

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

ANGOLA

Malaria Operational Plan FY 2020

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ABBREVIATIONS

ACT	Artemisinin-based combination therapy
ADECOS	Community health workers (<i>agentes de desenvolvimento comunitário e de sanitário</i>)
AL	Artemether-lumefantrine
ANC	Antenatal care
AS/AQ	Artesunate-amodiaquine
BMGF	Bill and Melinda Gates Foundation
CDC	Centers for Disease Control and Prevention
CECOMA	Central Procurement Agency for Medicines and Medical Supplies (<i>Central de Compras e Aprovisionamento de Medicamentos e Meios Médicos</i>)
CY	Calendar year
DHS	Demographic and Health Survey
DNME	National Directorate of Medicines and Equipment (<i>Direcção Nacional de Medicamentos e Equipamentos</i>)
E8	Elimination 8
FY	Fiscal year
GEPE	Office of Planning and Statistics (<i>Gabinete de Estudos, Planeamento e Estatística</i>)
GHI	Global Health Initiative
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GRA	Government of the Republic of Angola
GTI	Office for Technology and Information (<i>Gabinete de Tecnologia e Informação</i>)
IEC	Information, education, communication
INIS	National Institute of Health Research (<i>Instituto Nacional de Investigação em Saúde</i>)
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
LMIS	Logistics Management Information System
MIP	Malaria in pregnancy
MIS	Malaria indicator survey
MoH	Ministry of Health
MOP	Malaria Operational Plan
NMCP	National Malaria Control Program
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PMI	U.S. President's Malaria Initiative
PNDS	National Health Development Plan (<i>Plano Nacional de Desenvolvimento Sanitário</i>)
PPMRm	Procurement Planning and Monitoring Report for malaria
RDT	Rapid diagnostic test

SBC	Social and behavior change
SDP	Service Delivery Point
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

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 Angola to end malaria. PMI has been a proud partner of Angola since 2005, helping to decrease child death rates by 42 percent through investments totaling almost \$340 million total through FY 2019, in millions.

The proposed PMI fiscal year (FY) 2020 budget for Angola is \$20 million. This Malaria Operational Plan (MOP) outlines planned PMI activities in Angola 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 the Republic of Angola (GRA) as well as other donors and partners.

Angola at a glance

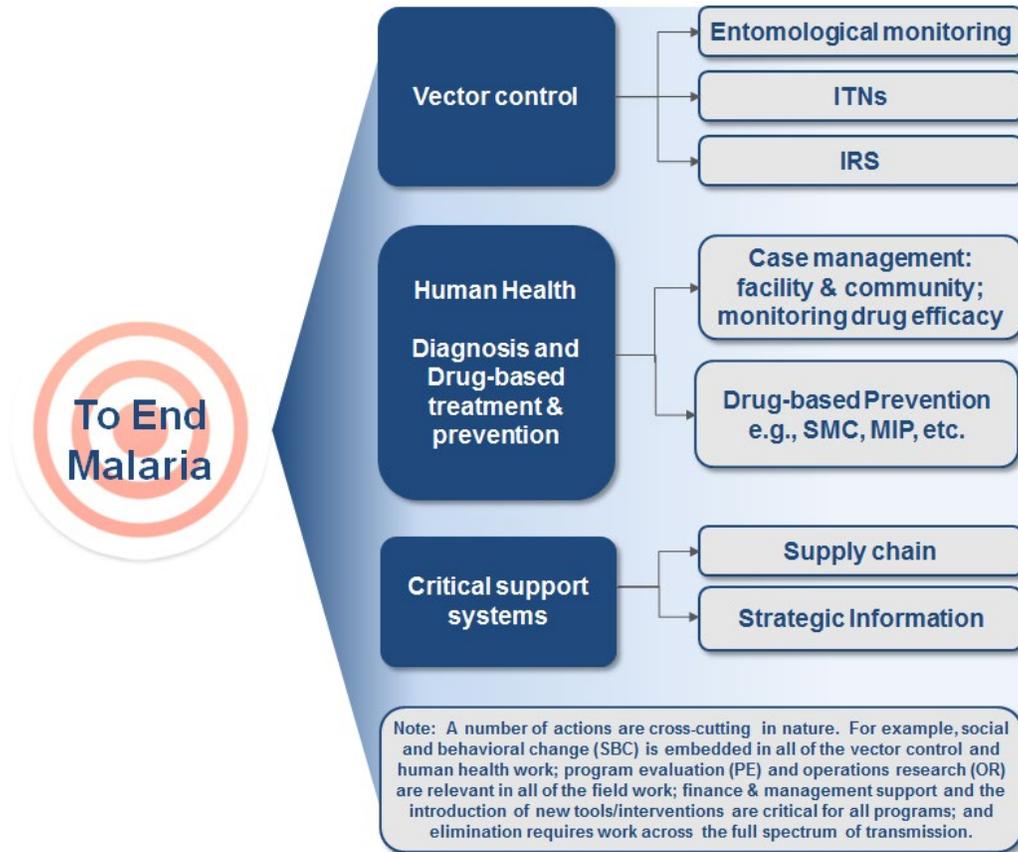
Indicators should remain the same year to year and only updated when new data becomes available.

- **Geography:** Located in southern Africa, bordered on the north by Democratic Republic of the Congo and Republic of Congo, east by Zambia, south by Namibia, and west by the Atlantic Ocean; almost twice the size of Texas (The CIA World Factbook)
- **Climate:** Northern half of the country has a dry season and rainy season; Southern half of the country and the coastal region are semi-arid (The CIA World Factbook)
- **Population in 2019:** 30.2 million (*Instituto Nacional de Estatisticas/National Institute of Statistics Angola*)
- **Population at risk of malaria:** 100% (World Health Organization Angola Malaria Profile)
- **Malaria incidence per 1000 population:** 135 (World Health Organization Angola Malaria Profile)
- **Under-five mortality rate:** 81.1 deaths per 1000 live births (UNICEF)
- **World Bank Income Classification & GDP:** Lower middle income; \$105.8 billion (World Bank Open Data)
- **Political system:** Presidential republic - a political party is voted for in general elections, and head of the party becomes president and chief of state; current President Joao Manuel Goncalves Lourenco

- **Trafficking in Persons designations, 2016-2018:** Tier 2 Watch List: does not meet the minimum standards for elimination of trafficking (2019 Trafficking in Persons Report: Angola, U.S. Department of State)
- **Malaria funding and program support partners include (but are not limited to):**
 - Global Fund to Fight AIDS, Tuberculosis and Malaria (GF)
 - Bill and Melinda Gates Foundation (BMGF)
 - U.S. President’s Malaria Initiative (PMI)
 - World Health Organization (WHO)
 - Southern African Development Council Malaria Elimination 8 Initiative (E8)
 - UNITEL
 - ExxonMobil Foundation
 - Chevron
 - Banco Fomento de Angola
 - Angola Liquefied Natural Gas Company
 - World Bank
 - UNICEF
 - Cuban Cooperation
 - Historically: Japan International Cooperation Agency, Spanish Cooperation
- **PMI Support of National Malaria Control Strategy:** PMI supports continuous and mass-campaign distribution of ITNs; ITNs and SP to prevent malaria in pregnancy; DHIS2 implementation for improved surveillance; procurement, warehousing, and distribution of ACTs, RDTs, and severe malaria drugs; entomological monitoring; and training of health workers at all levels in alignment with the GRA National Malaria Strategic Plan. (See III. Overview of PMI’s support of Angola’s Malaria Control Strategy for additional details)
- **PMI Investments:** Angola began implementation as a PMI focus country in FY 2005. The proposed FY 2020 PMI budget for Angola is \$20 million; that brings the total PMI investment to nearly \$360 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 Angola’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’s planned support for FY 2020 in the areas of vector control, human health, supply chain and strategic information contains elements of capacity building and system strengthening. PMI/Angola will continue to rely on and engage with local partners such as the Malaria Partners Forum, the National Directorate of Medicines and Equipment, Agostinho Neto University, Office of Information Technology, and the Office of Planning and Statistics, and is expanding its local partner base to reach the National Institute of Health Research (INIS) within the Ministry of Health. Finally, PMI/Angola will continue to rely on private sector partnerships such as UNITEL, Banco de Fomento, Exxon/Mobil Foundation, Chevron, and the Angola Liquefied Natural Gas Company.

To accelerate the journey to self-reliance, PMI developed a programmatic inventory to assess the strengths and persistent challenges of Angola’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 Angola is capable of fully financing its development

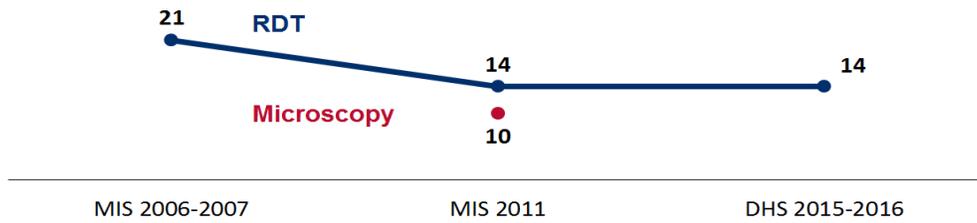
priorities, PMI will work with other partners (e.g., the Global Fund) to jointly track Angola's funding commitments across the malaria portfolio.

II. MALARIA SITUATION AND MALARIA CONTROL PROGRESS IN ANGOLA

Malaria continues to be the primary health problem in Angola and is the principal cause of morbidity and mortality. According to the 2013 *Plano Nacional de Desenvolvimento Sanitário* (PNDS) (National Health Development Plan), malaria accounts for 35 percent of curative care demand, 35 percent of mortality in children, 40 percent of prenatal mortality, 25 percent of maternal morbidity and causes 60 and 10 percent of hospital admissions in children less than five years of age and pregnant women, respectively. Malaria is also a leading cause of low birth weight and anemia.

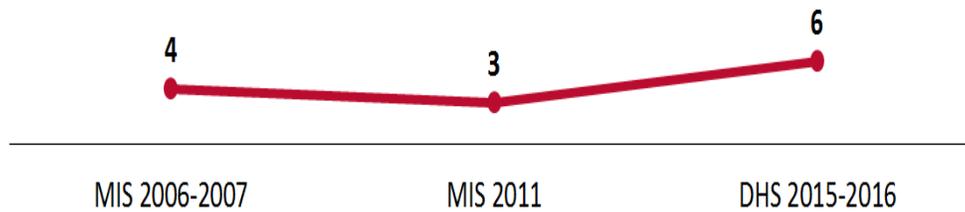
Data from the 2011 Malaria Indicator Survey (MIS) show a decline of almost 40 percent in parasitemia among children less than five years of age from the 2006-2007 MIS (from 21 to 13.5 percent). However, Angola's first Demographic and Health Survey (DHS), conducted from 2015 to 2016, reported no change from the 2011 MIS in parasitemia among children less than five years of age. Comparing MIS and DHS data, the mortality rate for children less than five years of age has decreased by 25 percent over the past five years and currently it is estimated there are 68 deaths per 1,000 live births. Most (87 percent) of malaria cases in Angola are caused by the *P. falciparum* parasite, with a portion of cases caused by *P. vivax*, *P. malariae*, and *P. ovale* parasites (estimated at 7, 3, and 3 percent, respectively). Based on existing evidence, there are five anopheline species responsible for malaria transmission in the country: *An. gambiae s.s.*, *An. funestus*, *An. melas* (in coastal areas), *An. arabiensis* and *An. pharaoensis* (in southern unstable mesoendemic areas). Secondary vectors of malaria, *An. rufipes* and *An. coustani*, have been identified in Huambo and Zaire provinces. The entire Angolan population is at risk for malaria, but there is significant heterogeneity in transmission, with hyperendemicity historically observed in the northeast provinces of Cabinda, Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, and Uige. In the north, the peak malaria transmission season extends from March to May, with a secondary peak in October to November. The central and coastal provinces (Benguela, Bie, Cuanza Sul, Huambo, Luanda, Moxico, and Zaire) are meso-endemic with stable transmission. The four southern provinces bordering Namibia have highly seasonal transmission and are prone to epidemics. Figure 4 depicts the prevalence of malaria among children less than five years of age according to the 2015/16 DHS, which varied between less than 1 percent in Cunene to 40 percent in Moxico. Although the transmission zones were unchanged from the 2011 MIS to the 2015/16 DHS, with hyperendemicity in the northeast, the DHS report presents a new prevalence data table and map which indicate that changes have occurred over the past four years. These survey results indicate Bie, Cuanza Norte, Cuando Cubango, Moxico, and Uige have the highest prevalence, suggestive of a provincial shift in malaria endemicity.

Figure 2. Trends in Malaria Prevalence
Percent of children age 6-59 months who tested positive for malaria by microscopy and RDT



*DHS/MICS surveys are generally fielded during the dry season, whereas MIS surveys are deliberately fielded during the high transmission season, which should be taken into consideration when interpreting these indicators.

Figure 3. Trends in Prevalence of Low Hemoglobin
Children age 6-59 Months with Moderate-to-Severe Anemia (hemoglobin < 8.0 g/dl)



*DHS/MICS surveys are generally fielded during the dry season, whereas MIS surveys are deliberately fielded during the high transmission season, which should be taken into consideration when interpreting these indicators.

Figure 4. Malaria Parasite Prevalence among Children by Geographic Area, Percent of children age 6-59 months who tested positive for malaria by RDT, 2015-16 DHS

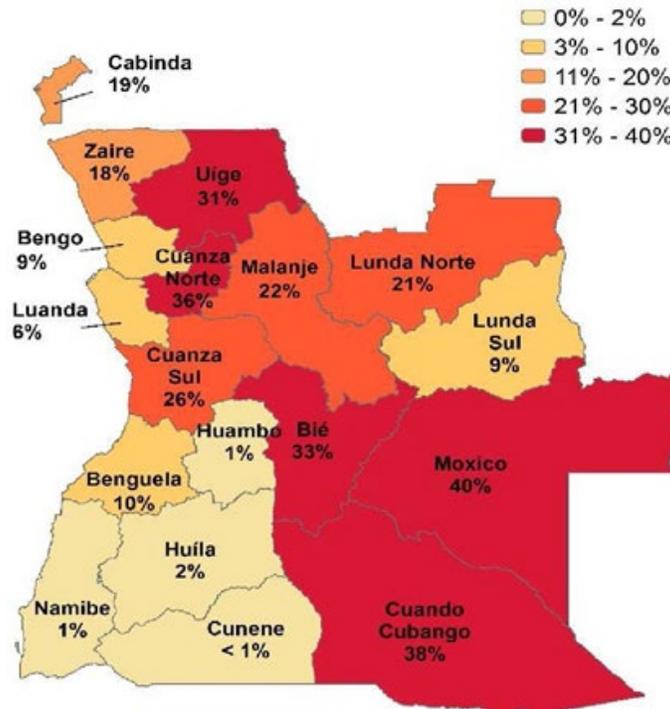


Figure 5. Key Indicators for Malaria Prevention and Treatment Coverage and Impact Indicators from Demographic Health Surveys (DHS) and Malaria Indicator Surveys (MIS) from 2006-2016.

Indicator	2006-2007 MIS	2011 MIS	2015-2016 DHS
% Households with at least one ITN	28	35	31
% Households with at least one ITN for every two people	5	6	11
% Population with access to an ITN	15	19	20
% Population that slept under an ITN the previous night*	12	19	18
% Children under five years of age who slept under an ITN the previous night*	18	26	22
% Pregnant women who slept under an ITN the previous night*	22	26	23
% Children under five years of age with fever in the last two weeks for whom advice or treatment was sought ²	55	59	51
% Children under five years of age with fever in the last two weeks who had a finger or heel stick	n/a	26	34
% Children receiving an ACT among children under five years of age with fever in the last two weeks who received any antimalarial drugs	6	77	77
% Women who received two or more doses of IPTp during their last pregnancy in the last two years ¹	3	19	38
% Women who received three or more doses of IPTp during their last pregnancy in the last two years ¹	n/a	n/a	20
Under-five mortality rate per 1,000 live births	118 ³	91	68
% Children under five years of age with parasitemia (by microscopy , if done)*	n/a	10	n/a
% Children under five years of age with parasitemia (by RDT , if done)*	21	14	14
% Children under five years of age with severe anemia (Hb<8gm/dl)*	4	3	6

*DHS/MICS surveys are generally fielded during the dry season, whereas MIS surveys are deliberately fielded during the high transmission season, which should be taken into consideration when interpreting these indicators

¹Note that this indicator has been recalculated according to the newest definition, 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

³Note that this indicator was not calculated for 2006-07, so this value was calculated for the period of 5-9 years before the 2011 MIS.

Figure 6. Evolution of key Malaria Indicators Reported through Routine Surveillance Systems

Indicator	2014	2015	2016	2017	2018
# Suspect malaria cases ¹	6,134,471	6,839,963	7,649,902	8,119,298	10,870,446
# Patients receiving diagnostic test for malaria ²	5,253,429	6,354,998	7,143,009	7,493,969	10,092,761
Total # malaria cases ³ (confirmed and presumed)	3,180,021	3,254,270	4,301,146	4,500,221	5,928,260
# Confirmed cases ⁴	2,298,979	2,769,305	3,794,253	3,874,892	5,150,575
# Presumed cases ⁵	410,716	484,965	506,893	625,329	777,685
% Malaria cases confirmed ⁶	72%	85%	88%	86%	87%
Test positivity rate (TPR) ⁷	44%	44%	53%	52%	51%
Total # <5 malaria cases⁸	1,189,891	1,231,732	1,531,695	1,588,112	2,077,660
% Cases under 5 ⁹	37%	38%	36%	35%	35%
Total # severe cases¹⁰	238,855	262,653	364,941	396,209	392,439
Total # malaria deaths¹¹	5,714	7,832	15,997	13,967	11,814
# Facilities reporting ¹²	2,281	2,805	2,938	2,965	2,965
Data form completeness (%) ¹³	82%	81%	80.0%	82.3%	8.6%

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 ANGOLA’S MALARIA CONTROL STRATEGY

The general objective of the National Malaria Strategic Plan for 2016-2020 is to reduce malaria-related morbidity and mortality by 60 percent by 2020, from 2012 baseline figures. A new

National Malaria Strategic Plan is in development and is scheduled to begin in 2021. Angola was selected as a PMI focus country in 2005 and activities were carried out throughout the country until 2016. Given the limited progress made in malaria prevention and control up until then, PMI decided to transition to a subnational program—starting in fiscal year (FY) 2016. Except for very targeted national interventions, this new approach concentrates PMI resources on six hyper-endemic provinces (combining for a total population of approximately 31 million).

Prevention of malaria: The NMCP’s strategy for malaria prevention has four main components: ITNs, prevention of malaria in pregnancy, spraying (indoor and outdoor), and larviciding. The GRA strategy calls for two approaches for ITN distribution: mass campaign distribution to achieve universal coverage and routine continuous distribution to maintain coverage. Routine distribution of ITNs occurs through the following channels: antenatal care (ANC) clinics and the expanded program for immunization (EPI), and outreach services for communities with no or little access to health services, such as mobile municipal health units and municipal health days. In addition to distributing ITNs to pregnant women to help prevent malaria in pregnancy, national policy calls for provision of IPTp with Sulfadoxine/pyrimethamine (SP) at all health units with ANC services. The target is that by the end of 2020, at least 80 percent of pregnant women with access to ANC and targeted for IPTp receive at least three doses of SP.

The NMCP integrated vector control strategy calls for larviciding applications, indoor residual spraying and outdoor fumigations to be implemented in targeted areas of epidemic risks and low transmission. However, only small-scale and very focal IRS is currently being implemented on ad-hoc basis by the GRA. Larviciding and outdoor fumigations are financed exclusively by the GRA with technical support from the Cuban Cooperation.

Malaria case management: In accordance with WHO guidelines, Angola’s National Strategic Plan recommends that all suspected cases of malaria be diagnosed parasitologically, using either microscopy or RDTs. Only confirmed malaria cases should be treated with an ACT. The country has three alternative first-line ACT treatments: artesunate-amodiaquine (AS-AQ), artemether-lumefantrine (AL), and dihydroartemisinin+piperazine (DP). National treatment guidelines for severe malaria recommend (in order of preference) injectable artesunate, intramuscular artemether, and injectable quinine. For pre-referral treatment in children under six years of age, rectal artesunate is recommended at a dosage of 10mg/kg. Malaria case management is provided at both the health facility and community level. Community health workers, through the ADECOS project, provide education, information and basic support related to health, water and sanitation, integrated community case management (iCCM) and other community development initiatives. Procurement, warehousing and distribution of RDTs and malaria medicines, and training and support for healthcare providers and ADECOS are all supported by PMI.

Monitoring and evaluation and epidemiologic surveillance: The NMCP has developed a costed Monitoring and Evaluating (M&E) Plan described in the National Strategic Plan for Malaria Control (2016-2020). At the municipal level, there is a malaria municipal supervisor who regularly collects data and transmits them to the national program, through the provincial level. The GRA is working to strengthen its epidemiology surveillance system. The National Epidemiological Surveillance System collects weekly reports on clinically diagnosed cases of malaria from the four epidemic-prone provinces in the south—Cuando Cubango, Cunene, Huila, and Namibe. However, since not all districts report on a regular basis and there are delays in releasing reports to the NMCP, these weekly data are currently of limited value for detecting and containing malaria epidemics. Support and training for implementation of HMIS using the DHIS2 platform is supported by PMI.

