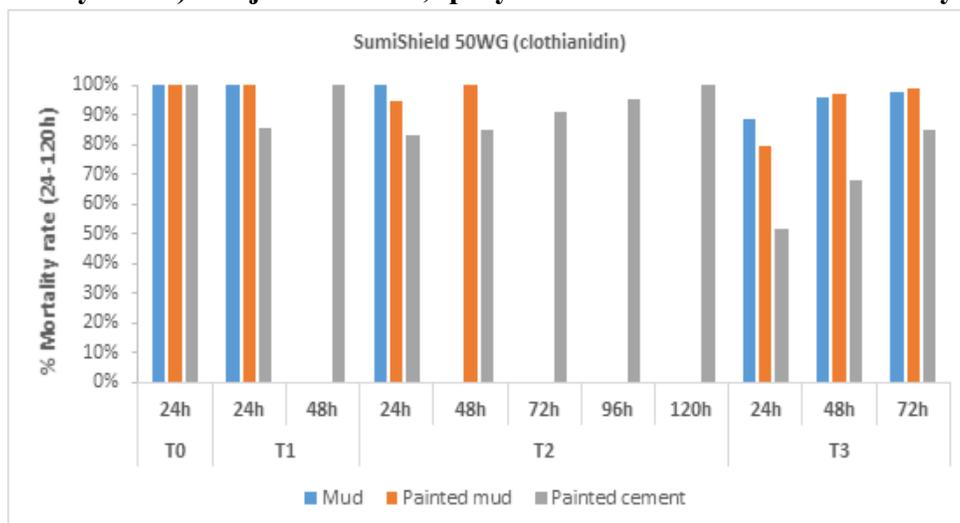


Figure A20: Monthly IRS residual efficacy monitoring by cone bioassay with *An. coluzzii* (insectary strain) in Djenné district, sprayed with SumiShield 50WG in July 2019.



Conclusion

WHO cone bioassays on sprayed walls at T0 (within five days of the start of spraying) produced 100 percent mortality for susceptible *An. coluzzii* when exposed to Actellic 300CS or SumiShield 50WG on all wall surfaces tested at all sites (mud, painted mud, cement and painted cement)

(Figures 19 and 20). At T2 (2 months from IRS) the mortality rate of *An. coluzzii* on mud surfaces sprayed with SumiShield was 100 percent after 24h. These values indicate good quality of spraying.

However, on mud walls sprayed with Actellic CS, mortality dropped to 80-85 percent in Mopti and Bandiagara. At T3, the mortality rate of *An. coluzzii* was slightly below 80 percent on mud walls sprayed with Actellic CS in Bandiagara. Elsewhere, mortality on mud walls varied from 81 percent in Mopti (Actellic CS) to 98 percent in Djenné (SumiShield WG). Mortality was generally higher on painted mud.

Key Question 4

What is the plan for insecticide rotation? What insecticide will be used next in PMI-supported areas?

Supporting Data

Figure A21. Insecticide Rotation in PMI-Supported Areas, 2017 - 2020

Year	Bandiagara	Bankass	Djenne	Mopti
2017	pirimiphos-methyl	pirimiphos-methyl	pirimiphos-methyl	pirimiphos-methyl
2018	clothianidin (SS)	clothianidin (SS)	pirimiphos-methyl	pirimiphos-methyl
2019	pirimiphos-methyl	No IRS	clothianidin (SS)	pirimiphos-methyl
2020	*clothianidin (SS)	No IRS	pirimiphos-methyl	Fludora-fusion

*Denotes planned insecticide classes

Conclusion

The 2019 campaign was the second year of SumiShield 50WG use in the Mopti Region (specifically, Djenné District was sprayed with Sumishield 50WG for two consecutive years); Mopti and Bandiagara districts were sprayed with pirimiphos-methyl. In 2017, these districts had been sprayed with pirimiphos-methyl only. From 2011 to 2014, Koulikoro, Baroueli, and Bla districts were sprayed with bendiocarb.

For the 2020 IRS campaign, a third insecticide (Fludora fusion) is being considered in the context of establishing an insecticide rotation strategy to mitigate the risk of vectors developing insecticide resistance.

Key Question 5

Are the NMCP and PMI considering withdrawing IRS from any PMI-supported? If so, what programs are in place to cover anticipated increases in malaria cases and promote consistent net use and care-seeking behaviors?

Supporting Data

Not applicable

Conclusion

No IRS withdrawal is being considered at the moment.

Key Question 5

Are there any other considerations that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

None.

Conclusion

IRS is not protecting as many people as it could in Mopti Region because of implementation challenges due to insecurity. Furthermore, the high operation costs preclude implementing IRS in more than a few districts.

Therefore, the Mali-MOP team believes that shifting resources to other less-costly prevention and control interventions such as next-generation LLINs could increase cost-efficiency, particularly given the very high rates of ITN use in Mali.

2. HUMAN HEALTH

2.A CASE MANAGEMENT in health facilities and communities

NMCP objective
The NMCP objective is to test (by RDT or microscopy) 100 percent of suspected malaria cases and to appropriately treat 100 percent of con-firmed malaria cases at health facility and community level, as per National Malaria strategic plan, by 2022.
NMCP approach
<ul style="list-style-type: none">• The National Malaria Control Program guidelines require parasitological diagnosis by RDT or Microscopy for all suspected cases before treatment with an antimalarial.• It is estimated that 82.8 percent of all malaria cases are diagnosed with RDT and 17.2 percent of all malaria cases are diagnosed with microscopy.• RDTs are used at all levels, including the community level. Only 89 health facilities out of 2343 use microscopy to confirm malaria.• In 2010, Mali approved an integrated community case management (iCCM) package offered by community health workers (<i>Agents de Santé Communautaires</i> [ASCs]) to provide health services at the village and household levels. The ASCs also provide primary care to

newborns and some family planning services for eligible families. Based on national iCCM directives, the iCCM package and ASC model have been introduced in villages located 5 km or more from a health facility and cover 2-3 villages in a radius of 3 km with a catchment area of approximately 1,500 people. This iCCM approach and ASC efforts are supported by an additional cadre of community health volunteers, the relays, whose role is to carry out social and behavior change activities (SBC) and health education to promote key health messages to complement iCCM activities. Support for the GoM plan for nationwide implementation of the iCCM package, including supervision, commodity management, RDT confirmation, and quality assurance/quality control (QA/QC), were incorporated into the most recent Global Fund consolidated grant. As of 2019, a total of 2,982 ASCs had been trained and were fully functional. According to the new MOH reform document, estimated numbers of ASCs needed to achieve full coverage of iCCM activities in Mali are 27,576 in 2022, 31,775 in 2025, and 35,210 in 2030. The Government of Mali is seeking funds to hire, train and support these new ASCs.

- PMI has contributed to the improvement of the quality of malaria diagnostics and clinical case management and works in partnership with the *Institut National de Recherche en Santé Publique* (INRSP) to build and strengthen the capacity of a cohort of staff with known competencies to train, supervise, and mentor laboratory technicians in accurate diagnosis of malaria. Malaria Diagnostic Refresher Training (MDRT) is also used to reinforce diagnostic competencies of supervisors in advance of supervisor training, which focuses on on-site training and mentoring skills. PMI has supported two Malian laboratorians to receive WHO Level 1 microscopy certification, an additional laboratorian received Level 2 certification, and the fourth achieved Level 3 competency. The individuals achieving Level 1 certification are considered expert microscopists capable of handling microscopy QA in the country. Through PMI support many health workers have been trained in quality malaria diagnostics.

PMI objective, in support of NMCP

The NMCP and PMI prioritize scaling up quality-assured diagnostic testing and treatment of all confirmed cases through:

- Procurement of RDTs, microscopes, laboratory supplies and reagents
- Procurement of ACTs
- Supporting training and supervision
- Providing technical assistance while NMCP develops a five-year strategic plan and updates case management guidelines
- Supporting iCCM in all regions except the northern regions of Mali
- Improving quantitative forecasting and distribution and management of RDTs and ACTs nationally

- Improving QA/QC for both microscopy and RDTs
- Supporting Outreach Training and Support Supervision (OTSS), which is a quality assurance program proven to be effective, to ensure that training directly contributes to improved quality of malaria diagnostics in the field.

PMI-supported recent progress (past ~12-18 months)

- Procured and distributed 1 million RDTs and 2.5 million ACTs.
- Supported the training and supervision of health staff and community health workers in all regions of Mali except Northern Mali.

Figure A22. PMI-Supported CHW Training and Supervision Activities

	2017	2018	2019*	Total
# Trained in Malaria Diagnosis	573	560	1060	2193
# Trained in ACTs/Treatment	1339	599	0	1938
# Supervisors Trained in OTSS	258	0	0	258
# Providers Supervised via OTSS	48	939	621	1608
# Providers Trained on MIP	776	506	1432	2714
# Providers Trained on SMC	4096	4410	0	8506

*Through September

- Strengthened medication quality assurance systems in Mali during 2009–2012 and 2014–2019. A major area of focus was strengthening the capacity of the Ministry of Health in quality assurance of medications; and established 8 sampling and screening sites and 66 technical personnel were trained in quality assurance topics.

Figure A23. Number and Percent of Antimalarial Samples Tested That Failed Quality Testing

FY	# Tested	# Failed	% Failed
2010	810	29	3.6%
2012	410	13	3.2%
2014	128	5	3.9%
2015	643	35	5.4%
2018	615	31	5.4%

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

- PMI will support OTSS activities in the PMI supported districts including training for case management and supportive supervision for front line health care workers. PMI will procure ACTs, RDTs and limited quantities of injectable artesunate.
- PMI will support the training and supervision of community health workers to offer iCCM services in their communities. PMI will procure ACTs and RDTs for this intervention.

PMI Goal

Improve access to and utilization of timely, quality, and well-documented malaria testing and treatment by providing facility- and community-based health workers with training, supervision, and malaria commodities to be able to provide high-quality, effective care.

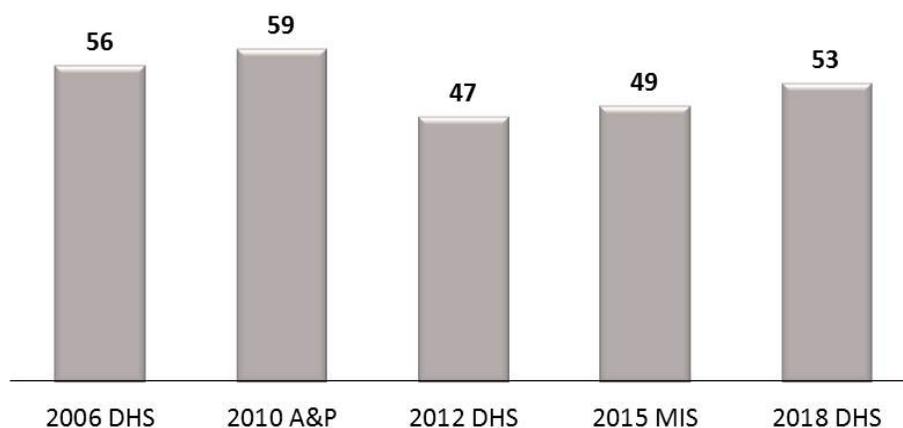
Do you propose expanding, contracting, or changing any Case Management activities? If so, why and what data did you use to arrive at that conclusion?

PMI will increase support for iCCM in the Sikasso region due to continued high malaria transmission
Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1 What is the status of care-seeking?

Supporting Data

Figure A24. Trends in Care-Seeking for Fever, Among Children Under 5 in the 2 Weeks Before the Survey for Whom Care or Treatment was Sought



Conclusion

The proportion of caregivers who report seeking advice or treatment for a child with fever hasn't changed much since 2006 (please see below for a discussion of possible reasons) although only

27 percent of caretakers of children with fever reported seeking healthcare within 24 hours of onset (2018 DHS). Interestingly of those seeking healthcare, 27 percent reported seeking care from the public sector (public hospital/clinic or other public sector provider); 12 percent went to a private sector health provider (pharmacy, private clinic/hospital or to a community health worker), and 21 percent sought care from other private sector providers (itinerant drug seller, boutique, traditional healer, market). Given these results, the Ministry of Health and Social Affairs may want to consider collaborating with private sector providers in the management of malaria in young children - including licensed and unlicensed providers and increasing the numbers of community health workers in order to expand access to malaria care and treatment.

Key Question 2

What is known about the major barriers and facilitators to care-seeking

Supporting Data

Household roles and responsibilities for case management of ill children differ between communities. Mothers are often not fully empowered to independently access resources or to make important health seeking decisions necessary to respond promptly to signs of severe childhood illness. Financial and geographic barriers also limit access to healthcare. Available data indicate that community health workers based in rural communities test and treat significant numbers of malaria cases among children living in areas that are more than 5 km from a health facility.

Figure A25. Key Barriers and Facilitators to Care-Seeking

Facilitator	Type of Factor	Data Source	Evidence
Free treatment	Environmental	Perez F 2009, Ponsar 2011, Johnson AH 2018	Studies by STC, MSF, Muso and others demonstrate an increase in consultations for fever/malaria when services are free.
Access to Community Health Workers	Environmental	DHIS2 data NMCP Annual reports	HMIS data indicate that CHWs are testing and treating significant numbers of malaria cases
Barrier	Type of Factor	Data Source	Evidence
Household power structures	Social	Ellis 2012; Ellis 2013	Case studies showed that although mothers tend to be the first to recognize signs of illness in their children, fathers and grandparents make decisions about whether, where, and when to seek care for the ill children.

			Grandparents may direct care to traditional healers before approaching allopathic practitioners.
Costs of consultation and treatment	Social/ Environmental	Ellis 2012; Ellis 2013	Mothers tend to have early awareness of children's illnesses but must wait for head-of-household to decide whether they are willing to pay for care.

Conclusion

Barriers to care and to early care-seeking in Mali include costs of consultation and non-subsidized treatments often recommended during visits for fever, and familial power structures that impede the ability of primary childcare-givers to seek or pay for care. National Health Reform measures, including the provision of free treatment, should reduce some of the barriers to access to health services, if these measures are implemented as written. At the same time, more SBC is needed at the household level (targeted to mothers but also to decision-makers such as fathers and grandparents) to increase proportions of febrile children who seek early care from a trained provider.

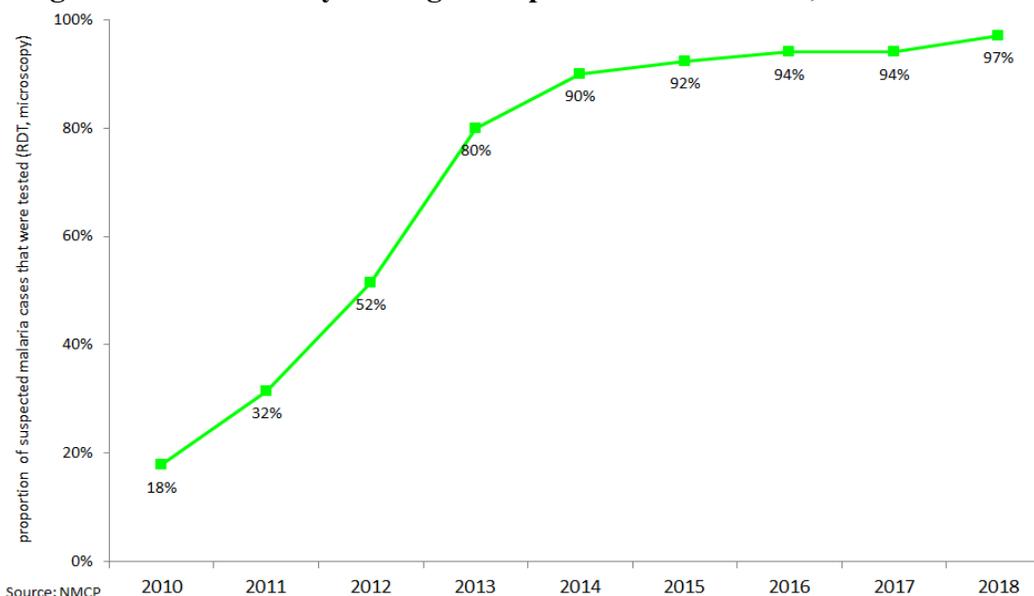
Key Question 3

How have malaria testing and treatment practices evolved over time?

Supporting Data

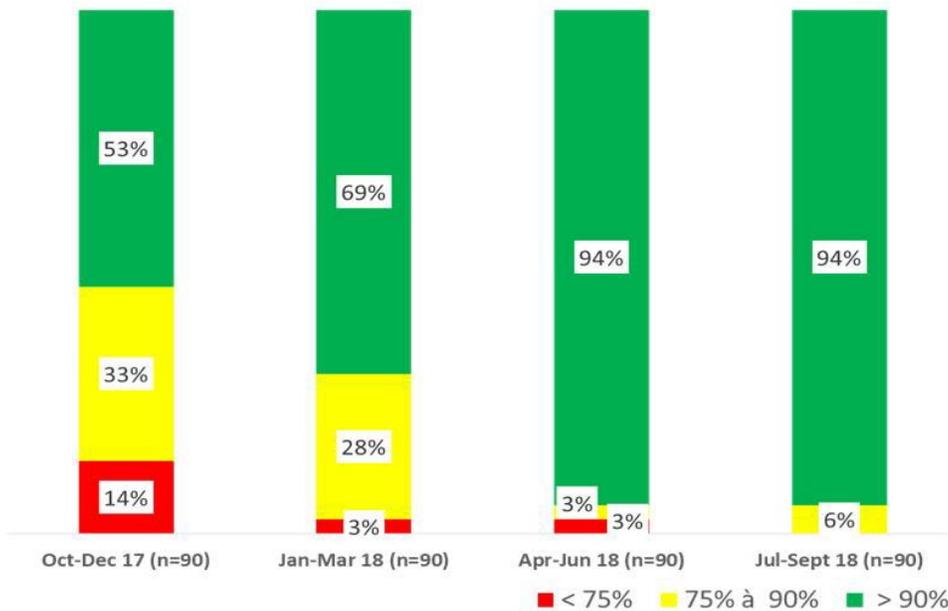
NMCP Annual Report data indicate a rapid increase in the proportion of suspected cases being tested

Figure A26. Laboratory Testing of Suspected Malaria Cases, Mali 2010 - 2018



NMCP program data indicate that parasitological confirmation of suspected malaria cases in Mali began rapidly increasing in 2012 when RDTs first became available nationwide. Data from maternal recall (DHS) and HMIS (see graphics below) and results from a study conducted by Ashton (2019) suggest that testing rates may not be quite as high as reported.

