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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

MOZAMBIQUE

Malaria Operational Plan FY 2020

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ABBREVIATIONS

ACPR	Adequate clinical and parasitological response
ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
APE	<i>Agente polivalente elementare</i> (community health worker)
ANC	Antenatal care
BMGF	Bill and Melinda Gates Foundation
CDC	Centers for Disease Control and Prevention
CMAM	Central Medical Stores
CY	Calendar year
DHS	Demographic and Health Survey
DP	Dihydroartemisinin-piperaquine
DQA	Data quality assurance
EUV	End-use verification survey
FELTP	Field Epidemiology Laboratory Training Program
FY	Fiscal year
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HSS	Health system strengthening
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
IVM	Integrated vector management
LMIS	Logistics management information systems
MCH	Maternal child health
MIP	Malaria in pregnancy
MIS	Malaria indicator survey
MoH	Ministry of Health
MOP	Malaria Operational Plan
NHS	National Health Service
NMCP	National Malaria Control Program
NMSP	National Malaria Strategic Plan
PARMA	PMI-supported Antimalarial Resistance Monitoring in Africa
PCV	Peace Corps volunteer
PELF	Strategic Plan for Pharmaceutical Logistics
PMI	U.S. President's Malaria Initiative
QA / QC	Quality assurance / quality control
RDT	Rapid diagnostic test
SBC	Social and behavior change
SM&E	Surveillance, monitoring, and evaluation
SP	Sulfadoxine/pyrimethamine

UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
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 Mozambique to end malaria. PMI has been a proud partner of Mozambique since 2007, helping to decrease child death rates by 37 percent and increasing the percent of children under five years of age who sleep under insecticide-treated nets from 7 percent in 2007 to 73 percent in 2018 through investments totaling almost \$355 million.

The proposed PMI fiscal year (FY) 2020 budget for Mozambique is \$27 million. This Malaria Operational Plan (MOP) outlines planned PMI activities in Mozambique 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 Mozambique as well as other donors and partners.

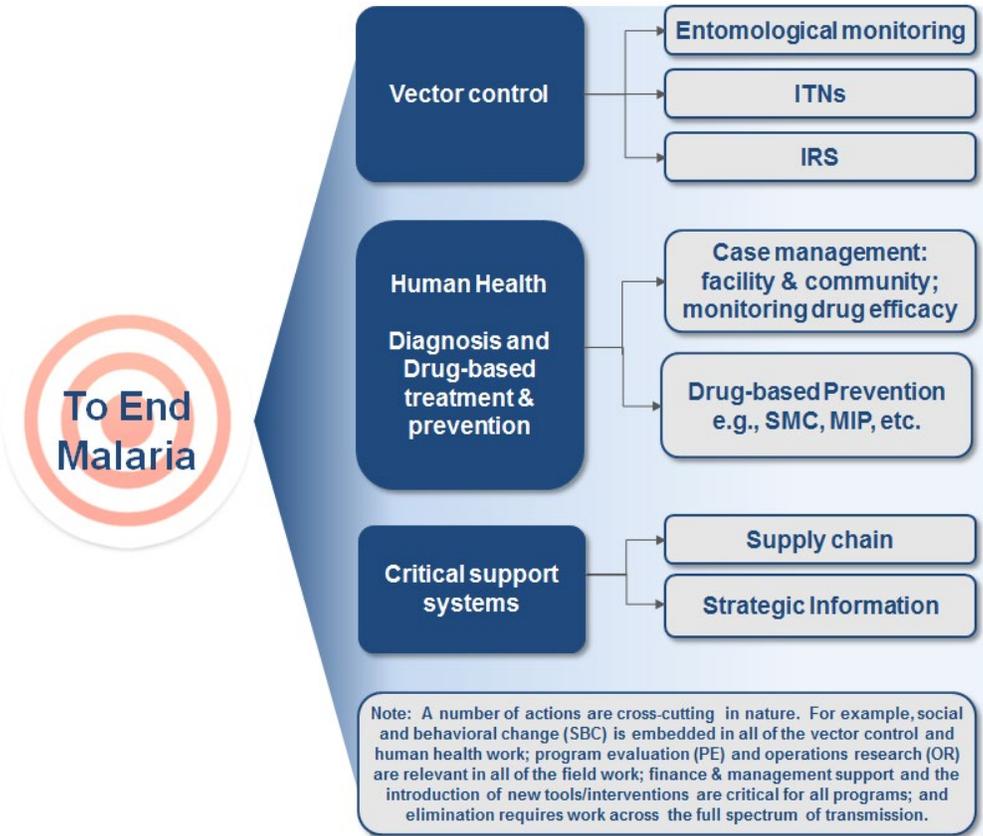
Mozambique at a glance

- **Geography:** 309,500 square mile country that borders Tanzania, Malawi, Zambia, Zimbabwe, South Africa and eSwatini and has 1,600-mile coastline. Divided into eleven provinces, including the capital of Maputo City
- **Climate:** subtropical and tropical with wet season primarily from October to March
- **Population in 2019:** 29,365,271 (Ministry of Health, 2019)
- **Population at risk of malaria:** 29,365,271 (Ministry of Health, 2019)
- **Malaria incidence per 1000 population:** 358 (National Malaria Control Program, 2019)
- **Under-five mortality rate:** 72
(https://databank.worldbank.org/views/reports/reportwidget.aspx?Report_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=n&zm=n&country=MOZ)
- **World Bank Income Classification & GDP:** Low income; \$14.46 billion
(https://databank.worldbank.org/views/reports/reportwidget.aspx?Report_Name=CountryProfile&Id=b450fd57&tbar=y&dd=y&inf=n&zm=n&country=MOZ)
- **Political system:** representative democratic republic
- **Trafficking in Persons designations, 2016-2018:** Tier 2
(<https://www.state.gov/reports/2019-trafficking-in-persons-report-2/mozambique/>)
- **Malaria partners in providing funding and program support include (but are not limited to):**
 - Global Fund (GF)
 - U.S. President's Malaria Initiative (PMI)

- World Health Organization (WHO)
- Bill & Melinda Gates Foundation (BMGF)
- **PMI Support of National Malaria Control Strategy:** PMI worked closely with the NMCP in drafting the National Malaria Strategic Plan (NMSP). The plan objectives and activities are well-aligned with the PMI priorities. PMI provides direct support for all intervention areas described above with the exception of elimination as there is complementary regional donor support in this area. (See III. Overview of PMI’s support of Mozambique’s Malaria Control Strategy for additional details)
- **PMI Investments:** Mozambique began implementation as a PMI focus country in FY 2007. The proposed FY 2020 PMI budget for Mozambique is \$27 million; that brings the total PMI investment to nearly \$382 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



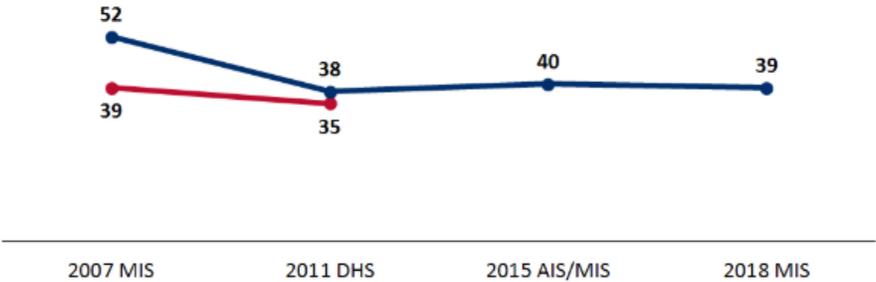
PMI’s approach is both consistent with and contributes to USAID’s Journey to Self-Reliance framework. Building and strengthening the capacity of Mozambique’s people and institutions – from the central level to communities – to effectively lead and implement evidence-based malaria control and elimination activities remains paramount to PMI. As denoted in Table 2 (the

budget table), nearly all of PMI’s planned support for FY 2020 is in the areas of vector control, human health, supply chain and strategic information contains elements of capacity building and system strengthening. PMI/Mozambique will continue to rely on and engage with local partners such as the *Programa Inter Religiosa contra a malaria in Mozambique* and is expanding its local partner base to reach the Provincial Government of Zambézia. Finally, PMI/Mozambique will continue to rely on private sector partnerships such as with ExxonMobil.

II. MALARIA SITUATION AND MALARIA CONTROL PROGRESS IN MOZAMBIQUE

Malaria is endemic in Mozambique and the entire population is at risk of contracting the disease. Pregnant women and children under the age of five have the greatest risk of developing severe malaria. *Plasmodium falciparum* accounts for 90% of all malaria infections, while *Plasmodium malariae* accounts for 9% and *Plasmodium ovale* for 1%. In 2018, malaria accounted for approximately 22% of all outpatient consultations with over 10 million cases diagnosed in public health facilities and communities. Since 2015, the number of reported malaria cases nationwide has increased each year, but there are important differences throughout the country with decreases noted in Gaza, Maputo City, and Maputo Province, but large increases noted in Zambézia and Nampula. Malaria incidence increased by 40% from 2015 to 2018 with 226 cases per 1,000 population in 2015 and 358 cases per 1,000 population in 2018. The number of reported hospital malaria deaths decreased from 2,337 deaths in 2015 to 968 deaths in 2018. Malaria prevalence among children aged 6-59 months remained stable at around 40% since 2011, but the prevalence of low hemoglobin in the same ages increased from 9% in 2011 to 14% in 2018. Data from the 2018 malaria indicator survey (MIS) showed that malaria prevalence varies across the country. Prevalence is higher in the Northern and Central regions (ranging from 29% in Sofala to 57% in Cabo Delgado) and lower in Southern region (ranging from 1% in Maputo city to 35% in Inhambane).

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



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, Percent of children age 6-59 months with moderate-to-severe anemia (hemoglobin <8.0g/dl)

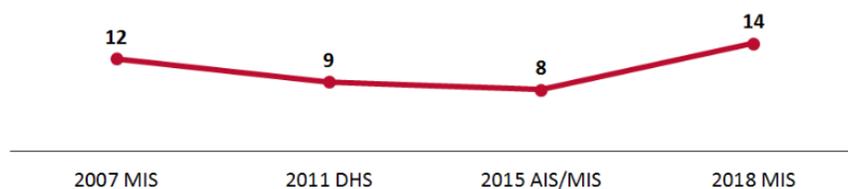


Figure 4. Malaria parasite prevalence among children under five years of age by geographic area, Percent of children age 6-59 months who tested positive for malaria by rapid diagnostic test (2018 MIS)

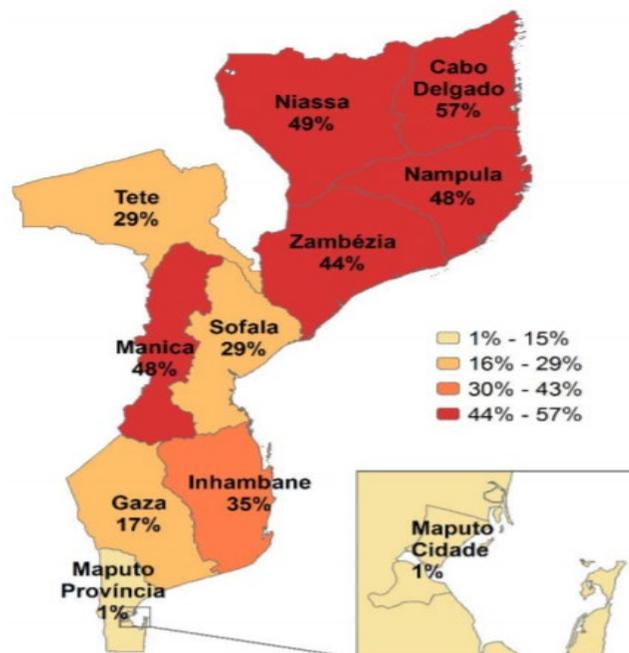


Figure 5. Key indicators for malaria prevention and treatment coverage and impact indicators from Demographic Health Surveys (DHS) and Malaria Indicator Surveys (MIS) from 2007-2018.