Procurement and supply chain management: PMI assists with multiple aspects of the NMCP’s strategic plan for procurement and supply chain management. Reporting on commodity availability, support for quantifications and inventory management, distribution of commodities, and capacity development of NMCP staff are all performed to strengthen the supply chain. Approximately 70% of the forecasted need for RDTs, ACTs, and medications for severe malaria in the 6 PMI-supported provinces are procured and distributed to health facilities by PMI. Due to limitations of the national supply chain, both PMI and the Global Fund operate parallel warehousing and distribution systems in the country. Additionally, PMI supports the implementation of an eLMIS in the 6 PMI-supported provinces of Angola.

Figure 7. PMI Intervention Support

Province Names	PMI support provided?	Type of Support
Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uige, Zaire	Yes	Procurement and distribution of commodities; support for prevention interventions (ITNs, IPTp, etc.); technical assistance for service delivery; surveillance, monitoring, and evaluation and improving information systems (HMIS, LMIS, etc.)
Bengo, Benguela, Bie, Cabinda, Cuando Cubango, Cuanza Sul, Cunene, Huambo, Huila, Luanda, Moxico, Namibe	Limited	Commodities are occasionally procured to assist with gaps forecasted in the non-PMI focus provinces; Support to the NMCP and other central-level technical assistance also provided (universal ITN campaign, trainings, etc.)
Huambo	Limited	Technical assistance for entomological surveillance

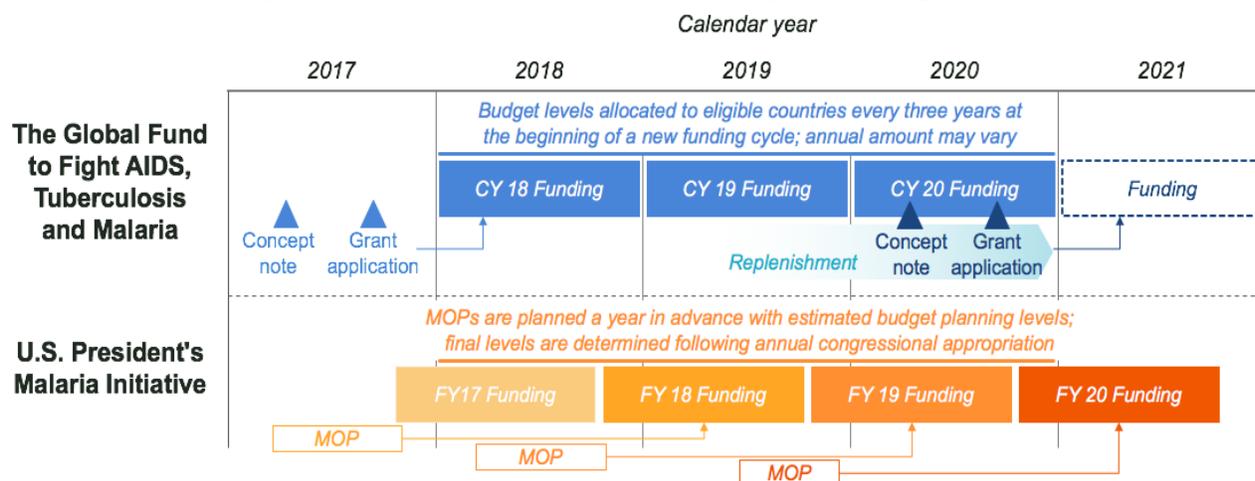
IV. PARTNER FUNDING LANDSCAPE

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 8 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 FY18 MOP funds implementation during FY19. Whereas 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 8. 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.

Figures 9, 10, and 11 summarize contributions by external partners and host country government in calendar years 2018-20, with the goal of highlighting total country investments. For Angola, data is available for PMI (FY 18) and Global Fund (CY 2018-2020). As the Global Fund 2021-2023 grant funding cycle is not yet underway at the time of this PMI FY 20 MOP development, Global Fund country investments for the 2021 implementation period and beyond are not yet known. Note that the Angolan 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 is

not yet possible in the FY 2020 MOP cycle to attribute this funding from the government. There may be similar challenges for other partners.

Figure 9. Annual budget by Level 1 category Year ¹	Funder	Vector Control	Case Management	Drug- Based prevention²	Supply Chain³	Monitoring, Evaluation & Research	Other Cross- Cutting and Health Systems Strengthening	Total
FY17/CY18	PMI	\$11.5M	\$3.4M	\$0.3M	\$0.7M	\$1.9M	\$4.3M	\$22.0M
	Global Fund	-	\$2.7M	-	-	\$0.7M	\$1.1M	\$4.5M
	Total	\$11.5M	\$6.1M	\$0.3M	\$0.7M	\$2.5M	\$5.4M	\$26.5M
FY18/CY19	PMI	\$4.0M	\$7.9M	\$0.6M	\$2.4M	\$2.8M	\$4.3M	\$22.0M
	Global Fund	-	\$3.8M	-	-	\$1.2M	\$2.5M	\$7.5M
	Total	\$4.0M	\$11.7M	\$0.6M	\$2.4M	\$3.9M	\$6.8M	\$29.5M
FY19/CY20	PMI	\$1.9M	\$6.5M	\$1.1M	\$2.3M	\$2.6M	\$5.6M	\$20.0M
	Global Fund	-	\$4.5M	-	-	\$1.0M	\$2.5M	\$8.0M
	Total	\$1.9M	\$11.0M	\$1.1M	\$2.3M	\$3.6M	\$8.1M	\$28.0M

Footnotes:

¹. Each year's figures represent the FY for PMI and one CY for GFATM that most closely align

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"

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.

While the GRA has historically also received malaria contributions from the World Bank, WHO, UNICEF, Japan International Cooperation Agency, Cuban Cooperation, Spanish Cooperation, and private partners, PMI and the Global Fund are currently the only significant donors for malaria in Angola. Additional Funding for malaria control in Angola is provided by the GRA, private partners (e.g., UNITEL, ExxonMobil Foundation, and Chevron) and J.C. Flowers.

The overall GRA budget for health in 2019 was seven percent of the overall national budget. Of this amount, the National Endemic Diseases Program, including the malaria program, receives approximately \$29 million (excluding salaries). These funds are used for commodity procurement, larviciding, training and supervision, capacity building of health personnel, and general operational costs. National hospitals in Luanda, provincial hospitals, and some municipal

and provincial governments receive budgets directly from the GRA, part of which contribute to malaria prevention and treatment at the sub-national level.

Southern African Development Council Malaria Elimination 8 Initiative (E8): Angola is a member of the E8 countries. The primary objective of E8 is aiming to end transmission in low transmission countries like Namibia and pave the way for elimination in four middle to high transmission countries including Angola. E8 is committed to working in concert with other partners supporting malaria control activities.

BMGF: The Bill and Melinda Gates Foundation (through E8) supports efforts to roll out an ADECOS project in two provinces in southern Angola (Cunene and Cuando Cubango) and IRS campaigns in 7 districts of Cunene and Cuando Cubango provinces. Additionally, a cross-sectional study to monitor *P. falciparum* transmission intensity in 16 districts of Namibe, Cuando Cubango, and Cunene provinces to develop a malaria transmission risk map was performed. Entomological monitoring of *Anopheles* vectors was also supported in eight sites.

World Bank: In 2017, the World Bank concluded a new \$100 million loan to the MoH which focuses on health systems strengthening, including piloting results-based financing in Angola. The World Bank loan will support malaria-related interventions such as integrated management of childhood illness, IPTp, and ADECOS in seven provinces and 21 municipalities, some of which overlap with PMI. The expenditure categories are \$65 million for improving quality of services in target provinces, \$35 million for strengthening system-wide health systems and \$10 million for M&E.

U.S. Government: Several activities co-funded by PMI and other programs from USAID's Bureau for Global Health will lead to cross-cutting outcomes including: technical assistance at CECOMA, the implementation of an improved Logistics Management Information System (LMIS), national pharmaceutical traceability through GS1 track and trace standards to be applied to both public and private sectors, technical assistance to National Directorate of Medicines and Equipment (*Direcção Nacional de Medicamentos e Equipamentos*) DNME, and workforce development activities.

Figure 10. 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	-	-	\$1.3M	-	\$1.2M	-
	Distribute ITNs via Continuous Distribution	-	-	\$1.6M	-	\$0.2M	-

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 ITNs for Mass Campaigns	-	-	-	-	-	-
	Distribute ITNs via Mass Campaigns	\$11.5M	-	-	-	-	-
	Other ITN Implementation*	-	-	\$0.3M	-	-	-
	IRS Implementation ⁴	-	-	-	-	-	-
	Procure IRS Insecticide ⁴	-	-	-	-	-	-
	Other IRS*	-	-	-	-	-	-
	Entomological Monitoring	-	-	\$0.8M	-	\$0.5M	-
	SBC for Vector Control ⁵	-	-	-	-	-	-
	Other vector control measures	-	-	-	-	-	-
	Removing human rights- and gender-related barriers to vector control programs**	-	-	-	-	-	-
Case Management	Active Case Detection**	-	-	-	-	-	-
	Community-based case management	-	\$0.8M	-	\$1.5M	-	\$1.0M
	Facility-based case management	-	\$0.2M	-	\$0.4M	-	\$0.3M
	Private-sector case management	-	-	-	-	-	-
	Procure ACTs	-	\$0.7M	\$0.6M	\$0.8M	\$0.5M	\$1.3M
	Procure Drugs for Severe Malaria	-	-	\$0.7M	-	\$0.3M	-
	Procure Other Diagnosis-Related Commodities	-	-	-	-	-	-
	Procure Other Treatment-Related Commodities	-	\$0.2M	-	\$0.2M	-	\$0.2M
	Procure RDTs	\$0.7M	\$0.4M	\$1.3M	\$0.6M	\$0.7M	\$1.1M

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund	PMI	Global Fund	PMI	Global Fund
	Therapeutic Efficacy	\$0.02M	-	\$0.3M	-	-	-
	SBC for Case Management ⁵	-	\$0.03M	-	\$0.1M	-	\$0.1M
	Other Case Management	\$2.7M	-	\$5.0M	-	\$5.0M	-
Drug-Based Prevention²	Procure SMC-Related Commodities	-	-	-	-	-	-
	SMC Implementation	-	-	-	-	-	-
	Prevention of Malaria in Pregnancy Implementation	\$0.3M	-	\$0.5M	-	\$0.7M	-
	Procure IPTp-Related Commodities	-	-	\$0.1M	-	\$0.3M	-
	IPTi**	-	-	-	-	-	-
	SBC for Drug-Based Prevention ⁵	-	-	-	-	-	-
	Other Prevention**	-	-	-	-	-	-
Supply Chain³	In-Country Supply Chain ³	-	-	\$0.8M	-	\$0.5M	-
	Supply Chain Infrastructure	-	-	-	-	-	-
	Ensuring Quality	-	-	-	-	-	-
	Pharmaceutical Management Systems Strengthening	\$0.7M	-	\$1.6M	-	\$1.8M	-
	Supply Chain System Strengthening	-	-	-	-	-	-
Monitoring, Evaluation & Research	Reporting, Monitoring, and Evaluation	\$1.9M	\$0.5M	\$1.5M	\$0.7M	\$1.4M	\$0.6M
	Program and data quality, analysis and operations research	-	\$0.2M	\$0.04M	\$0.4M	-	\$0.4M
	Surveys	-	-	\$1.0M	-	\$1.0M	-
	Other Data Sources**	-	-	-	-	-	-
	Support for FETP*	-	-	\$0.2M	-	\$0.2M	-

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund	PMI	Global Fund	PMI	Global Fund
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**	-	-	-	-	-	-
	Central and Regional Program management ⁶	\$0.8M	-	\$0.03M	-	\$0.9M	-
	In-Country Staffing and Administration*	\$2.4M	-	\$2.7M	-	\$2.9M	-
	Other Program Management**	-	\$1.1M	-	\$2.5M	-	\$2.5M
	SBC Unspecified ⁵	\$1.1M	-	\$1.5M	-	\$1.7M	-
Total	\$22.0M	\$4.5M	\$22.0M	\$7.5M	\$20.0M	\$8.0M	

Footnotes:

¹ Each year's figures represent the FY for PMI and CY for Global Fund that most closely align;

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 11. 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	-	-	-	-	\$0.7M	-	-	-	\$0.7M
	Global Fund	-	-	-	\$0.7M	\$0.4M	-	-	-	\$1.2M
	Total	-	-	-	\$0.7M	\$1.1M	-	-	-	\$1.8M
FY18/CY19	PMI	\$1.3M	-	-	\$0.6M	\$1.3M	\$0.7M	-	\$0.1M	\$3.9M
	Global Fund	-	-	-	\$0.8M	\$0.6M	-	-	-	\$1.4M
	Host Gov ⁵	-	-	-	-	-	-	-	-	-
	Other ⁶	-	-	-	-	-	-	-	-	-
	Total	\$1.3M	-	-	\$1.4M	\$1.9M	\$0.7M	-	-	\$5.3M
FY19/CY20	PMI	\$1.2M	-	-	\$0.5M	\$0.7M	\$0.3M	-	\$0.3M	\$2.7M
	Global Fund	-	-	-	\$1.3M	\$1.1M	-	-	-	\$2.4M
	Total	\$1.2M	-	-	\$1.8M	\$1.8M	\$0.3M	-	-	\$5.1M

Footnotes:

¹ Each year's figures represent the FY for PMI and CY for Global Fund that most closely align.

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 \$1.1 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.

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 Angola 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

NMCP objective
<p>Objectives of insecticide-based interventions:</p> <p>The current NMCP/PMI strategy for malaria prevention in Angola includes entomological and insecticide susceptibility monitoring as well as ITN ownership and use. The national strategy for integrated vector control drafted by the GRA also considers insecticide spraying (IRS and outdoor fumigations) and larviciding applications, exclusively undertaken by the GRA with the support of other partners.</p> <p>National Policy on ITNs included in the National Malaria Strategic Plan (2016-2020) :</p> <ol style="list-style-type: none">1. At least 80% of households have at least one long-lasting insecticide-treated mosquito net by the end of 2020;2. At least 80% of people with mosquito nets sleep under a long-lasting insecticide-treated mosquito net the night before by the end of 2020;3. At least 80% of children under the age of five sleep under a long-lasting insecticide-treated mosquito net the night before, by the end of 2020;4. At least 80% of pregnant women sleep under a long-lasting insecticide-treated mosquito net the night before, by the end of 2020;5. At least 60% of people living in areas targeted by residual spraying are protected, by the end of 2020. <p>NMCP IRS Strategy</p> <p>Currently, the NMCP is not implementing a national level IRS strategy and relies heavily on external partners for IRS implementation. PMI supported IRS in Angola with procurement, implementation, and technical assistance between 2005 and 2014. PMI has now transitioned out of supporting IRS, as the MoH has not prioritized IRS at the national level and shifted the responsibility for IRS to the provinces and municipalities, where there has been interest but no financial commitment. PMI has focused its efforts to support the MoH with its ITN coverage in areas that previously had IRS.</p>
NMCP approach
<p>Universal net distribution policy:</p> <ul style="list-style-type: none">• Since 2010, the NMCP has implemented a universal coverage strategy with ITNs, defined as one net for every two people. The current national strategic plan supports multiple distribution channels for ITNs to reach the coverage goals: mass campaign distribution every

three years and continuous distribution through routine ANC and EPI channels. The last mass distribution campaign took place between May 2017 and February 2019.

IRS:

- There is not a centralized strategy for implementing IRS. A focal IRS campaign (Nov-Jan 2018) was carried out in a few targeted locations along the Angola-Namibian border in Cunene and Cuando Cubango provinces, in support of Namibia's malaria elimination efforts as part of the Southern African Development Community Elimination 8 plans for the elimination of malaria in the region. The main objective was to stop the importation of cases to Namibia through the southern Angolan border. The GRA procured the insecticide for the 2018 IRS campaign and provided partial support for logistics, vehicles and operators. Both provinces were part of the last mass distribution campaign (2017-2018). The NMCP expects to continue IRS operations in the south of Angola funded by the GF regional grant (2019-2021, see pages 51-52).

PMI objective, in support of NMCP

PMI's contribution to Angola's vector control strategy, is mainly through four components:

1. ITN procurement, warehousing, transportation, micro-planning, supervision, registration, and other logistical support for universal ITN distribution campaigns.
2. ITN procurement and distribution for continuous distribution in the six PMI supported provinces of Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uige and Zaire.
3. Entomological surveillance and monitoring in six PMI supported provinces.
 - a. PMI support for entomological monitoring is focused mainly on capacity building and entomological surveillance-systems strengthening:
 - i. Implementation of a standard operating procedure to collect and process samples for in-country entomological surveillance and monitoring;
 - ii. Training local technicians to establish entomological monitoring at sentinel sites.
 - iii. Training MoH personnel to perform molecular assays for species identification, detection of DNA mutations associated with insecticide resistance and infection rates.
 - iv. Enter data into VectorLink Collect database, developed on the DHIS2 platform
 - b. PMI will support entomological monitoring in Angola, conducting entomological evaluations in February of each year (the peak of vector activity). Baseline and current data on mosquito populations will be compared in subsequent yearly evaluations and correlated with the information obtained from PMI interventions in

the six focus provinces. A long-term perspective would consider longitudinal entomological monitoring, adding more evaluations per year, i.e., pre and post rainy season, and additional representative sentinel sites.

- c. To strengthen technical capacity at the central level, a PMI-funded technical advisor will work in direct coordination with the NMCP, the INIS and other partners to establish vector monitoring systems in select PMI focus provinces
 - d. As a national priority established by the NMCP, a national level insectary will be set to function in Luanda within the INIS with technical assistance and supplies procurement from PMI.
4. Capacity building: training of personnel from MOH to perform all the necessary tasks to routine entomological monitoring including bionomics determination and susceptibility evaluation. Training for molecular sample processing. (National level)

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

- PMI supported the planning and implementation of a national mass campaign that aimed to distribute nearly 9 million ITNs to protect more than 16 million people in 15 provinces and ultimately saw the distribution of approximately 6.6 million ITNs, reaching over 2,370,000 households in 13 provinces. This approach covered 349,723 pregnant women and over 2 million children less than five years of age. Luanda, Benguela and Huila were covered by provincial-level campaigns at the beginning of 2017, and were not included in the plans for campaign. The campaign was completed in four phases from 2017 to early 2019 with PMI contributing over 5 million ITNs to phases 1-3 of this campaign as well as supporting their warehousing and in-country transportation.
- PMI developed a detailed work plan to resume entomological monitoring in Angola.
- PMI sponsored an FETP student to be trained as an entomologist. The student participated in a three-week visit to Mozambique and received training in various entomological monitoring techniques including sample collection and processing, insectary house-keeping and bioassays. The FETP student will work on the collections and sample processing in Angola as part of the fellowship training.
- PMI provided short-term technical assistance on:
 - Developing the Integrated Vector Control Strategy/ Vector Resistance Management Plan.
 - Designing a routine monitoring strategy, including susceptibility of the main vector species.
 - A rapid needs assessment of NMCP entomology needs, to identify priority areas for future programming and planning.

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

Entomologic Monitoring and Insecticide Resistance Management Implementation

- Entomology technical assistance to the GRA, specifically the NMCP and the INIS, to help strengthen malaria entomological capacity in-country; this includes fortifying the insectary and its staff in Huambo to establish monitoring sentinel sites and establish a national insectary in Luanda.
- Procurement of supplies and reagents for insectary essentials to support vector monitoring.
- Launching the first sample collection campaign in January-March 2020 in at least three sentinel sites. Determine vector species composition and abundance and perform bioassays to evaluate insecticide susceptibility. Samples will be preserved for follow up molecular processing starting May 2020.
- Capacity building. A locally based entomological coordinator will be hired to be the liaison between PMI, INIS and NMCP. MOH personnel will be trained by directly participating in sample collection and sample processing. The INIS director, the NMCP coordinator and the FETP coordinator have identified fellows to participate in entomological monitoring activities as part of their job description.
- Technical assistance to the NMCP to establish vector monitoring systems through collecting and processing mosquitoes and larvae from other selected sentinel sites that they might want to establish.

Procure ITNs for Continuous Distribution Channels

- Procurement of approximately 1,000,000 ITNs to fill the commodity pipeline requirements (700,000) for routine distribution in PMI-focus provinces and, if procurement timelines enable it, contribute approximately 300,000 of these ITNs towards continuous distribution needs in non-PMI-focus provinces (approximately 2,000,000) for 2020.
- Central level warehousing and distribution to municipalities of 1,000,000 ITNs needed for continuous distribution in six PMI-focus provinces.

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 to increase, decrease, or maintain funding allocation levels for this activity? Why, and what data did you use to arrive at that conclusion?

PMI Angola decided to keep the level of funding support proposed in the FY19 MOP in order to:

- continue entomological monitoring (first sampling scheduled for January - March 2020);
- increase the number of sentinel sites and insecticide susceptibility evaluations;
- continue the support for insectary functions (technical assistance and supplies);
- continue strengthening local capacity by integrating routine entomological monitoring activities: MOH personnel (already hired), an FETP fellow being trained in entomology and a senior level entomological coordinator that is acting as liaison between PMI, INIS and NMCP;
- strengthen molecular laboratory capacity at INIS to implement entomological protocols in country; and
- enter data into VectorLink Collect database, developed on the DHIS2 platform.

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

Since 2016, no systematic entomological evaluations have taken place in the country.

Geographical distribution and Bionomical information of Malaria vectors

The last formal assessment of malaria vectors in Angola was a sub-product of the 2015 national susceptibility study conducted by PMI. A total of 3,620 mosquitoes collected and used for the susceptibility evaluation (see Key Question 2) were shipped to the CDC Entomology Branch for molecular analysis.