Figure A27. Improvements in Performance of Health Facilities which Received 4 OTSS Visits, Adherence to Results of Biological Test (RDT/Blood Smear) Mali, October 2017 – September 2018

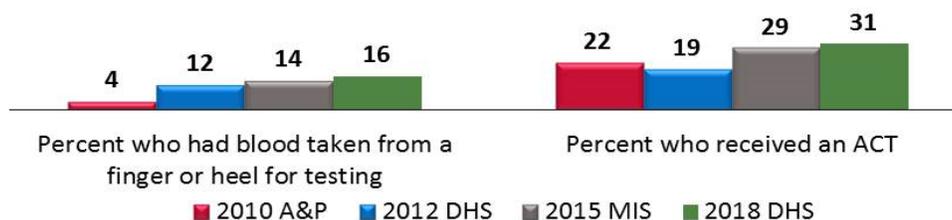


Source: <https://eds.psi-mis.org/dhis>

Figure A28. Trends in Diagnosis and Treatment of Children with Fever

Among children under 5 with fever in the 2 weeks before the survey

Among children under 5 with fever in the 2 weeks before the survey who received any antimalarial



Conclusion

- The OTSS data suggest that there are significant improvements in performance between the first and fourth supervisory visits in terms of adherence to national diagnosis and treatment guidelines.

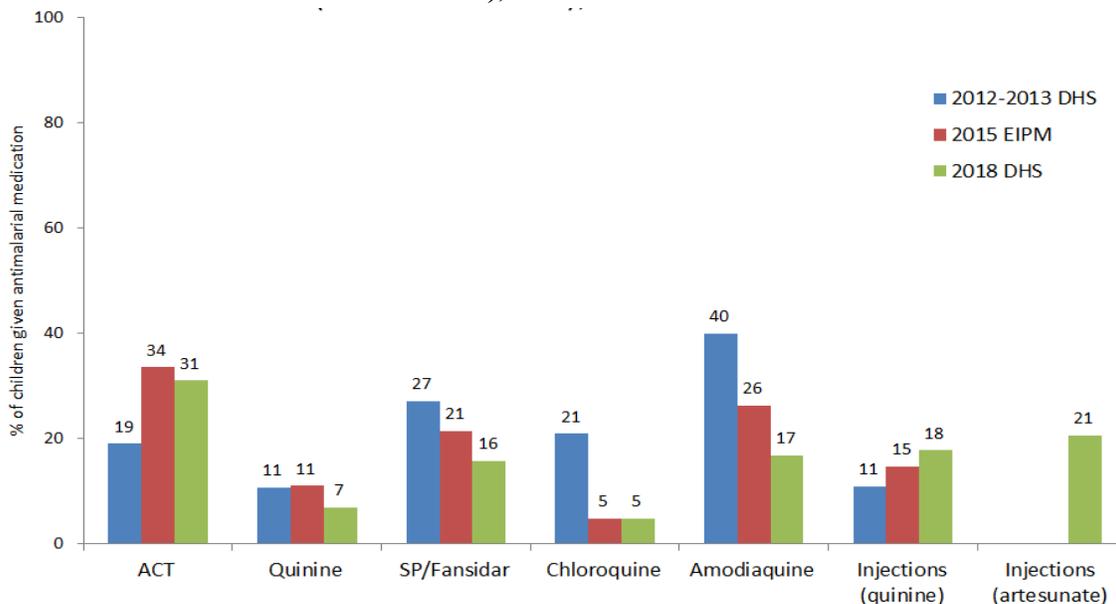
- Public health facilities report nearly 97 percent testing rates. However, approximately 50 percent of the Malian population seeks care in the private sector, where testing rates are very low since many of those facilities do not have access to rapid diagnostic tests. Providers in private clinics are more likely to treat malaria based on clinical signs and symptoms, without confirming malaria infection.
- Mali needs to continue the scale up malaria diagnostic confirmation with RDT or microscopy in both the public and private sectors. All confirmed malaria cases should be treated according to the national treatment policy.

Key Question 4

What is known about provider behavior in relation to testing and treatment practices in Mali?

Supporting Data

Figure A29. Antimalarial Medications Given to Children with History of Fever (Maternal Recall), Mali 2012 - 2018



Maternal recall data regarding which antimalarial medications were given to their febrile children indicate an increase in the proportion of children receiving injectable antimalarial drugs between 2012 and 2018. In addition, approximately one quarter of all malaria cases in children are classified as severe. PMI plans to follow up to find out more about the cases that are being classified as severe. Additionally, significant proportions of children with malaria (~60 percent) are receiving antibiotics (Ashton 2019).

Figure A30. Key Barriers and Facilitators to Appropriate Testing and Treatment Practices

Facilitator	Type of Factor	Data Source	Evidence
Adequate quantities of RDTs and ACTs in public health facilities	Environmental	2018 SARA	2018 SARA results indicate that 83% of facilities surveyed had malaria diagnostic capacity and 96% had ACTs in stock
Barrier	Type of Factor	Data Source	Evidence
Inadequate numbers of HCWs trained in malaria diagnosis and treatment	Environmental	2018 SARA (graph 28)	2018 SARA results indicate that only 62% of facilities surveyed have at least one health staff trained in malaria diagnosis and treatment

Conclusion

In general, RDT and ACT supplies appear to be adequate in the public sector. The MOH needs to find ways to ensure that more staff are trained in iCCM and in malaria diagnosis and treatment. PMI Mali plans to find out more about why a high proportion of cases is classified as severe malaria and support adjustments to training, supervision, and SBC as appropriate.

Key Question 5

What is the current and planned support for case management at health facilities and in the communities by CHWs?

Supporting Data

Figure A31. Current and Planned CHW Case Management Support at Health Facilities and Communities

Interventions	Nationwide	Regional	Comments
Drug distribution (ACTs, RDTs, SP)	x		Plus World Bank and GF contribution (See gap analysis)
SMC		Segou and Mopti	Plus World Bank and GF contribution (See gap analysis)
Case management, MIP, iCCM and SBC		All the south (Kayes, Koulikoro, Sikasso, Mopti, Segou, and Bamako)	Plus World Bank and GF contribution (See gap analysis)

Conclusion

The World Bank project, which contributes to buying ACTs, RDTs, and injectable artesunate, and to implementing SMC in 20 districts, will end in 2019; however, commodities procured in 2019 will be used in 2020. At this time, there are no implications for reprogramming, but in 2020 we will assess whether any gaps have emerged. We will also encourage the Government of Mali to plan for other means to support emerging needs

Key Question 6

What was the estimated need for RDTs during calendar year 2019? What are the estimated RDT needs over calendar years 2020 and 2021?

Supporting Data

Figure A32. Gap Analysis for RDTs 2019 - 2021

Calendar Year	2019	2020	2021
RDT Needs			
Total country population	19,658,031	20,251,000	20,838,279
Population at risk for malaria ¹	19,658,031	20,251,000	20,838,279
PMI-targeted at-risk population	19,658,031	20,251,000	20,838,279
Total number of projected fever cases	5,507,159	5,941,897	6,404,535
Percent of fever cases tested with an RDT	82.88%	82.88%	82.88%
Total RDT Needs (morbidity method)	4,564,443	4,924,763	5,308,206
Total RDT Needs ³ (consumption method)	4,141,953	5,177,441	6,471,802
Partner Contributions (to PMI target population if not entire area at risk)*			
RDTs carried over from previous year	2,931,164	3,321,936	5,394,495
RDTs from Government	2,445,400	3,750,000	5,783,025
RDTs from Global Fund	0	0	0
RDTs from other donors: world Bank	1,087,325	0	0
RDTs planned with PMI funding	1,000,000	3,500,000	3,500,000
Total RDTs Available	7,463,889	10,571,936	14,677,520
Total RDT Surplus (Gap)	3,321,936	5,394,495	8,205,718

¹ General Population is sourced from 2009 projections by INSTAT/DNP. 100% of general population is at risk

² The number of fever cases were counted at health facility and community level

³ The Needs were estimated through Consumption method. The increase/regression rate for consumption method was calculated during the quantification workshop by comparing actual consumption for the same quarter in subsequent years to take account the seasonality. The progression rates varied between 18% and 55% between July 2017 and June 2019. The quantification committee built the consensus of using 25% annual increase rate to estimate the needs for 2019-2021.

Conclusion

There is no Gap in RDTs.

Key Question 7

What was the estimated need for ACTs during calendar year 2019? What is the estimated need for ACTs over calendar years 2020 and 2021?

Supporting Data

Figure A33. Gap Analysis for ACTs 2019 - 2021

Calendar Year	2019	2020	2021
ACT Needs			
Total country population	19,658,031	20,251,000	20,838,279

Calendar Year	2019	2020	2021
Population at risk for malaria	19,658,031	20,251,000	20,838,279
PMI-targeted at-risk population ¹	19,658,031	20,251,000	20,838,279
Total projected number of malaria cases ²	3,706,417	3,774,462	3,827,073
Total ACT Needs ³ (Morbidity/Demographic method)	2,726,454	2,904,062	3,073,873
Total ACT Needs (Consumption method)	2,975,916	3,171,062	3,386,221
Partner Contributions (to PMI target population if not entire area at risk)¹			
ACTs carried over from previous year	2,682,191	1,878,455	6,364,692
ACTs from Government	743,040	5,474,430	
ACTs from Global Fund	0	1,182,870	1,386,414
ACTs from other donors	0	0	0
ACTs planned with PMI funding	1,429,140	1,000,000	1,000,000
Total ACTs Available	4,854,371	9,535,755	8,751,106
Total ACT Surplus (Gap)	1,878,455	6,364,692	5,364,885

¹ General Population is sourced from 2009 projections by INSTAT/DNP. 100% of general population is at risk

² The number of malaria cases were estimated based on the percentage of RDT & Microscopy Positive in addition to clinical cases

³ The Needs were estimated through Consumption method. The increase/regression rate for consumption method was calculated during the quantification workshop by comparing actual consumption for the same quarter in subsequent years to take account the seasonality. The increase/decrease rates for ALs are: AL6: +10%; AL12: -2%; AL18: +10%; and AL24: +9% for estimating the needs for 2019-2021.

Conclusion

There is no GAP in ACTs.

Key Question 8

What was the estimated need for severe malaria treatment and any other treatments as applicable during calendar year 2019? What is the estimated need for calendar years 2020 and 2021?

Supporting Data

Figure A34. Gap Analysis of Injectable Artesunate 2019 - 2021

Calendar Year	2019	2020	2021
Injectable Artesunate Needs			
Projected Number of Severe Cases ¹ (children < 5 years and pregnant women)	374,528	329,658	281,786
Projected # of severe cases among children (children < 5 years)	327,649	288,395	246,515
Projected # of severe cases among adults (pregnant women)	46,878	41,262	35,270
Total Injectable Artesunate vials Needs (Morbidity/demographic Method)	2,200,786	1,937,123	1,655,819
Total Injectable Artesunate vials Needs ² (Service statistics method)	1,534,145	1,577,101	1,621,260
Partner Contributions			
Injectable artesunate vials carried over from previous year	85,322	0	354,719
Injectable artesunate vials from Government	953,369	1,392,786	1,468,700

Calendar Year	2019	2020	2021
Injectable artesunate vials from Global Fund		379,034	448,524
Injectable artesunate vials from other donors	0	0	0
Injectable artesunate vials planned with PMI funding	0	160,000	160,000
Total Injectable Artesunate vials Available	1,038,691	1,931,820	2,431,943
Total Injectable Artesunate vials Surplus (Gap)	-495,454	354,719	810,684

¹ Indicate the percent of malaria cases expected to be severe malaria in this footnote to indicate how this number was calculated

² Number of vials needed was based on service statistic data collected from DHIS2 (HMIS). The number of severe malaria case is expected to reduce by 2.8% every year.

Figure A35. Gap Analysis of Artesunate Suppositories 2019 - 2021

Calendar Year	2019	2020	2021
Artesunate Suppository Needs			
Number of severe cases expected to require pre-referral dose at community level ¹	96,344	84,801	72,487
Total Artesunate Suppository Needs ²	141,078	124,176	106,143
Partner Contributions			
Artesunate suppositories carried over from previous year	2,486	0	1,772
Artesunate suppositories from Government	40,000	94,736	124,327
Artesunate suppositories from Global Fund	29,620	31,212	33,116
Artesunate suppositories from other donors	0	0	0
Artesunate suppositories planned with PMI funding	0	0	0
Total Artesunate Suppositories Available	72,106	125,948	159,215
Total Artesunate Suppositories Surplus (Gap)	-68,972	1,772	53,072

¹ Percent of malaria cases expected to be severe malaria for 2019, 2020, and 2021 are 25.3%, 21.86%, and 18.43%, respectively. 10.28% of malaria cases are expected to be diagnosed at CHWs.

² Number of artesunate suppository for each case is based on age: 1 suppository for 0-3 y/o; 2 suppositories for 4-5 y/o.

Conclusion

The Malian Government has been buying injectable artesunate for cost recovery, and for the time being Mali is overstocked. We need to monitor the usage of the existing stock before we decide on future PMI contributions.

Key Question 9

Are the first-line ACTs effective and monitored regularly?

Supporting Data

Figure A36. Recently Completed and Ongoing Antimalarial Therapeutic Efficacy Studies

Year	Sites	Treatment arms	PCR-corrected ACPR>90%?	Where molecular resistance work was completed or planned
2016 ¹	Sélingué, Missira	AL, ASAQ	Yes	University of Sciences, Techniques and Technologies of Bamako
2019	Sélingué, Missira, Dioro	AL, ASAQ	Pending	University of Sciences, Techniques and Technologies of Bamako

Footnotes - ACPR: adequate clinical and parasitological response; AL: artemether-lumefantrine; ASAQ: amodiaquine-artesunate; PARMA: PMI-supported Antimalarial Resistance Monitoring in Africa

¹Source: draft manuscript: Therapeutic efficacy of artemether-lumefantrine and artesunate-amodiaquine for the treatment of uncomplicated *Plasmodium falciparum* malaria in Mali, 2016

Conclusion

Current evidence suggests that AL and ASAQ continue to be effective in Mali.

Key Question 10

Are there other key items, such as lab strengthening, private sector support, etc. that should be considered?

Supporting Data: Mali

- PMI will continue to strengthen the capacity of the Ministry of Health regarding quality assurance of medications.
- PMI partners will continue to provide microscopy training to health workers in public and private sectors.

Conclusion

There is no implication for programming.

Key Question 11

Are there any other considerations that impact your funding allocation in this category?

Supporting Data

None.

Conclusion

Not relevant; budget unchanged.

2.B. DRUG-BASED PREVENTION

<p>NMCP objective</p>
<ul style="list-style-type: none"> • The 2018-2022 National Malaria Control Strategy objectives for drug-based prevention interventions are: <ul style="list-style-type: none"> ○ to reach at least 90 percent of the target population during each round of the annual Seasonal Malaria Chemoprevention (SMC) campaign; ○ to reach at least 80 percent of pregnant women with at least three doses of IPTp during their pregnancy.
<p>NMCP approach</p>
<p>The recently updated National Reproductive Health Policy includes IPTp and states that pregnant women should receive at least three doses of IPTp during their pregnancy. The first dose should be given during the fourth month of pregnancy and subsequent doses should be given at monthly intervals after that.</p> <ul style="list-style-type: none"> • 2012: SMC started in Mali in one district (pilot phase) • 2013: covered 5 districts • 2014: covered 21 districts • 2015: covered 48 districts • 2016, 2017 and 2018: SMC covered children less than 5 years old nationally • 2017 to 2018: PMI piloted SMC for children 5 to 10 years old in Kita District <p>In Mali’s SMC program, all eligible children with fever were tested for malaria before receiving SMC. If the malaria test is positive, then the child is treated with an ACT.</p>
<p>PMI objective, in support of NMCP</p>
<p>PMI SMC and IPTp objectives are to support Mali to achieve the National Malaria Control Strategy objectives above.</p>
<p>PMI-supported recent progress (past ~12-18 months)</p>
<ul style="list-style-type: none"> • In 2019, PMI implementing partners supported the NMCP: <ul style="list-style-type: none"> ○ To update the MIP components of the National Reproductive Health Policy. The updated National Reproductive Health Policy recommends four ANC clinic visits and four additional contacts which could be implemented in the community by the community health workers and/or during outreach visits.