Indicator	2007 MIS	2008 MICS	2009 INSIDA	2011 DHS	2015 IMASIDA	2018 MIS
% Households with at least one ITN	16	31	NA	51	66	82
% Households with at least one ITN for every two people	NA	NA	NA	23	39	51

Indicator	2007 MIS	2008 MICS	2009 INSIDA	2011 DHS	2015 IMASIDA	2018 MIS
% Population with access to an ITN	NA	NA	NA	37	54	69
% Population that slept under an ITN the previous night*	NA	NA	NA	30	45	68
% Children under five years of age who slept under an ITN the previous night*	7	23	49	36	48	73
% Pregnant women who slept under an ITN the previous night*	7	NA	NA	34	52	76
% Children under five years of age with fever in the last two weeks for whom advice or treatment was sought ²	36	NA	NA	56	63	69
% Children under five years of age with fever in the last two weeks who had a finger or heel stick	NA	NA	NA	30	40	48
% Children receiving an ACT among children under five years of age with fever in the last two weeks who received any antimalarial drugs	NA	NA	NA	60	93	99
% Women who received two or more doses of intermittent preventive treatment for pregnant women (IPTp) during their last pregnancy in the last two years ¹	16	43	33	20	35	61
% Women who received three or more doses of IPTp during their last pregnancy in the last two years ¹	NA	NA	NA	NA	23	41
IMPACT Indicators						
Under-five mortality rate per 1,000 live births	NA	NA	NA	64	NA	NA
% children under five years of age with parasitemia (by microscopy, if done)*	38	NA	NA	35	NA	NA
% children under five years of age with parasitemia (by RDT, if done)*	51	NA	NA	38	40	39
% children under five years of age with severe anemia (Hb<8gm/dl)	12	NA	NA	9	8	14

*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 Sulfadoxine/pyrimethamine (SP) (Fansidar) from any source wherever possible

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

Figure 6. Evolution of key malaria indicators reported through routine surveillance systems

	2014	2015	2016	2017	2018
# suspect malaria cases ¹	N/A	N/A	N/A	N/A	N/A
# patients receiving diagnostic test for malaria ²	11,428,811	14,241,392	15,434,390	17,375,330	18,752,761
Total # malaria cases ³ (confirmed and presumed)	5,820,380	6,418,526	7,546,091	9,980,677	10,336,065
# confirmed cases ⁴	5,820,380	6,418,526	7,546,091	9,892,473	10,301,229
# presumed cases ⁵	N/A	N/A	N/A	88,204	34,836
% of malaria cases confirmed ⁶	100%	100%	100%	99.1%	99.7%
Test positivity rate (TPR) ⁷	50.9%	45.1%	48.9%	56.9%	54.9%
Total # <5 malaria cases ⁸	2,424,395	1,999,849	2,132,139	4,543,335	4,796,243
% of cases under 5 ⁹	40%	38%	35%	45.5%	46.4%
Total # severe cases ¹⁰	93,885	85,785	80,829	72,309	70,676
Total # malaria deaths ¹¹	3,245	2,465	1,685	1,114	968
# facilities reporting ¹²	N/A	N/A	N/A	1,630	1,652
Data form completeness (%) ¹³	79%	81%	87%	92%	98.8%

Data sources and comments: This table was updated based on 2015, 2017 and 2018 (preliminary) National Malaria Control Program annual reports

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 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 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 MOZAMBIQUE'S MALARIA CONTROL STRATEGY

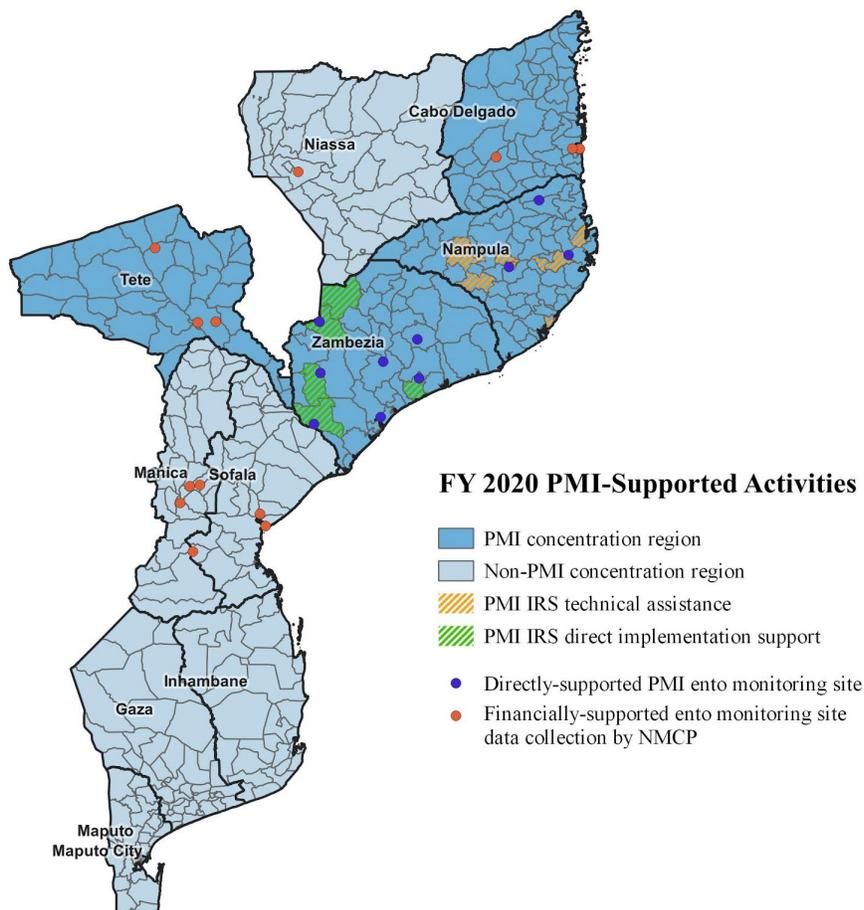
The goals of the Mozambique National Malaria Control Program, as described in the 2017-2022 NMSP, are by 2022, to reduce malaria morbidity and mortality at national level by at least 40%, compared to levels observed in 2015. In order to reach this vision, the NMSP includes the following six objectives:

1. Program Management- Strengthen program management skills at central, provincial & district levels, to achieve the Strategic Plan objectives, by 2022
2. Prevention- Provide at least 85% coverage of the population with a minimum of one vector control intervention, in every district of the country, by 2022
3. Case Management- Test 100% of suspected malaria cases & treat 100% of confirmed malaria cases, at health facility & community level, as per national guidelines, by 2022
4. Social & Behavior Change Communication (SBC)- Implement an effective SBC approach to ensure at least 70% of people seek appropriate & timely healthcare and at least 85% of the population uses an appropriate protection method, by 2022
5. Elimination- Accelerate efforts towards malaria elimination by implementing epidemiologically appropriate interventions, by 2022
6. Surveillance, Monitoring & Evaluation (S,M&E)- Strengthen the surveillance system so 100% of health facilities & districts are reporting complete, timely & quality data, by 2020

PMI worked closely with the NMCP in drafting this plan and the objectives and their associated activities are well-aligned with the PMI in-country priorities. PMI provides direct support for all intervention areas described above with the exception of elimination as there is complementary regional donor support (Elimination 8 and Mozambique, South Africa and Swaziland fund) in this area. PMI support is also complementary to that of the Global Fund. PMI and Global Fund-procured diagnostics and treatments are pooled and distributed nationwide through the national supply chain. Historically, Global Fund has procured insecticides for IRS and ITNs for campaign distribution, complementing PMI support for IRS implementation and routine ITN distribution. Additionally, the Gates Foundation supports national and targeted surveillance strengthening that is coordinated and complementary to PMI investments.

As shown in the figure below, PMI supports commodities for the whole country, but specifically targets case management, MIP, health system strengthening (HSS), SM&E, and SBC activities in the provinces of Zambézia, Nampula, Cabo Delgado and Tete. It fully supports IRS activities in targeted districts of Zambézia and provides some support to the MoH-led IRS program in Nampula. PMI supports direct entomological data collection in Zambézia and Nampula and provides financial support for entomological collection in the remaining provinces in the central and northern regions.

Figure 7. PMI Intervention Support Map



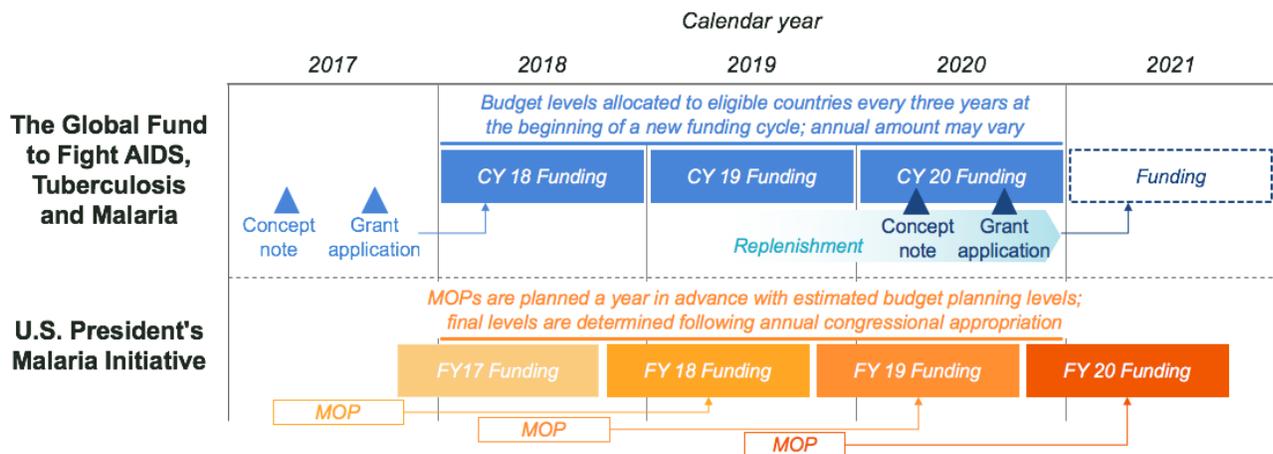
V. PARTNER FUNDING LANDSCAPE

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 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 7 below visualizes the annual cycle of PMI funding and the MOP implementation year. As the figure illustrates, any given FY MOP funds activities 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 reflect timing and/or based on changes in commodity consumption levels at country level, changes in commodity costs, or other donor orders.