The molecular analysis identified at least 11 different mosquito species (see Figure A1) used in the susceptibility study, which has a direct implication on the interpretation of a susceptibility study performed with a “species mix” instead of a single species. The susceptibility profile should be determined for each species, because different species might respond independently to the selective pressure of insecticide-related interventions.

A significant finding was the geographical structure in the species distribution with *An. gambiae* s.s. in the northern provinces (Zaire, Luanda, Malanje and Uije) and *An. arabiensis* in the southern/central ones (Cunene, Huila, Namibe, Benguela, Huambo). The *kdr* analysis indicated that *kdr*-east and *kdr*-west mutations were absent in the *An. arabiensis* mosquitoes from the

southern and central regions of the country. However, both east and west *kdr* mutations were detected in the *An. gambiae* s.s. specimens from the northern provinces. The *kdr*-east mutation was present in 0-25% of specimens, while the west mutation was found in 98-100% of the individuals evaluated from these four provinces.

Figure A1. Molecular Identification of Mosquito Species Used in the Susceptibility Study (Angola, 2015) per Province

Species detected by PCR	south			south-center		north				
	CUNENE	HUILA	NAMIBE	BENGUELA	HUAMBO	ZAIRE	LUANDA	MALANJE	UIJE	
<i>An. gambiae</i>	0	0	0	3	0	95	307	307	326	
<i>An. arabiensis</i>	181	514	17	2	149	0	1	21	0	
<i>An. funestus</i>	0	0	0	0	0	1	0	0	0	
<i>An. pretoriensis</i>	0	0	35	0	0	0	0	0	1	
<i>An. rufipes</i>	0	0	1	4	136	14	0	9	0	
<i>An. coustani</i>	0	0	0	1	20	14	0	18	0	
<i>An. squamosus</i>	383	0	0	5	0	0	0	0	0	
<i>An. azevedoi</i>	0	0	63	170	6	0	0	1	0	
Unknown	0	0	0	0	19	3	0	4	1	to corroborate species
<i>Culex spp</i>	0	0	5	0	0	0	0	7	0	
No amplification	55	85	16	24	0	6	54	8	0	Total
Total processed	619	599	137	209	330	133	362	375	328	3092
samples missing	3	1	1	3	0	0	0	2	4	
samples received	622	600	480	376	348	133	362	378	332	
pending processing	0	0	342	164	18	0	0	1	0	525

- From April 1, 2016, through August 31, 2016, PMI carried out bi-monthly entomological monitoring activities in three sentinel sites located in Cunene, Huambo, and Malanje Province. According to the morphological determination of ~5,500 mosquitoes captured, *An. funestus* was the predominant species found in houses in Huambo and Malanje, proving that it is also a contributor to Malaria transmission in the hyper endemic provinces where PMI focuses interventions.
- The most recent evaluations reported in Angola are the results from the E8 evaluations in two sites from the Cunene province between June 2018 and May 2019. A total of 308 mosquitoes were collected throughout the study period, of which 12 were males. *An. gambiae* s.l. comprised 65.4% (n=187) of the sample, *An. coustani* 30.4% (n=87) and *An. funestus* s.l. 4.2% (n=12). Sample collections were carried out with logistical constraints that impacted the ability to provide technical recommendations.

Conclusion

The decision in favor of re-establishing entomologic supported activities by PMI in Angola was based on demonstrated investment by the GRA. The current definition of priorities by the NMCP includes strengthening entomological monitoring capacity in-country and the establishment of a functioning national level insectary within the INIS, with basic and molecular processing capability. The INIS is currently receiving TA to establish monitoring of arboviral vectors, but acknowledges the need to strengthen the monitoring of anophelines. They have requested TA to

set up an insectary and identified personnel already hired to be trained while participating in PMI-supported entomological monitoring activities.

Baseline and current data on mosquito populations will be compared in subsequent yearly evaluations and correlated with the information obtained from PMI interventions in the six focus provinces. A long-term perspective would consider longitudinal entomological monitoring, adding more evaluations yearly, i.e., pre-post rainy season and more representative sentinel sites. The objectives will be to obtain reliable data to be used in information-based decision-making planning interventions.

Key Question 2

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

Supporting Data

There is currently NO systematic susceptibility evaluations taken place in Angola.

The last comprehensive susceptibility study in Angola was conducted by PMI in Feb-March 2015. *Anopheles* larvae were collected in the selected municipalities in nine provinces (see Figures A3 and A3). Larvae were reared to the adult stage. Mosquitoes were tested using the standard WHO tube susceptibility test (WHO, 1998, 2013) using WHO insecticide impregnated test papers with diagnostic doses of deltamethrin 0.05%, bendiocarb 0.1%, pirimiphos-methyl 0.25%, lambda cyhalothrin 0.05%, and fenitrothion 1% were used for the bioassay tests. Final mortality was recorded after a 24-hour holding period during which the *Anopheles* had access to 10% sugar solution. Results presented in Figure A2. Limitation for the findings of this evaluation were discussed in the previous section. For this reason, results from this susceptibility study can only be used as rough indicators.

Figure A2 represents the percentage of 24-hour mortality of mosquito populations from nine provinces exposed to different insecticides.

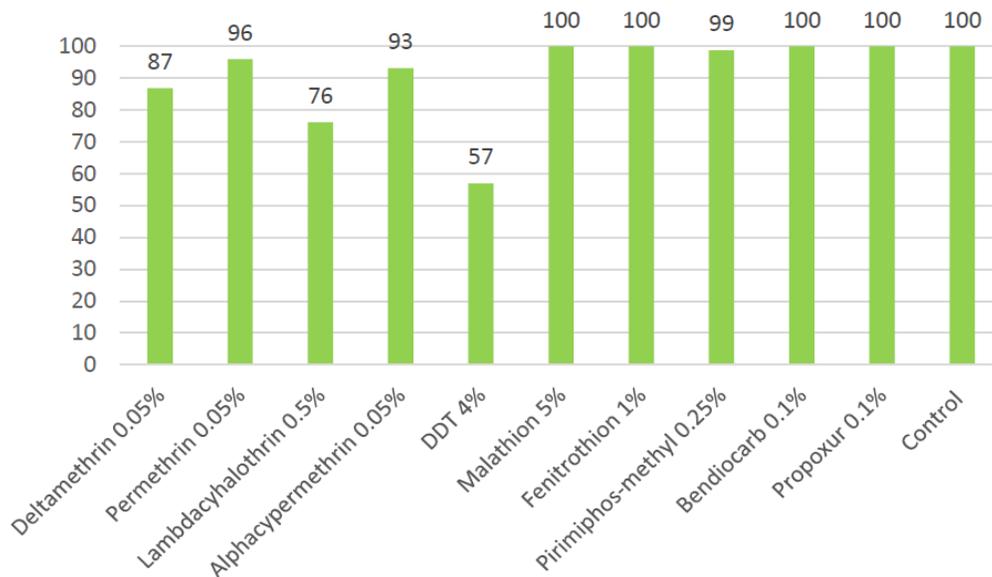
Figure A2. 24-Hour Mortality of Mosquito Populations by Insecticide

	Benguela	Cunene	Huambo	Huila	Luanda	Malanje	Namibe	Uige	Zaire
Deltamethrin	96% (100)	100% (100)	97% (100)	100% (100)	97% (100)	92% (100)	93% (100)	98% (100)	96% (100)
Lambda-cyhalothrin	N/D	91% (100)	N/D	99% (120)	100% (20)	97% (75)	100% (60)	100% (100)	N/D
Bendiocarb	100% (100)	100% (30)							
Pirimiphos-methyl	100% (100)	100% (100)	100% (100)	98% (100)	100% (100)	100% (100)	99% (100)	100% (100)	N/D
Fenitrothion	N/D	100% (100)	N/D	98% (100)	N/D	N/D	97% (100)	N/D	N/D

Insecticide resistance was not assessed in the 2016 longitudinal study described above, as captured adult mosquitoes died upon capture. *An. funestus* was the majorly captured species in this study, however, no baseline data on insecticide resistance for this species exists in the country as is very rare to capture *An. funestus* in larval stages.

A small evaluation of susceptibility was done in the context of the entomological evaluations carried out by E8 in the south of Angola. *An. gambiae* s.l. (n=2554) captured in the location of Ondjiva, Cunene, were exposed to different insecticides (see figure A3) with an additional 460 used as control, as Angola does not have a susceptible strain in culture. The susceptibility evaluation results per insecticide are summarized in the Figure A3. Confirmed resistance (mortality < 90%) was registered to lambda cyhalothrin (pyrethroid) and DDT (organochlorine). The assays indicated full susceptibility to all organophosphates (malathion, fenitrothion and pirimiphos methyl) and Carbamates (bendiocarb and propoxur) while possible resistance (90 – 97%) was observed to pyrethroids (permethrin and cypermethrin). Albeit preliminary and from only one location, these results indicate that organophosphates and carbamates might be more effective for IRS application in this area of Angola. It must be mentioned that DDT and pyrethroids have been--and continue to be--extensively used in the neighboring Namibian districts for IRS, which could explain the possible selection of resistance observed.

Figure A3. *Anopheles Gambiae* s.l insecticide susceptibility Status after 24-hours Exposure



Conclusion

As explained in the previous section, the mix of species used in the bioassays, as well as the inclusion of males in the tests, limits the reliability of these results and all mortality values should be taken with caution. However, a pattern of reduced susceptibility to deltamethrin could be observed in the northern provinces, where also the *kdr-west* mutation was found in 98-100% of the *An. gambiae* evaluated from these four provinces.

It is important to emphasize that the results mentioned above indicate the potential for pyrethroid resistance to develop in these populations, specifically in the *An. gambiae* populations from the northern region. Hence, the sole use of pyrethroid-impregnated ITNs as a strategy to prevent malaria transmission may eventually be jeopardized by insecticide resistance. We hence propose to establish continuous susceptibility evaluation and support the testing in the six PMI focus provinces, as well as provide TA to the NMCP to monitor susceptibility on the national level.

Moreover, because *An. funestus* was found in abundance inside the houses, we propose prioritizing the evaluation of its insecticide susceptibility pattern upon re-establishing entomological monitoring in Angola. To this purpose, entomological technicians will be trained to capture and preserve adult *An. funestus* mosquitoes, conduct forced oviposition and rear specimens to perform bioassays.

Key Question 3

What are the in-country considerations that impact your funding allocation in this category?

Supporting Data

As E8 was concluding activities in Angola, in January 2018, they organized a workshop where they presented and discussed the results and implication of their project with the NMCP. That scenario allowed to bring renewed attention to entomology and highlighted the lack of entomological monitoring capacity in the country. An ad-hoc technical working group prepared a series of recommendations compiled and included in the Operational Plan for Malaria Elimination in Southern Angola (2019-2021).

MOH authorities acknowledged the difficulties and established newly defined national priorities of the NMCP. These priorities include a commitment to build in-country capacity to establish entomological monitoring at the national level, set up a national insectary, and include entomology courses within the school of medicine to form technicians on basic and intermediate level.

The director of the INIS and the NMCP coordinator had identified a space to locate the insectary within the INIS and both had renewed commitment to have already hired personnel by the MOH to be trained as they participate in PMI-supported entomological monitoring activities.

Conclusion

Given the renewed commitment from various stakeholders from the MOH to build in country capacity for entomological monitoring, the PMI budget considers allocation of funds to support personnel from the MOH on entomological activities and support of FETP, which has a trainee focused on entomology. Moreover, a locally hired entomological advisor will act as a liaison between PMI/NMCP/INIS to coordinate the implementation of entomological monitoring activities in Angola.

1.B. INSECTICIDE-TREATED NETS (ITNs)

PMI Goal

Achieve high ITN coverage and usage of effective nets in endemic PMI-supported areas (in the context of the current insecticide resistance); and maintain high coverage and use with consistent ITN distribution (via campaigns and/or continuous distribution 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

Are you proposing to increase, decrease, or maintain funding allocation levels for ITN distribution and SBC activities? Why? What data did you use to arrive at that conclusion?

For MOP FY 2020 PMI will be increasing the funding allocation levels from that of MOP FY2019 because the ITN requirements for PMI-focus provinces related to the tentative national campaign in CY 2022 must have sufficient time allotted for procurement.

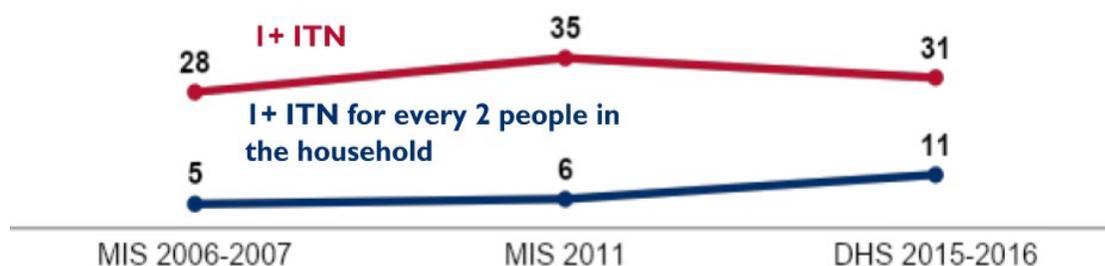
Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

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

Supporting Data

Figure A4. Trends in ITN Ownership, Percent of Households



Conclusion

The indicators collected by the last DHS study in 2015-2016 reflects low level coverage for national level ITN availability per household. These results however, were collected before the mass ITN distribution campaign (2017-2019) that PMI supported through procurement and distribution of an approximately 6.6 million ITNs and reaching over 2,370,000 households. A new assessment of net ownership and use is necessary. PMI proposes to continue the support for the procurement of routine distribution ITNs focusing on the six PMI provinces.

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?

Supporting Data

Figure A5. 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 A6. Angola ITN Use: Access Ratio, from HSS 2015 - 2016

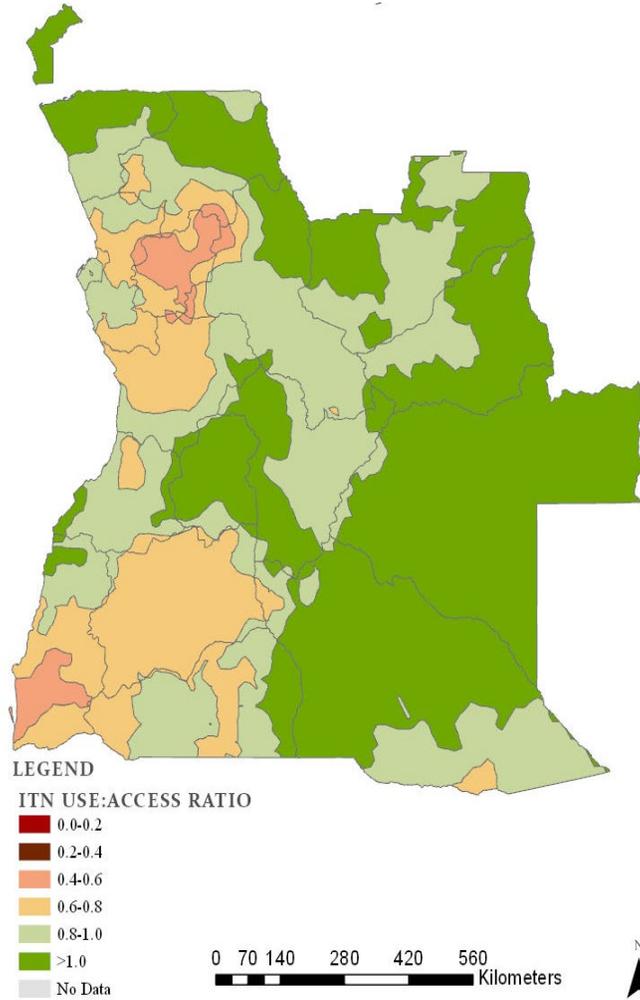


Figure A7. Use: Access Ratio for Cuanza Sul, Cunene, and Uige

<i>Indicator</i>	<i>Cuanza Sul</i>	<i>Cunene</i>	<i>Uige</i>	<i>Total</i>
<i>Percent population with access to ITN</i>	55.4%	51%	33.3%	45.7%
<i>Population that slept under ITN the previous night</i>	48.5%	35.1%	24%	35%
<i>Use:Access Ratio</i>	0.87	0.69	0.72	0.77

Source: VectorWorks ITN Use and Care Evaluation Final Report - Quantitative, 2019

Conclusion

These results indicate that ITN use correlates positively with availability globally however, the rate of use varies geographically, being lower on southern eastern provinces (non-PMI focus provinces).

PMI contributions to ITN availability have increased the percentages of both (availability and use) specifically in the six northern PMI focus provinces. Note that these indicators were collected before the mass ITN distribution campaign (2017-2019) that PMI supported.

PMI proposes to continue the support for the procurement of routine distribution ITNs focusing on the 6 PMI provinces, but contributing to the national needs, and proposes to allocate funds to contribute to the procurement of ITNs for a possible mass distribution campaign in CY2022, pending confirmation and plan by the NMCP. SBC activities will focus on those receiving through the routine distribution of nets via ANC and EPI, since this is the only current mode of distribution.

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 A8. Key Barriers and Facilitators to ITN Use

Facilitator	Type of Factor	Data Source	Evidence
Feeling reassured, comfortable, protected, no noise from insects	Internal	ITN Use and Care Evaluation Final Report - Qualitative	Quotes from 48 focus groups in 3 provinces
Barrier	Type of Factor	Data Source	Evidence
Itching, allergies, heat	Internal	ITN Use and Care Evaluation Final Report - Qualitative	Quotes from 48 focus groups in 3 provinces

Conclusion

More broadly, the last indicators collected in 2015-2016 indicated that the rate of access and use is high on the national level indicators, however, the rate of use varies geographically, being lower in southern eastern provinces, that are not PMI focus provinces. PMI does propose a malaria behavior survey to better understand barriers and facilitators in contexts such as high access/low use, which will hopefully inform planned activities around pre-campaign messaging for a proposed 2022 mass ITN campaign, in collaboration with other partners.

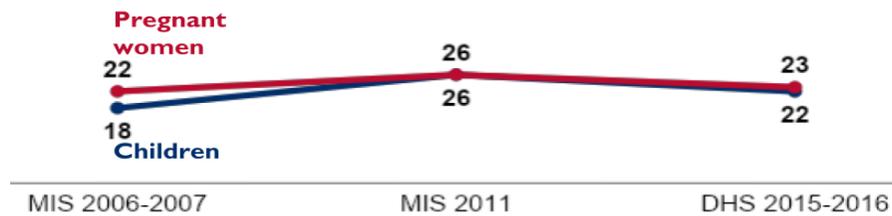
Key Question 4

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

Supporting Data

Figure A9. 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



Conclusion

Although the percentage of covered pregnant women and children under 5 years of age has increased over time, the percentage is still below a quarter of the population. Note that these indicators were collected before the mass ITN distribution campaign (2017-2019) that PMI supported. The estimated population covered (11,923,235) includes 349,723 pregnant women and 2,004,149 kids under 5 years old. PMI proposes to continue the support for the procurement of routine distribution ITNs focusing on the six PMI provinces, but also contributing to the national needs.

Key Question 5

What channels are used to distribute ITNs?

Supporting Data

Figure A10. ITN Distribution Channels

Channel	2015	2016	2017	2018	2019
EPI	x	x	x	x	
ANC	x	x	x	x	
Schools					
Mass Campaign			x	x	x

Source: National Malaria Control Program 2019

Conclusion

ITNs are distributed through both mass campaign and continuous channels through EPI and ANC in Angola, however both channels need continued strengthening. PMI has proposed contributions for ITN continuous distribution in both FY19 reprogramming and FY20 MOP proposed budgets. The FY20 budget also includes the procurement of ITNs to contribute to the national needs for a possible mass distribution campaign to be implemented in CY2022 per current strategy of massive campaign distribution every three years, pending a finalized plan by the NMCP.

Key Question 6

What is the estimated need for ITNs over the next three calendar years? What volume of ITNs are available from partners and the public sector for the next three calendar years?

Supporting Data

Figure A11. Gap Analysis Table for ITNs

Calendar Year	2019	2020	2021
PMI-targeted at-risk population ¹	5,691,088	5,870,657	6,053,598
Continuous Distribution Needs			
Channel #1: ANC ²	251,546	274,747	283,308
Channel #2: EPI ³	188,432	194,377	200,435
<i>Estimated Total Need for Continuous Channels</i> ⁴	439,978	469,124	483,743
Mass Campaign Distribution Needs			
2019/2020/2021 mass distribution campaign ⁵			3,363,110
Total ITN Need	439,978	469,124	3,846,853
Partner Contributions			
ITNs carried over from previous year ⁶	258,000	29,310	530,876
ITNs from MOH ⁷			2,004,981
ITNs from Global Fund ⁸			
ITNs from other donors			0
ITNs planned with PMI funding ⁹	211,288	1,000,000	1,600,000
Total ITNs Available	469,288	1,029,310	4,135,857
Total ITN Surplus (Gap) ¹⁰	29,310	560,186	289,004

¹ Entire population in PMI-focus provinces which represent approximately 20% of the entire country's population. Projected growth rate of 3.04% (INE) applied every year (data source: census report 2014)

² 5.2% of the population is made up of pregnant women (Reproductive Health Program). Proportion of women expected to attend ANC1 at 13 weeks or greater increases from 85% in 2019 to 90% in 2020 and 2021

³ EPI projection: The proportion of children under 1 year old is 4.3%. Angola DTP3 / immunization coverage in 2018 was estimated to 77%:

Data source: IIMS: Access to health centers were projected to be 58% in 2019, 60% in 2020 and 62% in 2021

⁴ This amount does not reflect the needs required to fill the pipeline. The minimum combined amount of continuous distribution ITN stock required at the central and provincial level warehouses to avoid stock outs at the facility level at the end of each year should be the equivalent of 6 months of needs according to the 2019 malaria quantification.