<ul style="list-style-type: none"> ○ To develop training materials on IPTp and treatment of pregnant women with malaria for ANC providers ○ To conduct a workshop of the National Technical Work Group whose members include two representatives from the Division of the MOH responsible for ANC and other stakeholders on the barriers affecting IPTp coverage among pregnant women. Workshop participants reviewed what is known about the barriers and developed an action plan for resolving them (training and supervision of health workers, SBC, outreach). ● In 2019, PMI funded the procurement of 3.8 million SP tablets and supported the training of 1432 healthcare workers in Sikasso, Kayes, Koulikoro and Bamako Regions. In Mopti and Segou, 36 health workers benefited from the training-of-trainers for MIP.
<p>PMI-supported planned activities (next ~12-18 months, supported by currently available funds)</p>
<ul style="list-style-type: none"> ● MIP: PMI will continue to conduct refresher training on the new ANC/IPTp guidelines for healthcare providers, and will distribute ITNs to pregnant women through ANC. PMI is also conducting an OR study on the optimal package of MIP activities to increase uptake of MIP (see OR section for details). PMI will also be supporting OTSS that includes the assessment of MIP services. ● SMC: In the next 12-18 months, PMI will support SMC in 10 districts in Mopti and Segou Regions, including planning, drug procurement, and implementation of SMC at the community level. PMI will also coordinate activities with other partners through the NMCP TWG on SMC.

2.B.i SEASONAL MALARIA CHEMOPREVENTION (SMC)

<p>PMI Goal</p>
<p>Support the national strategy for SMC addressing relevant geographic areas and age groups, which includes 4 rounds of prophylaxis among children 6 months to 5 years of age, in accordance with WHO recommendations.</p>

<p>Do you propose expanding, contracting, or changing any SMC activities? If so, why and what data did you use to arrive at that conclusion?</p>
<p>In response to the continued high burden of malaria in Sikasso Region, PMI proposes increasing the age range for SMC to age 10 years for ~250,000 children in some high-burden districts supported by PMI. This age increase will also be accompanied by SBC activities aimed at promoting uptake among the older age group. PMI recently completed an OR study on this approach which was presented to</p>

WHO in Oct 2019 and will be presented at ASTMH in Nov 2019. The results suggest that increasing the age range is effective at reducing the malaria burden in the older children. Furthermore, this is a priority request from the NMCP as an additional proven ‘tool’ to tackle the continued high burden in this region.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

What was the estimated need for SMC commodities during calendar year 2019? What is the estimated need for SMC commodities over calendar years 2020 and 2021?

Supporting Data

Figure A37. Gap Analysis of SP Needs 2019 - 2021

Calendar Year	2019	2020	2021
Total Targeted Population ¹	19,658,031	20,251,000	20,838,279
SMC drug (SP+AQ) Needs			
Population targeted for SMC ²	3,086,213	3,179,306	3,271,506
PMI-targeted population for SMC	650,000	916,202	916,202
Total SP+AQ Needs ³	12,221,403	12,590,052	12,955,164
Partner Contributions (to PMI target population if not entire area at risk)			
SP+AQ carried over from previous year	<i>4,243,414</i>	<i>5,703,829</i>	<i>2,200,000</i>
SP+AQ from Government	<i>0</i>	<i>394,471</i>	<i>4,232,014</i>
SP+AQ from Global Fund	5,588,182	3,491,752	5,723,150
SP+AQ from Other Donors: World Bank	5,093,636	0	0
SP+AQ planned with PMI funding ⁴	3,000,000	5,200,000	5,200,000
Total SP+AQ Available	17,925,232	14,790,052	17,355,164
Total SP+AQ Surplus (Gap)	5,703,829	2,200,000	4,400,000

1) General Population is coming from 2009 projections by INSTAT/DNP.

2) Children < 5 years represent 17% of population, Children below 3 months represent 7.65% of children < 5 years. SMC targets only children 3 months to 5 years.

3) The SMC coverage rate is estimated to 90% of the children between 3 months-5 years; Each child will receive 4 doses during the campaign (four rounds - July, August, September, and October). A wastage rate of 10% was applied to the number of doses requested to determine the total needs for SMC products. The needs are for the entire country, includes the 10 PMI targeted districts.

4) PMI contributions in 2019 and 2020 are based on actual procurement. We added blisters for 250,000 infants from 5-10 years. We assumed that in 2021, PMI will procure equivalent quantity for 2020.

Conclusion

PMI will continue to support commodities and operational costs for 10 districts, and we will increase the age range to <10 years old in some high-burden districts. PMI-Mali have accounted for these plans in the gap tables and budget analysis. The non-PMI districts will be covered by other donors including Global Fund, World Bank, and the Government of Mali.

Key Question 2

What are the estimated non-commodity resource needs to properly deliver SMC over the next 3 years?

Supporting Data

SMC is implemented nationwide in Mali. Using FY2020 funding, PMI will support SMC in 10 districts (with Global Fund, World Bank, and Government of Mali supporting the remainder). In the districts where PMI works, we support the commodity costs (detailed in the gap analysis tables) as well as training, supervision, and specific SBC activities aimed at community mobilization and adherence. At the national level, we also contribute to national coordination and micro-planning.

Conclusion

PMI has supported SMC in Mali since 2014, initially through OR activities to test program effectiveness, and later through the expansion to a nationwide intervention. During this interval, parasitemia in children less than five years old decreased from 32 percent in 2015 to 19 percent in 2018. PMI has maintained essentially the same number of SMC districts over time (some districts have split, requiring slight adjustments to the number of districts covered by PMI), while the GOM has been able to mobilize resources to take the intervention to scale. SMC appears to be a success in Mali and PMI will continue to support the SMC objectives of the NMCP.

Key Question 3

What does the data show about SMC refusal rates? How do refusal rates change from round to round? What barriers are contributing to SMC refusal rates?

Supporting Data

Figure A38. Key Barriers and Facilitators to SMC Acceptance and Uptake

Facilitator	Type of Factor	Data Source	Evidence
Strong community appreciation of SMC	Social	OR studies and anecdotal reports	Diawara F et al. Malar J. 2017 Aug 10;16(1):325. (See Figure A39)
Barrier	Type of Factor	Data Source	Evidence
Sub-optimal completion rates for each round	Internal	Monitoring data	Although care-givers report that the child has completed the round >95% of the time, observation of SMC cards and drug packaging estimate that the full course is taken 46%- 77% of the

			time. Barriers include vomiting in 9% of children or more after a dose, and most care-givers do not know to see a provider for a replacement dose; >60% of parents in most regions also reported children refusing to take the medications. However, these data are from a small subsample of households during routine monitoring and do not represent a robust assessment of adherence.
Some reluctance to return for rounds 3 and 4	Internal	Adherence surveys from OR studies	PMI OR studies on SMC from 2014-16, and 2017/18 Diawara F et al. Malar J. 2017 Aug 10;16(1):325: Only 54% of target children completed 4 rounds of SMC

Figure A39. Kita District Parent Opinions on SMC with Justification

	Round 1		Round 2		Round 2		Round 4		Total	
	n/N	%								
Parent Opinions on SMC										
Very Good	153/229	66.8	156/227	68.7	156/224	69.6	149/218	68.3	614/898	68.4
Good	75/229	32.8	71/227	31.3	68/224	30.4	69/218	31.7	283/898	31.5
Bad	1/229	0.4	0/227	0.0	0/224	0.0	0/218	0	1/898	0.1
Justification of the Opinion										
Improve Health	57/229	24.9	79/227	34.8	74/224	33.0	103/218	47.2	313/898	34.8
Prevent Malaria	114/229	49.8	72/227	31.7	88/224	39.3	52/218	23.9	326/898	36.3
Fight Malaria	57/229	24.9	63/227	27.6	49/224	21.8	48/218	21.3	317/898	23.9
Save Money	0/229	0.0	7/227	3.0	8/224	3.6	8/218	3.6	23/898	2.5
Ensure Good Health	0/229	0.0	6/227	2.6	4/224	1.8	7/218	3.1	17/898	1.9
No Harmful Effect	0/229	0.0	0/227	0.0	1/224	0.4	0/218	0.0	1/898	0.1
Calm the Mothers	1/229	0.4	0/227	0.0	0/224	0.0	0/218	0.0	1/898	0.1

Source: Diawara F et al. [Malar J.](#) 2017 Aug 10;16(1):325

Conclusion

Based on findings from PMI OR activities, PMI engaged its SBC partner to develop additional messages and activities aimed at improving completion of each round, retention for rounds 3 and 4, and increasing awareness that each round involves 3 days of medication. Data on parasitemia trends suggest that these additional SBC activities have improved uptake of SMC.

Key Question 4

Are there any other considerations that impact your funding allocation in this category?

Supporting Data

As discussed above, PMI-Mali plans on including approximately 250,000 children 5 - 10 years old in the highest-burden PMI districts. This is accounted for in the gap analysis and Table 2 budget.

Conclusion

PMI-Mali plans to continue to support this important intervention in Mali in 10 districts and will extend the age range to <10 years old in the districts with the highest transmission. PMI-Mali will also be supplementing implementation with SBC activities aimed at uptake in this older age group and at retention of children of all ages for rounds 3 and 4. PMI will continue to monitor progress through program records and routine surveillance.

2.B.ii MALARIA PREVENTION IN PREGNANCY (MIP)

PMI Goal

Support the national strategy for MIP, which includes provision of ITNs at first antenatal care (ANC) visit, intermittent preventive treatment for pregnant women (IPTp) to all pregnant women in malaria endemic areas starting at 13 weeks gestational age, for a minimum of 3 doses, and effective case management of malaria, in accordance with WHO recommendations.

Do you propose expanding, contracting, or changing any MIP activities? If so, why and what data did you use to arrive at that conclusion?

No changes will be made in terms of PMI support for MIP activities except for an increase in SBC for MIP. Please see Table 2 for a detailed list of proposed activities with FY 2020 funding. Activities will be prioritized based information from on-going OR studies on improvements to MIP.

Key Question 1

What proportion of pregnant women are receiving ANC early and frequently during their pregnancy?

Supporting Data

Figure A40. Trends in ANC Coverage

Percent of women age 15-49 with a live birth in the 5 years before the survey for most recent birth

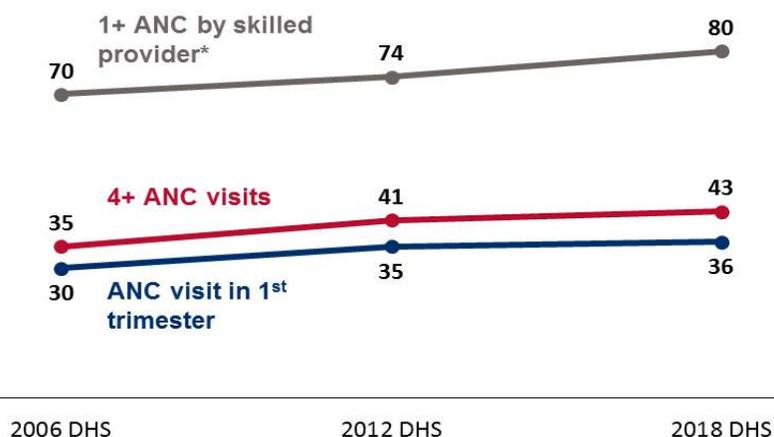


Figure A41. Key Barriers and Facilitators to ANC Attendance

Facilitator	Type of Factor	Data Source	Evidence
urban residence / higher economic socio-economic status / education	Social, environmental	DHS 2018	In 2018, 67% of women living in urban areas attended the recommended four ANC visits, in contrast to 37% of women living in rural areas.
Barrier	Type of Factor	Data Source	Evidence
Distance to facility, perceived low quality of care, additional costs, socio/cultural beliefs.	Structural, environmental, internal, social	Webster J et al. (2013, 2014); Ponsar F et al. (2011); Degni F et al. (2016); Klein MC et al. (2016)	Recent studies conducted in Mali indicate that access to healthcare services by pregnant women, and desire to access those services, especially among those living in rural communities, is limited by a variety of issues, including both environmental and socio-cultural issues.

Conclusion

Many financial and sociocultural barriers impede women from attending ANC, and perceptions that health facilities have issues with the quality of ANC services. Rates of ANC during the first trimester, particularly in rural areas, has remained low for many years, and is likely a major factor in coverage of ANC4+ and IPTp3+. A new USAID bilateral project will be implementing SBC at household and community levels to promote early ANC and IPTp; another new USAID bilateral project will support health facilities and health workers to provide quality services in

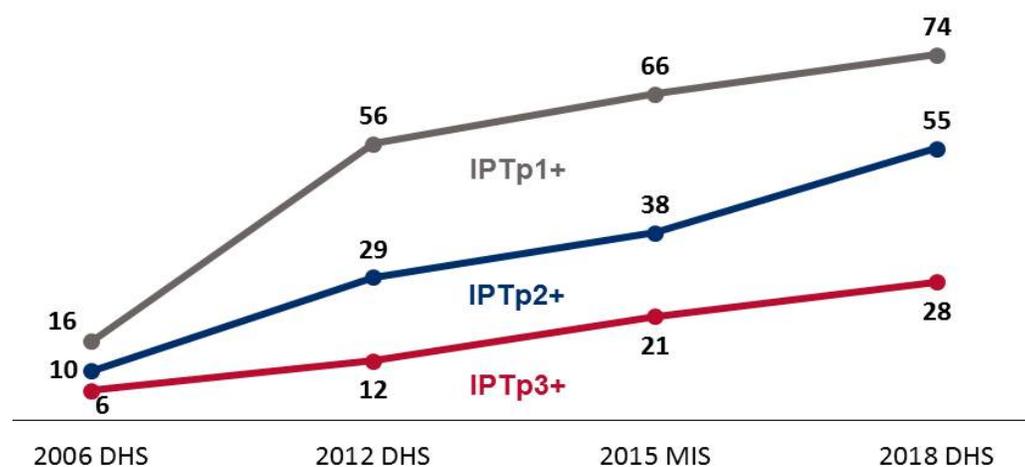
three regions (Segou, Sikasso, and Mopti). PMI has another field support mechanism which will support activities in Kayes, Koulikoro, and Bamako.

Key Question 2

What proportion of pregnant women are receiving the recommended doses of IPTp?

Supporting Data

Figure A42. Trends in IPTp, Percent of Women Age 15-49 with a Live Birth in the Two Years Before the Survey who Received the Specified Number of Doses of SP/Fansidar During Their Last Pregnancy



Note: Historical Data have been updated to reflect the new definition of these indicators, which includes the specified number of doses, regardless of source

Conclusion

Figure A42 shows that the number of pregnant women who received IPT during an ANC visit has increased significantly since 2006 (DHS 2018).

Coverage of pregnant women with ITNs and IPTp has been improving, but coverage with more than one dose of IPTp remains relatively low, despite multiple studies demonstrating its efficacy and cost-effectiveness, a number of which came from Mali. In 2018, 74 percent of women attending ANC received at least one dose of IPTp, 55 percent received at least two doses, and only 28 percent received at least three doses (2018 DHS).

Key Question 3

What is the gap between ANC attendance and IPTp? What barriers and facilitators exist, especially among providers?

Supporting Data

In Mali, although the majority (80 percent) of pregnant women attend at least one antenatal care (ANC) visit, only 37 percent of women living in rural areas attended the recommended four

visits, in contrast to 67 percent of women living in urban areas (DHS 2018). The number of pregnant women receiving the third and fourth doses of IPT remains relatively low (DHS 2018).

(Data source for graph: Mali HMIS)

Figure A43. Pregnant Women Who Received IPT during ANC and Number Who Completed at Least Four ANC Visits, Mali 2016 - 2019

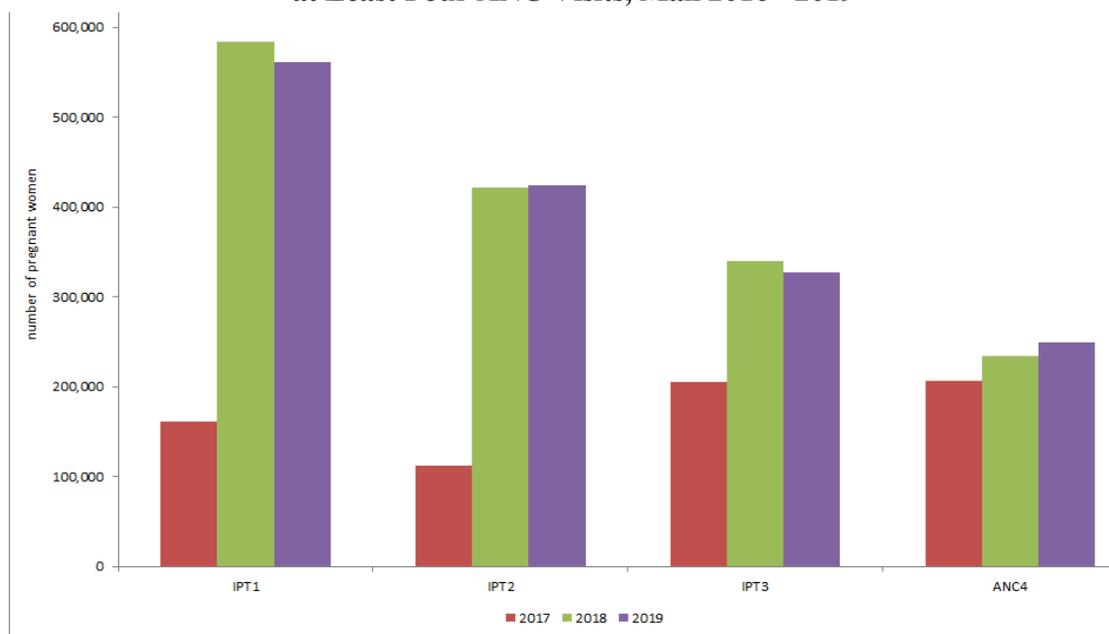


Figure A44. Key Barriers and Facilitators to IPTp Administration at ANC Visits

Facilitator	Type of Factor	Data Source	Evidence
Strong social support	Social	Kayes RHD	Numerous studies on barriers to ANC (and studies on general social norms)
Barrier	Type of Factor	Data Source	Evidence
Additional costs for some services, lack of clean water/cups for taking SP, fear of taking SP on an empty stomach (nausea), cultural barriers to seeking early ANC.	Internal, social, and environmental	NMCP	Numerous studies on barriers to ANC
SP stockouts	Environmental	LMIS (see graphic in section on Supply Chain)	SP stockout rates at the peripheral level were ~7% during 2018 Q3 - 2019 Q3.