Figures 8 and 9 below summarize contributions by external partners and host country government in calendar year 2018-2020, with the goal of highlighting total country investments. For Mozambique, data are available for PMI (FY 2018) 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 FY2020 MOP development, Global Fund country investments for the 2021 implementation period and beyond are not yet known. Note that the host country government invests substantial funding into the national-to-local infrastructure and service delivery for malaria and many other programs. However, there has not been a standardized method for attributing those investments to malaria specifically. Thus, it may not yet be possible in the FY 2020 MOP cycle to attribute funding from the host country government. 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 prevention ²	Supply Chain ³	Monitoring, Evaluation & Research	Other Cross-Cutting and Health Systems Strengthening	Total
FY17/ CY18	PMI	\$12.5M	\$7.2M	\$1.2M	\$2.2M	\$2.2M	\$3.8M	\$29.0M
	GFATM	\$20.4M	\$13.2M	\$1.6M	\$3.3M	\$0.6M	\$7.1M	\$46.1M
	Total	\$32.8M	\$20.4M	\$2.7M	\$5.5M	\$2.8M	\$10.8M	\$75.1M
FY18/ CY19	PMI	\$13.1M	\$8.7M	\$1.1M	\$1.0M	\$1.5M	\$3.6M	\$29.0M
	GFATM	\$69.1M	\$14.2M	\$1.3M	\$0.4M	-	\$6.3M	\$91.4M
	Total	\$82.3M	\$22.9M	\$2.5M	\$1.4M	\$1.5M	\$9.8M	\$120.4M
FY19/ CY20	PMI	\$10.9M	\$11.0M	\$4.4M	\$7.7M	\$1.0M	\$3.0M	\$27.0M
	GFATM	\$9.9M	\$13.3M	\$1.0M	\$5.5M	-	\$5.8M	\$30.5M
	Total	\$20.8M	\$24.3M	\$1.3M	\$1.2M	\$1.0M	\$8.8M	\$57.5M

1. Each year's figures represent the FY for PMI and one CY for GFATM that most closely align 2. Drug-based prevention, including MIP; 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, GFATM, and PMI in 2019, as part of a broader data harmonization initiative; potential for categories to continue to evolve through FY 2020 MOP process, as well as for additional donors and host country governments to adopt and reflect funding using same categories. BMGF also supports global and Mozambique-specific malaria systems strengthening.

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	GFATM	PMI	GFATM	PMI	GFATM
Vector Control	Procure ITNs for Continuous Distribution	\$3.0M	-	\$4.0M	-	\$4.0M	-
	Distribute ITNs via Continuous Distribution	\$2.1M	-	\$1.3M	-	\$1.0M	-
	Procure ITNs for Mass Campaigns	-	-	-	\$40.2M	-	-
	Distribute ITNs via Mass Campaigns	-	-	-	\$11.6M	-	\$9.9M
	Other ITN Implementation*	\$0.3M	-	\$0.1M	-	-	-
	IRS Implementation ⁴	\$6.1M	\$0.5M	\$6.9M	\$0.5M	\$5.4M	-
	Procure IRS Insecticide	-	\$17.6M	-	\$6.6M	-	-

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	GFATM	PMI	GFATM	PMI	GFATM
	Other IRS*	-	-	\$0.04M	-	-	-
	Entomological Monitoring	\$1.1M	\$0.4M	\$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	-	-	-	-	-	-
	Facility-based case management	-	\$0.5M	-	\$0.5M	-	-
	Private-sector case management	-	-	-	-	-	-
	Procure ACTs	\$4.0M	\$6.1M	\$5.0M	\$5.8M	\$6.0M	\$4.7M
	Procure Drugs for Severe Malaria	-	-	-	-	\$0.01M	-
	Procure Other Diagnosis-Related Commodities	-	\$1.3M	-	\$1.2M	-	\$1.1M
	Procure Other Treatment-Related Commodities	-	-	-	-	-	-
	Procure RDTs	\$1.8M	\$2.9M	\$2.4M	\$4.0M	\$3.8M	\$5.6M
	Therapeutic Efficacy	-	-	-	-	-	-
	SBC for Case Management ⁵	-	-	-	-	-	-
Other Case Management	\$1.5M	\$0.2M	\$1.3M	\$0.2M	\$1.2M	\$0.2M	
Drug-Based Prevention ²	Procure SMC-Related Commodities	-	-	-	-	-	-
	SMC Implementation	-	-	-	-	-	-

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	GFATM	PMI	GFATM	PMI	GFATM
	Prevention of Malaria in Pregnancy Implementation	\$0.7M	-	\$0.6M	-	\$0.4M	-
	Procure IPTp-Related Commodities	\$0.5M	-	\$0.5M	-	-	-
	IPTi**	-	-	-	-	-	-
	SBC for Drug-Based Prevention ⁵	-	\$1.6M	-	\$1.3M	-	\$1.0M
	Other Prevention**	-	-	-	-	-	-
Supply Chain³	In-Country Supply Chain ³	-	-	-	-	\$0.3M	-
	Supply Chain Infrastructure	-	\$2.4M	-	-	-	-
	Ensuring Quality	-	\$0.8M	-	\$0.4M	-	\$0.5M
	Pharmaceutical Management Systems Strengthening	\$2.2M	-	\$1.0M	-	\$0.4M	-
	Supply Chain System Strengthening	-	\$0.03M	-	-	-	-
Monitoring, Evaluation & Research	Reporting, Monitoring, and Evaluation	\$1.0M	-	\$0.6M	-	\$1.0M	-
	Program and data quality, analysis and operations research	-	\$0.6M	\$0.4M	-	-	-
	Surveys	\$1.1M	-	\$0.3M	-	-	-
	Other Data Sources**	-	-	-	-	-	-
	Support for FETP*	\$0.1M	-	\$0.2M	-	\$0.1M	-
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*	-	-	\$0.02M	-	\$0.02M	-

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	GFATM	PMI	GFATM	PMI	GFATM
	Cross-Cutting Human Resources for Health**	-	\$0.5M	-	-	-	-
	Central and Regional Program management ⁶	\$0.7M	\$0.7M	\$0.6M	\$0.7M	\$0.5M	\$0.6M
	In-Country Staffing and Administration*	\$1.4M	-	\$1.9M	-	\$1.7M	-
	Other Program Management**	-	\$5.8M	-	\$5.5M	-	\$5.2M
	SBC Unspecified ⁵	\$1.7M	-	\$1.2M	-	\$0.7M	-
Total		\$29.0M	\$46.1M	\$29.0M	\$91.4M	\$27.0M	\$30.5M

¹ Each year's figures represent the FY for PMI and 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";

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, GFATM, and PMI in 2019, as part of a broader data harmonization initiative; potential for categories to continue to evolve through FY 2020 MOP process, as well as for additional donors and host country governments to adopt and reflect funding using same categories.

* 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	\$3.0M	-	-	\$4.0M	\$1.8M	-	-	\$0.5M	\$8.8M
	GFATM	-	-	\$17.6M	\$6.1M	\$2.9M	-	-	-	\$26.6M
	Total	\$3.0M	-	\$17.6M	\$10.1M	\$4.7M	-	-	-	\$35.3M
FY18/ CY19	PMI	\$4.0M	-	-	\$5.0M	\$2.4M	-	-	\$0.5M	\$11.4M
	GFATM	-	\$40.2M	\$6.6M	\$5.8M	\$4.0M	-	-	-	\$56.6M
	Total	\$4.0M	\$40.2M	\$6.6M	\$10.8M	\$6.4M	-	-	-	\$67.9M
FY19/ CY20	PMI	\$4.0M	-	-	\$6.0M	\$3.8M	\$0.01M	-	-	\$13.9M
	GFATM	-	-	-	\$4.7M	\$5.6M	-	-	-	\$10.3M
	Total	\$4.0M	-	-	\$10.7M	\$9.5M	\$0.0M	-	-	\$24.2M

¹ Each year's figures represent the FY for PMI and CY for GFATM 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 GFATM 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 \$18.4 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, GFATM, and PMI in 2019, as part of a broader data harmonization initiative; potential for categories to continue to evolve through FY 2020 MOP process, as well as for additional donors and host country governments to adopt and reflect funding using same categories.

V. ACTIVITIES TO BE SUPPORTED WITH FY 2020 FUNDING

Please see the FY 2020 Budget Table 2 for a detailed list of activities PMI proposes to support in Mozambique 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
The objective of the 2017-2022 NMSP for vector control is to provide at least 85% coverage of the population with a minimum of one vector control intervention, in every district of the country, by 2022.
NMCP approach
Mozambique has prioritized coverage of the entire population with ITNs and deploys IRS in areas with pyrethroid insecticide resistance, continued high transmission, and in areas targeted for elimination. For ITNs, the country uses two distribution channels: mass campaign distribution and routine distribution through antenatal care (ANC) services. For the mass campaign distribution, the country aims to distribute one ITN for every 1.8 people. However, the maximum number of ITNs per household is four nets. For ANC distribution, the recommendation is that every pregnant woman should receive an ITN during her first ANC visit.
PMI objective, in support of NMCP
In keeping with the goals set forth in the NMSP and in the integrated vector management (IVM) strategy, PMI aims to: <ul style="list-style-type: none"> • Support the implementation of the IVM strategy to ensure sustained ITN coverage through both continuous and campaign channels; • Support collection and use of quality entomological data; • Support an evidence-based approach to IRS that results in a more cost-effective and efficient, targeted strategy; and • Strengthen the Ministry of Health (MoH)-led entomology, IRS, and ITN programs.
PMI-supported recent progress (past ~12-18 months)
<ul style="list-style-type: none"> • PMI continued to support a semi-parallel distribution system for ANC ITNs, from port-of-entry to the provincial level, nationwide. In addition, PMI supported the distribution down to the district level in Cabo Delgado province. In Nampula and Zambézia provinces, PMI supported transportation from provincial warehouses to district warehouses, and from district warehouses to health facilities. No significant improvement in ITN availability was, however, noted in these provinces relative to other provinces in which the MoH distributes from the province down to the district and health facility levels without donor support. • PMI started the process of procuring approximately 1.6 million ITNs for ANC distribution. However, this procurement was delayed due to the change in the PMI procurement color specifications which led to extensive negotiations with MoH.