⁵ 1 net for 1.8 persons in endemic areas (WHO recommended) in 6 PMI-focus provinces for campaign tentatively planned for 2022

⁶ Quantity of ITNs carried over from 2020 could be as much as 100% of the amount procured in 2020 depending on arrival date of continuous distribution ITNs procured for CY 2020

⁷ Government's notional contribution projected to be approximately 70% of ITN commodities requirements for tentative mass campaign in 6 PMI-focus provinces in 2022.

⁸ Global Fund notional contribution to PMI-focus provinces involved in the tentative national campaign of 2022 is indicated as zero as there is no indication at the time of the MOP FY 2020 product that ITNs would be funded under future grants. Subsequently the notional amount to cover national campaign gaps in PMI-focus provinces is assigned to the GRA.

⁹ PMI commitment covers 100% of continuous distribution channel requirements in 6 PMI-focus provinces and 30% of ITN requirements for 2022 tentative mass campaign in the same 6 PMI-focus provinces

¹⁰ Notional surplus in 2020 assumes standard procurement timelines facilitates mid-year delivery of PMI's 2020 contribution. Notional surplus figure is approximately 14 months of inventory requirements for PMI-focus provinces. Actual surplus in excess of 6 months equivalent (possible up to 300,000 ITNs) inventory may be allocated towards continuous distribution requirements in non-PMI focus provinces in 2021 or 2022 depending on delivery date. Should PMI contributions for 2020 arrive late in the year the amount of surplus will be greater and after this quantity was factored into continuous distribution requirements for PMI-focus provinces the remaining amount would be factored into contributing to the requirements for continuous distribution in non-PMI-focus provinces or towards the requirements of the tentative national campaign in 2022

Conclusion

Mass campaign ITNs were last distributed in PMI-focus provinces in 2017 and 2018. There is only a tentative plan for the next campaign, and this would likely be no earlier than calendar year 2022. Although the GRA has indicated in the past that they could contribute up to 70% of the national campaign requirements, and have struggled to meet this commitment, this MOP notionally allocated the same percentage of GRA contribution towards the CY 2020 campaign.

One hundred percent of the ITN requirements for continuous distribution in PMI-focus provinces in CY 2021 and 30% of the requirements for the tentative campaign in PMI-focus provinces will be procured with MOP FY20 funding.

Key Question 7

What is the current status of durability monitoring?

Supporting Data

No durability monitoring has been performed recently.

Conclusion

No durability monitoring is proposed in FY 2019 or FY 2020 MOPs. A study of durability monitoring will be planned in the context of the next mass distribution campaign (proposed for CY 2022).

Key Question 8

What are the in-country considerations that impact your funding allocation in this category?

Supporting Data

Although the GRA has indicated in the past that they could contribute up to 70% of the national campaign requirements, it struggled to meet this commitment for ITNs in the past. Even though MOP FY2020 funding will cover the costs to procure approximately 30% of the needs for the PMI-focus province portion of the next national ITN campaign it will be expected that the warehousing of these ITN will be provided by the GRA and not funded by PMI as done in the past.

Conclusion

There is a need to begin replacing ITNs distributed in the last campaign. PMI is waiting for the NMCP to present its plan for next campaign. PMI is willing to contribute to the next national mass campaign, and pending additional discussion with NMCP and other donors.

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 to increase, decrease, or maintain funding allocation levels for this activity? Why, and what data did you use to arrive at that conclusion?

IRS is currently not supported by PMI and planned investment remains at zero.

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 does not support current IRS interventions in Angola. E8 supported the implementation of targeted IRS between September 2018 through February 2019. Over this period, a total of 21,079 households were sprayed, translating into an overall household coverage of 89.65%, protecting approximately 111,000 individuals.

Site selection criteria:

- During the 2017/18 IRS preparatory phase, an initial malaria risk map was developed to implement IRS operations in a targeted and more cost-effective approach. This map was modeled based on different data sources, considering populations at risk, population density and accessibility; in addition to Demographic Health Survey (DHS 2015-16) data, Namibian case-based surveillance data and preliminary 2018 MIS data collected for southern Angola. A refinement of the risk map was done in 2018, using data from the prevalence survey, E8 border posts and ADECOS. Field verification was conducted to actualize the targeted areas and a refined risk IRS decision map was developed to optimally implement IRS.
- The GRA procured the insecticides, a major milestone to ensure all other activities were on course. A total of 12,748 bottles of Actellic (300g/l Pirimiphos-methyl capsule suspension) were purchased.

Conclusion

Current IRS activities in Angola are not supported by PMI and do not affect the proposed budget allocations.

Key Question 2

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

Key Question 3

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

Key Question 4

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

Key Question 5

Are any PMI-supported areas considering withdrawing IRS? 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

Not applicable.

Key Question 6

What are the in-country considerations that impact your funding allocation in this category?

Supporting Data

Not applicable.

Conclusion

Although there is high-level GRA interest, without established entomological monitoring, there is limited data to support IRS in the PMI-focus provinces and therefore Angola does not meet the criteria per PMI guidance to support IRS in the country at this time.

2. HUMAN HEALTH

2.A CASE MANAGEMENT in health facilities and communities

NMCP objective

- According to the 2016-2020 National Malaria Control Program Strategic Plan, the overall objective is to reduce malaria morbidity and mortality in the country by 60% by 2020 compared to the 2012 baseline.
- To deliver this objective, the following specific objectives are outlined:
 - By the end of 2020, 100% of suspected malaria cases in health facilities and communities should be tested before being treated.
 - By the end of 2020, 100% of confirmed malaria cases should be treated in accordance with national policy guidelines at all levels of the health pyramid, including the community.

NMCP approach

- The national guidelines for diagnosis and treatment of malaria are based on the prevailing policy environment and aligned with WHO recommendations on universal diagnostic testing and treatment. The Angolan guidelines state that “all suspected feverish malaria syndrome should be confirmed” should receive a parasitological diagnosis by microscopy or malaria rapid diagnostic tests (RDTs), and antimalarial treatment should only be administered to patients with confirmed malaria.
- The NMCP also recommends three first-line antimalarials for the treatment of uncomplicated malaria: artemether -lumefantrine, artesunate-amodiaquine, and dihydroartemisinin-piperaquine. The recommendations are the same for pregnant women in the second or third trimester. For those pregnant women in the first trimester, oral quinine (with or without clindamycin) is recommended. For severe malaria, IV artesunate is recommended in facilities able to administer IV medications. In lower level facilities, IM artemether is recommended. Although IV quinine is the third-line option for treatment of severe malaria, it is the most commonly used treatment due to unavailability of IV artesunate or IM artemether. For pre-referral treatment of severe cases, the guidelines recommend rectal artesunate suppositories for children less than six years of age. Health workers at facility-level have been trained in the use of rectal artesunate suppositories, but currently it is not provided to ADECOS for treatment at the community level.
- The NMCP recommends that malaria testing be done by using RDTs or microscopy. The national guidance requires that RDTs be performed in the consultation room and microscopy in a laboratory. Health posts and health centers generally follow national guidance. However, in hospitals, all malaria tests (RDTs and microscopy) are conducted in a laboratory. Recently, with the introduction of malaria testing at the community level, ADECOS were authorized and trained to conduct RDTs and treat positive cases of uncomplicated malaria for children less than five years of age in the community. In 2018, the NMCP announced a policy shift to increase the use of microscopy for diagnosis in hospitals and health centers across the

country. PMI will work with the NMCP and other donors to assess the feasibility, details, and timeline of the implementation of this policy shift to ensure that appropriate and quality diagnostic tools remain available at all levels of the health system.

- The NMCP recommends the inclusion of RDT and microscopy quality assurance coverage during twice-yearly supervision visits. However, Angola is lacking a comprehensive quality assurance / quality control (QA/QC) program for malaria diagnosis. In 2019, it has begun a process of formative supervision in previously trained laboratory technicians. Formative supervision guidelines were developed and are in implementation phase. Formative supervision has focused on those health units with clinical laboratories that cover 80% of the burden of confirmed malaria cases.
- The national policy of ADECOS is a joint initiative between the Ministry of Territorial Administration (MAT) through the Social Support Fund (FAS) and Ministry of Health (MOH), piloted since 2015, with the support of various partners. This policy is still in the implementation and expansion phase, with 2,145 ADECOS nationwide (846 in PMI-focus provinces). Of those there are 1,185 ADECOS nationwide (786 in PMI-focus provinces) trained in malaria case management as of September 2019. Currently, the main objectives of the ADECOS are to increase community awareness of health prevention interventions, such as basic malaria prevention activities (e.g., use of ITNs, early treatment-seeking, and compliance with diagnostic outcomes), as well as vaccination, improved sanitation, and access to safe water. The MAT's three-month long ADECOS curriculum includes limited training on providing basic services, including testing with RDTs and administering ACTs for uncomplicated malaria. Severe malaria cases should be referred to the nearest health facility. ADECOS are linked to municipal health centers, where integrated health teams are responsible for performing routine supervision. Salaries and operational costs of the ADECOS are paid by the MAT. While ADECOS is the platform for iCCM inclusive of diarrhea and pneumonia, currently only malaria components are supported with commodities. According to national policy each ADECOS worker is responsible for a micro-area. A micro-area is a delimited geographical space of households of 100 to 250 families, approximately 2,400 to 4,000 people. Certified ADECOS are covering approximately 1900 families, representing more than 272,000 people at the community level.
- While national treatment guidelines are for both the public and private sectors, the private sector often does not follow the established norms and there is not much reinforcement in terms of regulatory authorities to address this issue. Currently, there is no technical working group on private sector case management for malaria. Antimalarials of all kinds—including monotherapies and drugs for severe malaria—are available in private outlets. According to a fever management Reach and Recall study conducted by PMI in 2016 in Uige and Huambo, with 1,068 respondents, 14% of respondents went to private sector pharmacies, 4.5% visited a private health facility, and 24% self-medicated after detecting a fever.

PMI objective, in support of NMCP

PMI is helping the NMCP to achieve its 2020 objectives:

- All suspected cases at health facilities and in the community will be tested for malaria prior to treatment;
- All confirmed malaria cases should be treated in accordance with national policy guidelines at all levels of the health pyramid, including the community level.

This support is focused through technical assistance via training and supervision in six focus provinces (Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uige, and Zaire), with contributions to the central level and national commodity quantification needs.

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

- PMI procured, warehoused and distributed approximately more than 1 million ACTs and 1.6 million RDTs in FY 2018.
- To address poor service delivery in the public sector, PMI supported case management training for healthcare workers:
 - 992 health workers in case management with ACTs;
 - 1,454 health workers in diagnostics with RDTs;
 - 259 health workers in IPTp;
- Supported a total of 198 ADECOS in Cuanza Norte, Zaire and Lunda Sul Provinces to test and treat uncomplicated malaria at the community level.
- Expanding quality and consistent supportive supervision remains a key area for growth in Angola; 849 healthcare workers received supportive supervision for RDT and ACT use in FY2019

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

- PMI plans to procure approximately 5 million RDTs and 3.6 million treatments of ASAQ for the public sector to support nationwide needs. Ten percent of these malaria commodities will go towards supporting the ADECOS platform at the community level, while the MoH will provide commodities for the other diseases included in the care package (e.g., pneumonia and diarrhea). Both IM artemether and IV artesunate will be procured for use in referral centers and larger health centers. We anticipate that this will be the last FY for which PMI funds will be used to procure IM artemether, and will continue to work with the NMCP to ensure they are prepared for the transition.
- At the health facility level, PMI will target resources to strengthen malaria case management, including three- to five-day trainings on supportive supervision for provincial- and

municipal-level malaria supervisors in Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uige, and Zaire, which together include 578 health facilities and serve 20 percent of the national population.

- Support “training-of-trainers” workshops, provincial-level trainings for all 18 provinces and municipal-level trainings for 61 municipalities in the six PMI focus provinces. The municipal level malaria supervisors will be supported to provide regular formative supervision visits to health facilities on a quarterly basis.
- Training in laboratory diagnostics (RDTs and microscopy) and quality control will take place at provincial and municipal levels. Supervision visits to 18 provincial laboratories and 48 municipal laboratories will also be supported.
- At the community level, in coordination with the Global Fund, PMI will continue to support the GRA’s iCCM initiative with ADECOS, including strengthening the supportive supervision component. Recipients of training will include senior ADECOS trainers on iCCM and M&E. Funds will also go towards essential supportive tools such as thermometers, registration books for data collection, backpacks, raincoats/boots, and cellphones for ADECOS.

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 to increase, decrease, or maintain funding allocation levels for this activity? Why, and what data did you use to arrive at that conclusion?

Compared to the original FY 2019 MOP, the funding allocation levels for case management support in FY 2020 has been maintained. However, there are two strategic shifts: (1) a decision to increase commodity procurement to avoid potential stock outs of essential products so that investments in facility-level and community-level case management are maintained and supported; and (2) the scope of the technical assistance and activities will be maintained but with decreased funding given carryover from previous year funding.

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

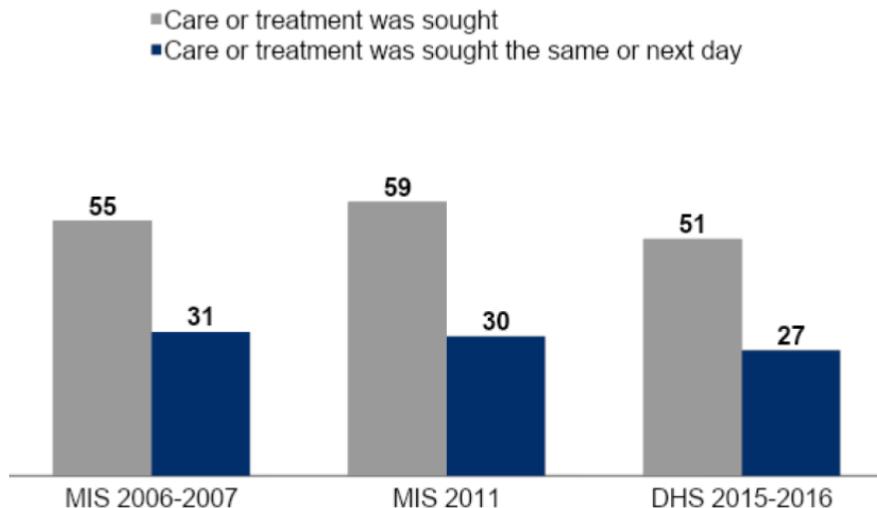
Key Question 1

What is the status of care-seeking?

Supporting Data

Figure A12. Trends in Care-Seeking for Fever

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



*Excludes treatment or advice from a traditional practitioner.

Conclusion

As data from national household-level surveys demonstrate (MIS 2006-2007, MIS 2011, DHS 2015-2016), around half of children under five with a fever seek treatment, and less than a third seek prompt treatment within the same or next day. In over a decade's time, there has been no significant improvement in this care-seeking trends as measured. PMI and other stakeholders need to strengthen efforts to improve the culture of prompt care seeking in Angola by understanding the most common barriers to this behavior and intensifying efforts at provincial, municipal, and community levels. PMI proposes support of a malaria behavior survey with care seeking as a component.

Key Question 2

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

Supporting Data

Figure A13. Barriers and Facilitators to Care-Seeking

Facilitator	Type of Factor	Data Source	Evidence
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(i) Non-payment in public health units	<i>Social</i>	National Malaria Control Program Strategic Plan, 2015-2020	Strategic efforts are made to eliminate financial barriers for basic health services, including those for malaria. (pg. 49-50)
Barrier	Type of Factor	Data Source	Evidence
(i) delayed decision to go the health unit based on cultural aspects;	<i>Social</i>	Demographic Health Survey (<i>Inquérito de Indicadores Múltiplos de Saúde</i> , IIMS) 2015 – 2016	30% of women cited challenges in obtaining consent to seek out health services. (pg. 146)
(ii) transport and geographical barriers;	<i>Internal, Social, and Environmental</i>	IIMS 2015 – 2016	The second most common challenge cited by women for accessing health services was distance to health units (52%). (pg. 146)
(iii) financial barriers;	<i>Internal, Social, and Environmental</i>	IIMS 2015 – 2016	The first most common challenge cited by women for accessing health services was obtaining money for consultations and treatment (63%). (pg. 146)

Conclusion

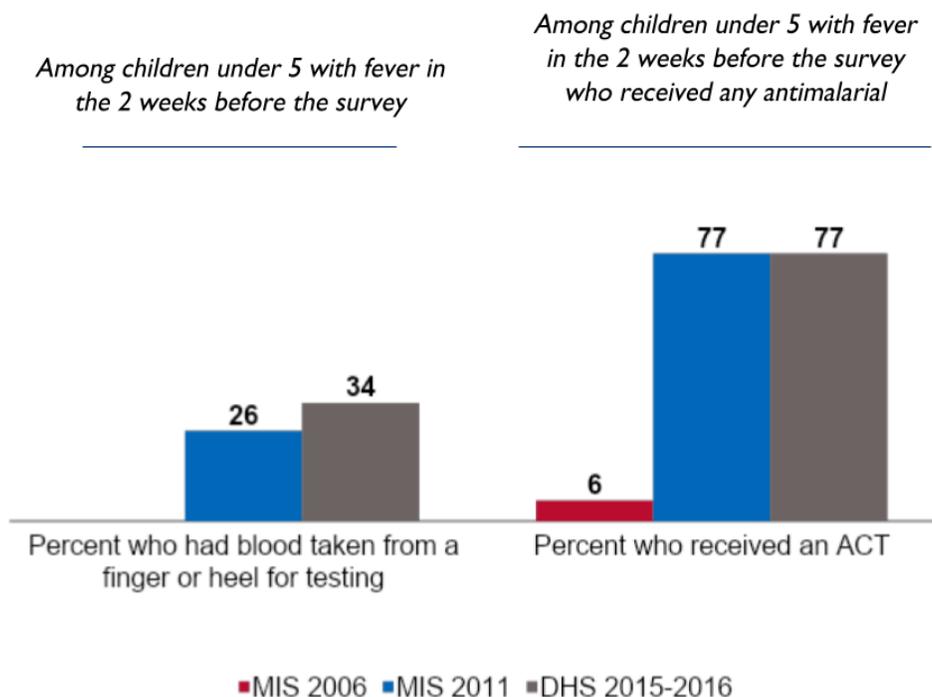
The available data show that care-seeking can be impacted by structural barriers/facilitators (i.e., cost system, transportation) and individual/cultural behaviors and decision-making. Programmatic data also suggests that issues with health care functionality remain (i.e., efficiency of services, available drugs). In addition to learning more through a proposed malaria behavior survey and thinking more strategically with the NMCP around how to address barriers for women seeking services, PMI will increase its contribution to case management commodities and invest in strengthening quality of care at facility and community-levels through training and supportive supervision, as well as health care worker interpersonal communication.

Key Question 3

How have malaria testing and treatment practices evolved over time?

Supporting Data

Figure A14. Trends in Diagnosis and Treatment of Children with Fever



Conclusion

The data from nationwide household surveys demonstrate that the percentage of children under five with fever receiving diagnostic tests for malaria and receiving appropriate treatment has increased since 2006, but there is significant room for improvement. In FY 2019, a total of 849 healthcare workers received formative supervision on malaria diagnostics and ACT use; indicators were revised with our implementing partner in November 2019 to measure outcomes of these investments in supervision. PMI continues to invest in various areas to increase these two critical components of malaria case management: (1) training and formative supervision of facility-level and community-level health workers; (2) increasing the community-based platform for hard to reach communities; and (3) increasing availability of RDTs and ACTs to avoid stockouts.

Key Question 4

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

Supporting Data

Figure A15. Facilitators and Barriers to Testing and Treatment

Facilitator	Type of	Data	Evidence
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	Factor	Source	
			N/A
Barrier	Type of Factor	Data Source	Evidence
Stock outs of ACTs	Environmental	2016 Health Facility Survey	In Uíge province, 60% (42-75) of patients with uncomplicated malaria were appropriately treated. Incorrect case management of suspect malaria cases was associated with ACT stockouts.
Lack of healthcare worker training	Social	2016 Health Facility Survey	In Huambo province, 30% (23-38) of patients with uncomplicated malaria were appropriately treated. Incorrect case management of suspect malaria cases was associated with lack of health care worker training.

Conclusion

To better understand facilitators and barriers to appropriate testing and treatment practices, PMI will be investing in activities such as a malaria behavior survey and a health facility survey in early 2021. These two surveys will provide information about community perceptions of health worker attitudes and healthcare worker performance, respectively. PMI plans to continue investing in case management commodities and healthcare worker training and supportive supervision.

Key Question 5

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

Supporting Data

Both PMI and Global Fund contribute to broader nationwide commodity needs. Central level support is also provided by PMI. Figure A16 outlines the targeted technical assistance provided at provincial level.