Conclusion

ANC during the first trimester has remained low in Mali; fewer than 40 percent of pregnant women in rural areas received >3 ANC visits (DHS2018), and coverage of IPTp doses 2 - 4 has remained low. There are cultural barriers to seeking early ANC that continue to be an issue, along with all the factors mentioned above.

The recently revised 2019 National Reproductive Health Policy documents recommend eight contacts (recommended in the 2016 WHO ANC guidance) in addition to the four clinic visits (recommended in the 2002 WHO ANC guidance). PMI has developed training materials based on the National Policy, which supports the initiation of IPTp beginning at 13 weeks gestation.

New USAID bilateral projects will implement SBC at household and community levels to promote early ANC and IPTp, and will support health facilities and health workers to provide quality services. These bilateral projects will also work closely with the MOH Reproductive Health Directorate to improve ANC services and ANC coverage.

Key Question 4

What proportion of pregnant women with fever and malaria infection are getting diagnosed and treated?

Supporting Data

Figure A45. Management of Suspected Malaria in Pregnant Women, Mali 2016-2019

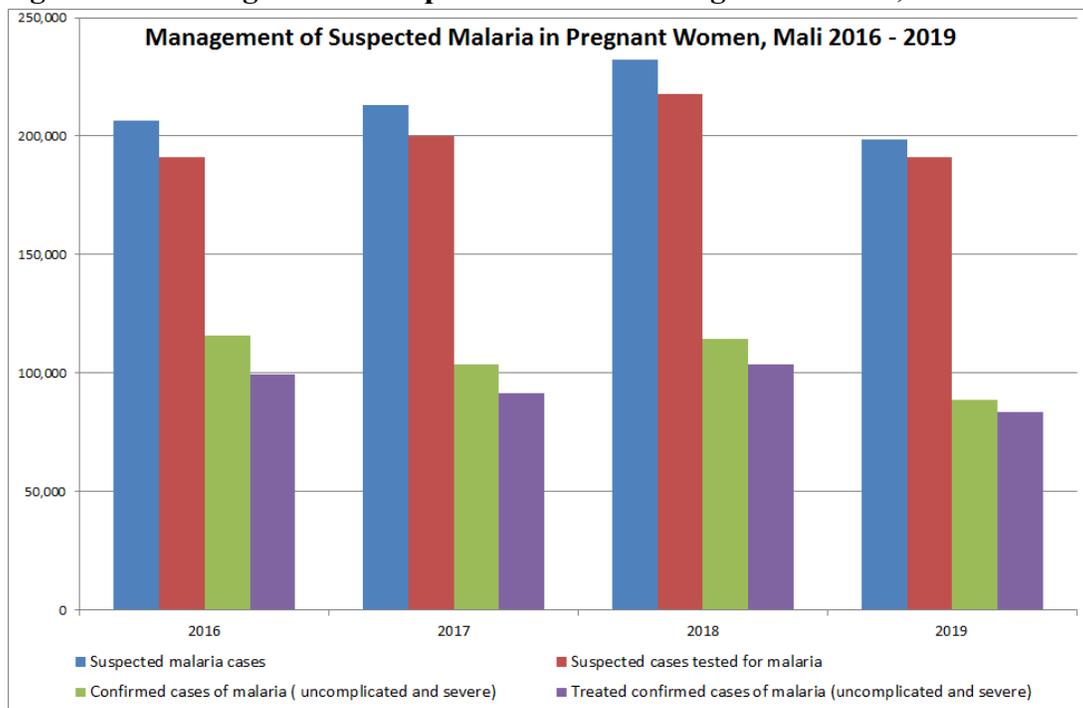


Figure A46. Management of Pregnant Women Suspected to Have Malaria

	2016	2017	2018	2019*
% Tested	93	94	94	96
% Positive	61	52	53	46
% Treated	86	88	90	94

*(Data source for graph and table: Mali HMIS. 2019 data are through October.)

Conclusion

On an annual basis, approximately 200,000 pregnant women with suspected malaria seek health care and more than 90 percent of them are tested for malaria. Approximately half of them (between 46 and 61 percent of tested cases) are confirmed to have malaria (about 10 percent of all pregnant women) and more than 85 percent of confirmed cases are treated as recommended in the MOH Malaria Treatment Guidelines. Between 40 to 45 percent of all cases are classified as severe and are treated with injectable Artesunate/Artemether/ Quinine. Although the National Malaria Treatment Guidelines and training materials have been updated, many health workers are still following the previous WHO guidelines that all cases of malaria in pregnancy be treated as severe. PMI has budgeted for a case management TDY to further explore this issue and to identify next steps for working with the MOH to address the high proportion of malaria cases which are treated as severe.

Key Question 5

What was the estimated need for IPTp commodities during calendar year 2019? What is the estimated need for IPTp commodities over calendar years 2020 and 2021?

Supporting Data

Figure A47. Gap Analysis of SP Needs 2019 - 2021

Calendar Year	2019	2020	2021
Total Population at Risk	19,658,031	20,251,000	20,838,279
SP Needs			
Total number of pregnant women ¹	982,902	1,012,550	1,041,914
Total SP Need (in treatments) ² (Statistic services method)	1,517,638	1,744,489	1,978,843
Total SP Need (in treatments) ³ Consumption method	1,294,177	1,313,589	1,333,293
Partner Contributions			
SP carried over from previous years	474,833	1,447,322	1,810,862
SP from Government	0	677,130	300,000
SP from Global Fund	0	0	0
SP from Other Donors	0	0	0
SP planned with PMI funding	2,266,666	1,000,000	1,000,000
Total SP Available	2,741,499	3,124,452	3,110,862
Total SP Surplus (Gap)	1,447,322	1,810,862	1,777,569

¹ The total number of pregnant women is estimated at 5% of the total population. General Population is sourced from 2009 projections by INSTAT/DNP.

² The number of treatments is based on percentage of pregnant women received number of SP doses.

³ The forecasted needs for SP is based on consumption method which is based on 2018 consumption with 1.5% increase per year.

Conclusion

No SP GAP is expected. See SP GAP analysis table.

Key Question 6

Are there any other considerations that impact your funding allocation in this category?

Supporting Data

Not applicable

Conclusion

Not applicable

3. CROSS-CUTTING AND OTHER HEALTH SYSTEMS

3.A. SUPPLY CHAIN

NMCP objective
A main component of the National Malaria Strategy (2018-2022) is to reach universal coverage of key malaria commodities, which cannot be achieved without consistent access and availability of essential malaria commodities through a functioning supply chain. The NMCP and PMI plan to increase the availability of malaria commodities through a strengthened supply chain and improved understanding and implementation of logistics and pharmaceutical management tools.
NMCP approach
The PPM manages, procures, and distributes medicines for Mali's primary health care system. The PPM stores and distributes commodities procured by the GoM and key donors such as PMI and the Global Fund. PPM delivers all commodities from the central level to the regional level, but lacks the capacity to ensure reliable transportation of commodities to the community level. The PPM has five warehouses in the regions of Kayes, Koulikoro, Mopti, Sikasso, and Ségou, and three offices in Gao, Koutiala, and Tombouctou.
PMI objective, in support of NMCP
PMI aims to build the capacity of PPM as a fully functional supply chain partners, including its capacity to store and distribute commodities, and maintain reliable logistics management.
PMI-supported recent progress (past ~12-18 months)
Activities supported by PMI in the last 12-18 months: <ul style="list-style-type: none">• With USAID's support, the PPM developed its first strategic plan (2015-2019), which has fed into the relocation of PPM, improved operating procedures, and resulted in smoother

functioning of PPM. Due to an agreement with PPM and increased trainings and supervision, commodities now flow past the regional level. Reporting systems have also improved, allowing for more visibility and decision-making. The national laboratory is able to test and report on the quality of malaria pharmaceuticals. Regular coordination meetings now occur among malaria partners regarding commodities and policies in order to make informed decisions about commodities and supply chain.

- PMI supported the building of a warehouse in Bamako, which doubled the national storage capacity. USAID, in collaboration with the Dutch cooperation, is building warehouses ‘in-a-box’ in Kayes, Koulikoro and Mopti. These warehouses will contribute to improving the storage capacity in those regions.
- Contributed to the implementation of SAGE X3-WMS (warehouse management system), a new software which will be used by Mali’s central warehouse
- Supported stabilization of interoperability between DHIS2 and OSPSANTE: Malaria commodity data for each health facility is entered in DHIS2 and transferred to OSPSANTE for data aggregation, reporting, and use in reports for decision-making. LMIS reporting rates increased to 96-100% over the last 12 months
- Supported the training in the northern regions on LMIS SOPs (Paper-based LMIS, OSPSANTE and its interoperability with DHIS2)
- Completed two EUVs and disseminated key findings
- Supported regions and districts to conduct supportive supervision and coaching to build capacity of malaria stock managers

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

- Continue supporting the development of interoperability between OSPSANTE and SAGE X3-WMS to make OSPSANTE an ordering tool
- Support the use of OSPSANTE reports for decision-making at all levels of the national supply chain
- Support training on LMIS SOPs
- Continue support to national malaria commodity quantifications
- Continue support to EUV
- Continue to provide technical assistance to the NMCP (quantification, supply plan, PPMRm, EUV, etc.)
- Support the development and implementation of malaria commodity distribution plan
- Support redistribution of products among facilities to correct stock imbalances

- Strengthen PPM warehouse operations management
- Support implementation of last-mile distribution of malaria products in Sikasso Region

PMI Goal

Ensure continual availability of quality products needed for malaria control and elimination (ACTs, RDTs, SP, Artesunate. Injectable, and ITNs) at health facilities and community level.

Do you propose expanding, contracting, or changing any supply chain activities? If so, why and what data did you use to arrive at that conclusion?

There is no change from FY 2109 MOP allocations; PMI-Mali will continue to use GHSC-PSM to help with quantification, forecasting, procurement, and distribution. Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

Has the central level, been stocked according to plan for ACTs, RDTs, SP and Art. Inj over the last year? If not stocked according to plan, have they been under, over or stocked out?

Supporting Data

Figure A48. Central Stock Levels for ACTs

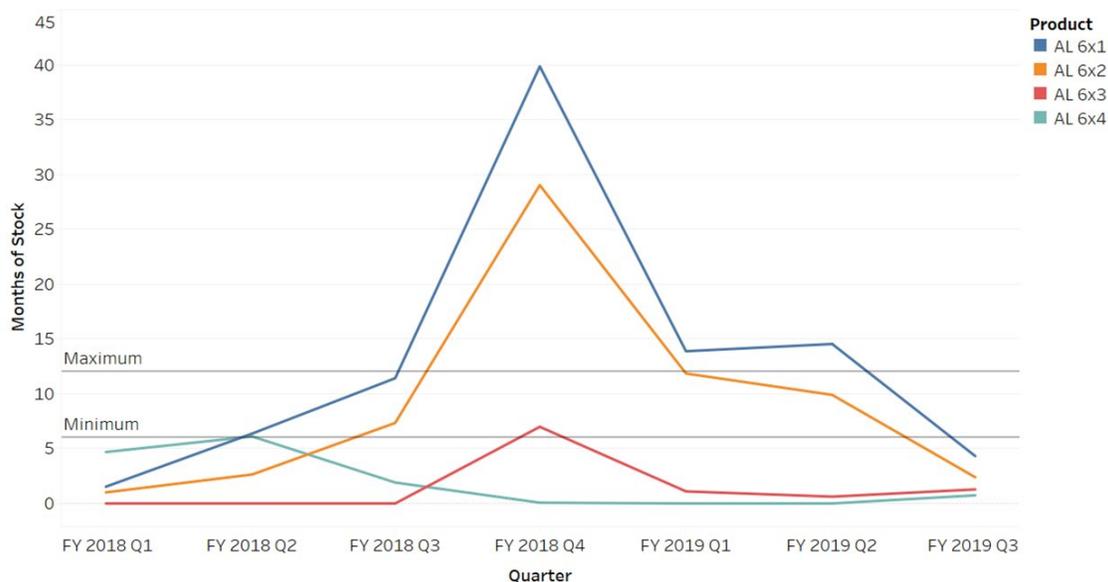


Figure A49. Central Stock Levels for Injectable Artesunate, 60mg

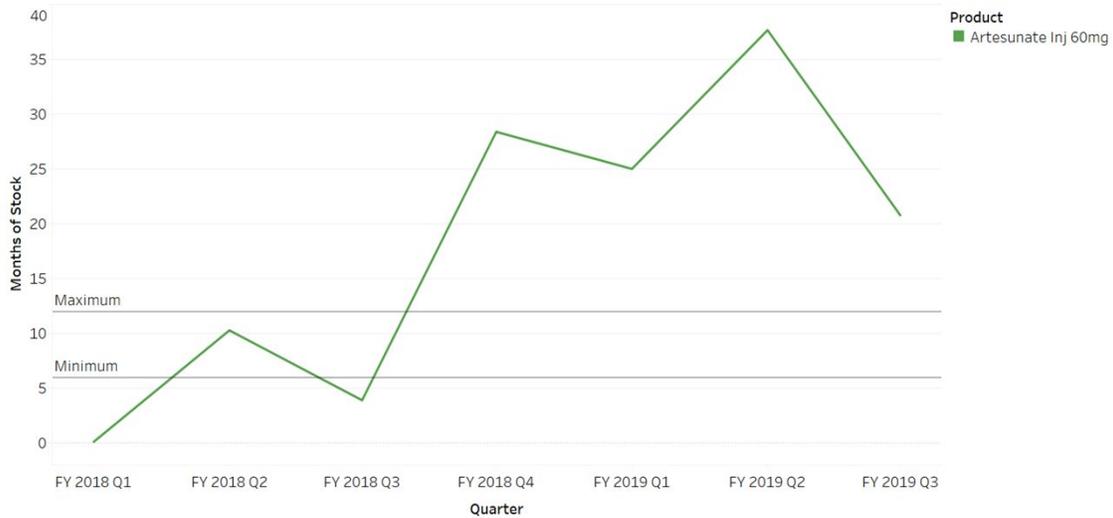
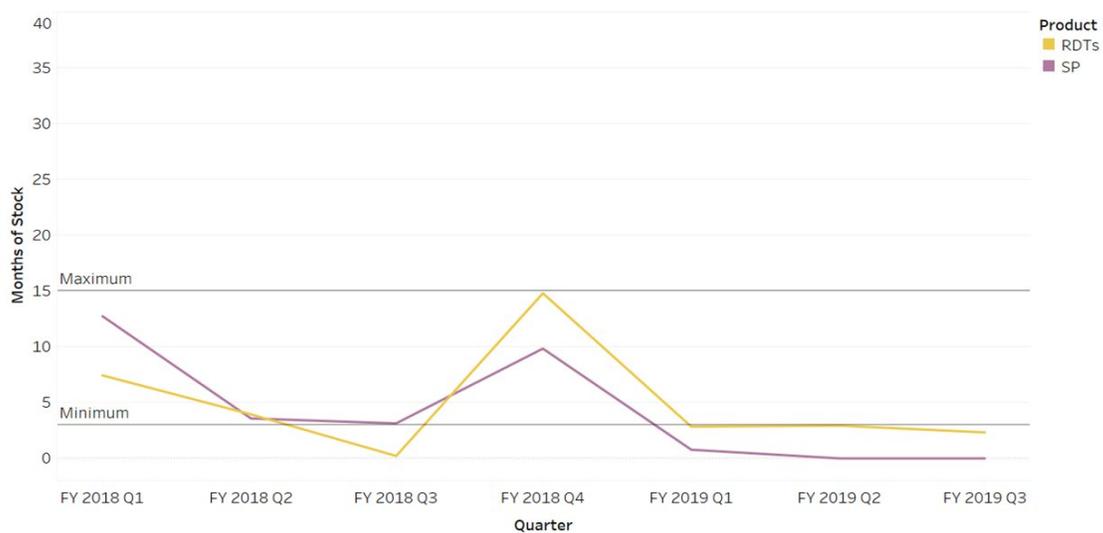


Figure A50. Central Stock Levels for RDTs and SP



Conclusion

Mali is overstocked with injectable artesunate and PMI will monitor the usage of the existing stock before placing future orders. Stock of other commodities such as SP, RDTs, and ACTs is typically minimal at the central level because these commodities are quickly distributed for use at lower levels of the health pyramid.

Key Question 2

What are the trends in facility- and community health worker-level stock out rates for ACTs, RDTs, and SP over the last year (if tracked)? Is there a seasonal or geographic difference in stock out rates?