- PMI implemented a school based ITN distribution pilot to determine the feasibility of introducing this channel in the country. The pilot was implemented in one district of Zambézia province during a period of two years, 2018 and 2019. The preliminary results of the pilot were discussed during a workshop with NMCP and other stakeholders. A final report with recommendations will be finalized in calendar year 2019. The findings of the pilot will inform the process of updating the national policy for routine distribution of ITNs.
- PMI also continued to support durability monitoring of ITNs with final, 36-month data collection completed in May and July-August 2018.
- As part of the emergency response to cyclone Idai, PMI supported transportation and distribution of PMI-procured ITNs to cyclone affected areas in Sofala Province.
- PMI supported the direct implementation of IRS in six districts of Zambézia, spraying 387,413 structures (94.5% of eligible structures) which provided malaria protection to 1,663,078 inhabitants. Of these, 237,944 were children under five years of age and 90,089 were pregnant women.
- PMI provided technical and financial support to the national IRS campaign implemented in Nampula province, including leading a training of trainers and funding central-level supervision. It further supported the national government to harmonize and align the existent IRS campaigns modalities in place throughout the country.
- PMI supported the direct collection and analysis of routine vector bionomic, resistance and IRS quality data at seven sentinel sites in Nampula and Zambézia province. It also financially supported the MoH collection of data from 14 additional sites in Niassa, Cabo Delgado, Tete, Sofala and Manica. Additionally, PMI supported cyclone-related entomological surveillance in the province of Sofala to inform the vector control response to the emergency.

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

- PMI will continue support for collection of vector bionomics and insecticide resistance data in all provinces of Central and Northern Mozambique. This will include resistance testing of both predominant vector populations, *Anopheles funestus* and *Anopheles gambiae*.
- PMI will support the distribution of ITNs that were procured with PMI FY 2018 funds and Global Fund support to every province in the country.
- PMI will provide support for the direct implementation of IRS in six districts in Zambézia, targeting approximately 350,000 structures.

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?

We propose to maintain funding levels at \$700,000. This investment has been sufficient to generate robust entomological data for decision-making, including informing insecticide selection for IRS and ITNs. Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

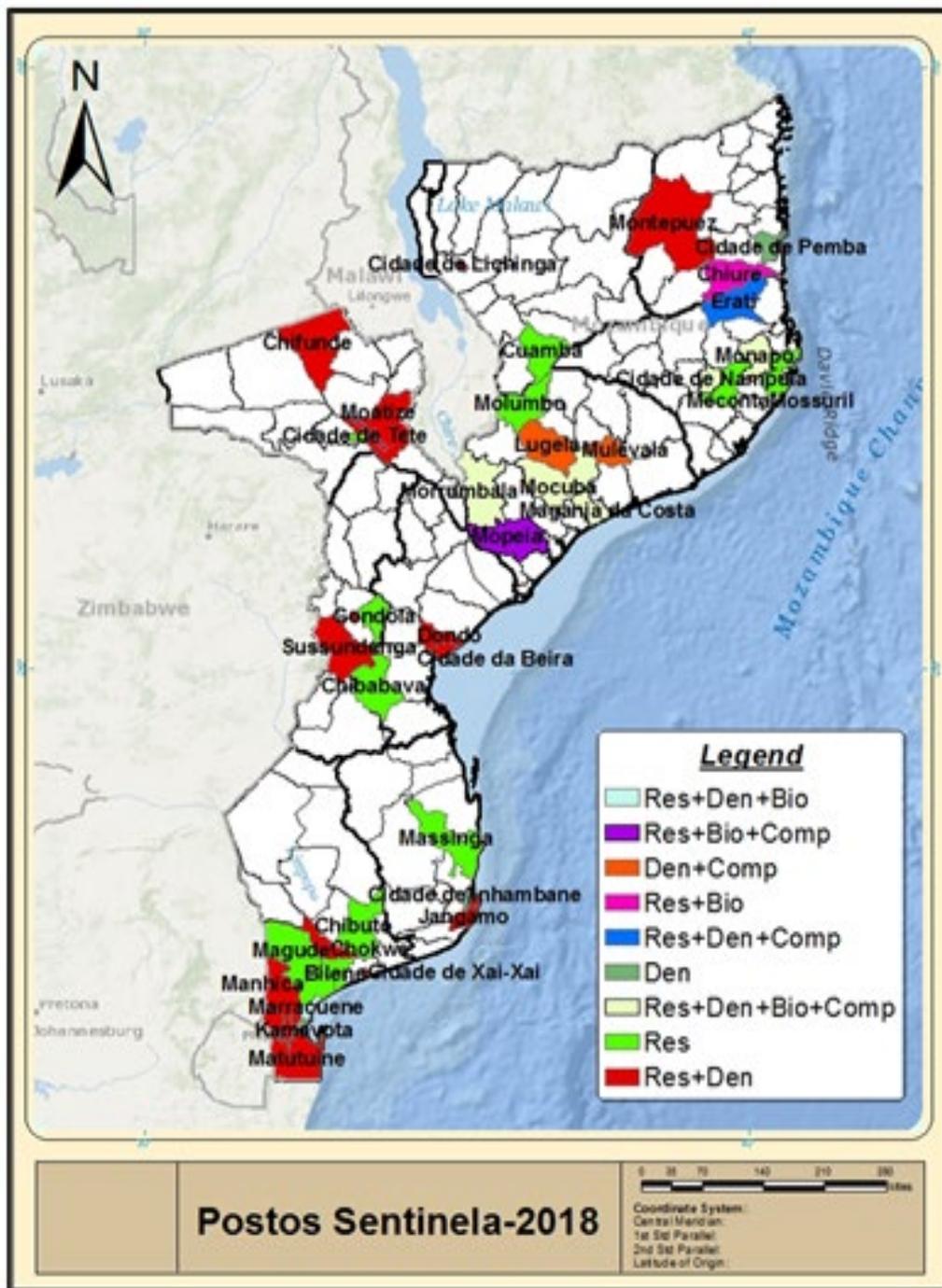
Key Question 1

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

Supporting Data

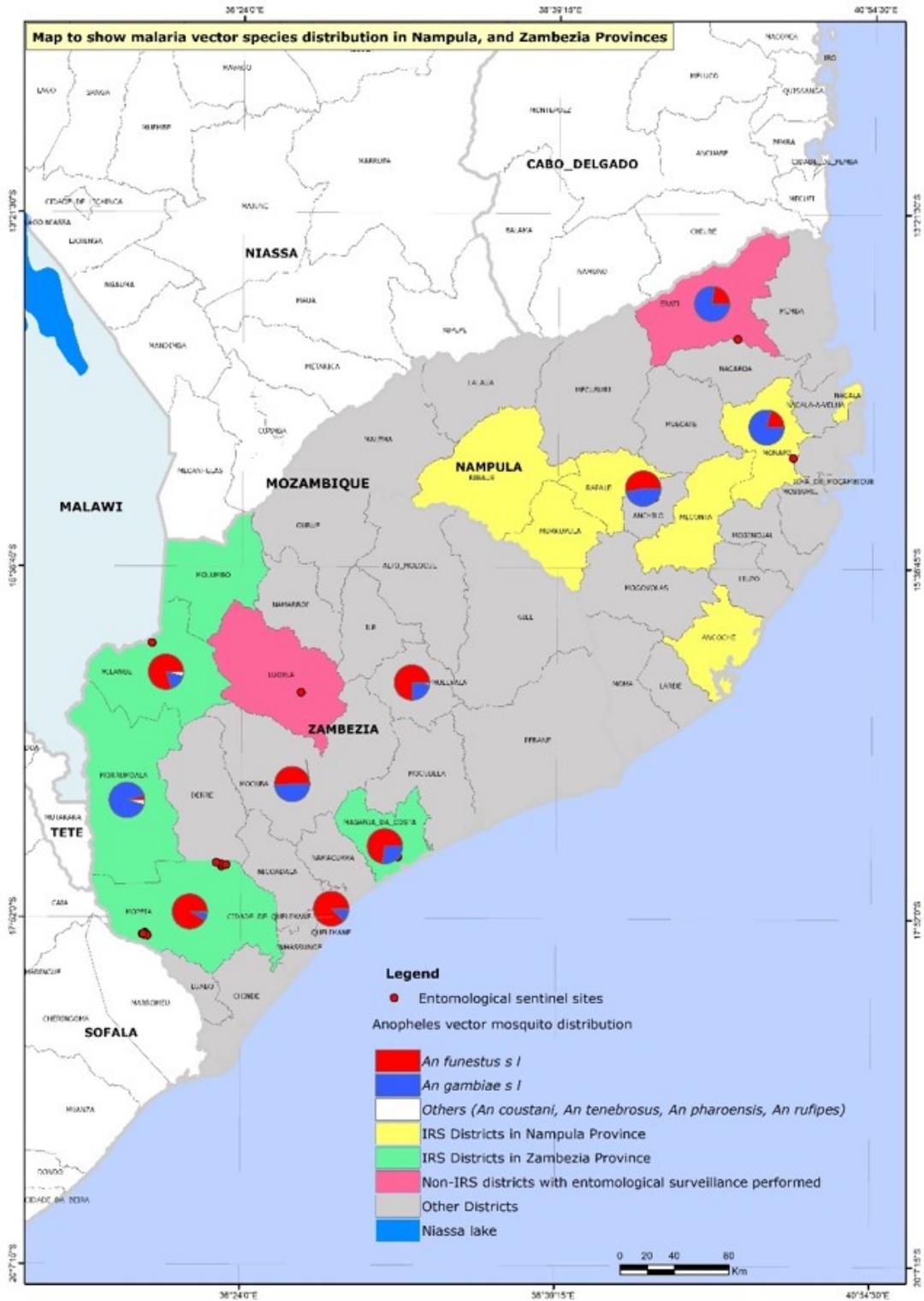
Figure A1 (below) shows the location of each of the entomological monitoring activities that take place nationally at sentinel sites that receive PMI and other donor support. The map of the provinces of Zambézia and Nampula show where entomological activities are conducted with direct PMI involvement and financial support. The specific activities at each site are indicated by the color of the district where **res** indicates that resistance testing is conducted at the site, **den** indicates that density collection are conducted at the site, **bio** indicates that IRS bio-assays are conducted at the site, and **comp** indicates that vector behavior monitoring is conducted at the site. These are further described in the table below.

Figure A1. National sentinel sites with associated tests



Note: Specific activities at each site are indicated by the color of the district where **res** indicates that *resistance testing* is conducted at the site, **den** indicates that *density collection* are conducted at the site, **bio** indicates that *IRS bio-assays* are conducted at the site, and **comp** indicates that *vector behavior monitoring* is conducted at the site.

Figure A2. Vector composition in Nampula and Zambézia provinces



Note: Distribution reflects combined results from human landing catches, pyrethrum spray catches and CDC light trap collections.