Figure A16. Planned Support for Case Management at Health Facilities and CHWs

Donor		Facility	Community
PMI	Activities	Training/ supportive supervision; Laboratory QA/QC; Commodities	Training/supportive supervision; ADECOS equipment
	Geographic scope	Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Zaire, Uíge	Cuanza Norte, Lunda Sul, Zaire

Donor		Facility	Community
Global Fund: national grant	Activities	Training/ supervision; Commodities; Training on Malaria Early Warning System-MEWS in 4 Epidemic provinces (Cuando Cubango, Cunene, Huila and Namibe)	Training/supervision
	Geographic scope	Bengo, Benguela, Bié, Cabinda ,Cuando Cubango, Cuanza Sul, Cunene, Huila, Huambo, Luanda, Moxico, Namibe	Luanda, Moxico, Uíge, Malange, Bengo and Lunda Norte
Global Fund: regional grant	Activities	Training/ supervision; Commodities	Training/supervision; ADECOS equipment
	Geographic Scope	Quando Cubango	Quando Cubango
World Bank	Activities	n/a	Training/supervision; ADECOS equipment
	Geographic scope	n/a	Bengo, Cuando Cubango, Cunene, Lunda Norte, Malanje, Moxico, Uíge, Luanda, Cabinda, Bie, Huambo, Benguela, Huila, Cuanza Sul, Zaire, Lunda Sul, Cunene, Cuanza Norte
Bill & Melinda Gates Foundation	Activities	n/a	Training/supervision, ADECOS equipment
	Geographic scope	n/a	Quando Cubango, Cunene

Conclusion

Global Fund and PMI continue to be significant external donors supporting facility-level and community-level case management, with support from the World Bank and the Gates Foundation for the community-level ADECOS program. Although geographic scope is coordinated for case management activities, there remain critical gaps, especially in non-PMI focus provinces around supportive supervision, commodities, etc. PMI will continue to collaborate closely with the Global Fund and GRA, while also moving forward with interventions (such as a revised supervision checklist) to encourage roll-out nationwide.

Key Question 6

What is the estimated need for RDTs for FY 2020?

Supporting Data

Figure A17. Gap Analysis Table for RDTs

Calendar Year	2019	2020	2021
RDT Needs			
Total country population	30,175,553	31 127 674	32,097,671
Population at risk for malaria ¹	30,175,553	31 127 674	32,097,671
PMI-targeted at-risk population ²	5,691,109	5,870,679	6,053,621
Total number of projected fever cases ³	21,373,329	22,047,715	22,734,764
Number of projected fever cases in PMI-targeted at-risk population ³	4,030,998	4,158,187	4,287,764
Percent of fever cases tested with an RDT ⁴	50%	45%	43%
RDTs needed for PMI-targeted at-risk population	1,410,849	1,384,676	1,438,116
Total National RDT Needs ⁵	7,480,665	7,341,889	7,625,240
Partner Contributions to national needs			
RDTs carried over from previous year ⁶	5,683,004	0	1,040,548
RDTs from Government ⁷			5,400,000
RDTs from Global Fund ⁸	56,750	3,382,437	
RDTs from other donors			
RDTs planned with PMI funding ⁹	1,613,330	5,000,000	5,000,000
Total RDTs Available	7,353,084	8,382,437	11,440,548
Total RDT Surplus (Gap) ¹⁰	-127,581	1,040,548	3,815,308

¹Geographic coverage: the entire country is at risk of malaria

² PMI targeted area of 6 focus provinces is 18.6% of total country population:

³ The total number of fever episodes per year is based on the following population breakdown:

- a. <5 years (17% of the population); 1.5 fevers/year
- b. 5-9 years (17% of the population); 1 fever/year
- c. 10-14 years (13% of the population); 0.63 fevers/year
- d. > 14 years (53% of the population); 0.38 fevers/year

⁴ Data Source: NMCP: Proportion with access to diagnosis in the public sector and percent of those fevers accessing public sector that are diagnosed with a RDT; 2019-70%, 2020-74%; 2021-78%

⁵ This is the qty required to meet testing needs. It does not include the amount required to fill the pipeline with a minimum of 6 months of stocks to avoid stock outs at the facility level.

⁶ 2019: From FY 19 Q1 PPMRm

⁷ Notional GRA contribution for 2021 (if realized) will amount to 70% of national need

⁸ GF procures RDTs but these are generally not allocated to PMI provinces to avoid stockouts elsewhere. No order has been placed for the quantity indicated here as of October 2019

⁹ PMI contribution will first cover 100% of PMI-focus province requirement which will include quantities to maintain minimal levels of stock. Remaining quantities will be allocated to meet approximately 40% of the needs in the remaining provinces.

¹⁰ For 2020 and 2021 the gap figure contributes towards pipeline requirements. Notional surplus in 2021 assumes GRA contribution and amounts to the minimum (6 months) stock holding level recommendation for Angola

Conclusion

MOP FY 2020 funding will support the procurement of 100% of the RDT requirements in PMI-focus provinces and approximately 30% of the needs for the remainder of the country.

Key Question 7

What is the estimated need for ACTs for FY 2020?

Supporting Data

Figure A18. Gap Analysis Table for ACTs

Calendar Year	2019	2020	2021
ACT Needs			
Total country population	30,175,553	31,127,674	32,097,671
Population at risk for malaria ¹	30,175,553	31,127,674	32,097,671
PMI-targeted at-risk population ²	5,691,088	5,870,657	6,053,598
Total projected number of diagnosed malaria cases ^{3,4}	7,106,632	7,072,687	7,093,246
Projected number of diagnosed malaria cases in PMI-targeted at-risk population ⁴	1,340,307	1,333,905	1,337,782
ACTs needed for PMI-targeted at-risk population ⁵	1,340,307	1,333,905	1,337,782
Total National ACT Needs ⁵	7,106,632	7,072,687	7,093,246
Partner Contributions to national needs			
ACTs carried over from previous year ⁶	612,762		
ACTs from Government ⁷			
ACTs from Global Fund ⁸	292,710	1,808,074	
ACTs from other donors			
ACTs planned with PMI funding ⁹	956,839	3,653,108	2,500,000
Total ACTs Available	1,862,311	5,461,182	2,500,000
Total ACT Surplus (Gap) ¹⁰	-5,244,321	-1,611,505	-4,593,246

footnotes:

¹Geographic coverage: the entire country is at risk of malaria

² PMI targeted area of 6 focus provinces is 18.6% of total country population:

³ The total number of fever episodes per year is based on the following population breakdown:

- a. <5 years (17% of the population); 1.5 fevers/year
- b. 5-9 years (17% of the population); 1 fever/year
- c. 10-14 years (13% of the population); 0.63 fevers/year
- d. > 14 years (53% of the population); 0.38 fevers/year

⁴ Data Source: NMCP: Proportion of fevers with access to diagnosis in the public sector: % of fevers accessing public sector that are diagnosed with a RDT/Microscopy: Positivity rates for RDT/microscopy

⁵ This is the qty required to meet annual treatment needs. It does not include the quantity required to fill the pipeline with a minimum of 6 months of stocks to avoid stock outs at the facility level.

⁶ 2019: From FY19 Q1 PPMRm

⁷ Government's contribution (if any) will not be allocated to PMI-focus provinces in order to contribute to national needs.

⁸ GF procures ACTs but these are generally not allocated to PMI provinces to avoid stockouts elsewhere.

⁹ 2020; PMI contribution covers 100% of PMI focus area needs and approximately 30% of the needs for the remaining provinces

¹⁰ For 2020 and 2021 the projected gaps would be realized in non-PMI-focus provinces

Conclusion

Mop FY 2020 funding will support the procurement of 100% of the ACT requirements in PMI-focus provinces and approximately 30% of the needs for the remainder of the country.

Key Question 8

What is the projected need for severe malaria treatment and any other treatments as applicable?

Supporting Data

Figure A19. Gap Analysis Table for Injectable Artesunate

Calendar Year	2019	2020	2021
Injectable Artesunate Needs			
Projected Number of Severe Cases (Nationally)	419,487	346,461	345,701
Projected Number of Severe Cases in PMI targeted area ¹	113,261	93,544	93,339
Projected # of severe cases among children ²	53,233	43,966	43,869
Projected # of severe cases among adults ²	60,029	49,579	49,470
Total Injectable Artesunate vials Needs³	792,830	654,811	653,375
Partner Contributions			
Injectable artesunate vials carried over from previous year ⁴	229,909	0	327,406
Injectable artesunate vials from Government ⁵	50,965	582,217	252,656
Injectable artesunate vials from Global Fund ⁶			
Injectable artesunate vials from other donors			
Injectable artesunate vials planned with PMI funding	215,000	400,000	400,000
Total Injectable Artesunate vials Available	495,874	982,217	980,062
Total Injectable Artesunate vials Surplus (Gap)⁷	-296,956	327,406	326,687

¹ PMI supports requirements for larger health centers in 6 PMI-focus provinces (27% of national fevers): National Quantification: % of all diagnosed malaria cases projected to be severe malaria; 6% for 2019, 5% for 2020 and 2021.

² Proportion of severe malaria cases in children; 47%; 53% in adults. 2019 NMCP quantification

³ Estimates of 7 vials per course from National Malaria protocol (ed:2017): The needs to fill the pipeline with minimum of 6 months of stock are not included. This quantity is factored into the calculations of any surplus

⁴ 2019: A prorated amount of the national stock for PMI-focus provinces. In 2021 the surplus is the amount required to maintain minimum buffer stock of six months

⁵ 2019: Prorated portion of GRA procurements for PMI-focus provinces: Government's commitment is projected to be 60% of the quantified needs in 2020 for non-PMI-focus provinces. This is a decrease from previous commitments to contribute 70% of the national requirements in 2019

⁶ GF procures this produce the it is generally not allocated to PMI provinces to avoid stockouts elsewhere.

⁷ Projected surplus in 2020 and 2021 is equivalent to 6 months consumption which is the minimum stock holding recommended in Angola

Figure A20. Gap Analysis Table for Rectal Artesunate

Calendar Year	2019	2020	2021
Artesunate Suppository Needs			
Projected Number of Severe Cases (Nationally) ¹	419,487	346,461	345,701
Number of severe cases expected to require pre-referral dose at community level ²	62,923	51,969	51,855
Total Artesunate Suppository Needs³	125,846	103,938	103,710
Partner Contributions			
Artesunate suppositories carried over from previous year	53,287		169,530
Artesunate suppositories from Government ⁴			
Artesunate suppositories from Global Fund			
Artesunate suppositories from other donors			
Artesunate suppositories planned with PMI funding ⁵		273,468	
Total Artesunate Suppositories Available	53,287	273,468	169,530
Total Artesunate Suppositories Surplus (Gap)	-72,559	169,530	65,819

Footnotes:

- 1) PMI has supported pre-referral requirements nationwide: National Quantification: % of all diagnosed malaria cases projected to be severe malaria; 6% for 2019, 5% for 2020 and 2021.
- 2) 15% of severe malaria cases require referral - National Malaria Commodities Quantification Report (2018-19): The MoH policy for rectal artesunate currently supports its use in children less than six years of age in peripheral health facilities,
- 3) An average of 2 suppositories per case - National Malaria protocol (2017). This amount does not include the quantity required to maintain a minimum stock balance equivalent to six-months of requirements as per minimum suggested national program recommendations
- 4) Procured by GRA with national essential drugs kits but not allocated to PMI-focus provinces
- 5) 2020 PMI amount is a 2019 procurement slated to arrive in 2020

Conclusion

MOP FY 2020 funding will support the procurement of 100% of the artesunate injection requirements in PMI-focus provinces. PMI will not support the procurement of rectal artesunate due to a large procurement of the product in FY 2018.

Key Question 9

Are the first-line ACTs effective and monitored regularly?

Supporting Data

Figure A21. Most recently completed and ongoing antimalarial therapeutic efficacy studies

Year	Sites	Treatment Arms	PCR-corrected ACPR>90%?	Where molecular resistance work was completed or the plan, if any, for molecular resistance work
2017	Zaire, Benguela (No AL), Lunda Sul (no ASAQ)	AL, ASAQ, DP	Yes	CDC Atlanta (PARMA)
2019	Zaire, Benguela, Lunda Sul	AL, ASAQ	Pending	CDC Atlanta (PARMA)
2021	TBD	TBD	TBD	CDC Atlanta (PARMA)

Footnotes:

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

Conclusion

As of 2017, antimalarials remain efficacious in Angola: (1) DP and ASAQ in Benguela, (2) AL and ASAQ in Zaire, and (3) AL and DP in Lunda Sul. Results from the 2019 study are pending, but PMI continues to support the NMCP in the planning and execution of TESs in Angola while building country capacity to monitor antimalarials.

Key Question 10

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

Supporting Data

Not applicable.

Conclusion

At this time, given the bulk of the need in the public sector, PMI does not propose direct private sector support.

Key Question 11

What are the in-country considerations that impact your funding allocation in this category?

Supporting Data

Although the GRA has indicated in the past that they could contribute up to 70% of the national commodity requirements they have struggled to meet this commitment.

Conclusion

To achieve PMI objectives, PMI will still rely on the GRA to fund commodities for malaria case management but will plan to meet the requirements in PMI-focus provinces by procuring 100% of the needs in the provinces with FY 2020 funding.

2.B. DRUG-BASED PREVENTION

NMCP objective
<p>The NMCP does not have seasonal malaria chemoprevention (SMC) as a core intervention in Angola, per WHO guidance. However, drug-based prevention is a component of the approach for addressing malaria in pregnancy (MIP) through intermittent preventive therapy for pregnant women (IPTp). The NMCP has a three-pronged approach to malaria prevention and control during pregnancy: IPTp, ITN use, and diagnosis and treatment of clinical illness in line with the WHO recommendations. According to its strategic plan, the NMCP has the following objectives for malaria in pregnancy (MIP):</p> <ul style="list-style-type: none">○ By the end of 2020, at least 80 percent of pregnant women sleep under an ITN○ By the end of 2020, 80 percent of pregnant women will have access to prenatal consultations and those eligible for IPTp receive at least three doses of SP

- By the end of 2020, all laboratory-confirmed malaria cases should be treated at all levels of the health system, including the community level, in accordance with national policy guidelines.

NMCP approach

The NMCP and the Reproductive Health Department have tried to improve the design and coordination of MIP activities. There is a national MIP working group with limited reach currently, but the NMCP is currently working with partners to develop regional MIP workshops to support collaboration at the provincial and municipal levels for MIP activities. In 2014, PMI collaborated with the NMCP and the Reproductive Health and HIV Departments to review the new IPTp guidance adopted in 2013, which stipulates that IPTp be given to all pregnant women in areas of moderate to high malaria transmission at every scheduled ANC visit, except during the first trimester. The National Protocol for Malaria in Pregnancy was updated, and a new training manual was developed. The guidelines specify that IPTp starts at the 13th week of pregnancy and continues at every prenatal visit until the delivery date; a new Strategic Plan will be developed in 2020 anticipated to more specifically include the 2016 WHO guidelines for monthly SP doses. MIP trainings and supervisions are integrated with malaria case management with the aim of achieving a national scale. Unfortunately, a national target for the training of health workers has not yet been set.

As per national policy, pregnant women receive ITNs at the first ANC visit. With regard to the treatment of uncomplicated malaria in pregnancy, the NMCP's policy is to administer oral quinine during the first trimester and ACTs during the last two trimesters of the pregnancy. For severe malaria, the first-line treatment is intravenous (IV) artesunate, with intramuscular (IM) artemether as second-line treatment and quinine IV as third-line treatment. However, since artesunate and artemether are often not available, 33 quinine IV is the treatment most often administered. Health facilities track malaria cases during pregnancy and report on a monthly basis.

PMI objective, in support of NMCP

- PMI contributes to the national drug-based prevention strategy by supporting IPTp administration through ANC visits.
- PMI has focused its efforts at the central level, with targeted technical assistance in the six PMI focus provinces (Uige, Zaire, Lunda Norte, Lunda Sul, Malanje, and Cuanza Norte) for training and supervision in MiP and the procurement of SP.

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

- Angola has adopted the 2016 WHO ANC Guidelines. In the context of the recommended eight ANC contacts schedule, MIP and IPTp are being addressed by the Department of Reproductive Health. Additionally, ANC registers have been updated to capture eight to nine contacts, although a few provinces are still piloting its introduction. Currently, the HMIS/DHIS2 has not

yet been updated to capture these contacts because the use of the updated registers is not a nationwide practice.

- PMI supported a focused 3-day training for 259 ANC health workers in the six PMI focus provinces in 60 municipalities targeted for MIP. The training focused on IPTp for MIP, as well as the management of malaria for pregnant women. Additionally, formative supervision checklists are integrated to include MIP and ANC.
- PMI has aimed to minimize SP stockouts, which negatively impacts the frequency of antenatal visits, through greater investments in supply chain strengthening at all levels and by providing SP for the six hyperendemic PMI focus provinces and a portion of the need in other provinces.

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

- Procure SP to meet 100% of the needs in PMI-focus provinces and the majority of needs in the remaining provinces. Continue capacity building efforts aimed at increasing IPTp -SP rates in Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uíge, and Zaire by promoting best practices. Training will focus on accurately implementing the updated IPTp protocols based on WHO 2016 recommendations and appropriate management of malaria in pregnancy. PMI will work to ensure that the latest national IPTp-SP guidelines are available in health facilities for health workers providing ANC services.
- Support health facilities to continue to strengthen ANC services, maintain and expand support for training and supervision, and promote early and regular ANC attendance through mobilization led by community health workers. PMI will also support the scaling up of community awareness for IPTp-SP and quality improvement to increase provision of IPTp at every ANC visit, as per the national guidelines.
- PMI support will focus on supportive supervision, on-site training as needed, as well as activities aimed at improving awareness and facilitating behavior change related to malaria prevention.
- PMI will continue to collaborate with the NMCP and the Reproductive Health Department to strengthen prevention, diagnosis, and treatment of MIP at the health facility level.

2.B.i 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 area 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 to increase, decrease, or maintain funding allocation levels for this activity? Why, and what data did you use to arrive at that conclusion?

Compared to the original FY 2019 MOP, the funding allocation levels for MIP support in FY 2020 has been decreased slightly. However, there are two strategic shifts: (1) a decision to increase commodity procurement to avoid potential stock outs of SP so that investments in IPTp are maintained and supported; and (2) the scope of the technical assistance and activities will be maintained but with decreased funding given carryover from previous year funding.

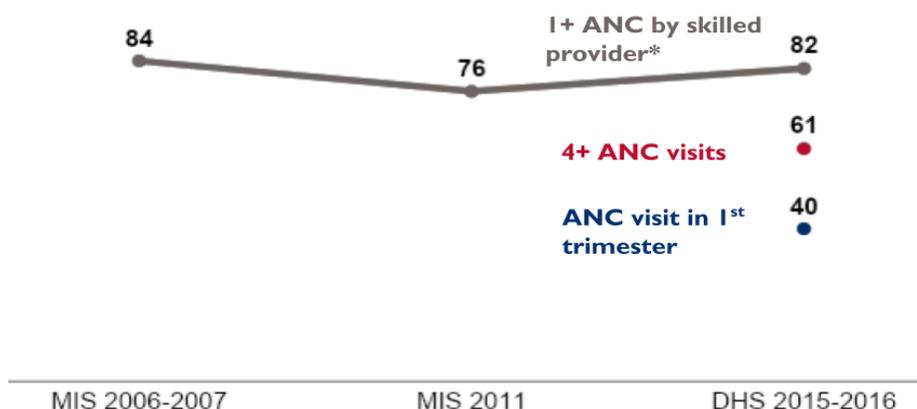
Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

What proportion of pregnant women are receiving ANC early and frequently (as recommended by national and/or WHO strategies) during their pregnancy?

Supporting Data

Figure A22. 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



*Skilled provider includes doctor, nurse, or midwife.

Conclusion

The national policy has adopted the 2016 WHO ANC guidelines and supports early initiation of IPTp between 13-16 weeks. The data above from the 2015-2016 DHS indicate that 82% of pregnant women are receiving at least one ANC visit by a skilled provider, a trend relatively consistent since 2006. However, only 40% of pregnant women are making that first visit within their first trimester and only 61% are reaching at least four of the recommended number of ANC

visits. There needs to be continued efforts in Angola to increase both the number and earlier initiation of ANC visits. Key barriers identified for efficient delivery of IPTp in Angola in 2016 included need for policy development and dissemination, health worker training and supervision, and supporting health systems development. Additional key barriers identified in a follow-up qualitative study among pregnant women were waiting time in health facilities, feeling judged by providers, and expectation of side effects from SP. Providers identified workload, insufficient peer review, lack of availability of safe drinking water to take SP, and cost and distance to facilities as barriers. These data support the plans for formative supervision and training that are in progress.

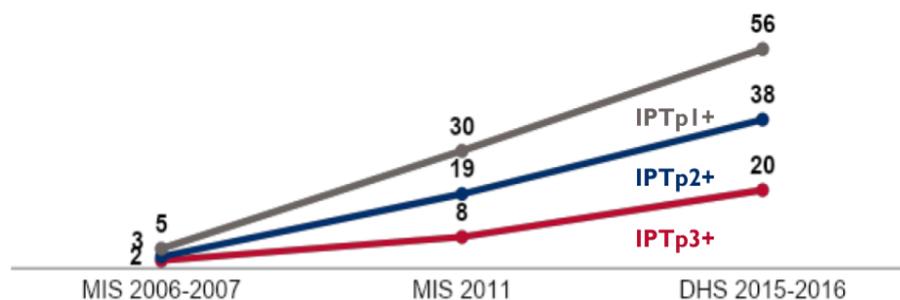
Key Question 2

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

Supporting Data

Figure A23. 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



*These indicators have changed slightly over time. Depicted here is the coverage value, not restricted to doses received at ANC.

Conclusion

Data from three national household-level surveys from 2006 to 2016 demonstrate a significant improvement in the trend of pregnant women receiving doses of IPTp. However, in 2016 only slightly more than half of pregnant women were receiving one dose of IPTp and the proportion of women returning for a second or third dose continued to decline. PMI is proposing a malaria behavior survey to hopefully shed some light on barriers to ANC access.