Supporting Data

Figure A51. ACT Stockout Rates

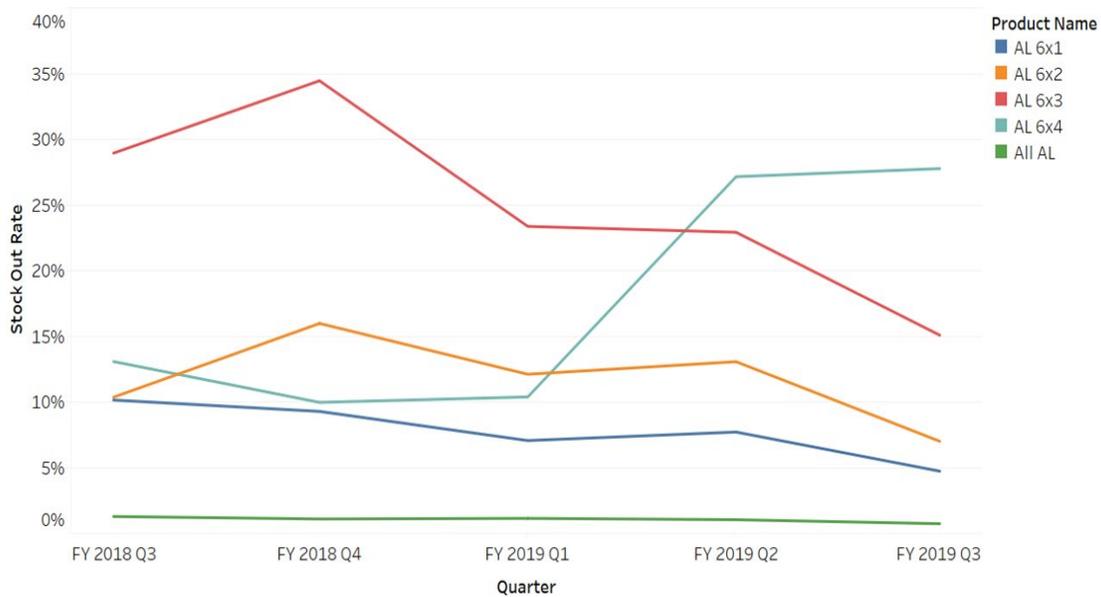
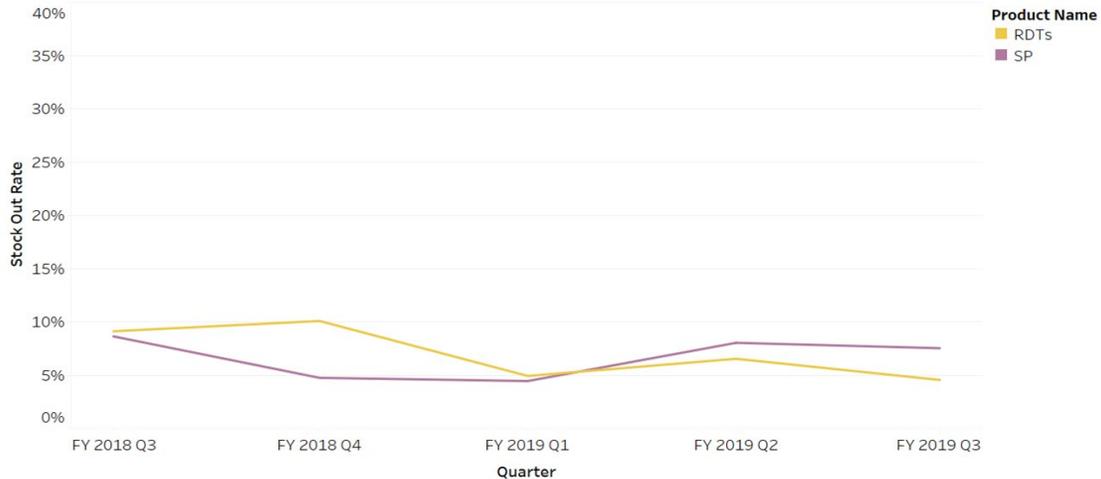


Figure A52. SP and RDT Stockout Rates



Conclusion

Facilities in Mali experienced zero stockouts of all ACT formulations simultaneously, but stockouts of individual ACT formulations occurred during the past 12 months. ACT and RDT stockouts were generally most common at the peripheral level while central stores were high in Q4 2018, which suggests that commodities have been distributed more efficiently to peripheral levels since that time.

Key Question 3

What is the difference between quantities for ACTs consumed and malaria cases, and RDTs consumed and numbers tested? What is driving any differences seen?

Supporting Data:

Figure A53. NMCP Annual Report Data and OPSANTE Consumption Data

2018	Indicator	Discrepancy
Number of suspected malaria cases tested by RDTs	3,457,267	333,440 (10%)
Number of RDTs consumed	3,123,827	
Number of confirmed uncomplicated malaria cases	1,594,508	293,206 (13%)
Number of confirmed severe malaria cases	750,973	
Total number of confirmed malaria cases	2,345,481	
Number of ACTs (treatments) consumed	2,638,687	

Conclusion

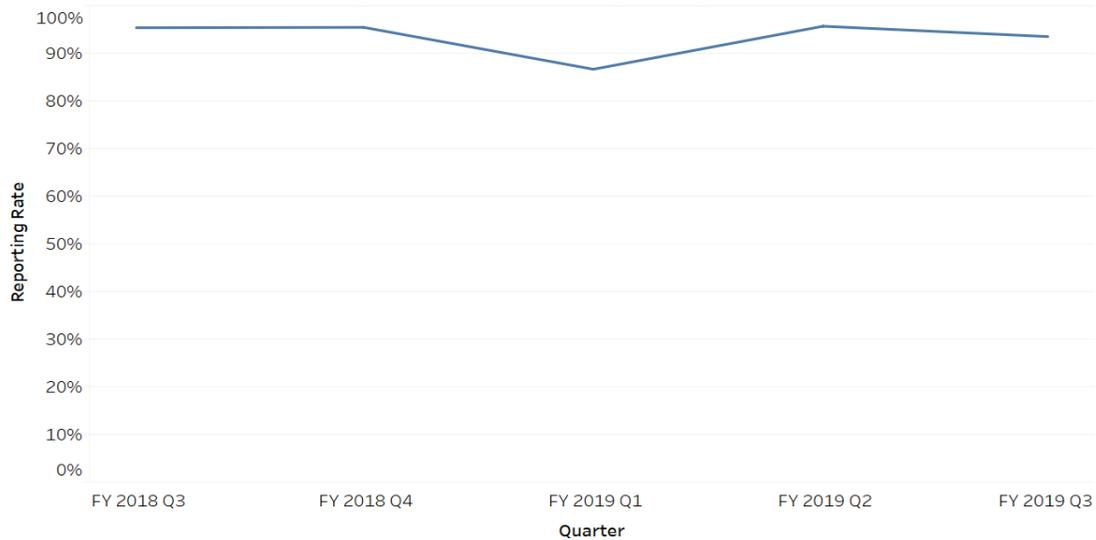
In 2018, discrepancies between the reported numbers of suspected cases tested and the numbers of RDTs consumed, and between the number of confirmed cases and ACTs consumed, were not large. We are aware that in some locations in 2018, multiple pediatric blisters were used to treat adults because the medication was nearing the expiration date. Further exploration may help us understand the roles of reporting issues, waste due to commodity expiration or other causes, use of multiple pediatric treatment courses for adults, or fraud in explaining these discrepancies. We also hope to explore the high consumption rates of injectable antimalarials and the high proportion of confirmed cases which are diagnosed as severe (in 2018, $[750,973/2,345,481]=32\%$ of confirmed cases classified as severe).

Key Question 4

What are the trends in LMIS reporting rates?

Supporting Data

Figure A54. LMIS Reporting Rate



Conclusion

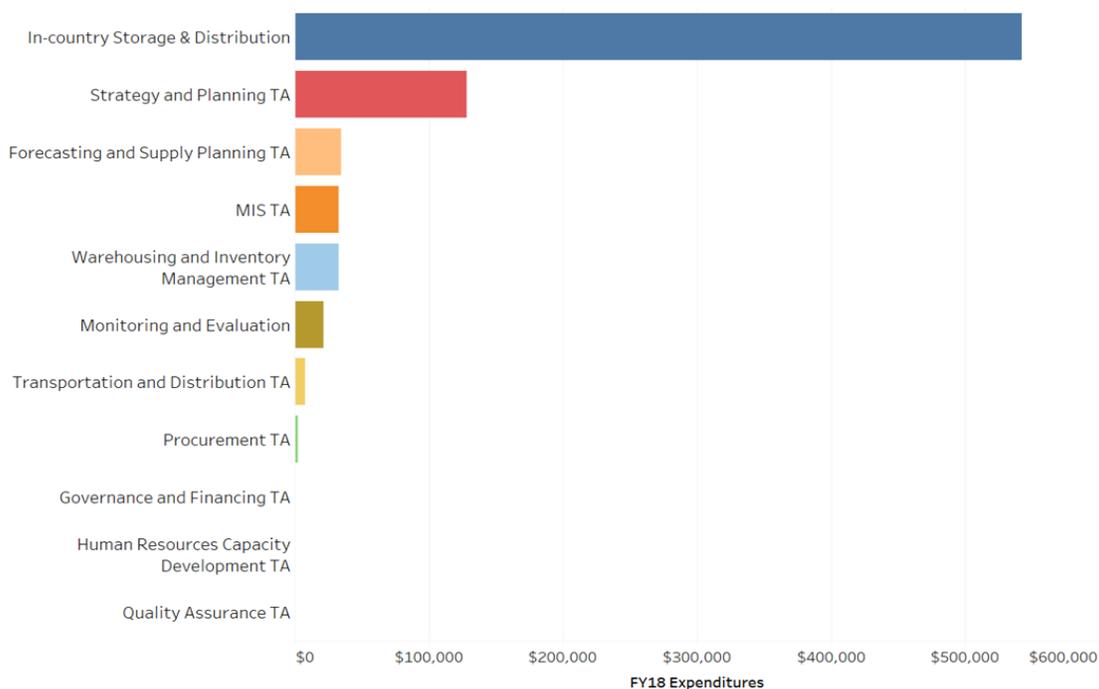
LMIS reporting rate has been consistently above 85%. There are no implications on reprogramming.

Key Question 5

What are the main supply chain functions supported by PMI? For areas that are not as strong is there additional investment that PMI should? In areas performing well, is it dependent on PMI/donor funding and so should be maintained?

Supporting Data

Figure A55. PMI Supply Chain Investments in FY 2018



Conclusion

In-country storage and distribution costs are high due to the cost of storage and distribution of ITNs via ANC and EPI. There are no needs for reprogramming.

Key Question 6

Are there any other considerations that impact your funding allocation in this category?

Supporting Data

The World Bank project, which contributes to buying ACTs, RDTs, and injectable artesunate, and to implementing SMC in 20 districts, will end in 2019; however, commodities procured in 2019 will be used in 2020.

Challenges or bottlenecks that slowed or prevented implementation of supply chain activities:

- Malaria commodities procured by the Malian Government with funding from the World Bank and MOH were not delivered on time.
- Lack of host-country skilled human resources to carry out supply chain functions especially at peripheral levels
- Low internet connectivity at peripheral levels negatively impacted malaria commodity data entry in DHIS2 and data transfer in OSPSANTE

Conclusion

At this time, there are no implications for reprogramming, but in 2020 we will assess whether any gaps have emerged. We will also encourage the Government of Mali to plan for other means to support emerging needs.

3.B. SURVEILLANCE, MONITORING & EVALUATION (SM&E)

NMCP objective
<ul style="list-style-type: none">• The NMCP’s goal is to ensure that the people of Mali have universal and equitable access to malaria interventions according to the national health policy, and reduce the burden of malaria to a level where it is no longer a major cause of morbidity and mortality or a barrier to social and economic development in Mali. SM&E-related objectives include:<ul style="list-style-type: none">○ Providing timely information in a form appropriate for the needs of national programs and sharing with local and international partners.○ Using data to improve delivery of health services at the peripheral level.○ Contributing to the lasting improvement of health systems in Mali
NMCP approach
<ul style="list-style-type: none">• Target interventions based on epidemiologic data• Optimize use of existing data through systematic analysis and improved presentation of the data• Promote malaria surveillance activities, including training workers at all levels to use DHIS2 and improving supervision
PMI objective, in support of NMCP
PMI’s objectives and approach for SM&E align well with those of the NMCP. PMI-Mali strives to improve malaria data quality and use at all levels, including the district level, in coordination with other major partners and donor agencies, and while encouraging NMCP leadership in SM&E activities.
PMI-supported recent progress (past ~12-18 months)
<ul style="list-style-type: none">• Developed a new National Strategic Plan for 2018 - 2022• In 2018, implemented DHIS2 in Kayes, Koulikoro, Ségou, Sikasso, Mopti and Bamako District• Conducted periodic validation and review of routine data in all districts, and audited data in 4 regions (Kayes, Mopti, Koulikoro, Ségou) plus Bamako• Trained/supervised 133 health districts on epidemic thresholds

- Organized a national surveillance training course; 22 health agents trained (primarily malaria focal points in Sikasso)
- Produced 10 monthly malaria bulletins
- Completed a DHS in 2018

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

- Support implementation of the District Health Information System-2 for the HMIS to improve malaria data quality and use at all levels
- Conduct routine data quality assessment in 1 region
- Produce monthly malaria bulletins
- Support 7 frontline FETP fellows
- Conduct MIS in 2020

PMI Goal

To support the NMCP to build their capacity to conduct surveillance as a core malaria intervention, using high-quality data from both surveys and routine health information systems.

Do you propose expanding, contracting, or changing any SM&E activities? If so, why and what data did you use to arrive at that conclusion?

The proposed overall budget for SM&E in Mali PMI-Mali for FY2020 is smaller than the proposed FY2019 budget because PMI-Mali will not need to support a household survey using FY2020 funds. However, PMI-Mali proposes slight increases in SM&E support to routine surveillance in FY2020, including support for implementation of DHIS2, analysis of surveillance data and production of monthly malaria bulletins, and two years of support for a fellow in the advanced FETP program scheduled to begin in Mali in 2020 (described in more detail in Section 3E: Other Health Systems Strengthening). Mali has made good progress implementing DHIS2, which attained national coverage in 2018, with very high rates of reporting and with trends in geographic estimates of malaria incidence mirroring those of survey-derived malaria prevalence in 2018. Additional support may lead to increased reporting timeliness, higher data quality, and increased capacity to use data for decision-making.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

Which sources of data are available to inform estimates of intervention coverage, service availability and readiness, and morbidity and mortality?

Supporting Data

Figure A56. Data Source and Collection Activities 2015 - 2021

Data Source	Data Collection Activities	Year								
		2015	2016	2017	2018	2019	2020	2021	2022	2023
Household Surveys	Demographic Health Survey (DHS)				X					
	Malaria Indicator Survey (MIS)	X					(X)			
	Multiple Indicator Cluster Survey (MICS)	X								
	EPI survey									
Health Facility Surveys	Service Provision Assessment (SPA)									
	Service Availability Readiness Assessment (SARA) survey				X*					
	Other Health Facility Survey									
Other Surveys	EUV	X	X	X	X	X	(X)	(X)	(X)	(X)
	School-based Malaria Survey									
	Other (Knowledge, Attitudes and Practices Survey, Malaria Behavior Survey)									
	Other (Malaria Impact Evaluation)		X							
Malaria Surveillance and Routine System Support	Support to Parallel Malaria Surveillance System									
	Support to HMIS	X	X	X	X	X	(X)	(X)	(X)	(X)
	Support to Integrated Disease Surveillance and Response (IDSR)	X	X	X	X	X	(X)	(X)	(X)	(X)
	Other (Electronic Logistics Management Information System (eLMIS))			X	X	X	(X)	(X)	(X)	(X)
	Other (Malaria Rapid Reporting System)									

*Asterisk denotes non-PMI funded activities; x denotes completed activities and (x) denotes planned activities.

Conclusion

DHS and SARA surveys in 2018 have provided high-quality data to guide program activities and to corroborate findings obtained using routine data. An MIS is planned in 2020 to provide additional high-quality data in the near future. DHIS2 has been implemented nationally for the HMIS in Mali since 2018, and continued support will help improve the quality, utility, and use of the data it contains.

Key Question 2

What HMIS activities have been supported in your country? What current priorities will be supported with this MOP funding?

Supporting Data

Figure A57. HMIS-Supported Activities in Mali

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
Central Level					
Register, tools (e.g. checklists, indicator glossary), job aids (design, indicators, definition of data elements, data dictionary, system support)	X	X	X	X	X
Data quality assessments (separate from supervision – funding for travel to lower levels)	X	X	X	X	X
Program monitoring and technical assistance (funding for travel to lower levels)	X	X	X	X	X
Training (funding for central level to conduct training at lower levels, capacity building, i.e. on the job training for central level staff)	X	X	X	X	
Human Resources (secondment of person in NMCP for SM&E, office/team for SM&E)	X	X	X	X	
Data Use (analysis, interpretation, visualization (dashboards, bulletins, dissemination/feedback to lower levels, decision-making)	X	X	X	X	
Policy guidelines and coordination (updating policies, guidelines, supporting sub-committee meetings, supporting participation in sub-committee meetings)	X	X	X	X	X

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
External relations/Communications/Outreach (support travel to international meetings and publications)	X	X	X	X	X
Support to annual operational plans for national malaria program	X	X	X	X	X
Desk review to catch “logic errors system” (provide TA to catch logic errors)	X	X			
Admin 1 Level (Region/Province/State). PMI support in 3 regions while Global Fund supports activities in 3 regions.					
Registers (warehousing, printing, distribution)	X	X	X	X	X
Data quality assessments (separate from supervision – funding for travel to lower levels)	X	X	X	X	X
Program monitoring and technical assistance (funding for travel to lower levels)	X	X	X	X	X
Training (funding for Admin 2 staff to conduct training at lower levels, capacity building (i.e. on the job training for Admin 2 level staff)	X	X	X	X	X
Human Resources (secondment of person for malaria SM&E, office/team for SM&E)		X	X		
Data Use (analysis, interpretation, visualization (dashboards, bulletins), dissemination/feedback to lower levels, decision-making)		X	X	X	
Adaptation of national policy guidelines and coordination (adapting policies, guidelines, supporting sub-committee meetings, supporting participation in sub-committee meetings)		X	X	X	X
Adaptation of checklists and job-aides	X	X	X	X	X
Participation in national meetings (support for travel costs)	X	X	X	X	X
Support to Annual Operational Plans for Admin 1 Malaria Program					
Admin 2 Level (District)					

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
Data entry, summary, and transmission (training, re-training, computers, internet, tools)	X	X	X	X	X
Supervision (training, traveling, supervision tools/checklists, create/design system for organized/methodical supervision)	X	X	X	X	X
Data validation (data validation activities before monthly data submission - organize health facilities)	X	X	X	X	X
Monthly/Quarterly data quality review meetings (venue, meeting support)	X	X	X	X	X
Data Use (analysis, interpretation, visualization (i.e. dashboards), dissemination/feedback to facilities, decision-making)	X	X	X		
Human Resources (secondment of person for malaria SM&E, office/team for SM&E)					
Annual planning with Admin 1 (support travel)	X	X	X	X	X
Facility Level					
Data collection/entry, summary, and transmission (training, re-training, computers, internet, tools)	X	X	X	X	X
Supervision of CHWs (training, traveling, administering supervision tools/checklists of community health workers)	X	X	X	X	X
Data use (analysis, interpretation, visualization (dashboards), dissemination/feedback to CHWs, decision-making)	X	X	X	X	
Monthly/Quarterly data quality review meetings(support for travel)	X	X	X	X	X
Community Level					
Data collection/entry and transmission (training, re-training, tools)	X	X	X	X	X
Data use (analysis, interpretation, decision-making)					

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
Monthly/quarterly data quality review meetings (support for travel)	X	X	X	X	X

Conclusion

PMI, Global fund, UNICEF and many NGOs have contributed to strengthening HMIS and have been involved in data collection and management, supervision, training, and monthly or quarterly data review meetings. All malaria partners contributed computers and supported the expansion of internet access so that DHIS2 can function. Gaps include support for data use, particularly at peripheral levels.