Figure A3. Support for Sentinel Sites by Province

Province	Total sentinel sites	Activities	Supported by
Zambézia	7 (Maganja da Costa, Mocuba, Morrumbala, Milange, Molevala, Quelimane, Mopeia)	Longitudinal monitoring (5) Resistance monitoring (7)* *This number will be reduced in 2020 to 5 sites	PMI
Nampula	3 (Nampula City, Monapo, Erati)	Longitudinal monitoring (3) Resistance monitoring (2)	PMI
Maputo City	3 (Kamaxakeni, Ka Mubukwana, Ka Mavota)	Longitudinal monitoring (1) Resistance monitoring (3)	PMI (through 2018) Tchau-Tchau Malaria (2019)
Maputo Provincia	6 (Boane, Moamba, Marracuene, Namaacha, Matutuine, C. Matola)	Longitudinal monitoring (6) Resistance monitoring(6)	Tchau-Tchau Malaria
Gaza	4 (Chokwe, C. Xai-Xai, Chibuto, Bilene)	Longitudinal monitoring (2) Resistance monitoring (4)	PMI (through 2018) WHO (Resistance) Tchau-Tchau Malaria (2019)
Inhambane	4 (C. Inhambane, Jangamo, Maxixe, Massinga)	Longitudinal monitoring (3) Resistance monitoring (3)	PMI (through 2018) Tchau-Tchau Malaria (2019)
Sofala	3 (C. Beira, Dondo, Chibabava)	Longitudinal monitoring (2) Resistance monitoring (3)	PMI
Manica	3 (C. de Chimoio, Sussundenga, Gondola)	Longitudinal monitoring (2) Resistance monitoring (3)	PMI
Tete	3 (C. de Tete, Chifunde, Moatize)	Longitudinal monitoring (2) Resistance monitoring (3)	PMI
Cabo Delgado	3 (C. de Pemba, Metuge, Montepuez)	Longitudinal monitoring (3) Resistance monitoring (3)	PMI
Niassa	1 (Chimbonila)	Longitudinal monitoring (1) Resistance monitoring (1)	PMI

Figure A4 details the geographic distribution of malaria vectors in Mozambique in 2018 and available bionomical data. For any additional information, please refer to the Entomological monitoring report (<https://www.pmi.gov/docs/default-source/default-document-library/implementing-partner-reports/mozambique-2017-2018-entomological-monitoring-final-report.pdf>).

Figure A4. Geographic Distributions of Malaria Vectors in Mozambique in 2018*

Site	Major Vector	Minor Vector	Peak abundance	Preferred biting location**	Peak sporozoite rate
Maganja da Costa	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	NA	<i>An. funestus</i> s.l. Outdoor (O) <i>An. gambiae</i> s.l. (O)	NA
Mocuba	<i>An. funestus</i> s.l., <i>An. gambiae</i> s.l.		NA	<i>An. funestus</i> s.l. Indoor (I) and (O) <i>An. gambiae</i> s.l. (O)	NA
Morrumbala	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l.	NA	<i>An. funestus</i> s.l. (I+O) <i>An. gambiae</i> s.l. (O)	NA
Milange	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	NA	<i>An. funestus</i> s.l. (O) <i>An. gambiae</i> s.l. (O)	NA
Molevala	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l. (July-Sept, Jan - Feb), <i>An. gambiae</i> s.l. (Nov-Dec)	<i>An. funestus</i> s.l. (I) <i>An. gambiae</i> s.l. (O)	NA
Quelimane	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	NA	NA	NA
Mopeia (Intervention)	<i>An. funestus</i> s.s.	<i>An. arabiensis</i>	NA	<i>An. funestus</i> s.l. (I) <i>An. gambiae</i> (O)	10.7% Pf 1.96% Pv
Mopeia (Control)	<i>An. funestus</i> s.s.	<i>An. arabiensis</i>	<i>An. funestus</i> s.l. (Jul, Jan) <i>An. gambiae</i> s.l. (Jan-Feb)	<i>An. funestus</i> s.l. (I) <i>An. gambiae</i> s.l. (O)	0
Nampula City	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	NA	<i>An. funestus</i> s.l. (O) <i>An. gambiae</i> s.l. (I)	NA
Monapo	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	NA	<i>An. funestus</i> s.l. (I+O) <i>An. gambiae</i> s.l. (O)	NA
Erati	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	NA	<i>An. funestus</i> s.l. (O) <i>An. gambiae</i> s.l. (I)	NA
Kamaxakeni	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l.	NA	NA	NA
Boane	--	--	NA	NA	NA

Site	Major Vector	Minor Vector	Peak abundance	Preferred biting location**	Peak sporozoite rate
Moamba	--	--	NA	NA	NA
Marracuene	--	--	NA	NA	NA
Chokwe	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l. (Oct) <i>An. gambiae</i> s.l. (Jan, Jul)	NA	NA
C. Xai-Xai	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l.	<i>An. funestus</i> s.l. (Oct-Nov) <i>An. gambiae</i> s.l. (Jan, Nov)	NA	NA
C. Inhambane	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l. (Jan-Apr) <i>An. gambiae</i> s.l. (Apr, Aug)	NA	NA
Jangamo	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l. (Apr, Oct) <i>An. gambiae</i> s.l. (Sept)	NA	NA
Maxixe	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l. (Feb, Nov) <i>An. gambiae</i> s.l. (Feb)	NA	NA
C. Beira	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l. (Apr, Jun) <i>An. gambiae</i> s.l. (Apr)	NA	NA
Dondo	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l. <i>An. gambiae</i> s.l. (Jun)	NA	NA
C. Chimoio	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l. (May) <i>An. gambiae</i> s.l. (Nov)	NA	NA
Sussundenga	<i>An. funestus</i> s.l., <i>An. gambiae</i> s.l.		<i>An. funestus</i> s.l. (Nov) <i>An. gambiae</i> s.l. (Jun)	NA	NA
Chifunde	<i>An. funestus</i> s.l. <i>An. gambiae</i> s.l.		<i>An. funestus</i> s.l. (Jul) <i>An. gambiae</i> s.l. (Jul)	NA	NA

Site	Major Vector	Minor Vector	Peak abundance	Preferred biting location**	Peak sporozoite rate
Moatize	<i>An. funestus</i> s.l., <i>An. gambiae</i> s.l.		<i>An. funestus</i> s.l. (Nov) <i>An. gambiae</i> s.l. (Nov)	NA	NA
C. de Pemba	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l.	<i>An. funestus</i> s.l. <i>An. gambiae</i> s.l. (May-Jun, Sept, Dec)	NA	NA
Metuge	<i>An. gambiae</i> s.l.	--	<i>An. gambiae</i> s.l. (Jul-Nov)	NA	NA
Montepuez	<i>An. gambiae</i> s.l.	--	<i>An. gambiae</i> s.l. (May-Sept)	NA	NA
Chimbonila	<i>An. funestus</i> s.l.	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l. (Jan-Mar) <i>An. gambiae</i> s.l.	NA	NA

*Information on preferred resting location, preferred host, and annual EIR not currently available.

** Vector biting behavior is only collected at the sentinel sites located in Nampula and Zambézia province.

Conclusion

In 2018, PMI entomological activities were conducted in Zambézia and Nampula. In Zambézia, insecticide resistance monitoring was conducted in the seven targeted IRS areas (Derre, Maganja da Costa, Milange, Mocuba, Molumbo, Mopeia and Morrumbala). Additionally, entomological monitoring was carried out at four of the IRS sites (Maganja da Costa, Milange Mocuba and Morrumbala) and one non-IRS site (Molevala) using light traps (LT), human landing catches (HLC) and pyrethrum spray collections (PSC). Monthly light trap collections were conducted in Quelimane for monitoring after IRS ended in 2016. In Nampula, entomological monitoring was conducted in three districts (Nampula City, Monapo and Erati districts) also using LT, HLC and PSC. *An. funestus* s.l. was the most abundant vector collected in Zambézia and Nampula. While observed biting activity was consistently higher outdoors than indoors for *An. gambiae* s.l., there were mixed observations with *An. funestus* s.l. In some sites indoor biting of *An. funestus* was higher than outdoor biting (in the intervention sites of Maganja da Costa and Mopeia and control sites of Molevala and Mopeia).

In 2018, PMI supported the NMCP in longitudinal monitoring using PSC in 22 sites in eight provinces. With joint support from PMI, Tchou and WHO, malaria susceptibility testing was conducted in 25 sites nationwide. In seven sites *An. funestus* s.l. was the major vector and in 3 sites both *An. funestus* s.l. and *An. gambiae* s.l. collected in approximately equal numbers.

Key Question 2

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

Supporting Data

Figure A5. 24-hour Mortality of Adult *Anopheles gambiae* s.l., from Larval Collections Exposed to a Range of Insecticides at Respective Diagnostic Concentrations in Zambézia Province.

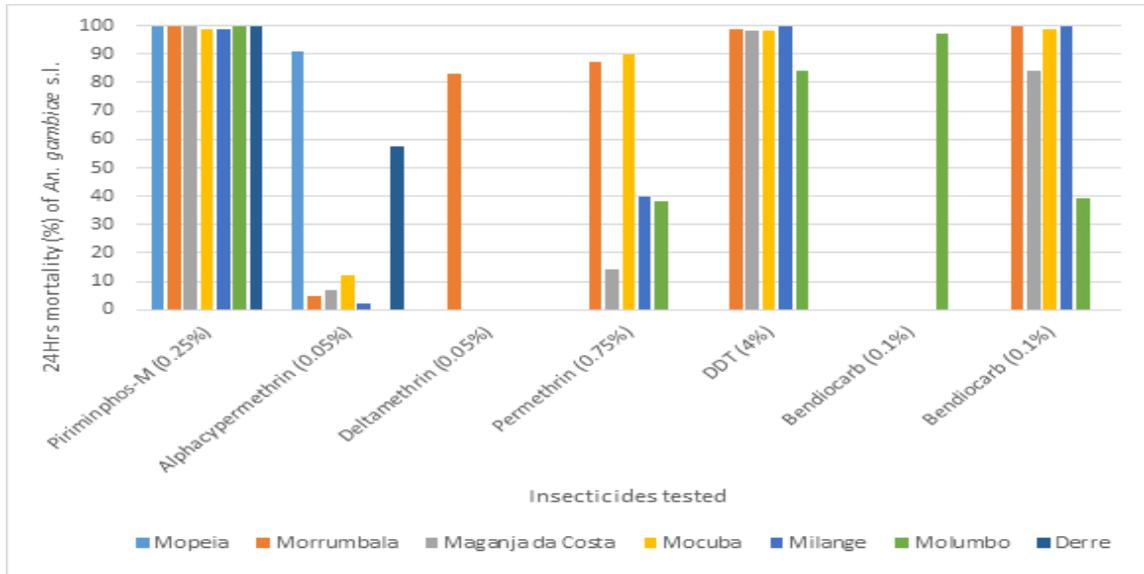


Figure A6. 24-Hour Mortality of Adult *Anopheles gambiae* s.l. from Larval Collections Exposed to a Range of Insecticides at Respective Diagnostic Concentrations in Nampula Province.