Key Question 3

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

Supporting Data

Figure A24. Trends in Missed Opportunities for IPTp

Percent of women age 15-49

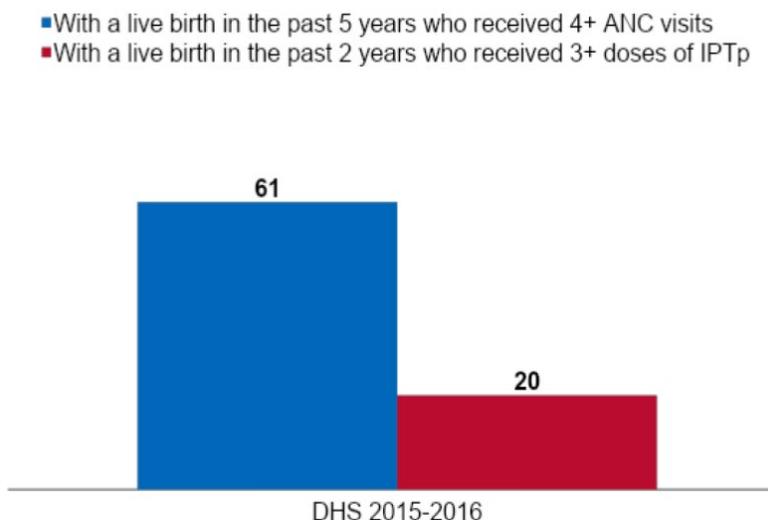


Figure A25. Facilitators and Barriers to IPTp Uptake

Facilitator	Type of Factor <i>(Internal, Social, or Environmental)</i>	Data Source	Evidence
Availability of follow-up cards for pregnant women	Environmental	PMI IPTp Facilitators and barriers survey - Luanda, 2016	The fact that all of the users had pregnancy health cards indicates that both health workers and users attach importance to the card and they find a solution when the cards are not in stock. (pg. 25)
Barrier	Type of Factor <i>(Internal, Social, or Environmental)</i>	Data Source	Evidence
Health workers without sufficient IPTp-SP training	Social	PMI IPTp Facilitators and barriers survey - Luanda, 2016	In this study, provider knowledge did vary significantly on when to initiate IPTp-SP and the contraindications to IPTp-SP. (pg. 39)

Conclusion

Data from the 2015/2016 national household-level survey demonstrates that over 60% of pregnant women are going for at least four visits to ANC. However, only 20% of pregnant women were receiving at least three treatment courses of IPTp. This indicates that while multiple visits for ANC services may be happening, those women may not be receiving multiple treatments of SP. Potential factors impacting this include SP availability at ANC facilities at the time of visits, or a barrier in provider behavior to offer SP treatment. PMI proposes to strengthen supportive supervision for MIP services by providers, engaging the supply chain partner to monitor challenges with stock-levels, procure enough SP for the country's needs, as well as conduct a malaria behavior survey to look into potential barriers at the level of the beneficiary and a health facility survey at the level of the provider to better inform programming.

Key Question 4

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

Supporting Data

The Angolan HMIS does not collect and record information on pregnant women with febrile syndrome, only records cases of pregnant women with malaria. No information exists on barriers and facilitators to testing and treatment.

Figure A26. Proportion of Diagnosis and Treatment of Pregnant Women with Fever

2018	Microscopy	RDT
Total Tested	Positive: 2,442,500 Negative: 2,624,280	Positive: 2,708,075 Negative: 2,317,906
Pregnant Women	Positive: 85,276 Negative: 156,751	Positive: 61,801 Negative: 101,268

Conclusion

In Angola, there is a need to improve the capture of information on the treatment of malaria in pregnancy. PMI is proposing to assess barriers and facilitators to this through a malaria behavior survey. PMI will also continue support for the DHIS2 system roll out, as well as supportive supervision at facility-level to help improve both the system and data quality entry at the point of care.

Key Question 5

What is the estimated need for IPTp commodities over the next three years and what proportion of this need will PMI support?

Supporting Data

Figure A27. Gap Analysis Table

Calendar Year	2019	2020	2021
Total population (National)	30,175,553	31,127,674	32,097,671
Total Population at Risk	30,175,553	31,127,674	32,097,671
SP Needs			
Total number of pregnant women ¹	1,569,129	1,618,639	1,669,079
Total SP Need (in treatments) ^{2,3}	5,099,669	5,454,813	5,624,796
SP Needs (in treatments) for PMI-focus provinces	961,795	1,028,777	1,060,836
Partner Contributions			
SP carried over from previous years ⁴	3,867,661	0	2,727,407
SP from Government ⁵	0	5,727,554	3,178,629
SP from Global Fund	0	0	0
SP from Other Donors	0	0	0
SP planned with PMI funding	271,333	2,454,666	2,531,158
Total SP Treatments Available ⁶	4,138,994	8,182,220	8,437,194
Total SP Treatment Surplus (Gap) ⁷	-960,675	2,727,407	2,812,397

¹ 5.2% of the national population is made up of pregnant women through 2021 (Reproductive Health Program). PMI contributes to national requirement

² Projected ANC attendance rates for 2020 and 2021: ANC1 (90%), ANC2 (90%), ANC3 (90%), ANC4 (80%) to receive IPTp.

³ This amount does not reflect the needs required to fill the pipeline. The minimum combined amount of stock required at the central and provincial level warehouses to avoid stock outs at the facility level at the end of each year should be the equivalent of 6 months of needs according to the 2019 malaria quantification.

⁴ Procurement Planning and Monitoring Report (malaria) Q1 FY19

⁵ Government's previous commitment to contribute 70% of the quantified commodities is maintained

⁶ One treatment of IPTp is comprised of 3 SP tablets.

⁷ Projected surplus in 2020 and 2021 are the quantities required to keep the pipeline with a minimum of 6 months of inventory

Conclusion

In FY 2019 and FY 2020 MOPs, PMI will increase its procurement of SP to meet 100% of the needs (approximately 1 million treatments each year) of the six PMI focus provinces and approximately 30% of the needs for the remainder of the country which approximately 4.5 million treatments each year.

Key Question 6

What are the in-country considerations that impact your funding allocation in this category?

Supporting Data

The GRA has indicated in the past that they could contribute up to 70% of the national commodity requirements though they have struggled to meet this commitment for almost all commodities in recent years.

Conclusion

Because the GRA has indicated in the past that they could contribute up to 70% of the national requirements for all commodities, the expectation is that at a minimum it will do this for SP needs in FY 2020. If this is unable to be done, the amount of SP procured with MOP FY 2020 funding should still be sufficient to meet the requirements in PMI-focus provinces.

3. CROSS-CUTTING AND OTHER HEALTH SYSTEMS

3.A. SUPPLY CHAIN

NMCP objective
<p>Even though the NMCP relies on other GRA entities and donors to manage the physical warehousing and distribution of commodities used in malaria programming in Angola it still has supply chain related activities within its programming meant to achieve the following objectives:</p> <ul style="list-style-type: none">• Improved availability of malaria commodities at the national and provincial levels• The generation of timely and accurate data to be used for supply chain decision making• Strengthened regulatory system for medicines and other pharmaceutical products• Improved storage conditions for pharmaceutical products.• Engagement of partners to support the procurement of antimalarial products• Coordinated national, provincial and municipal procurements• The NMCP has committed to funding a portion of the cost for the procurement, and distribution of malaria program commodities
NMCP approach
<p>Angola's National Plan for Health 2012-2025 (<i>Plano Nacional de Desenvolvimento Sanitário – PNDS 2012-2025</i>), has highlighted the lack of a comprehensive and strategic supply chain plan as a key challenge to access pharmaceuticals in Angola. As of late 2019, Angola had still not finalized a National Supply Chain Strategy, drafted in 2016, that is meant to serve as the principal guiding document for better planning and the effective alignment of financial, technology, and human</p>

resources to improve the overall performance of health commodities supply chains, including that of malaria, in Angola.

Despite this, the NMCP participates in activities, such as the following, that are expected to be in alignment with the National Supply Chain Strategy once it is finalized:

- In conjunction with the DNME developing a drug registration, approval, rational use and quality control system as well as a surveillance drug network to monitor adverse effects
- Strengthening the joint planning and coordination of all actors throughout the supply chain
- Improving the use of antimalarial consumption data to accurately determine future commodity needs for each service delivery point, municipality, province and the central level

PMI objective, in support of NMCP

At both nationally and in the six PMI-focus provinces PMI supports achievement of the NMCP's own objectives of the national health commodity supply chain. The following are examples of this support:

- Production of monthly malaria commodity availability reports for the national and provincial levels
- Quarterly convening of procurement funders for the creation of the Procurement Planning and Monitoring Report for malaria (PPMRm)
- Provision of technical assistance for the creation of annual malaria quantifications and quarterly updating of supply planning
- Inventory storage and management technical assistance designed to improve the storage and management conditions for pharmaceutical products (e.g., temperature monitoring, configuration of existing racking layouts, implementation of warehouse management software, and planning for integration of logistic software platforms (SIGLOFA, WMS, TransIT).
- Distribution planning
- Provision of PMI-funded outsourced warehousing and distribution services via a parallel supply chain (to provinces, municipalities and select LMD locations) for PMI-funded malaria commodities
- Development and implementation of improvements to the national LMIS
- Updating monthly supply plans to enhance coordination of procurement for the availability of anti-malarial drugs and RDTs and reduce stock-out rates
- Conducting on-the-job training to NMCP supply chain staff to improve their required capabilities to perform their roles.

- Creating an enabling environment for effective and accountable communication within the TWG to secure adequate resources through procurement and supply chain management.
- Expansion of supply technical assistance to the provincial level in 6 PMI-focus provinces via embedded staff to support improved malaria commodity availability, and related data, at the service delivery point (SDP) level

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

The quantities of commodities procured, as well as those warehoused and transported with PMI funding via a parallel supply chain, are detailed elsewhere in this document. Supply chain strengthening activities, illustrative of support by PMI in the last 12 months are as follows:

- Two roundtables of Lessons Learned conducted at 12 national hospitals that concentrated on malaria program data quality. There were 40 participating technicians at each roundtable.
- A training workshop on malaria was conducted with 109 municipal Logistics Focal Points to improve the supply chain management of malaria in four PMI-focus provinces
- Support to strengthening institutions involved in regulatory and policy aspects of supply chain such as the DNME, GTI, School of Public Health and GEPE
- Though the process of delivering PMI-procured commodities directly to the provincial warehouses has proven to be more efficient than previous methods that went through CECOMA's central warehouse a portion (up to 10%) of some PMI-funded procurements may be allocated to CECOMA for distribution to non-PMI-focus provinces to fill gaps in national needs and to facilitate opportunities to execute supply chain strengthening activities that might otherwise be merely theoretical in the absence of GRA-supplied commodities.
- PMI is committed to working with the National Directorate of Medicines and Equipment (DNME) and CECOMA to strengthen the GRA national distribution system to the point where it can assume, over time, the management of the warehousing and transportation of both GRA- and donor-supplied malaria commodities. This commitment of PMI will be channeled into work streams that supports the transition from a 'government managed, government operated' to a 'government managed, private sector operated' health supply chain.
- The implementation began of the online version of the national logistics management information system (*Sistema Informática de Gestão de Logística Farmacêutica de Angola: SIGLOFA*) with four sites in two PMI-supported provinces going live and receiving training, hardware, material and supervisory support as part of a validation period of the logistics platform. By the end of CY 2020 SIGLOFA should be functional at 60 sites within PMI-focus provinces.

- Various efforts towards improving data visibility from SDPs for all public health programs in PMI-focus provinces via improvements in supportive supervision processes and the augmenting of provincial level staff via embedded staff tasked with collating SDP stock status data from paper-based LMIS forms.

Challenges to effective malaria supply chain management in Angola that contribute to slowed implementation include:

- Poor adherence to standardized of case management and consumption data reporting ACTs and RDTs leading to duplication and unreliable data overall.
- Absence of standard operational procedures for the management of malaria products
- Weak analysis of malaria stock data at the national level
- Weak participation of partners in monthly malaria procurement planning meetings
- Poor use of quantification reports and supply plans to inform acquisition quantities and scheduling by MOH and partners
- Delays in data availability from CECOMA for monthly reporting further delaying decision making at the national level

A challenge that prevented implementation of PMI activities in support of, but outside the control of the NMCP, particularly efforts focused on the collection and dissemination of supply chain data, was the repeated delay in obtaining approvals from the Ministry of Health to proceed with certain pieces of technical work as well as a delay in obtaining authorization to continue providing technical assistance to CECOMA via embedded supply chain advisors. Opportunities to have government counterparts participate in international supply chain fora were not able to be realized because of delays of a similar nature.

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

- Monthly physical stocktaking of antimalarials at central and provincial levels
- Preparation of the monthly Stock Situation Report for central, provincial, municipal and SDP levels
- Provision of technical assistance to help build the capacity of warehouse management and operations at CECOMA
- Continued rollout out the eLMIS
- Conducting of EUV (End User Verification) in six PMI-focus and four other provinces
- Supporting MoH supervision visits in Provincial and Municipal Deposits using the new Integrated Guide for supervision of drug and medical management.
- Training workshops on malaria and Municipal Logistics Focal Points to improve the supply chain management of Malaria in the six provinces of PMI.

- Improving policies, guidelines and approval processes for clearer roles and responsibilities between the DNME and CECOMA through the adoption of a technical working note
- Assisting DNME to publish the process for new medicines pharmaceuticals and medical equipment vendor registration
- Supporting the creation of a supply chain logistician career profile with Departamento de Recursos Humanos (Department of Human Resources, DRH) to advocate for proper staffing of the workforce working in Angola’s public health supply chain
- Assisting CECOMA, *Gabinete de Tecnologia e Informação* (GTI), and DNME in the creation of national systems for the storage of key master data based on GS1 classification codes (e.g., facilities registry, product database) as well as the development of Standard Operating Procedures for coordination improvements between national programs

PMI Goal

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

Do you propose to increase, decrease, or maintain funding allocation levels for this activity? Why, and what data did you use to arrive at that conclusion?

It is proposed that the funding allocation for this activity remain approximately the same as it was in MOP FY19. The MOP FY 2020 proposed allocation amount is \$2,650,000.

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

Key Question 1

Has the central level, (or sub-central level if appropriate) 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 A28. Central Stock Levels for AL

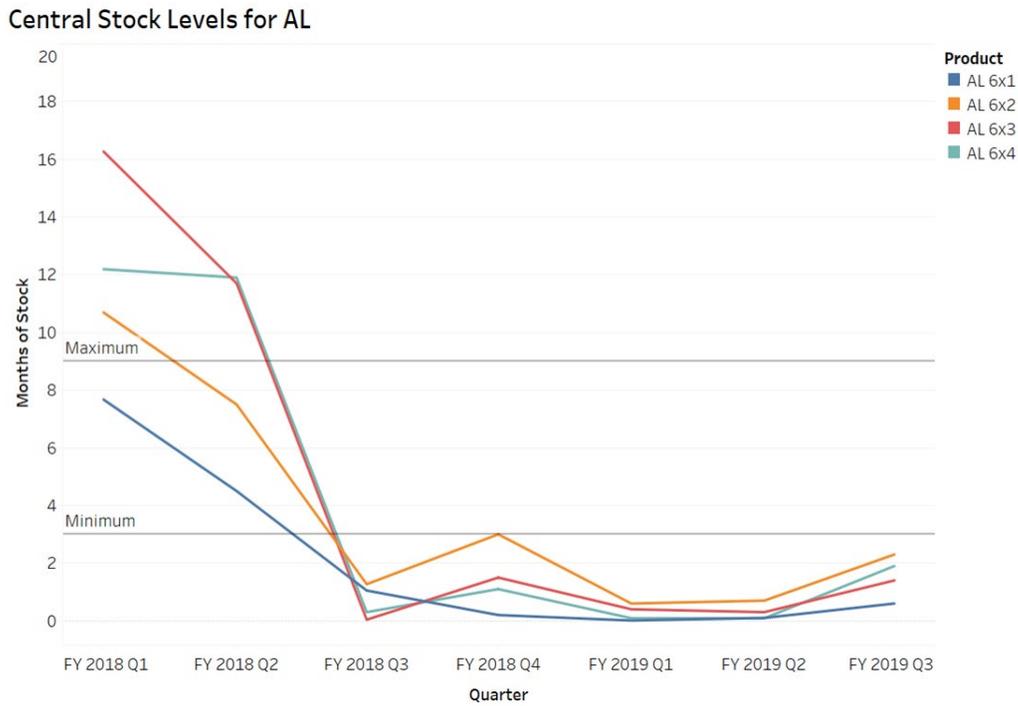


Figure A29. Central Stock Levels for AS/AQ

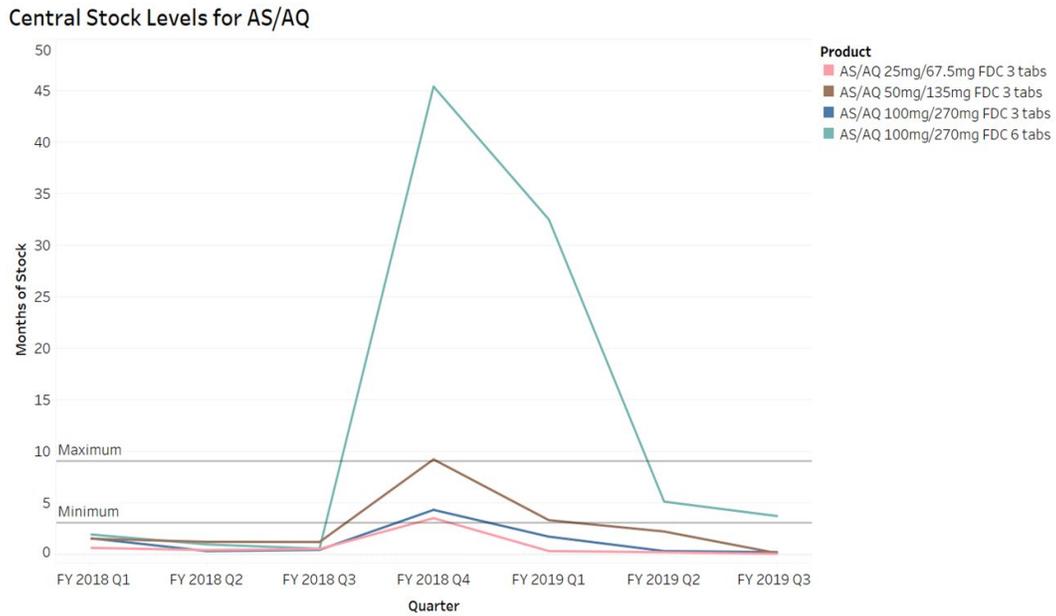
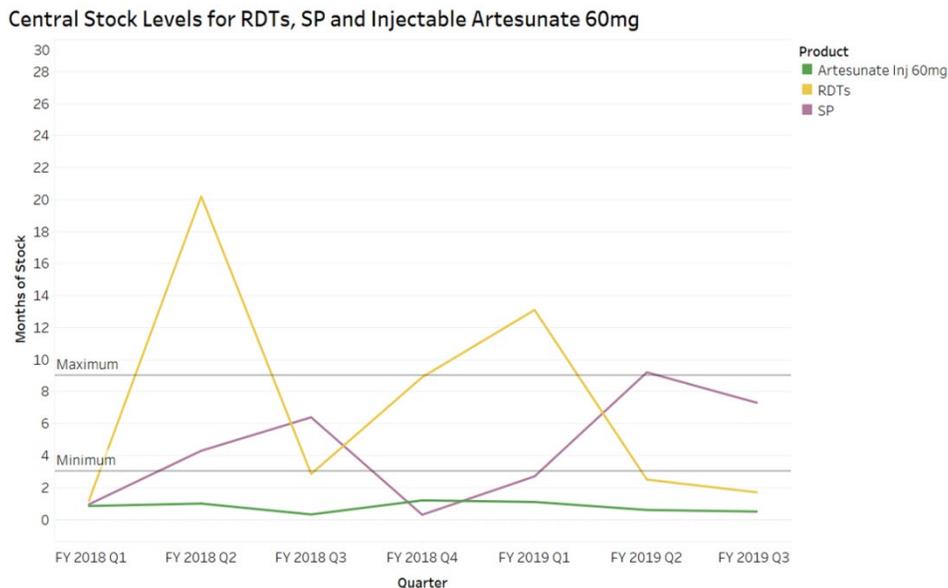


Figure A30. Central Stock Levels for RDTs, SP and Injectable Artesunate, 60mg



Conclusion

The central level of Angola has generally been under stocked of all but one ACT formulation and injectable artesunate over the last fiscal year. SP and RDTs have been generally stocked according to plan at the central level in the past fiscal year. The understocking of ACTs resulted principally from the GRA being unable to meet the NMCP’s commitment to fund 40% of the value of all malaria program commodity procurements or 70% of all commodities requirements. This situation has had an impact, particularly at the end of FY19, not just on service delivery outcomes but on all PMI funded programming. An example of this would be where efforts to improve data visibility through the implementation of the eLMIS or the embedding of implementer staff were able to be achieved yet these efforts were unable to be leveraged to achieve improved health commodity availability as there was insufficient stock or even no stock to respond to improved demand signals originating from lower levels.. Likewise, efforts to create efficiencies in resupply planning and distribution were also unable to achieve their desired impact because of a lack of commodities to be managed.