Key Question 3

What are the outcomes of HMIS strengthening efforts?

Supporting Data

Figure A58. HMSI Strengthening Efforts

		2017	2018
Timeliness	% of reports received on time	25%	48%
Completeness	"Confirmed malaria cases for children under 5 years of age" was reported in X% of facility-months	93%	96%
Accuracy	Populate with most recent DQA data	N/A	84 - 99% (across diseases, per PRISM 2018)

Data sources: M-DIVE, PRISM report 2018

Conclusion

Reporting completeness for malaria data is high. Timeliness was approximately 50% in 2018, but this is an increase from 23% in 2017. Timeliness of reporting is difficult to achieve in Mali because of security and infrastructure challenges in northern Mali, but reporting timeliness also needs improvement in the southern regions in order for the data to be most useful.

Key Question 4

Are there any other considerations that impact your funding allocation in this category?

Supporting Data

Socio-political instability may hamper efforts to strengthen surveillance in the northern regions of Tombouctou, Kidal, Gao, and Mopti. Using FY2020 funds, PMI-Mali will also support an

FSN dedicated to management, analysis, and use of malaria data. It is anticipated that the incumbent will sit at the NMCP.

Conclusion

PMI-Mali will attempt to strengthen malaria surveillance and data use throughout the country but may need to consider instability and feasibility when targeting areas for SM&E activities.

3.C. SOCIAL AND BEHAVIORAL CHANGE (SBC)

NMCP Objective
<p>The National Malaria Control Program has developed a new five-year (2019-2023) Malaria Control Communication and Advocacy Plan with the financial and technical support of PMI., The vision of this communication and advocacy plan is “Malaria-free Mali, with a population sufficiently informed about malaria and adopting favorable behaviors to ensure prevention and early care, by 2030.”</p> <p>This Plan aims to harmonize the fight against malaria in Mali and strengthen communication channels regarding resource mobilization and knowledge and beliefs of the actors and service beneficiaries to affect behavior change and ownership of malaria interventions.</p>
NMCP Approach
<p>The malaria communication and advocacy plan is based on an approach commonly known as Strategic Communication. This approach integrates multiple communication activities into a coherent set of elements to better support the Program. Communication actors attempt to reach specific audiences by means of effective strategic communication interventions, tools, and channels adapted to the context of malaria control in Mali. These include:</p> <ul style="list-style-type: none"> • Interpersonal communication • Community mobilization • Social mobilization • Communication through media • Advocacy • Capacity strengthening <p>Following a recommendation of the Roll Back Malaria Communication Working Group, the Mali National Malaria Control Program created, with the support of its partners, an integrated Malaria Communication Working Group (in French: <i>Groupe de Travail Communication sur le Paludisme</i>, or GTCP). The main purpose of this working group is to ensure coordination among communication stakeholders, sharing of information, materials, and research findings in the fight against malaria, and supporting the implementation of the NMCP Malaria Communication and Advocacy Plan.</p>

The Communication Working Group has the following specific objectives and activities:

- Coordinating the implementation of the national advocacy
- Coordinating multimedia and multi-sectoral communication campaigns about malaria
- Advising the Ministry of Health and its technical and financial partners and providing them with tools needed to implement the World Malaria Strategic Framework
- Advocating for more financial resources to implement malaria communication interventions
- Monitoring and evaluating studies, research, and surveys before, during and after the implementation of communication activities
- Documenting and sharing success stories about malaria
- Contributing to strengthening collaboration among the various communication stakeholders.

PMI Objective in Support of NMCP

PMI-Mali's SBC-related objectives align well with those of the NMCP. Specifically, PMI-Mali would like to leverage SBC to increase uptake and efficiency of malaria-related interventions, while also increasing SBC capacity and sustainability within Mali.

PMI-Supported Recent Progress (Past 12-18 Months)

PMI works closely with the National Center for Information, Education, and Communication for Health (CНИЕCS), the MOH structure responsible for the centralized production of information, education, and communication materials and harmonization of SBC messages to develop and implement communication approaches and messaging. CНИЕCS also supports regions and districts to implement these community mobilization activities. PMI-funded activities are in the regions of Kayes, Koulikoro, Sikasso, Mopti, and Gao. PMI also supports implementation of district-level SBC for SMC using funds from the SMC budget in the 9 health districts in Segou and Mopti regions.

- During the past twelve months, PMI supported the development of develop the National Malaria Communication and Advocacy Plan for 2019 - 2023
- PMI, through its partners, developed a communication platform called *Jigisigi* that broadcasts voice messages and SMS via an interactive voice server. It has several platforms including malaria (IPTp uptake, SMC sensitization, sleeping under ITNs, etc.). PMI implementing partners and women's groups rolled out *jigisigi baroni*, delivering 1,487 sessions.
- Implementing partners reached 712 couples, pregnant women and mothers on Intermittent Preventive Therapy for pregnant women (IPTp), LLINs and care-seeking and treatment during house visits as part of the "*Jigisigi* Wedding Celebration" activities. "*Jigisigi* wedding party" targets newly married couples to help them approach the different stages of their life cycle together, with a package of information provided in the form of a booklet. During the wedding celebration, mayors and religious leaders share with the bride and groom a preview of the contents of the *jigisigi* wedding party booklet. Later on, the Community Health

Counselors (CC) visit the home of the couple to follow up on the use of the booklet, strengthening this discussion with counseling cards developed for this purpose.

- The Community Counselor takes advantage of these visits to discuss with the couple and / or family members the importance of use of ITNs.
- From July 1, 2019 to September 31, 2019 the CCs carried out 1,335 home visits to new couples as part of the Jigisigi Wedding Party follow-up activities. These activities are an important contribution to supporting couples in decision-making and attitudinal or behavioral reinforcement in the protection of pregnant women, children and families against malaria.

Other recent activities implemented by KJK with PMI financial support:

- Supported the meetings of the Malaria Communication Working Group
- Broadcast malaria in pregnancy *jigisigi jiri* programs 24 times in project intervention areas
- Strengthened the national technical working group on Malaria in Pregnancy
- Broadcast the existing radio microprogram on IPTp 5,000 times on community radios in 12 local languages, and broadcast the TV spot at the national level
- Sent 1,000 voice messages on IPTp, ITNs and malaria care-seeking and treatment during pregnancy by IVR (Interactive Voice Response) to pregnant women
- Sent 60,000 SMS messages on IPTp, ITNs, and malaria care-seeking and treatment during pregnancy
- Distributed 2,000 posters on the use of ITNs in the regions, health districts, health areas and communities
- Reached 8,254,793 people through TV broadcast of an SMC spot; 10,273 people through *Jigisigi Baroni* educational talks led by NGO partners, focused on using mosquito nets and taking SP during pregnancy; and 8,097 women through phone calls on IPTp with SP and the use of LLINs in Kayes, Koulikoro and Bamako.

PMI-Supported Planned Activities (*Next 12-18 Months Supported by Currently Available Funds*)

- Printing and disseminating the new NMCP SBCC five-year strategy
- Supporting the coordination of communication activities by the National Malaria Control Program Communication Working Group and its partners (government entities, NGOs, and other donors)
- Continuing SBC support for MIP, Case management, Vector Control (ITN and IRS), and SMC, specifically including:

- Supporting communication activities related to prevention of malaria in pregnancy, such seeking ANC early and completing four ANCs, which will contribute to higher coverage of IPTp4
- Supporting communication activities related to early care-seeking for malaria detection and appropriate treatment.

PMI Goal

Through the use of social and behavior change interventions and in alignment with a country’s national malaria control communication strategy, PMI supports the uptake and correct and consistent use of malaria interventions, thereby improving the overall quality of malaria control efforts that will contribute to reductions in malaria morbidity and mortality.

Do you propose expanding, contracting, or changing any SBC activities? If so, why and what data did you use to arrive at that conclusion?

To bolster efforts to improve IPTp coverage (including via increasing early ANC attendance), early care-seeking for fever, and uptake of SMC and the next-generation ITNs that will be distributed in Sikasso Region, we propose increasing the SBC budget by ~70% over the original FY 2019 allocations. PMI-Mali also proposes reprogramming the FY 2019 SBC budget to increase the SBC allocations. See responses to key questions below for further justification.

Another major change from FY 2019-approved activities is that the mechanism which implemented SBC activities in the last five years is ending in December 2019, and there is no new mechanism to replace it. However, the mechanisms supporting vector control (IRS, ITN), MIP, and case management will implement SBC activities for those components.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

What behaviors is PMI proposing to prioritize through its SBC programming? Will support be geographically targeted or at national scale? What data support this prioritization?

Supporting Data

According to 2018 DHS, only 36 percent of initial ANC visits occur during the first trimester. This is due to various barriers, including financial, cultural, and health workers’ behavior. We believe that SBC will contribute to overcoming those barriers. In addition, additional sensitization training may contribute to improving health workers’ behavior towards pregnant women during ANC visits. We hope that the new Mali Health Reform, which recommends that pregnant women get free access to all health services, will address the financial barriers to care-seeking during pregnancy.

The SMC monitoring activities conducted by one of PMI implementing partners and Global Fund in 2019 revealed that, according to caregivers, 96% of children eligible for SMC took all three doses of malaria drugs. However, verification using SMC cards and observing drug blisters indicated that only 46% of children took the full course of drugs.

Figure A59. Difficulties Reported by Parents in Completing SMC Rounds at Home, 2019 (%)

Region	Forgot to give doses at the correct time	Medication was difficult to follow	Child Refused	Vomited	Other
Kayes	14	0	71	55	16
Koulikoro	92	5	62	50	5
Mopti	6	7	27	67	3
Segou	11	0	79	12	4
Sikasso	44	44	77	76	18

(data source: NMCP presentation of results of independent monitoring of SMC campaign, Jul - Aug 2019, N=6400)

Failure to complete rounds of SMC may increase the child’s risk for malaria, contribute to drug resistance, and lead to inappropriate use of the retained SMC drugs. We believe that SMC adherence can be improved nationally through SBC messages.

Additionally, Sikasso Region, which had the highest malaria prevalence (30%) in Mali in DHS2018 and had the highest incidence in 2018 according to data in DHIS2, will receive ~900,000 next-generation ITNs via mass campaign and additional next-generation ITNs via routine distribution in 2020. SBC activities regarding acceptance and use of these new ITNs, along with early care-seeking for fever, will be targeted to this region.

Conclusion

Low rates of ANC attendance during the first trimester and weak or incomplete administration of second and third doses of SMC drugs can be improved through SBC. Introduction of next-generation ITNs in one region should be supported with SBC activities.

Figure A60. Prioritized Behaviors with FY2020 Funds

Behavior	Target Population	Geographic Focus	Justification
Increased early and regular ANC attendance by pregnant women	Pregnant women	Nationwide, particularly in rural areas	To increase early and regular ANC attendance which in turn will lead to the increase of IPTp3+. The later that women come for first ANC, the harder it is to reach IPTp 3+. so early and regular attendance will provide more opportunities for IPTp administration.
Improved adherence by caregivers to SMC guidelines.	Care providers of children	PMI SMC focus zones (Mopti and Segou)	Strong SBC messages via interpersonal communication and mass media messages targeting care providers will contribute to increasing the uptake of second and third dose of SMC

Behavior	Target Population	Geographic Focus	Justification
	under five years		drugs administered at home, and return for additional rounds of SMC.
Uptake of next-generation ITNs	All	Sikasso	Approximately half the population of Sikasso Region will receive next-generation ITNs in 2020. Because these have not been used previously in Mali and they are a large investment, their introduction should be accompanied by appropriate SBC.

Key Question 2

Given the priority behaviors identified, what data are available to better understand the factors influencing low uptake? What are the behavioral determinants of the prioritized behaviors? Are there gaps in understanding the barriers to uptake?

Supporting Data

Figure A61. Summary of Determinants and Gaps for FY2020 Prioritized Behaviors

Behavior	Key Facilitators	Key Barriers	Knowledge Gaps
Increased early ANC attendance by pregnant women	Providing information about the benefits of early ANC attendance and the disadvantages of late ANC visits	Cultural barriers, financial barriers, difficult access to health facilities due to distance and road conditions	Traditional leaders, decision-makers, head of families may not be aware of the benefits of early ANC. Women and families may not be aware of the new Government of Mali Health Reform, which guarantees free health services for all pregnant women and children under five.
Correct administration of second and third doses of SMC drugs	Close supervision, strong SBC messages via interpersonal communication and mass media messages targeting caregivers. Availability of different communication channels such as local radio, new technologies, pictorial instructions on packaging, reminders by health providers. Strongly favorable parental perceptions of SMC.	<ul style="list-style-type: none"> • Low educational level of care providers • Child refusing medications • Caregivers saving medications for later use or use with other children 	Most effective methods of encouraging children to take medications or helping care-givers understand medication schedule in these settings

Behavior	Key Facilitators	Key Barriers	Knowledge Gaps
Return for 3rd and 4th rounds of SMC	Strongly favorable parental perceptions of SMC.	<ul style="list-style-type: none"> • Low educational level of care providers • Lack of recognition that children need three doses every month 	Most effective methods of informing caregivers that effective prevention requires a dose every month.
Use of next-generation ITNs	Strong existing culture of net use in Mali	Mass distribution of standard ITNs in Sikasso Region in 2018 may cause confusion about which ITN to use/decrease initial uptake of next-generation ITNs there	Next-generation ITNs have not been distributed in Mali previously and recipient knowledge, attitudes, and beliefs are unknown.

Conclusion

Barriers to and facilitators of the above behaviors are fairly well understood in Mali, and SBC activities supported by FY 2020 funds will target these. Some formative work may be required to best target SBC activities related to next-generation ITNs.

Key Question 3

What activities are needed to bolster the country's capacity for SBC? Are these activities needed at the national or sub-national level?

Supporting Data

A recent study conducted by an independent consultant, entitled « *Analyse situationnelle de la mise en œuvre du Plan de Communication et de Plaidoyer en matière de lutte contre le paludisme 2014-2018* » (Situational analysis of the implementation of the Communication and Advocacy Plan for the fight against malaria - 2014-2018) revealed a number of issues confronting the country's communication capacities, including :

- Limited Government financial resources to fund communication and advocacy activities
- Lack of dynamism of the Malaria Communication Working Group, preventing it from holding regular meetings to make appropriate decisions involving all the malaria communication stakeholders
- Lack of coordination between two government communication entities (CНИЕCS and NMCP Communication Division) at the central level and between health and social

development actors at the operational level in conducting malaria communication activities

- Insecurity and inter-community troubles hampering communication activities

The same study also revealed some strong areas for Mali SBC:

- Strong community involvement in communication activities
- Availability of communication media (posters, national guidelines, etc.)
- Support from local partners and involvement of local NGOs at the community level
- Involvement of local radio stations in the dissemination of messages local languages targeting pregnant women
- Community involvement in raising awareness during SMC campaigns through community health workers, religious leaders, and traditional communicators (public criers)
- Availability of advocacy tools (guidelines, modules, epidemiological data, reports)
- Existence of human resources competent in advocacy
- Private sector that is conducive to SBC activities
- Existence of a dynamic civil society that adheres to activities and other actors in terms of local communication
- Existence of the Malaria Communication Working Group within the National Malaria Control Program,
- Organization of supervision to monitor activities at all levels
- Existence of a district-level consultation framework (from the preparatory phase to the restitution phase) of the campaigns
- Transfer of state financial resources to communities to fund malaria control activities

Conclusion

Mali has structures in place to coordinate and disseminate SBC activities, and has a number of available SBC tools. Efforts to increase the functionality of the SBC coordinating bodies, and additional funding, would bolster the impact of SBC in Mali; thus, some funds will support National Center for Information, Education, and Communication for Health (CNIECS) capacity to develop and implement communications approaches and messaging malaria prevention and control. PMI-Mali proposes increases in SBC allocations in FY 2020 to try to accelerate progress related to some key behaviors.