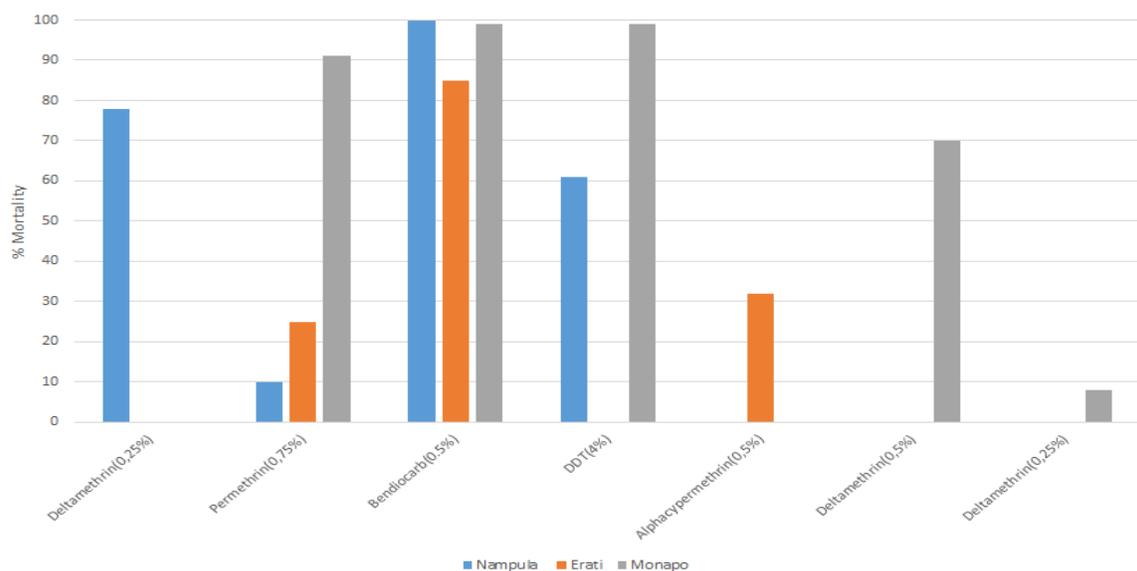


Figure A7. 24-hour mortality of adult *Anopheles funestus* s.l., from adult collections exposed to a range of insecticides at respective diagnostic concentrations in Zambézia province. Similar collections in Erati, Nampula showed 13% mortality 24 hours after exposure to permethrin (0.75%).

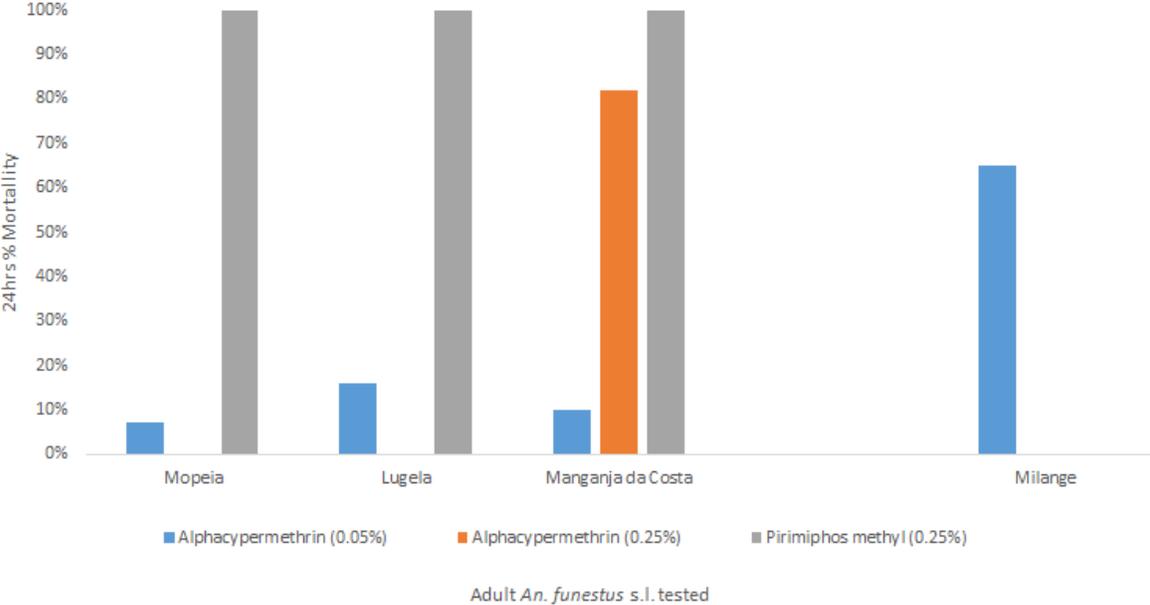
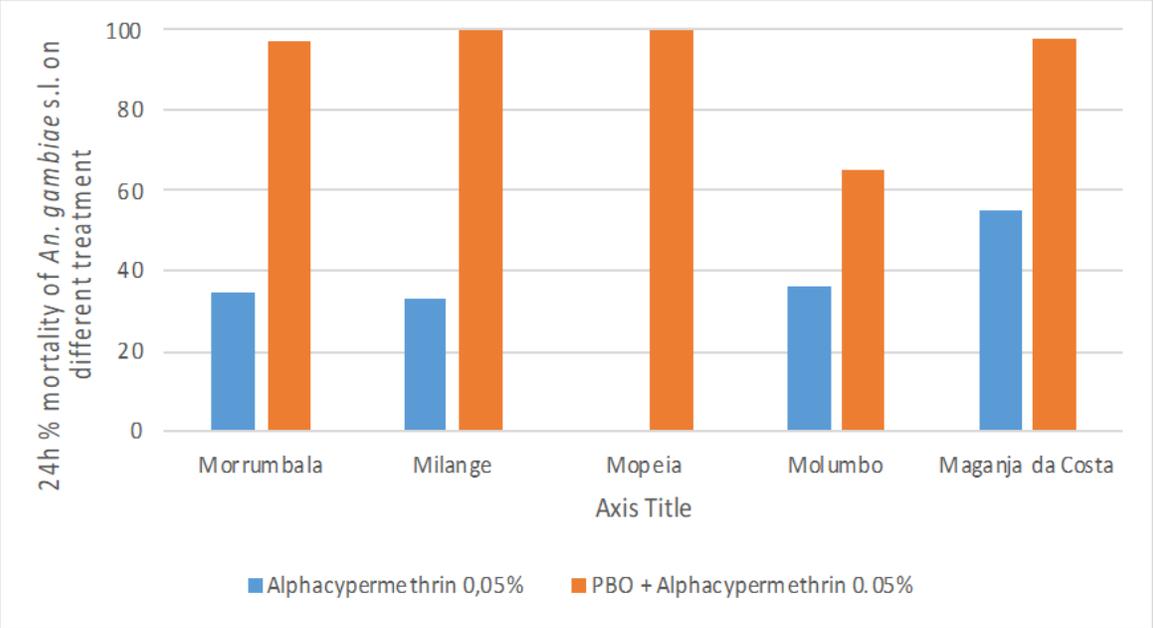


Figure A8. 24hr mortality of Adult *Anopheles gambiae* s.l., from larval collections exposed to alphacypermethrin (0.05%) and PBO + Alphacypermethrin (0.05%) at various sites in Zambézia province.



Conclusion

Anopheles gambiae s.l. from larval collections in seven sites from Zambézia and three sites from Nampula were tested for insecticide resistance. Additionally, *Anopholes funestus* s.l. were collected in Zambézia and Nampula. Following WHO guidelines, mortalities between 98-100% indicate that mosquitoes are susceptible, mortalities between 90-97% indicate possible resistance, while anything below 90% mortality indicates resistance. According to the latest susceptibility data, mosquitoes are susceptible to pirimiphos-methyl at all sites that tested this insecticide. There is also susceptibility to bendiocarb in some sites. There is resistance to pyrethroids across all sites except Monapo where there was possible resistance to permethrin. This implies that the use of pirimiphos-methyl is still a viable choice. Resistance data show that addition of PBO restored alphacypermethrin susceptibility in four of five sites. Currently there is also data being collected on chlorfenapyr and clothianidin susceptibility, and, although not shown in the graph above, there appears to be full susceptibility to both insecticides across all sites. The susceptibility to several insecticides provides the opportunity to implement a rotation strategy to mitigate future insecticide resistance, consistent with the national IVM strategy.

Key Question 3

What are the in-country considerations (e.g. in-country staffing capacity, political climate, security concerns) that impact your funding allocation in this category?

Supporting Data

PMI, Global Fund and the government of Mozambique have invested in capacity-building of provincial level staff and insectary development, as evidenced by the increase in the presence of insectaries and entomological laboratories from 3 of 11 provinces in 2018 to 10 provinces of Mozambique in 2019. Sentinel sites from all provinces now generate annual resistance data.

Conclusion

While provincial-level capacity is still nascent, it is expected that the FY2020 PMI investment in central level supervision to provinces will solidify provincial capacity so that routine activities can be independently implemented in the future.

1.B. INSECTICIDE-TREATED NETS (ITNs)

PMI Goal

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

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?

PMI will decrease its funding allocation for ITN procurements as this activity has shifted to another donor partner, but will maintain its funding allocations for distribution and SBC to promote ITN use. The decision to make this transition was determined in consultation with the MoH who requested ITN specifications which are no longer procured by PMI.

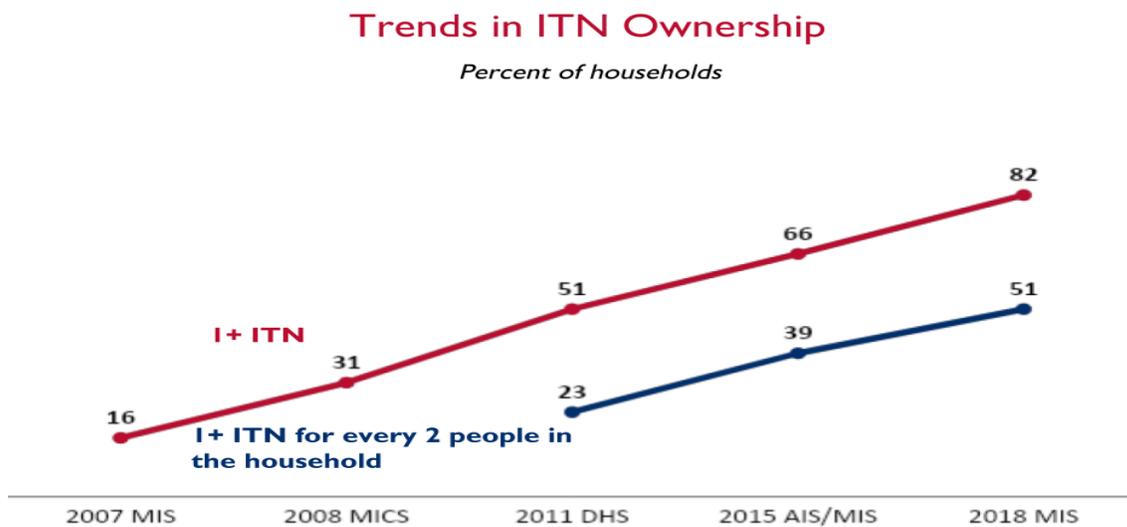
Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

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

Supporting Data

Figure A9. Trends in ITN Ownership



Conclusion

There has been a steady trend in increased ITN ownership from 16% in 2007 to 82% in 2018. Universal access with at least one ITN for every 2 people in the household has increased, but remained only 51% in 2018. There is an ongoing (2019/2020) Global Fund-sponsored ITN universal coverage campaign which is expected to increase ITN ownership.