Key Question 2

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

Supporting Data

Figure A31. AL Stockout Rates

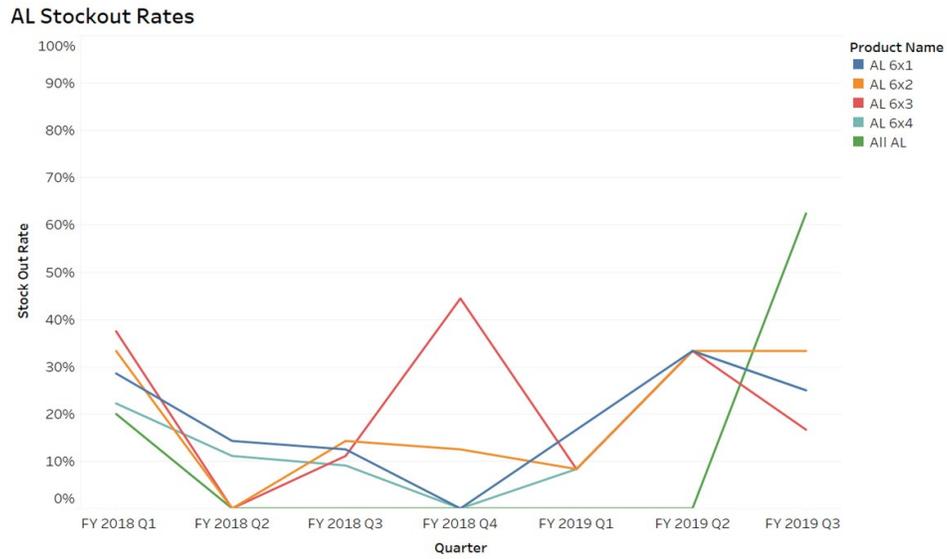


Figure A32. AS/AQ Stockout Rates

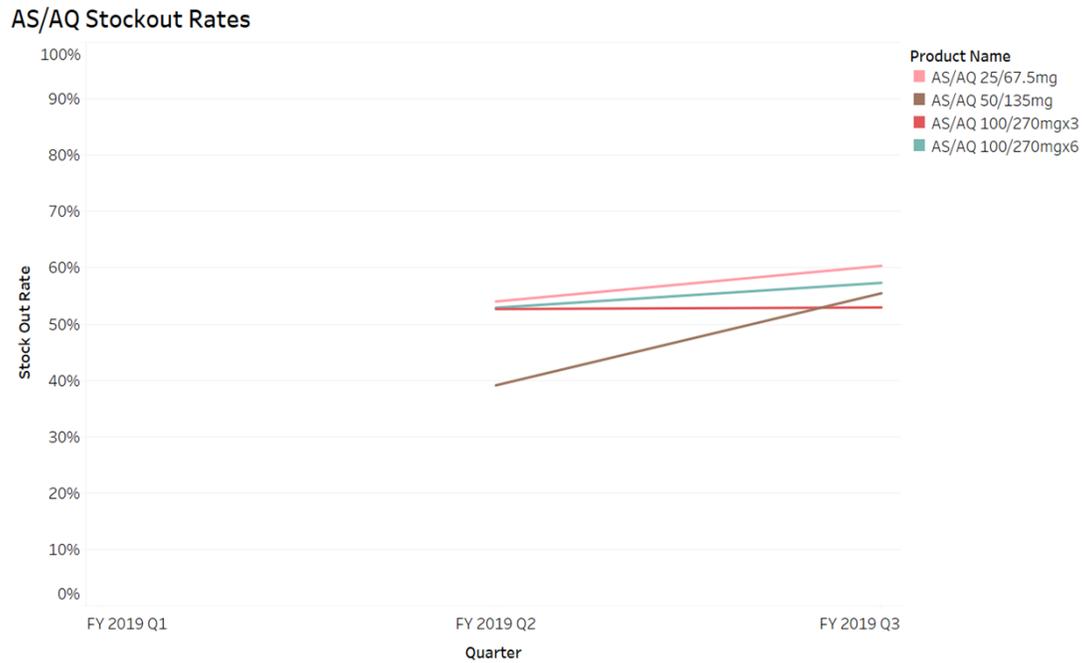
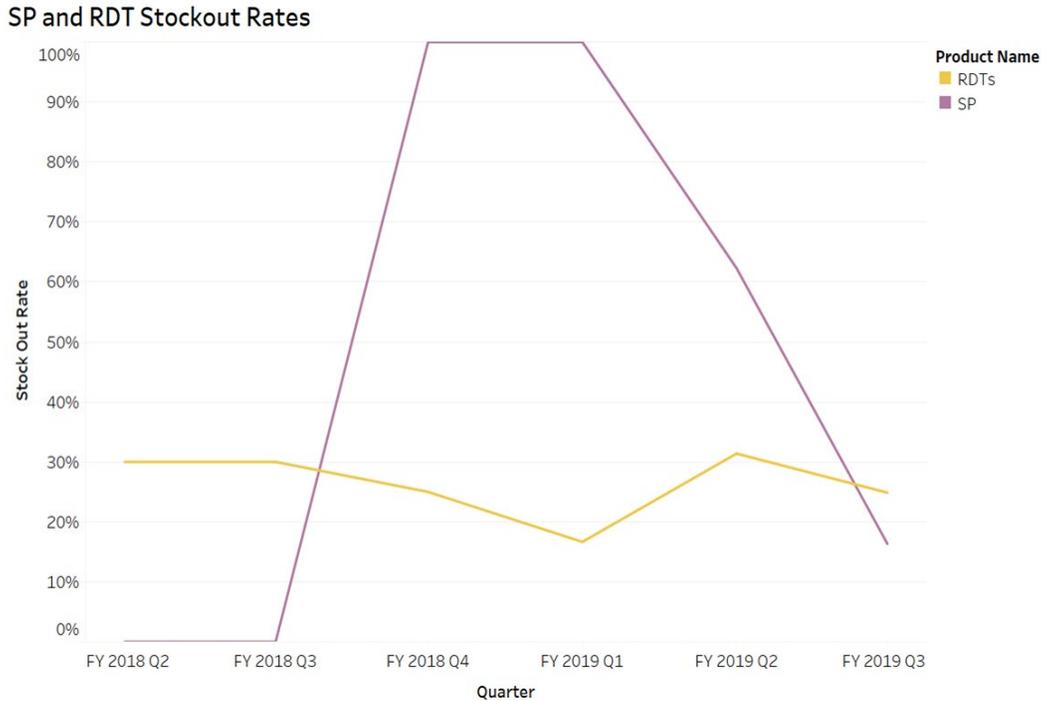


Figure A33. SP and RDT Stockout Rates



note: The number of facilities providing data significantly increased in FY19 Q2 from 12 facilities in Luanda for RDTs to about 450, and then 607 (including facilities in six PMI focus provinces) in FY19Q3. SP has only 1 facility reporting until FY19Q2 when it jumps to 450 and then down to 110 in FY19 Q3. The increases in the overall number of reporting sites from a baseline of 12 and then the subsequent variation in the number sites thereafter reflects the relative, but variable success of scaling up the embedding of technical assistance at the six PMI-focus provincial depots. Early outputs from FY19 Q4 data, not reflected here, indicate that there is improved consistency in both the number of sites in PMI-focus provinces reporting as well as consistency in the number of malaria commodities being reported.

Conclusion

Stockout rates, as indicated from the available data are poor. Because of the small number of facilities for which these data were available at the central analysis in the past year, determining the breadth of the problem has, until recently, been a challenge. However, with the central level being understocked for most of the year, it is likely that stockout rates at facilities not captured in the analysis were also comparatively poor. Activities that support increasing the availability of data warrant investment.

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 A34. ACT Discrepancies, 2018 data

ACTs Consumed (LMIS)	Uncomplicated Malaria Cases (HMIS)	RDTs Consumed (LMIS)	Number of Patients Tested with RDTs (HMIS)

4,381,903	5,535,821	3,746,960	5,025,981
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Source: NMCP

Conclusion

The data above indicate that there are discrepancies between reporting in the LMIS and HMIS and that some of the assumptions about testing rates and positivity rates used for quantifications may need to be adjusted. However, the ratio indicated between the quantity of ACTs consumed and the number of patients tested with a RDT may be accurate if, as the NMCP states, 45% of all presenting fevers are tested via microscopy and the positivity rate is approximately 50%.

Though not confirmed the number of cases of simple malaria could also be higher than the quantity of ACTs consumed due to the treatment of patients of different weights with AL. For instance, a lack of a lower dosage for a child may be addressed by dividing a higher AL dosage, (AL 24 can treat four children 5-15kg in weight).

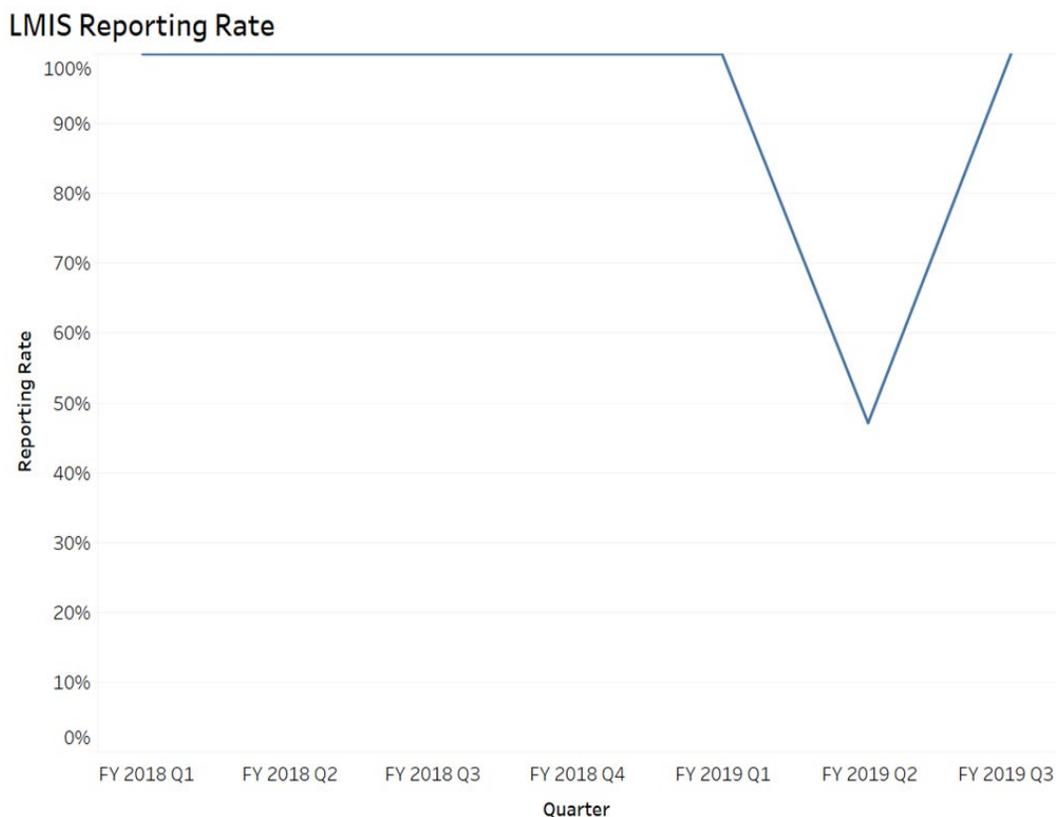
PMI continues to invest in and provide technical assistance to strengthen both the implementation of electronic information systems (i.e. DHIS2 and SIGLOFA) and their systematic use in order to improve data quality around commodity consumption, case management and the relationship between these two data sources.

Key Question 4

What are the trends in LMIS reporting rates?

Supporting Data

Figure A35. Trends in LMIS Reporting



Conclusion

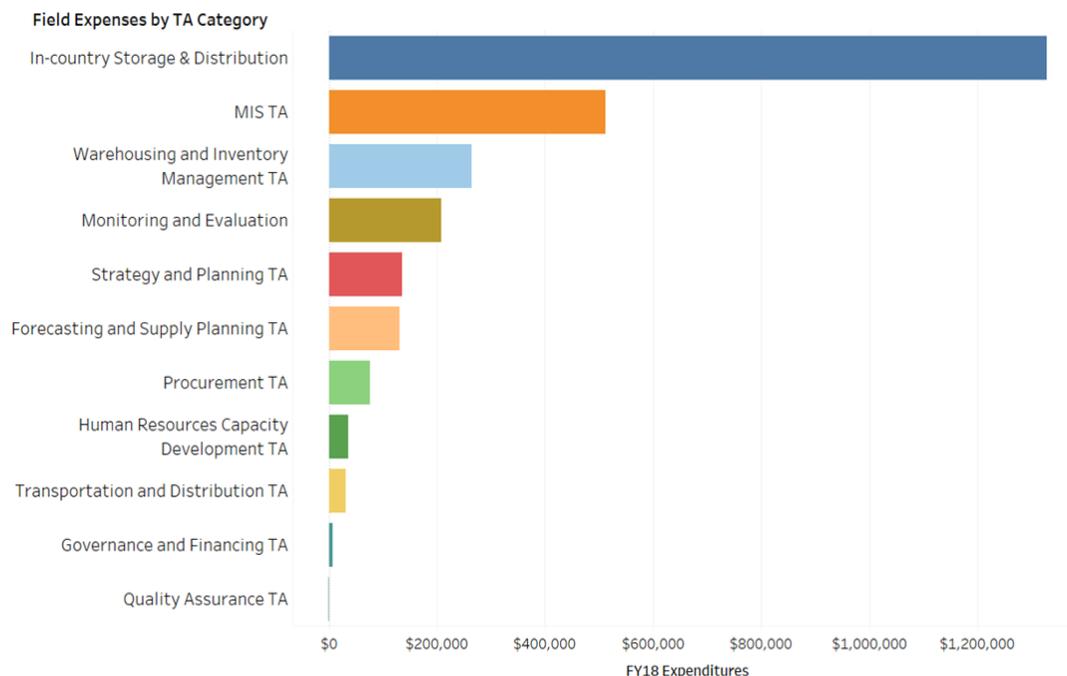
Even though a LMIS has been in use in Angola for many years the data it produces has been primarily used for reporting and requisitioning between SDPs and their nearest resupply points which is typically the province medical store. Prior to FY19 this data was not readily available in a disaggregated form at the central level. Subsequently the denominator for reporting rates was based not on the number of SDPs but only on the number of SDPs for which LMIS data was expected to be available at the central level. In FY19Q2, in conjunction with the expansion of PMI-funded TA to PMI-focus provinces the denominator was able to be increased from 12 sites to 462 and then further increased to 980 sites in FY19Q3. PMI will continue to support the expansion further to approximately 970 SDP in FY20.

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 make? In areas performing well, is it dependent on PMI/donor funding and so should be maintained?

Supporting Data

Figure A36. PMI Supply Chain Investments in FY 2018



Conclusion

The main supply chain functions supported by PMI are the temporary warehousing and in-country distribution of PMI-funded commodities through a parallel supply chain. This investment has continued to ensure malaria commodity availability at the provincial level and lower when they are available to be distributed from the central level. Based on the relatively low capacity for the GRA to adequately warehouse and distribute commodities, some continued support towards improving these processes should be maintained, but the continued use of outsourced logistics to manage PMI-funded commodities is still recommended.

Improving the environment to support improvement in facility level data visibility would be very supportive towards the GRA, and it is proposed that with MOP 2020 funding support towards the continuing rollout of the eLMIS should continue. While the eLMIS is expanded from province to municipality, and eventually health facilities in CY 2021 there should remain a short-term effort, using se MOP 2020 funding, to manually collect and collate facility level supply chain data that is available through the existing paper-based LMIS.

Continued support to strengthening institutions involved in regulatory and policy aspects of related to supply chain such as the DNME, GTI, School of Public Health and GEPE is recommended to continue as activities will be designed to support Angola on the journey to self-reliance.

Key Question 6

What are the in-country considerations that impact your funding allocation in this category?

Supporting Data

Not applicable.

Conclusion

With funding from PMI, the warehousing and distribution of PMI-funded commodities has been managed, for the most part, outside of CECOMA for over 10 years due primarily with continual concerns regarding a lack of capacity at CECOMA to ensure the safeguarding of these products and to manage their onward distribution to provinces. Because almost 100% of the commodity requirements for PMI-focus provinces will be funded through MOP FY 2020 programming it is recommended that warehousing and distribution, using outsourced logistics providers, be maintained with MOP 2020 funding. Other health system strengthening activities should also continue to be supported with MOP 2020 funding.

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

NMCP objective
<p>The main M&E objectives of the NMCP, as described in the 2016-2020 National Strategic Plan for Monitoring and Evaluation, are to complete the following by 2020:</p> <ul style="list-style-type: none">● Establish an efficient epidemiology surveillance, monitoring and evaluation system in all 18 provinces;● Develop capacity to detect and respond to epidemics within two weeks in 16 epidemic-prone municipalities;● Report that all provinces are providing data in a timely manner and in accordance with the data collection protocol;● Municipalities are able to detect epidemic risks in less than two weeks and respond appropriately.
NMCP approach
<ul style="list-style-type: none">● As per the Angola PNDS (National Health Development Plan - <i>Plano Nacional de Desenvolvimento Sanitário</i>), the MoH is transitioning from paper-based to technology-enabled health information systems in order to improve data quality and allow for better resource allocation and faster detection and response to epidemics. As a first step in the transition process, in 2016 the MoH adopted the DHIS2 platform for monthly service delivery data reporting, informed by the findings of a PMI-funded pilot.

- The NMCP also aims to integrate community-generated malaria data from ADECOS into the HMIS systems, as well as the private pharmaceutical network in the collection and transmission of data related to the diagnosis and treatment of cases of simple malaria.
- The NMCP is in the process of conducting end-term (2020) programmatic evaluations of the National Malaria Strategic Plan (2016-2020) with the view of developing a new strategic plan (2020 -2025).
- There is also continued advocacy for the creation of a malaria research center, in coordination with the National Institute of Public Health.

PMI objective, in support of NMCP

- A core area of strategic focus under PMI's current global strategy, and a priority for the NMCP, is strengthening surveillance, monitoring, and evaluation capacity and building a culture of data driven decision-making.
- To strengthen routine data collection and reporting (including both timeliness and completeness), PMI provides training, supervision, data quality checks, and reporting tools to health facilities at the municipal and provincial levels.
- PMI supports strengthening monthly malaria surveillance data reporting through the current paper-based HMIS while simultaneously rolling out electronic DHIS2 in the six PMI focus provinces, as well as at the central level.
- To collect critical health indicators, PMI supports population-based surveys (MIS 2006/7, MIS 2011, DHS 2015/16, and DHS 2021).
- PMI also aims to strengthen the institutional capacity of the NMCP in M&E (through the development of tools, training in M&E, data quality analysis and embedding high-level technical assistance in the NMCP for peer-mentoring).

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

- Supporting the NMCP in the development and updating of data collection tools (report template, supervision guidelines), elaboration of the M&E plan.
- Implementation of DHIS2 in 6 provinces (Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uíge, Zaíre) through:
 - Training of over 280 municipal and provincial DHIS2 users;
 - Routine quarterly supervision of DHIS2 systems at provincial and municipal levels;
 - Training for data quality analysis, interpretation and use of data for action through workshops at central level and quarterly meetings in each province;
- Remaining challenges to overcome with DHIS2 roll-out include:

- Lack of electricity infrastructure to power electronic devices;
- Limited internet access and bandwidth in several municipalities support;
- High turn-over of human resources trained in DHIS2.

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

- Continuing to support the national roadmap and to complement other donor contributions, PMI will help to strengthen monthly malaria surveillance data reporting through the rollout of DHIS2 at the facility, municipal, provincial, and central levels by training and supervision of data collection staff. Efforts to improve data accuracy and timely reporting will be undertaken. Data review meetings and feedback at the municipal and facility level will also inform decision-making.
- PMI will also support the Demographic and Health Survey (DHS) to examine progress made on malaria-related outcome indicators, including prevalence of parasitemia and anemia.

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.

Are you proposing to increase, decrease, or maintain funding allocation levels for this activity? Why? What data did you use to arrive at that conclusion?

Funding has been decreased for SM&E in FY 2020, but this is due to the support provided to the DHS 2020/21 in FY 2019 MOP. Similar level of support is expected towards HMIS/DHIS2 strengthening and supervision.

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 A37. Data to inform Collection Activities 2015 - 2023

Data Source	Data Collection Activities	Year								
		2015	2016	2017	2018	2019	2020	2021	2022	2023
Household Surveys	Demographic Health Survey (DHS)	X	X				(X)			
	Malaria Indicator Survey (MIS)									
	Multiple Indicator Cluster Survey (MICS)									
	EPI survey									
Health Facility Surveys	Service Provision Assessment (SPA)									
	Service Availability Readiness Assessment (SARA) survey									
	Other Health Facility Survey		X					(X)		
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)	X					(X)			
	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)									
	Other (Electronic Logistics Management Information System (eLMIS))					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

Significant investment has been made by PMI in SM&E over time, with an increasing focus on improving the capture of routine data on electronic platforms. In addition to supporting household-level national surveys to capture key indicator measures over time, PMI continues to support the roll out of the routine DHIS2 (HMIS system) and SIGLOFA (eLMIS system) in the six PMI focus provinces, while contributing to stakeholder conversations around national roll-out.