Key Question 4

Are there any other considerations that impact your funding allocation in this category?

Supporting Data

- Regions not covered by PMI are supported by the Global Fund and the Ministry of Health of Mali.
- Additional challenges for SBC implementation in Mali include
 - Weak government contributions to SBC, which does not ensure the sustainability of the strategy after partners' withdrawal
 - Disparity in the remuneration / incentivization of relays (community health communicators) and Community Health Officers
 - Poor involvement of local authorities in leveraging funds for SBC activities
 - Insufficient knowledge/and or poor enforcement of the decrees/laws establishing free malaria treatment for children under 5 years;
 - Insufficient knowledge of decentralized services officers with respect to communication and advocacy in the fight against malaria;
 - Insufficient monitoring of communication activities and supervision of staff tasked with communications activities.

Conclusion

PMI-Mali's unique, integrated SBC project, KJK, will close in December 2019. Each key malaria activity (SMC, Case Management, MIP, and IRS) will have dedicated funds to implement SBC activities. We propose increases across PMI-Mali's SBC budget to help address the above general challenges, while also prioritizing some key malaria-related behaviors.

3.D. PROGRAM EVALUATION AND OPERATIONAL RESEARCH

NMCP objective
To utilize OR to test the best approaches to reduce the continued high burden of malaria in Mali.
NMCP approach
The NMCP does not have a research agenda per se, but works with the robust research community in Mali to develop projects and studies that contribute to better understanding of the etiology and transmission of malaria, vector dynamics, and intervention approaches. The research community includes the NIH-funded International Center of Excellence for Malaria Research (ICEMR) located at the University of Bamako, and the Laboratory of Biological and Molecular Analysis (LBMA), as well as other partners and donors.

PMI objective, in support of NMCP
PMI supports OR activities that are in line with PMI’s overall OR strategy and contribute to the improvement of our interventions in Mali.
PMI-supported recent progress (past ~12-18 months)
<ul style="list-style-type: none"> • The study on the Optimal Package of MIP interventions to improve MIP uptake (ongoing): This study is funded with FY16 funds but was delayed due to mechanism challenges. In the past year, we launched the study with MRTC and as of this MOP’s deadline, the training of field teams had begun. • SMC in children <10 years old in Kita District: The data collection phase of this study concluded in Dec. 2018. Preliminary results were presented at a recent WHO meeting on SMC and an abstract was accepted to ASTMH in 2019. A draft report and manuscript are under review. • A manuscript on cost implications for SMC, based on data from an older OR study (2014) was developed by MRTC and is currently under review at CDC.
PMI-supported planned activities (next ~12-18 months, supported by currently available funds)
PMI is currently supporting on-going OR on the Optimal Package of MIP interventions that just began in 2019 (using funds from 2016 that were delayed). This study will run for 2 years and contribute to the mitigation of barriers to IPTp uptake at both the level of the provider and pregnant women.

PMI Goal
PMI will conduct OR/PE that helps to evaluate coverage of population at-risk, quality of intervention(s), and efficiency in intervention delivery, or study reducing remaining malaria transmission and disease burden, test effectiveness of new or evolved priority interventions and strategies, or explore new metrics and mechanisms to assess the impact of interventions. Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Do you propose expanding, contracting, or changing any program evaluation and operational research activities? If so, why and what data did you use to arrive at that conclusion?
We do not propose changes to on-going OR funded in previous MOPs. We propose a new operational research study to address high malaria burden in one region (Sikasso) in the face of SMC for children less than 5 years old and high ITN coverage and use, but high rates of insecticide resistance. Please see the response to Key Question 1 below for more information about the proposed study.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

Have technical challenges or operational bottlenecks that require operations research or program evaluation been identified in consultation with the NMCP? How have they been prioritized?

Supporting Data

Mali has a very rich research environment. The University of Bamako is an NIH-funded ICMER site and multiple departments of the University conduct research through NIH and other donor funding. A review on clinicaltrials.gov using the key word ‘malaria’ and ‘Mali’ yielded 76 studies ranging from clinical trials of vaccines and new drug regimens to more programmatic applications such as SMC using DP. Due to the long list of non-PMI funded studies we have left them off this MOP (they can be referenced at clinicaltrials.gov).

Figure A62. PE/OR Currently Conducted in Country with USG, GF, Multilaterals or Other Major Donors.

Source of Funding	Implementing institution	Research Question/Topic	Current status/timeline
NIH/ICMER	MRTC/University of Bamako	Multiple	Various
NIH	MRTC/University of Bamako	Seasonal Malaria Chemoprevention With Dihydroartemisinin Piperazine vs. Sulfadoxine-pyrimethamine+Amodiaquine	Recruiting
NIH	MRTC	Optimization of SMC Delivery	Recruiting

Conclusion

PMI is proposing an OR study to look at using one round of MDA followed by SMC to extend the duration of malaria chemo-prevention and potentially reduce the number of SMC rounds with the ultimate goal of increased burden reduction in high burden areas. This activity was prioritized for PMI support as an extension of our body of OR work around the mechanisms of SMC in country and in response to NMCP concerns about high malaria burden in some regions despite high coverage and use of ITNs and national SMC for children less than 5 years old. Next steps would include development of a concept note to share with stakeholders for buy-in, followed by protocol development and initiation of the OR approval process within PMI.

Key Question 2

In the technical areas covered above, are there specific issues in any of the intervention areas that merit further exploration, in anticipation of establishing intervention strategies that are or could become available in the future that could be applied?

Supporting Data

PMI is interested in supporting further OR around SMC due to the importance of that intervention for the NMCP in Mali and the interest in determining whether further impact could be achieved in high burden areas through the addition of MDA.

Conclusion

If this study produces positive results, and the cost analysis indicates feasibility, the addition of MDA in targeted high-burden areas of the country could help to mitigate the continued high levels of transmission in the region.

Key Question 3

Are there any other considerations that impact your funding allocation in this category?

Supporting Data

The funding allocation will include the operational costs of mounting the study plus the procurement of MDA medications (which are not currently in use in Mali). The SMC components are already covered by SMC funding from PMI and other partners.

Conclusion

If this study produces positive results, and the cost analysis indicates feasibility, the addition of MDA in targeted high-burden areas of the country could help to mitigate the continued high levels of transmission in the region.

3.E. OTHER HEALTH SYSTEMS STRENGTHENING

NMCP objectives
The objectives of the National Strategic Malaria Control Plan 2018-2022 are to reduce malaria morbidity and mortality and to coordinate the planning, implementation and evaluation activities of all stakeholders at all levels including the public and private sectors, NGOs, research institutions, funding partners.
NMCP approach
The NMCP approach for reducing malaria morbidity and mortality is to target malaria prevention and control interventions according to the epidemiological and entomological characteristics of different zones. The NMCP needs accurate epidemiological, entomological and climate data to map these zones in order to plan, implement and monitor these targeted interventions for reducing malaria

incidence and mortality. The MOH has a field epidemiology and laboratory training program (FELTP) and has been conducting frontline and intermediate training since 2014. The first cohort of the national two FELTP will begin their training in October 2020. To date, the frontline trainees have been providing useful district level epidemiologic data on malaria without any support from PMI. The Minister for Health and the NMCP Director have requested that PMI support at least one FELTP per year who will focus on malaria epidemiology.

The NMCP approach for strengthening program coordination and management at all levels of the health system includes interventions to improve program management; mobilize additional resources; improve coordination with the NMCP across all levels; strengthen the NMCP organizational structure; improve the technical capacity of NMCP personnel; strengthen planning, implementation, and monitoring and evaluation; and improve coordination of stakeholders.

PMI objective, in support of NMCP Infrastructure

PMI builds the technical and managerial capacity of the NMCP. PMI will also support the National Laboratory in its role ensuring the quality of medications in the country. PMI will also provide support to district-level staff for the FELTP program.

PMI-supported recent progress (past ~12-18 months)

NMCP has a new building and PMI contributed with basic office equipment such as tables, chairs, computers (and supplies), air conditioner for the conference room, etc. This will allow them to work in optimal conditions. NMCP staff attended several international technical meetings, workshops, etc., with PMI support. They also attended and facilitated various trainings and supervisions at district and regional levels.

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

- Support to strengthen the national laboratory to do quality control testing of antimalarial medications
- Support for FELTP frontline training
- Support to NMCP staff for professional travel, supervision, etc.

PMI Goal

PMI's goal is to build the technical and managerial capacity of the NMCP and its affiliated institutions.

Key Question 1

How might socio-political insecurity in Mali impact efforts to build the NMCP's technical and managerial capacity?

Supporting Data

The major challenge in Mali is political insecurity, especially in the north, which has remained following the 2012 political crisis. Due to the insecurity, PMI does not directly implement activities in the 4 regions of the north but does provide essential malaria commodities and technical assistance to partners and the government who are providing services in the area. Occasionally the insecurity issues occur further south, disrupting activities in the Mopti and Segou regions. PMI works closely with the NMCP to ensure that malaria programming reaches all regions of the country through a network of partners.

Conclusion

Despite the insecurity issues, the NMCP has continued to provide strong leadership for malaria control and the country has made continued progress as evidenced by the nationwide decline in parasitemia from 47% among children under 5 years old in 2012 to 19% in 2018.

Key Question 2

Are there any other considerations that impact your funding allocation in this category?

Supporting Data

Not applicable.

Conclusion

Not applicable

ANNEX B: COUNTRY PROGRAM INVENTORY

The MOP seeks to facilitate a consultative, collaborative process between PMI, the NMCP, and other partners, where relevant. This section outlines a high-level program inventory along key intervention areas, and is intended to structure discussions around the relative strengths and challenges facing a program, as well as prioritization and opportunities to drive catalytic impact with specific investments.

Key:

Example score

Figure B1. Category: Vector Control

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
Entomological Monitoring	Insecticide Resistance monitoring	No insecticide resistance monitoring conducted	Limited insecticide resistance monitoring conducted on an ad-hoc basis	Insecticide Resistance monitoring conducted on an annual basis in a limited number of sites, not covering all administrative units. Occasional monitoring of molecular mechanisms	Insecticide resistance monitoring conducted in a greater number of sites on an annual basis with some collaboration with other partners, routine monitoring of some resistance mechanisms	Regular high quality insecticide resistance monitoring done in multiple sites per administrative division, consideration of molecular mechanisms and bioassay data, collaboration with other partners and NMCP
	Insectary	No functioning insectaries in country	Insectary present, but frequent ruptures in rearing and contamination of strains, frequent challenges in meeting needs	Insectary present, full-time staff present, some capacity for strain verification, sometimes challenges to get enough mosquitoes, occasional contamination	One or more insectary present, regular verification, rare challenges in getting sufficient mosquitoes, some capacity for strain verification	Highly functioning insectaries with verification of strains, capacity for rearing wild strains, quality controls in place
	Data-based vector control decision making	No consideration of entomological data when making decisions	Limited review of data, reliance on outdated data, uncoordinated analysis of data with limited collaboration with partners	Irregular and incomplete review of data from multiple partners, sometimes in collaboration with research and funding partners	Collaborative but irregular review of entomological data, sometimes providing timely evidence for decisions	Collaborative regular review of entomological data from multiple sources when making decisions about vector control
	Vector bionomics monitoring or research	No research or longitudinal monitoring done in country	Limited longitudinal monitoring and research done in country	Regular vector bionomics monitoring, and vector control research done in country, but generally not having an important role in decision making	Regular vector bionomics and vector control research conducted in country but not sufficient to respond to all major needs of the national program	Regular monitoring driven by program priorities conducted alongside research done in country to provide timely data on the best malaria vector control
	Institutionalization of funding	No resources	Only supported by external partners, no host government funding	Some host country government funding	>50% funded by host country government	Fully funded by host country government

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
ITNs	Consistent distribution channels, in accordance with national strategy	Infrequent campaigns with no continuous distribution	Regular (e.g., every 3 years) campaigns, no continuous distribution	Regular campaigns, inconsistent continuous distribution	Regular campaigns, plus at least one well-managed continuous distribution channel	Regular, well- executed campaigns and well-managed continuous distribution channels
	Regular supervision of routine ITN distribution (e.g. HFs)	No HFs regularly supervised in ITN distribution	0-25% of HFs regularly supervised in ITN distribution	25-50% of HFs regularly supervised in ITN distribution	50-75% of HFs regularly supervised in ITN distribution	75-100% of HFs regularly supervised in ITN distribution
	ITN distribution reporting capabilities	Quantities of ITNs distributed not reported at all into LMIS (or other system)	Some quantities of ITNs distributed reported routinely	Some quantities of ITNs distributed reported routinely but cannot be disaggregated by channel	Quantities of ITNs distributed reported routinely and disaggregated by channel	All ITNs distributed captured routinely, disaggregated, and reported electronically
	Capacity to use data to appropriately target and rotate new types of nets	N/A	No capacity	Limited capacity	Some capacity	Good capacity
IRS	Host country government's IRS implementation capacity	N/A, no host country government implemented spray campaign	Host country government has very limited capacity to implement minor aspects of spray campaign	Host country government has capacity to implement some aspects of spray campaign	Host country government has capacity to implement most aspects of spray campaign	Host country government implements independent spray campaign
	Institutionalization of funding	N/A, no IRS conducted in country	No host country government funding, only supported by external sources (e.g. PMI, GF, mining companies)	Limited host country government funding in addition to external sources	>50% funded by host country government in addition to external sources	Fully funded by host country government, no external sources
	Coverage of Government-Implemented Spray Campaign	N/A, no government-implemented spray campaign	Spray coverage not reported	85+% coverage in some government-sprayed areas	85+% coverage in most government-sprayed areas	85+% coverage in all government-sprayed areas

Figure B2. Category: Case Management

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
Community-based CM, if in national strategy	Coverage of CHWs trained in and providing CM (geographic or numerical target)	No CHWs conducting CM	0-25% of national target met	25-50% of national target met	50-75% of national target met	75-100% of national target met
	Regular supervision of CHWs in CM (regular defined as per national QA/QC guidelines)	No CHWs regularly supervised in CM	0-25% of CHWs regularly supervised in CM	25-50% of CHWs regularly supervised in CM	50-75% of CHWs regularly supervised in CM	75-100% of CHWs regularly supervised in CM
	CHW reporting capabilities	CHW-managed cases not reported into HMIS	Some CHW-managed cases routinely reported into HMIS	Cases routinely reported into HMIS but cannot be disaggregated from HF-reported cases	Cases routinely reported into HMIS and can be disaggregated from HF-reported cases	All CHW case data routinely captured and reported electronically
	Institutionalization of funding (salaries and/or other support)	No resources	Only supported by external partners, no host government funding	Some host country government funding	>50% funded by host country government	Fully funded by host country government
Facility based CM	Access to HF-based care (within 5 km of a health facility or as per national definition)	0-20% of population has access to HF	20-40% of population has access to HF	40-60% of population has access to HF	60-80% of population has access to HF	>80% of population has access to HF
	Regular* supervision of public HFs in CM	No HFs regularly supervised in CM	0-25% of HFs regularly supervised in CM	25-50% of HFs regularly supervised in CM	50-75% of HFs regularly supervised in CM	75-100% of HFs regularly supervised in CM
	Drug resistance monitoring	No TES performed in last 3 years	TES performed in last 3 years but results not available	Recent TES results available (within last 3 years) but no training in molecular testing	Recent TES results available (within last 3 years) and in-country staff trained in molecular testing	Recent TES results available (within last 3 years) and in-country capability for molecular testing

Figure B3. Category: Drug-Based Prevention

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
SMC (where applicable)	Geographic scope	No eligible districts receiving SMC		50% eligible districts receiving SMC		All eligible districts receiving SMC
	Coverage in targeted areas (% of eligible children 3-59 months who received complete SMC courses for all 4 rounds)	<60%	60-69%	70-79%	80-89%	90%+
	Institutionalization of funding	No resources	Only supported by external partners, no host government funding	Some host country government funding	>50% funded by host country government	Fully funded by host country government
MIP	National policy exists for malaria prevention in pregnancy	No policy	Policy exists but is not comprehensive (does not cover all aspects of MIP: ITN, IPTp and case management)	Comprehensive policy exists for prevention (ITNs, IPTp) and case management but not all WHO recommendations are included	Policy meets current WHO recommended MIP prevention	Comprehensive, WHO-aligned policy is actively implemented
	Country policy adoption/adaptation of ANC guidelines with at least 4 recommended contacts	No policy	Country has started discussions and consultations for adopting the new ANC guidelines and recommendations	Country has policy specifying ANC contacts but no provision for early delivery of IPTp and is not able to systematically track ANC visits in HMIS	Country policy specifies ANC contacts and has provision for delivery of IPTp at 13-16 weeks but cannot track all ANC visits in HMIS	Country policy specifies the number of contacts to be delivered during pregnancy and has a provision for delivery of IPTp at 13-16 weeks and is able to track ANC visits in HMIS.
	National MIP working group established and coordinating effectively	No working group established	Working group formed and meets on an ad hoc basis, TORs are established	Working group engages in regular coordination but does not have mechanisms to ensure programmatic integration across technical areas	Working group coordinates at the national level only with Malaria and Maternal Health and has limited mechanisms for ensuring programmatic integration across technical areas	Working group engages in regular coordination at national and sub-national level with Malaria and Maternal Health and has mechanisms to ensure programmatic integration across technical areas.

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
Supportive MIP supervision conducted	No HFs regularly supervised in MIP	0-25% of HFs regularly supervised in MIP	25-50% of HFs regularly supervised in MIP	50-75% of HFs regularly supervised in MIP	75-100% of HFs regularly supervised in MIP	
Routine SP resistance monitoring via biomarkers conducted	No SP resistance monitoring conducted	SP resistance monitoring conducted in the last 6-10 years	SP resistance monitoring conducted in the last year 4-5 years	SP resistance monitoring conducted in the last year 3 years	SP resistance monitoring conducted in the last 3 years and results published or being published.	