Key Question 2

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

Supporting Data

Figure A10. Trends in ITN Access and Use

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

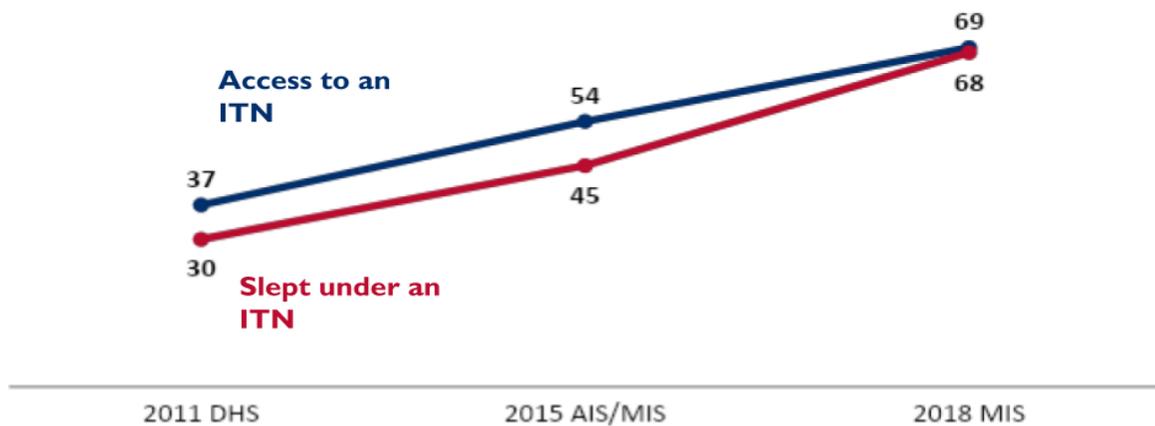
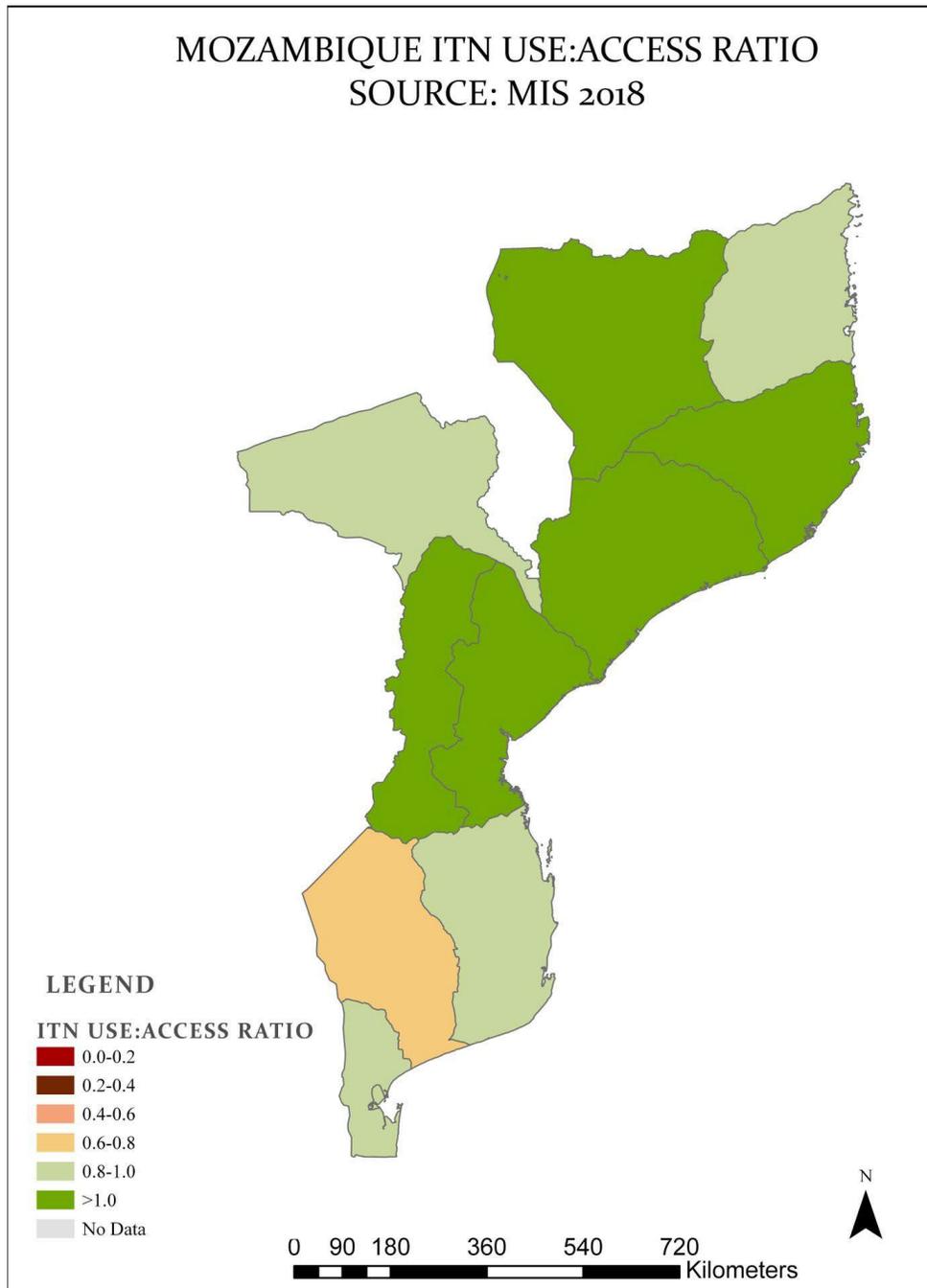


Figure A11. Mozambique ITN Use:Access Ratio, from MIS2018



Conclusion

There has been a steady trend in both increased access to ITNs and the number of people who slept under a net the night before the survey with use and access nearly equal in 2018. The ITN use to access ratio is between 0.8 and 1 or above 1 in most of the country, except Gaza Province. This indicates generally high use among individuals who have access to ITNs.

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 A12. Facilitators and Barriers to ITN Use

Facilitator	Type of Factor <i>(Internal, Social, or Environmental)</i>	Data Source	Evidence
Risk perception	Internal	MIS	A total of 64.2% and 60.4% of respondents in the 2018 MIS felt that children and pregnant women, respectively, were at risk of contracting malaria.
Barrier	Type of Factor <i>(Internal, Social, or Environmental)</i>	Data Source	Evidence
Limited response efficacy	Internal	MIS	Nearly one third (30.9%) of respondents in 2018 MIS felt the risk of contracting malaria was the same among those who did and did not sleep under and ITN.
Community norms	Social		Only 50.3% of respondents in 2018 MIS felt that the majority of the people in their community slept under an ITN during the rainy (higher transmission) season and 45.5% during the dry (lower transmission) season.

Conclusion

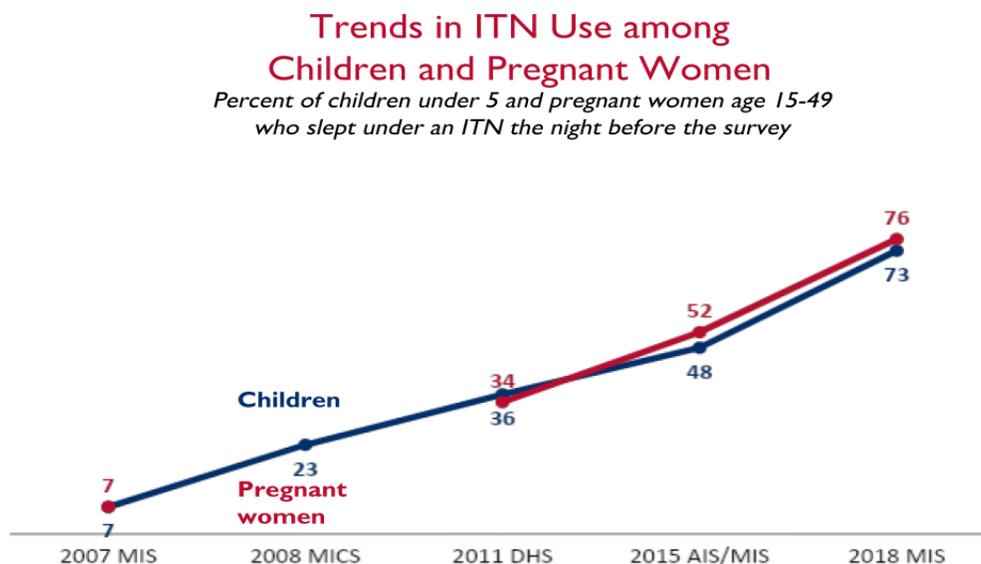
Mozambique included relevant questions in the 2018 MIS that provided data to inform the national and provincial SBC strategies and materials. These barriers and facilitators are key intervention targets for the implementation and monitoring of the national SBC package.

Key Question 4

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

Supporting Data

Figure A13. Trends in ITN Use among Children and Pregnant Women



Conclusion

Since 2007 the proportion of children under five years of age and pregnant women who slept under an ITN the night before the survey has been steadily increasing. According to the 2018 MIS data, 76% of pregnant women age 15-49 and 73% of children under 5 years of age slept under an ITN the night before a survey.

Key Question 5

What channels are used to distribute ITNs?

Supporting Data

Figure A14. ITN Distribution Channels

	2015	2016	2017	2018	2019	2020	2021
EPI							
ANC	1,570,875	2,154,700	1,548,550	1,435,350	1,500,087*	1,548,977*	1,597,415*
Schools				30,000	30,000		
Community							
Mass Campaign	3,869,861	3,744,637	12,813,181		5,346,710*	10,792,312*	

* Planned numbers

Conclusion

In 2020 there will only be two channels of ITN distribution: ANC and the continuation of the mass campaign that began in 2019.

Key Question 6

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

Supporting Data

Figure A15. Estimated ITN Availability 2019 - 2021

Calendar Year	2019	2020	2021
Total Targeted Population (see footnote 1)	29,365,271	30,093,007	30,820,744
Continuous Distribution Needs			
Channel #1: ANC (see footnote 2)	1,500,087	1,548,977	1,597,415
Channel #2: School-Based Distribution	30,000		
<i>Estimated Total Need for Continuous Channels</i>	1,530,087	1,548,977	1,597,415
Mass Campaign Distribution Needs			
2019/2020/2021 mass distribution campaign(s) (See footnote 3)	5,346,710	10,792,312	0
<i>Estimated Total Need for Campaigns</i>	5,346,710	10,792,312	0
Total ITN Need: Routine and Campaign	6,876,797	12,341,289	1,597,415
Partner Contributions			
ITNs carried over from previous year	738,844	1,040,007	1,040,007
ITNs from MOH	0	0	0
ITNs from Global Fund	5,346,710	12,341,289	1,597,415
ITNs from other donors	0	0	0
ITNs planned with PMI funding (See Footnote 4)	1,831,250	0	0
Total ITNs Available	7,916,804	13,381,296	2,637,422

Total ITN Surplus (Gap)

Footnote 1: Population percentages per age category based on 2017 Population and Housing Census, Population Projection Trends. Final 2019-2040 population projections from this census have not been published yet, however, provincial data were used. Assumes 2.4% annual population growth. These are the Ministry of Health official figures.