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 A38. HMIS-Supported Activities

Intervention	PMI-Funded? (X)			Does Global Fund 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
Data quality assessments (separate from supervision – funding for travel to lower levels)	X	X	X	
Program monitoring and technical assistance (funding for travel to lower levels)	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

Intervention	PMI-Funded? (X)			Does Global Fund 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
Support to annual operational plans for national malaria program	X	X	X	X
Desk review to catch “logic errors system” (provide TA to catch logic errors)				
Admin 1 Level (Province). PMI supports activities in 6 provinces while Global Fund supports activities in 12 provinces.				
Registers (warehousing, printing, distribution)	X	X	X	X
Data quality assessments (separate from supervision – funding for travel to lower levels)	X	X	X	X
Program monitoring and technical assistance (funding for travel to lower levels)	X	X	X	X
Training (funding for District staff to conduct training at lower levels, capacity building (i.e. on the job training for District level staff)	X	X	X	X
Human Resources (secondment of person for malaria SM&E, office/team for SM&E)	X	X		X
Data Use (analysis, interpretation, visualization (dashboards, bulletins), dissemination/feedback to lower levels, decision-making)	X	X	X	X
Adaptation of national policy guidelines and coordination (adapting policies, guidelines, supporting sub-committee meetings, supporting participation in sub-committee meetings)				
Adaptation of checklists and job-aides	X	X	X	X
Participation in national meetings (support for travel costs)	X	X	X	X
Support to Annual Operational Plans for Provincial Malaria Program				
Admin 2 Level (District)				
Data entry, summary, and transmission (training, re-training, computers, internet, tools)	X	X	X	X
Supervision (training, traveling, supervision tools/checklists, create/design system for organized/methodical supervision)	X	X	X	X

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

Conclusion

PMI and Global Fund (through both its malaria and health systems strengthening grant) contribute to various HMIS activities in Angola, although significant data quality gaps persist at health facility level. There is a need to strengthen data quality collection, analysis and use at health facility level through training, supervision and data quality audits, to ensure data generated at that level has the necessary quality to inform accurate decision-making through DHIS2. There is also a need to configure DHIS2 to effectively capture community malaria generated data through ADECOS/CHWs (interoperability between Kobocollect and DHIS2).

Key Question 3

What are the outcomes of HMIS strengthening efforts?

Supporting Data

Figure A39. HMIS Strengthening Efforts 2017-2018

		2017	2018**
Timeliness	% of reports received on time*	25%	21%
Completeness	"Confirmed malaria cases for children under 5 years of age" was reported in X% of facility-months	82.3%	81.6%
Accuracy	Populate with most recent DQA data	n/a	n/a

*- Timeliness of reports has a set data limit at which reports must reach the national level is the 10th of the following month, all reports arriving after this date are considered late.

** - Improvements have been made since the launch of DHIS2. For April-June 2019, DHIS2 shows 40% of timely reports of malaria forms, and 75% in PMI provinces (5 out of 6 provinces already reached above 85% of timely reports, with Malange at 72%).

Conclusion

Timeliness of health facility paper-based malaria reports (between 1–10th of the following month), remains a challenge. However, in the first half of 2019 there began to be significant improvements with the roll-out of DHIS2. PMI will continue to improve data quality and timeliness through its support in the six PMI-focus provinces, and collaborate with the NMCP at central level to ensure planning and action is being taken in the remaining provinces, especially as DHIS2 continues to be rolled-out.

Key Question 4

What are the in-country considerations that impact your funding allocation in this category?

Supporting Data

Not applicable.

Conclusion

Not applicable.

3.C. SOCIAL AND BEHAVIORAL CHANGE (SBC)

NMCP Objective

According to the National SBC Strategy (*Plano Estratégico de Comunicação para Mudança Social e de Comportamento Sobre a Malária 2017 -2020*), the NMCP's objective is to ensure that, by the end of 2020:

- 80% of the population has access to adequate information through available means of communication;
- At least 80% of households with a mosquito net treated with long-lasting insecticide are aware of its correct use;
- 80% of women of childbearing age increase their knowledge on the importance of IPTp-SP;
- At least 80% of caregivers know the cause, signs, and symptoms of malaria, and at least one malaria prevention and one treatment measure.
- 80% of the primary target group seeks health facilities as soon as the first symptoms and signs of malaria appear.
- 80% of the primary target group are treated in line with the national malaria treatment guidelines.

NMCP Approach

- The National SBC Strategy was adopted in 2018 under the leadership of the Secretary of State for Social Communications. This strategy conforms to RBM global best practices and defines roles and responsibilities of all key actors, identifies priority issues and gaps, and provides a basis for multi and bilateral assistance and inter-sectoral coordination. The strategy covers vector control (IRS, ITNs, and larviciding), case management, IPTp, and epidemic preparedness and response. It addresses misconceptions about malaria in Angola and seeks to improve knowledge about key behaviors essential to achieving sustained malaria control.
- The National Malaria SBC Technical Working Group and a National Integrated SBC Coordinating Committee were established in 2018. The roles and functions of the National Integrated SBC Coordinating Committee are to coordinate activities across different departments within the MoH to ensure synergies in messaging and provide a platform to harmonize GRA and partners' activities.
 - The integrated committee is under a broader commission co-led by MoH and Ministry of Social Communications, with the participation of representatives of different sections of different ministries and stakeholders. The integrated SBC technical working group comes up with communication materials that are then presented to the commission for approval and then disseminated by the GRA, with their own funds. Recently, the group approved advertisements for *Jornal de Angola* (national daily newspaper), two TV spots, seven Radio Spots, one Radio-drama and two Tele-dramas, and leaflets on both cholera and malaria prevention and treatment. The production of all materials was fully financed by the GRA. The office of the Secretary of State for Social Communications was also fully responsible for the

placement of the materials on National Radios and TV channels, as well as for the distribution to Health Provincial Directorates.

- This inter-ministerial committee also coordinates communication efforts for emergency response and goes beyond malaria and cholera; currently, working around polio and measles outbreaks.
- From 2016-2019, E8 developed the Malaria Elimination Project at the Angola-Namibia border, which included a communication campaign for malaria, through implementers partners such as The MENTOR Initiative, World Vision and J.C. Flowers.
- Partners within the public and private sector support the MoH with SBCC activities.
 - UNITEL supported the recent universal ITN campaign distribution by providing free messaging on the importance of using ITNs and their proper use and care. During the four phases of the recent ITN campaign, UNITEL sent a total of 1,825,748 reminder messages for communities to use ITNs correctly.
 - ExxonMobil and Chevron raise awareness and mobilization through AFRICARE, ADPP (*Development Assistance by the People for the People - Ajuda de Desenvolvimento de Povo para Povo*), and Core Group through interpersonal communication via community home visits, sensitization in churches and schools, reproduction of posters/comics, and participation in health fairs.

PMI Objective in Support of NMCP

- PMI supported the NMCP in drafting the strategic communication plan for Social Change and Behavior (CMC) on malaria 2017-2020 (SBCC Strategy) in 2015, which outlines NMCP's priorities and goals related to SBCC for malaria.
- PMI concentrates its technical assistance in six hyperendemic provinces for SBC: Cuanza Norte, Malanje, Lunda Sul, Zaire, Uige, and Lunda Norte. This includes reproduction and distribution of resources with messages for behavioral change, as well as post-mass ITN campaign communication skills training for provincial and municipal levels.

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

- PMI is investing in the capacity building of Angolan public health staff to design effective and innovative social and behavior change activities. 20 participants from the Ministry of Health's National Malaria Control Program and Health Promotion Department, as well as the Ministry of Social Communication, were engaged in a three-day master class to learn and practice human centered design approaches to create malaria social behavior change (SBC) activities.
- Reproduction and distribution of illustrative pamphlets with messages for behavioral change in the North Cuanza, Malanje, Lunda Sul, Zaire, Uige, Lunda Norte with information on ITN use promotion and general malaria transmission messages.

- Trained community activists during and after mass LLIN campaign distribution in 13 provinces.
- In partnership with Unitel, informative and educational text messages were sent on the prevention of malaria during and after the campaign mosquito net distribution.
- Completed a post-mass-campaign *ITN Net Use and Care Evaluation* with both quantitative and qualitative components in 3 sites in Angola, 2 of which were PMI-supported provinces, which will help inform future net distribution activities
- Realization of the post-campaign communication training for the provincial supervisors of malaria and health promotion.
 - Refresher training in PMI provinces for LLIN distribution phase 1 (Zaire, Malanje, Uíge and Cuanza Norte) for 96 malaria and health promotion supervisors.
 - The SBCC LLIN post-campaign training was completed in: two provinces of phase 3 (Cuando Cubango and Moxico) for 43 malaria and health promotion supervisors for all municipalities; and three provinces of phase 4 (Lunda Sul, Lunda Norte, and Bengo) for 46 malaria and health promotion supervisors for all municipalities.
- Key challenges in SBC implementation include the need for comprehensive interventions rather than isolated efforts and a lack of continuous supervision to ensure SBC activities are consistently and effectively implemented.

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

- Provide technical assistance to improve prevention of malaria in pregnancy at the community level, through promotion of ANC attendance and education on the importance of ITN use and receiving at least three doses of IPTp.
- Reproduction, printing, and dissemination of SBC materials from central down to provincial/district/facility/community levels.
- Preparation to implement a malaria behavior survey, a cross-sectional household survey designed to measure malaria-related behaviors and the internal and social factors associated with those behaviors.
- Host regional workshops of health workers to improve interpersonal communication (two workshops per focus province per year.) The goal is to enhance health workers' abilities to communicate with caretakers and ensure compliance with treatment recommendations and follow up.
- Host an SBC workshop, co-facilitated by the MoH and the Ministry of Social Communications and targeted for representatives of key public and private stakeholders, will convene to develop a malaria communications plan. The three-day workshop will comprehensively cover prevention to treatment, targeting three key behaviors: sleeping under

a bed net, seeking medical care after the onset of a fever, and adhering to national recommendations for IPTp-SP.

- Results from the ITN Use and Care Study will be presented and disseminated for evidence-based decision making for future mass campaigns and routine ITN distribution channels.

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.

Are you proposing to increase, decrease, or maintain funding allocation levels for this activity? Why? What data did you use to arrive at that conclusion?

In FY 2020 MOP, there is a reduction in SBC funding overall to \$600,000. This partially due to a reduced overall planning level (from \$22 million to \$20 million) and removal of post-campaign ITN messaging given the last universal campaign has concluded. However, with FY 2019 we are also proposing to conduct a malaria behavior survey which should help better inform the type and scope of SBC activities that could be added and planned in FY 2020 reprogramming.

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

Figure A40. PMI-Prioritized Behaviors by Target

Behavior	Target Population	Geographic Focus	Justification
Sleeping under a bed net	General population	National	A universal ITN campaign concluded in early 2019. Data from the recently completed <i>ITN Use and Care Evaluation</i> will be used to improve communications for future distribution efforts.
Adhering to national recommendations for IPTp	Pregnant women	Zaire, Uige, Malanje, Cuanza Norte, Lunda Norte e Lunda Sul	Qualitative studies show different barriers to access IPTp, even after addressing the issue of access and SP availability. There is a need in Angola to improve both provider adherence to guidelines and ANC attendance by pregnant women in order to improve IPTp uptake..

Behavior	Target Population	Geographic Focus	Justification
Seeking medical care after the onset of a fever	Mothers/Caregivers	Zaire, Uige, Malanje, Cuanza Norte, Lunda Norte e Lunda Sul	There is the need to continue highlighting that not all fever is malaria – to prevent self-medication – and that, especially children under-five, should receive medical care within the first 24 hours after fever onset.

Conclusion

The three behaviors highlighted above are in line with the Roll Back Malaria (RBM) recommendations on key malaria behaviors and target populations. Given PMI has invested in mass ITN campaigns and routine distribution, IPTp, and malaria case management and commodity procurement, it is important to continue to encourage behaviors around ITN use, receiving IPTp doses, and early care-seeking. To address this need, PMI already supported assessments such as the ITN use and care study carried out in 2019 and plans for a malaria behavior survey using FY 2019 reprogramming, and therefore will use evidence generated to deploy appropriate SBC interventions.

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 A41. Summary of Determinants and Gaps for FY2020 Prioritized Behaviors

Behavior	Key Facilitators	Key Barriers	Knowledge Gaps
Sleeping under a bed net	Feeling reassured, comfortable, protected, no noise from insects	Feeling hot, itchy, and allergies to net	No major gaps in knowledge are identified at this time.
Adherence to case management guidelines			Not available
Early ANC attendance			Not available

Conclusion

There is insufficient formative research to identify and address behavioral determinants in Angola. PMI proposes a malaria behavior survey to help with the critical information gap in order to improve its programming.

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

- 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.
- The SBC Technical Working Group lacks some needed resources/staff and generally only coordinates at the national level only.
- High-quality, formative assessment conducted, but no evidence that data was used to inform intervention design.

Conclusion

In Angola, the biggest challenges are:

- 1) Coordination between and within levels of the health system, and
- 2) Lack of directive decision-making based on data with actual implications in activity implementation.

PMI plans to begin national quarterly data sharing meetings to be chaired by the NMCP so that data gathered from all sources will be discussed and acted upon in a timely manner. Additionally, based on NMCP request and observed need, provincial level Malaria Partners Forums will be re-activated in at least three PMI-supported provinces where they had previously been established so that all partners can meet and discuss plans and interventions quarterly. Given the comprehensive methodology, PMI hopes that the proposed malaria behavior survey provides the data and actionable recommendations needed to improve SBC programming in Angola. This could bring the focus more on addressing behavior change rather than just community awareness.

Key Question 4

What are the in-country considerations that impact your funding allocation in this category?

Supporting Data

Not applicable.

Conclusion

Not applicable.

3.D. PROGRAM EVALUATION AND OPERATIONAL RESEARCH

NMCP objective
<p>Angola's National Malaria Strategic Plan, through the National Health Development Strategic Plan (2012-2025) contains a list of priorities that guide operational research (OR). This includes:</p> <ul style="list-style-type: none"> ● Conduct a study for malaria vaccine introduction; ● Carry out parasitological and entomological studies every 2 years; ● Conduct differential diagnosis studies of febrile syndromes; ● Conduct knowledge, attitude, and practice studies (KAP).
NMCP approach
<ul style="list-style-type: none"> ● The National Malaria Strategic Plan defines the orientations in the field of OR. ● NMCP, in collaboration with partners, defines OR priorities that can have the greatest impact and whose outcomes influence decision-making and health improvement for the general population and in particular, the improvement of health strategies: prevention, detection, diagnosis and treatment, M&E, capacity building for OR by the program.
PMI objective, in support of NMCP
<ul style="list-style-type: none"> ● PMI provides technical assistance in designing study protocols, performing field work, and analyzing data, reporting, and publishing results in scientific journals. PMI also supports the discussion of results to identify action points with implications for public health. In this process, PMI works with local staff to strengthen technical capacities in research and interpretation of decision-focused results. ● PMI also partially or fully, financially supports research, training of graduate students in specific skills like biostatistics, field epidemiology and laboratory diagnostics, basic research methods, etc.
PMI-supported recent progress (past ~12-18 months)
<p>Study of Asian Migrants 2019 in Luanda, Lunda Sul and Zaire Provinces</p> <ul style="list-style-type: none"> ● Objectives: Characterize malaria prevention and treatment seeking behaviors of Asian migrants in Angola, determine prevalence of malaria infection, and assess the risk of importation of resistant strains into Angola ● Sample size: 900 total (150 Chinese, 150 Southeast Asian per province). ● Fieldwork completed in Luanda and Lunda Sul, and in process in Zaire. Over 80% of expected sample size reached.
PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

- No new OR studies are planned at this time.

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.

Are you proposing to increase, decrease, or maintain funding allocation levels for this activity? Why? What data did you use to arrive at that conclusion?

At this time, PMI is maintaining funding allocation levels at zero for operational research. PMI will continue to consider ideas in conjunction with the NMCP and partners to identify appropriate opportunities.

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

Figure A42. Status of Research Funding

Source of Funding	Implementing institution	Research Question/Topic	Current status/ timeline
PMI	Population Services International (PSI) / Health for All Project	Malaria risk in Asian migrants to Angola	In process (>80% complete as of 9/2019)

Conclusion

PMI is currently implementing one OR study to assess malaria prevention and treatment behavior of migrants of Asian origin in Angola. This will provide data on the risk of importation of resistant strains from Asia and will inform NMCP policy on surveillance for antimalarial resistance. No new OR studies are being explored at this time, but PMI will continue to collaborate with the NMCP and other partners to explore appropriate opportunities.

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

Not applicable.

Conclusion

Not applicable.

Key Question 3

What are the in-country considerations that impact your funding allocation in this category?

Supporting Data

Not applicable.

Conclusion

Not applicable.

3.E. OTHER HEALTH SYSTEMS STRENGTHENING

NMCP objective
Not applicable.
NMCP approach
Not applicable.
PMI objective, in support of NMCP Infrastructure
<ul style="list-style-type: none">● To build staffing capacity, PMI has embedded technical staff in the NMCP. This investment was intended to be a temporary investment to transfer technical skills.● Through the Field Epidemiology Training Program (FETP), PMI support aims to build skills in data analysis, epidemiologic methods, and use of strategic information through trainee cohorts.
PMI-supported recent progress (past ~12-18 months)

- PMI supported embedded staff at CECOMA for supply chain strengthening and the NMCP for SM&E to support capacity building.
- PMI provided support to two trainees within the FETP program in Angola. From the full cohort, there were seven graduates in Q2/2019.
- PMI also provided support to the National Malaria Partners' Secretariat to improve coordination of malaria activities.

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

- PMI will continue to support embedded staff for supply chain, SM&E, and entomology within the NMCP.
- PMI proposes to support three students in the Field Epidemiology Training Program to focus on malaria; additional funds to ensure recruitment/retention and supporting training in the epidemiologic monitoring sites (short course in epidemiology training).
- PMI will continue support to the National Malaria Partners' Secretariat to improve coordination of malaria activities at the municipal, provincial, and national level(s). This also includes supporting participation of NMCP/MOH staff for training, internal courses, and/or conference attendance for building their capacity.

PMI Goal

To identify investment and activity opportunities to build capacity throughout the health system to support Angola's journey to self-reliance and to sustain gains in malaria prevention and control.

Key Question 1

How does PMI provide infrastructure support that engages FETP?

Supporting Data

PMI supports the FETP program to build capacity in malaria prevention and control in new professional cohorts working at various levels of the health system. Examples include:

- Sending one resident to Mozambique for entomological technical training.
- Participation of residents in PMI-funded studies (ex. Health Facility Surveys, TES, etc.)

Conclusion

PMI Angola sees value in continuing this level of support and has decided to increase its investment in FY2019 and FY2020 from supporting two trainees to three trainees in malaria.

Key Question 2

What are the in-country 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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	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
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 1 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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	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
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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	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 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.
	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)</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 resource mobilization. Outputs shared through global platforms</p>

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	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.</p> <p>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>

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	Routine distribution/ resupply between stock holding levels	<p>No routine requisition and resupply schedule between stock holding levels</p> <p>No resources routinely available and allocated for transportation from higher to lower stock holding levels</p>	<p>Routine requisition and resupply between at least two stock holding levels according to a schedule</p> <p>Resources for transportation from higher to lower stock holding levels provided on ad hoc basis</p>	<p>Routine resupply between all stock holding levels according to a schedule</p> <p>Allocated resources for transportation from higher to lower stock holding levels provided on an irregular basis and resupply often achieved through unplanned means</p> <p>Resupply performance monitored post-activity</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>Allocated resources for transportation provided on a regular basis and augmented with 3PLs</p> <p>Resupply performance monitored real-time</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 inter-facility resupply mechanisms are in place</p> <p>Allocated resources for transportation available internally or outsourced with 3PLs. Resupply transaction data is digitized for all stock transfers</p> <p>Near real-time visibility into upstream and downstream activities</p> <p>Resupply operations adhere to GDP and or meet in-country compliance standards for maintaining quality during distribution</p>

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	Logistics Management Information System	<p>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</p> <p>No facility level records or not maintained. Low reporting rates. No visibility into CHW supplies. No visibility by central level on facilities and none by facility level on central level.</p>	<p>Stand-alone, program specific LMIS processes and structures defined but no formal or ongoing monitoring or measurement protocol exists.</p> <p>Some visibility of facility level inventory and consumption, low reporting rates, mostly paper-based</p>	<p>The country has documented LMIS processes and structures. The structures are functional. Metrics for performance monitoring, quality improvement, and evaluation are systematically used.</p> <p>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 for maintaining data quality throughout the data supply chain.</p>	<p>Government and stakeholders use the national LMIS systems for key performance monitoring and follow standard practices.</p> <p>Facility inventory and consumption data is digital at facility level, upstream data available to facilities,</p> <p>System alerts for low stock/expiry, use of master product list and master facility list</p> <p>Interoperability with other information systems (e.g., warehouse management, medical records, laboratory management, enterprise resource planning systems, and health information management systems)</p>	<p>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.</p> <p>The government and stakeholders routinely review interoperability activities and modify them to adapt to changing conditions.</p> <p>Compliance with standards for data exchange, messaging, and security is regularly reviewed. The regulatory framework is reviewed and updated to reflect best practices for data exchange, messaging, and systems security.</p>

	<p>Regulatory, Policy and Governance</p>	<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 regulatory functionality, weak or absent</p> <p>No approved supply chain strategic plan</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. 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 of product licensing, registration, manufacturing, post-marketing surveillance.</p> <p>Approved (and up to date) supply chain strategic plan. Partially implemented</p>	<p>Strong policy and strategic leadership by government, with firm grasp of budgets and financial sustainability 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 (contains clear roles and responsibilities, stakeholder mapping, costs).</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>
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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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	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.
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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	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 B6. 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 only 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.

Activity	Metrics/Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	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
	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
General Infrastructure	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

Activity	Metrics/Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	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
	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)