Figure B4. Category: Supply Chain

Activity	Metrics/Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
Supply Chain	Forecasting and Procurement Planning	<p>Ad hoc forecasting based on poor, inadequate, or inaccessible data</p> <p>Insufficient skills for selecting and implementing appropriate forecasting methodologies.</p> <p>Procurement plans are not developed from forecasts</p> <p>No coordination among procurers</p>	<p>Annual forecasting and supply planning done but is based on poor, inadequate, or inaccessible data</p> <p>Locally based skills in quantification are developing</p> <p>Review of procurement plans is irregular.</p> <p>Coordination among procurers is limited</p>	<p>Annual forecasts incorporate service and/or/consumption data</p> <p>Supply plans updated semi-annually and incorporate review/revisions of available funding</p> <p>Coordinated procurement planning done at the national level (and regional level, if the health system is decentralized) and among procurers</p>	<p>Semi-annual forecasts incorporate service and/or/consumption data, account for seasonality</p> <p>Supply plans updated quarterly and incorporate review/revisions of available funding</p> <p>Coordinated procurement planning done at the national level (and regional level, if the health system is decentralized). Identified commodity gaps effectively communicated to stakeholders for purposes of resource mobilization</p>	<p>Near real-time demand/consumption, enhanced with additional programmatic contributions, drives monthly forecasting</p> <p>Forecasting and supply planning-specific software used and outputs visible across networks.</p> <p>Supply plans updated monthly and incorporate review/revisions of available funding</p> <p>Coordinated procurement planning done at the national level (and regional level, if the health system is decentralized). Identified commodity gaps effectively communicated to stakeholders for purposes of</p>

Activity	Metrics/Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
						resource mobilization. Outputs shared through global platforms
	Warehousing/Storage	<p>Quality of infrastructure and operations at all stock holding levels (Central, Sub-central/facility) compromises ability to ensure commodities are adequately protected from damage, deterioration and loss.</p> <p>Unable to locate stock by batch in central/mid-level stores/warehouses.</p>	<p>Quality of infrastructure and operations in at least one stock holding level (Central, Sub-central/facility) ensures that commodities are adequately protected from damage, deterioration and loss.</p> <p>Paper-based inventory management system.</p> <p>No SOPs.</p>	<p>Quality of infrastructure and operations in at least two stock holding levels (Central, Sub-central/SDP) ensures that commodities are adequately protected from damage, deterioration and loss. Warehousing SOPs exist. Able to track inventory level with central level WMS but information is not routinely shared across warehouses.</p> <p>Some maintenance occurring</p> <p>Limited ability to scale storage capacity</p>	<p>Quality of infrastructure and operations at all stock holding levels (Central, Sub-central/SDP) ensures that commodities are adequately protected from damage, deterioration and loss</p> <p>Stock data is digitized in at least two stock holding levels</p> <p>Some routine maintenance occurring</p> <p>Storage capacity scaled through contracting of third party logistics providers (3PLs)</p>	<p>Quality of infrastructure and operations at all stock holding levels (Central, Sub-central/SDP) ensures that commodities are adequately protected from damage, deterioration and loss.</p> <p>Storage infrastructure and operations adhere to Good Warehousing Practices and/ or meet in-country compliance standards</p> <p>Stock data is digitized at all stock holding levels and near real-time stock visibility available across networks</p> <p>Routine and predictive maintenance budgeted for and institutionalized</p> <p>Storage capacity is logically located and can be effectively scaled with 3PLs</p>
	Routine distribution/ resupply between stock holding levels	<p>No routine requisition and resupply schedule between stock holding levels</p> <p>No resources routinely available</p>	<p>Routine requisition and resupply between at least two stock holding levels according to a schedule</p>	<p>Routine resupply between all stock holding levels according to a schedule</p> <p>Allocated resources for transportation from higher to lower stock</p>	<p>Routine resupply between all stock holding levels according to a schedule shared with all levels and informed by accurate demand signals</p>	<p>Routine resupply between all stock holding levels according to a schedule shared with all levels and informed by accurate, timely, demand signals</p> <p>Robust emergency and</p>

Activity	Metrics/Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
		and allocated for transportation from higher to lower stock holding levels	Resources for transportation from higher to lower stock holding levels provided on ad hoc basis	holding levels provided on an irregular basis and resupply often achieved through unplanned means Resupply performance monitored post-activity	Allocated resources for transportation provided on a regular basis and augmented with 3PLs Resupply performance monitored real-time	inter-facility resupply mechanisms are in place Allocated resources for transportation available internally or outsourced with 3PLs. Resupply transaction data is digitized for all stock transfers Near real-time visibility into upstream and downstream activities Resupply operations adhere to GDP and or meet in-country compliance standards for maintaining quality during distribution
	Logistics Management Information System	System to aggregate, analyze, validate and display data (from all levels of the logistics system) that can be used to make logistics decisions and manage the supply chain not institutionalized or followed No facility level records or not maintained. Low reporting rates. No visibility into	Stand-alone, program specific LMIS processes and structures defined but no formal or ongoing monitoring or measurement protocol exists. Some visibility of facility level inventory and consumption, low reporting rates, mostly paper-based	The country has documented LMIS processes and structures. The structures are functional. Metrics for performance monitoring, quality improvement, and evaluation are systematically used. Migration of data collection and reporting from a paper system to an electronic system at the district level and above. A documented mechanism is in place	Government and stakeholders use the national LMIS systems for key performance monitoring and follow standard practices. Facility inventory and consumption data is digital at facility level, upstream data available to facilities, System alerts for low stock/expiry, use of master product list and master facility list Interoperability with	Near real time visibility into inventory and consumption data at all levels, data from multiple systems feed into common platform/control tower (automated process), predictive analytics. The government and stakeholders routinely review interoperability activities and modify them to adapt to changing conditions. Compliance with standards for data exchange,

Activity	Metrics/Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
		CHW supplies. No visibility by central level on facilities and none by facility level on central level.		for maintaining data quality throughout the data supply chain.	other information systems (e.g., warehouse management, medical records, laboratory management, enterprise resource planning systems, and health information management systems)	messaging, and security is regularly reviewed. The regulatory framework is reviewed and updated to reflect best practices for data exchange, messaging, and systems security.
	Regulatory, Policy and Governance	<p>Legal basis to enable a medicines (and related health commodities - e.g., devices, vaccines, etc.) regulatory agency to function is absent or inappropriate</p> <p>Formal organizational structure regarding in-country stakeholders and relevant agencies to whom authority is delegated, is absent or inadequate (e.g., up-to-date organogram of MOH).</p> <p>Human and financial capacity to enable</p>	<p>Medicines framework exists and is sufficient to support basic regulatory functions including clinical dossier review (licensing) and marketing authorization with registration.</p> <p>Documented domestic financial support to enable regulatory activities-including human resources</p> <p>Approved supply chain strategic plan but not updated recently.</p> <p>Poorly implemented strategic plan</p>	<p>All SDP levels have in place policies that address STG, quality assurance and HR.</p> <p>Management policies for the supply chain system are in place at the MOH level.</p> <p>Policy and strategic leadership is not always translated into robust implementation plans, and supportive supervision, capacity building and guidance to managers within the system.</p> <p>No consistent approach to pharmacovigilance or a standard reporting structure for pharmacovigilance events</p> <p>Overall quality management system in place to support interface</p>	<p>Strong policy and strategic leadership by government, with firm grasp of budgets and financial sustainability</p> <p>Robust implementation plans, and supportive supervision, capacity building and guidance to managers within the system.</p> <p>Regulatory and policy bodies in alignment to support quality product availability</p> <p>National and standardized Pharmacovigilance or a standard reporting structure for pharmacovigilance events in place, not fully functional.</p> <p>Approved (and up to date) supply chain strategic plan</p>	<p>The MOH leads strategic functions such as, policy formulation, quality assurance and overseeing the funds required for policy implementation.</p> <p>Ability to ensure product quality, automated drug registration process, clear/transparent importation process, robust post-market surveillance system and, track and trace regulations developed and/or in the process of implementation.</p> <p>Approved (and up to date) supply chain strategic plan (contains clear roles and responsibilities, stakeholder mapping, costs). Includes risk mitigation plan.</p>

Activity	Metrics/Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	regulatory functionality, weak or absent No approved supply chain strategic plan			of product licensing, registration, manufacturing, post-marketing surveillance. Approved (and up to date) supply chain strategic plan. Partially implemented	(contains clear roles and responsibilities, stakeholder mapping, costs).	

Figure B5. Category: Strategic Information

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
Data, Surveillance, Monitoring & Evaluation	Overall HMIS reporting rate (CY 2018)	<60%	60-69%	70-79%	80-89%	90%+
	Element specific reporting rate: “Confirmed malaria cases among children under 5” (CY 2018)	<60%	60-69%	70-79%	80-89%	90%+
	HMIS data quality assurance and quality control	Few standards exist for data collection, assembly, & analysis. Data quality reviews and audits are ad hoc for specific data needs. No data-quality assurance plan and national coordinating body exist.	Standards used for data collection, assembly & analysis in limited settings. Some electronic tools used for data quality review and audit. Data-quality assurance plan is available.	Standards defined and implemented for data collection, assembly, analysis, and used nationally. Data quality reviews and audits scheduled and include a remediation process to address identified issues. SM&E staff are seconded to NMCP	Data reviews and audits are integrated in strategic plans, conducted on a regular schedule. Regular meetings held by national data-quality governing body; issues identified are addressed through an established remediation process.	Continuous review and auditing through automated and manual processes, to ensure defined levels of data quality. Data quality metrics are used for continuous improvement. The data-quality assurance plan is reviewed periodically by a national coordinating body and appropriate stakeholders.

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	Reporting Systems	Data collection tools are not standard, and procedures are not consistently followed; data are collected and stored in an unstructured format. NMCP does not have access to malaria data from HMIS.	Data systems support longitudinal health data (clinical, surveillance, M&E) in limited settings. The data are available for centrally mandated reporting. A parallel malaria reporting system may exist.	Most data platforms/applications ensure data availability at all levels for decision support and M&E for authorized users. No parallel malaria reporting system exists. NMCP has access to malaria data from HMIS.	The data systems in use ensure reliable and appropriate access to data at all levels for authorized users. Changes in reporting requirements are accommodated with minimal disruption to data availability. Data systems support secondary use of data and NMCP has access.	Data availability is monitored for continuous improvements and to meet emerging health sector needs. Reporting is available from private facilities and community-level providers and can be disaggregated.
	Data collection	Data collection is not done at the most peripheral level (CHWs) and is irregular and inaccurate at rural and more central health facilities. System is entirely paper based, but registers may be absent	Data collection is well managed at HF level, but incomplete at community level (CHWs); most collection is paper based, and aggregation is paper based; registers generally available; timeliness and completeness remain challenges	Data collection is well managed at HF level and at community level (CHWs); most collection is paper based, aggregation is electronic; registers available; timeliness and completeness >80%, feedback to collectors limited	Data collection at all levels); collection is electronic and sometimes paper based, aggregation is electronic; registers include all program-critical data; timeliness and completeness >80%, feedback to collectors is standardized	Data collection occurs at all levels, is transmitted in real time with timely feedback to those collecting and those using the data; data checks exist at point of collection; electronic transmission is the norm, including to data collectors
	Data use	Activities (analysis, interpretation, visualization) to ensure data use are rarely implemented	Limited data use activities are implemented (bulletin has been developed but analysis and interpretation for decision-making needs to be strengthened)	Country conducts regular data use activities (review meetings, bulletin at least quarterly, at least at the central level).	Country conducts regular data use activities at all levels (review meetings, bulletins, dashboard at least quarterly).	Country has developed their own high- quality dashboard to facilitate data use, and data-informed decision making is evident at all levels, on a frequent basis.

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
OR/PE	PMI in-country OR experience	No previous PMI OR experience in country	PMI team has prepared concept notes (CNs) but has not completed protocols or conducted OR	PMI team has completed protocols and received approval for OR; studies in planning, underway, or recently completed	PMI team and/or other country partners have completed a OR study and prepared and shared reports	Multiple OR studies completed in country that address malaria program implementation bottlenecks with publication and sharing of results, with involvement from MOH co-investigators
	Country mechanisms for OR/PE review	No in-country process for research review, determination or IRB processes	Limited in-country processes for research review, determination and IRB oversight	Processes in place for research and IRB review with federal-wide assurance approval; no previous PMI in-country OR experience	Processes in place for research and IRB review with federal-wide assurance approval; previous PMI in-country OR experience	Full complement of research review, approval, oversight processes including data safety and monitoring boards and systems for results sharing
	In-country partnerships for OR	No in-country partners (academic, NGO, or other) with OR experience	1-2 in-country partners with OR experience, but no malaria specific experience	3+ in-country partners with OR experience; 1+ with some malaria expertise; no current PMI-linked OR work	3+ in-country partners with OR experience; 1+ with malaria expertise; current or recent work with PMI OR	Multiple in-country partners with specific malaria experience in PMI OR, including completed past work and reporting on malaria OR
	Conceptualization of problems needing scientific evaluation	No experience	Some but limited experience in identifying programmatic problems and prioritization	Experience with identifying program problems and prioritizing PE and OR	Experience with identifying problems needing PE or OR and developing study approaches with partners	Extensive experience with problem identification, prioritization, proposal development and conducting PE or OR

Figure B7. Category: Support Systems

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
SBC	National Malaria SBCC Strategy used to guide design and implementation of malaria SBC activities	No strategy exists.	Strategy exists but there is no evidence that it has been used to guide design or implementation.	Strategy exists and is used from time-to-time to guide design and implementation, but is of poor quality and does not include any of the key elements identified in the RBM SBCC Working Group National Malaria SBCC Strategy Template.	Strategy is used from time-to-time to guide design and implementation, but lacks alignment with the broader National Malaria Strategy and only incorporates a couple of the key elements identified in the RBM SBCC Working Group National Malaria SBCC Strategy Template.	Strategy is well aligned with the broader National Malaria Strategy, includes the key elements identified in the RBM SBCC Working Group National Malaria SBCC Strategy Template, and is used to guide design and implementation.
	SBC Technical Working Group coordinates effectively	No technical working group exists.	The SBC Technical Working Group exists on paper, but has not been operationalized.	The SBC Technical Working Group has significant resource and staffing gaps and does not have clear pathways for coordination.	The SBC Technical Working Group lacks some needed resources/staff and generally coordinates at the national level only.	The SBC Technical Working Group is well resourced and staffed and engages in regular coordination at both the national and sub-national level.
	High-quality formative assessments used to inform intervention design	No high-quality, formative assessment conducted in the last five years.	Formative assessment conducted, but significant quality issues in the design and no evidence that data was used to inform intervention design.	High-quality, formative assessment conducted, but no evidence that data was used to inform intervention design.	Data from prior projects used exclusively to guide intervention design; no new data collected.	High-quality, formative assessment conducted, and data used to inform intervention design.
Elim (relevant only for countries actively pursuing elimination)	Elimination planning to implementation	No elimination or pre-elimination targets in the national strategic plan	Risk stratification conducted using latest incidence data and interventions targeted	Readiness assessment/ capacity inventory conducted	Capacity built and systems in place to initiate elimination activities	Elimination activities implemented fully in targeted areas

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	Surveillance system readiness to track all cases	Monthly, aggregate data from public sector only	At least monthly, aggregate data from public, private, and community levels	Case-based reporting initiated	Real-time, case-based surveillance inclusive of all sectors and levels in targeted areas	Real-time, case-based reporting and response activities implemented
Additional Health Systems Strengthening	Staffing	No staff	Manager and a few technical staff; not all intervention areas are covered	Manager and technical staff for each intervention area; many staff have limited training and experience ; limited program support staff	Full staffing of program areas and support systems but some staff need further training to optimize their effectiveness; limited plans and opportunities for such training	Fully staffed with personnel with relevant training and experience; complete plan for professional development
	Office space, transport	No office space or transport	Office space exists but is insufficient for staff; Transport available at intervals but limited for program needs	Office space adequate for current staff but no growth possible; office not well positioned for access to MOH leadership. Transport available but not covering all needs and not well managed/maintained	Office space adequate for current staff and some technical areas (e.g., lab) but not fully adequate for growth and all technical services. Transport covers most needs.	Office space is fully adequate for current staff and technical needs (lab, insectary, meeting space, etc.) and some growth and well positioned in the MOH; Transport is fully available for needed purposes -- trucks and 4-wheel drive vehicles where needed - all maintained and managed.
	Internet connectivity	No Internet connectivity	Intermittent connectivity; poor bandwidth; challenging maintenance; very little budget	Mostly connected with some outages; ok but not ideal bandwidth; irregular maintenance; modest budget	Generally stable connections, adequate bandwidth for most work, fair to good maintenance and sufficient budget	Fully connected, maintained, good bandwidth for all needs, and sufficient budget including all needed hardware and software

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	NMCP placement within Ministry of Health	NMCP exists but is barely visible in the MOH structure	NMCP is visible in the MOH structure but NMCP manager reports to supervisor who is still low in the MOH system	NMCP is visible and manager reports to high level leader in MOH (e.g., Director of Public Health or Permanent Secretary for Health)	NMCP (or NMEP) is highly visible and reports at a high level in MOH and has some access to other ministry leadership (e.g., education, agriculture, community development)	NMCP (or NMEP) is highly visible within MOH and with all other relevant ministries and has ready access to country leadership (e.g., the president/prime minister; and parliament)