Footnote 2: Pregnant woman account for 5.1% of the general population. These LLINs are for ANC only.

Footnote 3: For 2019 (Nampula & Cabo Delgado) 2020 (Niassa & Zambézia) 2020(Tete, Manica & Sofala) 2020 (Inhambane & Gaza)

Footnote 4: PMI net procurement for routine distribution will transition to Global Fund country grant in FY 2019

Conclusion

The total target population in 2019, 2020, and 2021 are as follows: 29,365,271, 30,093,007, and 30,820,744. Population percentages per age category based on 2017 Population and Housing Census, Population Projection Trends. Final 2019-2040 population projections from this census have not been published yet, however, provincial data were used which assume 2.4% annual population growth. These are the MoH official figures.

The ITN need was calculated based on the fact that pregnant women account for 5.1% of the general population. The total ITN needs for the 2019/2020 mass campaign will be 5,36,710 in 2019 and 10,792,312 in 2020. This brings the total ITN need for both routine and mass campaign to 6,876,797, 12,341,289, and 1,597,415 in 2019, 2020, and 2021 respectively. In calendar years 2020 and 2021 Global Fund will be procuring the total estimated ITN needs for both the routine and mass campaign (12,341,289, and 1,597,415 respectively).

Key Question 7

What is the current status of durability monitoring?

Supporting Data

Figure A16. ITN Durability Monitoring, 2015

Campaign Date	Sites	Brands	Baseline	12-month	24-month	36-month
2015	Inhambane	Royal Sentry	x	x	x	x
2015	Tete	MAGNet	x	x	x	x
2015	Nampula	Royal Sentry	x	x	x	x

Figure A17. Survey of ITN Effectiveness Since Distribution

Site	Survey and time since distribution (months)	Attrition wear and tear (%)	Remaining nets in serviceable condition (%)	Remaining nets hanging over sleeping space (%)		Optimal insecticidal effectiveness in bio-assay (%)
				Campaign	Other	
Inhambane	12m: 9.7	0.4	98.5	50.3	62.2	100
	24m: 21.5	6.2	93.4	68.8	77.8	100
	36m: 33.5	16.0	78.2	71.2	57.9	3.3
Tete	12m: 13.4	1.4	97.2	57.8	70.6	100
	24m: 24.1	6.9	80.7	68.3	79.2	100
	36m: 36.0	20.4	64.3	66.1	61.6	11.1

Site	Survey and time since distribution (months)	Attrition wear and tear (%)	Remaining nets in serviceable condition (%)	Remaining nets hanging over sleeping space (%)		Optimal insecticidal effectiveness in bio-assay (%)
				Campaign	Other	
Nampula	12m: 9.9	2.3	96.6	76.3	--	100
	24m: 21.9	12.3	91.8	80.6	70.1	100
	36m: 33.9	24.5	62.8	86.8	85.8	29.3

Conclusion

After three years of follow-up among rural populations in the provinces of Inhambane, Tete and Nampula, the 150-denier polyethylene ITN Royal Sentry/MAGNet showed significant differences in median physical survival ranging from 3.0 years in Inhambane to 2.8 in Tete and 2.4 in Nampula. The survival estimate for Nampula was significantly below the assumed three-year ITN survival while at the other two sites it was consistent with that assumption. The differences in survival could be attributed at least in part to house and net environment and net care and repair behaviors. Insecticidal performance was optimal up to 24 months after distribution, but then dropped significantly. However, 96% of samples at 36 months still demonstrated minimal effectiveness (defined as 60-minute knock-down $\geq 75\%$ and 24-hour functional mortality $\geq 50\%$) and provided at least some insecticidal protection. For more details, see the full report (<https://www.pmi.gov/docs/default-source/default-document-library/pmi-reports/durability-monitoring-of-llin-in-mozambique-final-report-after-36-months-follow-up-2018.pdf?sfvrsn=4>).

It is expected that the durability monitoring of standard, PBO, Interceptor G2, and Royal Guard ITNs distributed through the 2020 national ITN campaign will be supported through the New Nets Project with funding by Unitaid and The Global Fund.

Key Question 8

What are the in-country considerations (e.g. in-country staffing capacity, political climate, security concerns) that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

The Mozambique MoH has noted preference for blue ITNs over white ITNs in more rural and northern parts of the country due to the association of white with funeral shrouds. PMI policy limiting procurement to only white colored ITNs has been a cause for concern on the

acceptability of these nets for routine distribution, as evidenced by the multi-month delay in accepting their procurement.

Conclusion

To prevent any potential decrease in net use due to net color, procurement of ITNs from FY 2019 onwards has transitioned from PMI to Global Fund in order for the country to receive ITNs that are consistent with its procurement specifications. PMI has increased its procurement of other malaria commodities to compensate for this increased cost from the Global Fund country grant.

1.C. INDOOR RESIDUAL SPRAYING (IRS)

Key Goal

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

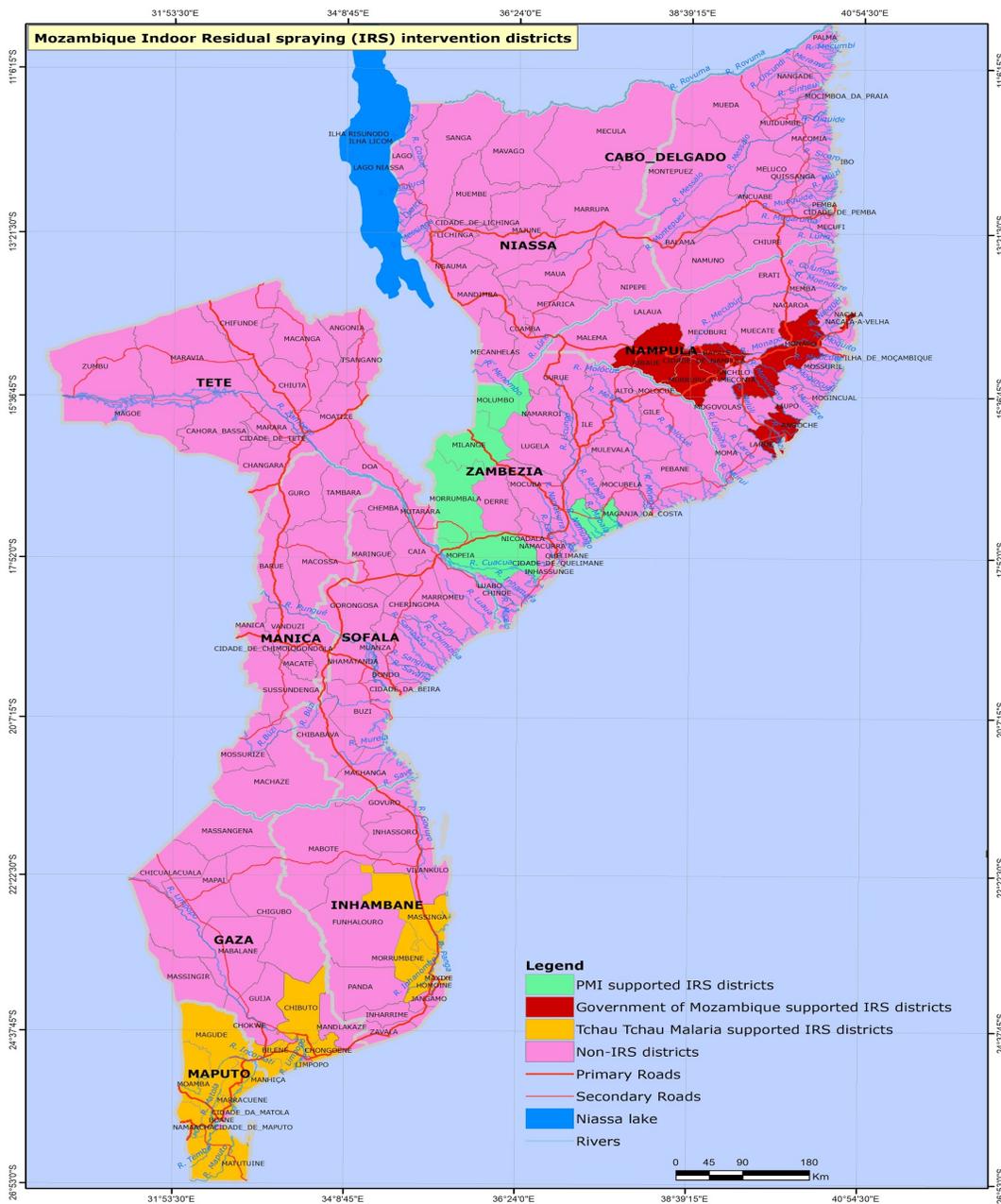
Do you propose to increase, decrease, or maintain funding allocation levels for this activity? Why, and what data did you use to arrive at that conclusion?

PMI will increase its geographic coverage, but decrease funding allocation levels for IRS as it transitions some support to the provincial government. The transition to have more support directly through the MoH with complementary investments in technical support from partners will increase the cost-efficiencies of the IRS program while maintaining high IRS quality and coverage. 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?

Figure A18. Mozambique Intervention Districts



IRS in 2019 implementation with Government of Mozambique, PMI, and Tchau Tchou financial support is shown in red, green, and yellow in the figure above. All insecticide is procured through the Government of Mozambique Global Fund grant. It is anticipated that these same districts will be targeted in 2020. IRS is targeted in southern Mozambique in support of regional elimination efforts and concentrated in Zambézia and Nampula because of the evidence there of pyrethroid resistance and continued high malaria transmission.

Conclusion

The current strategic distribution of IRS to target high burden districts with documented insecticide resistance and to support elimination efforts with financial support for different geographic areas by different donors will continue. These efforts are coordinated at the central level by an active technical working group that continues to strengthen harmonization and quality of IRS throughout the country.

Key Question 2

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

Supporting Data

Figure A19. Spray Coverage Rates 2016 - 2019

Calendar Year	Number of Districts Sprayed	District Names**	Number of Structures Sprayed	Coverage Rate	Population Protected
2016	7	Derre, Milange, Mocuba, Molumbo, Mopeia, Morrumbala, and Quelimane	405,597	80%	1,929,654
2017	7	Derre, Maganja da Costa, Milange, Mocuba, Molumbo, Mopeia, and Morrumbala	381,463	88%	1,711,518
2018	6	Derre, Maganja da Costa, Milange, Molumbo, Mopeia, and Morrumbala	387,413	94.5%	1,663,109
2019*	5	Maganja da Costa, Milange, Molumbo, Mopeia, and Morrumbala	~331,360	85%+	~1,424,848

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

Conclusion

Over the past five years the number of districts where IRS has been conducted with PMI support was reduced from seven to five districts. The major limiting factor is the continuous increase in costs associated with all the IRS activities. Coverage has, however, consistently increased with an achievement of 94.5% coverage in 2018, providing protection to 1,663,109 people.

Key Question 3

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

Supporting Data

Figure A20. Cone Bioassay Mortality Results at 24-hour of susceptible *Anopheles arabiensis* KGB Strain on Mud and Burnt Brick in Maganja da Costa and on Mud in Milange for Actellic 300CS.

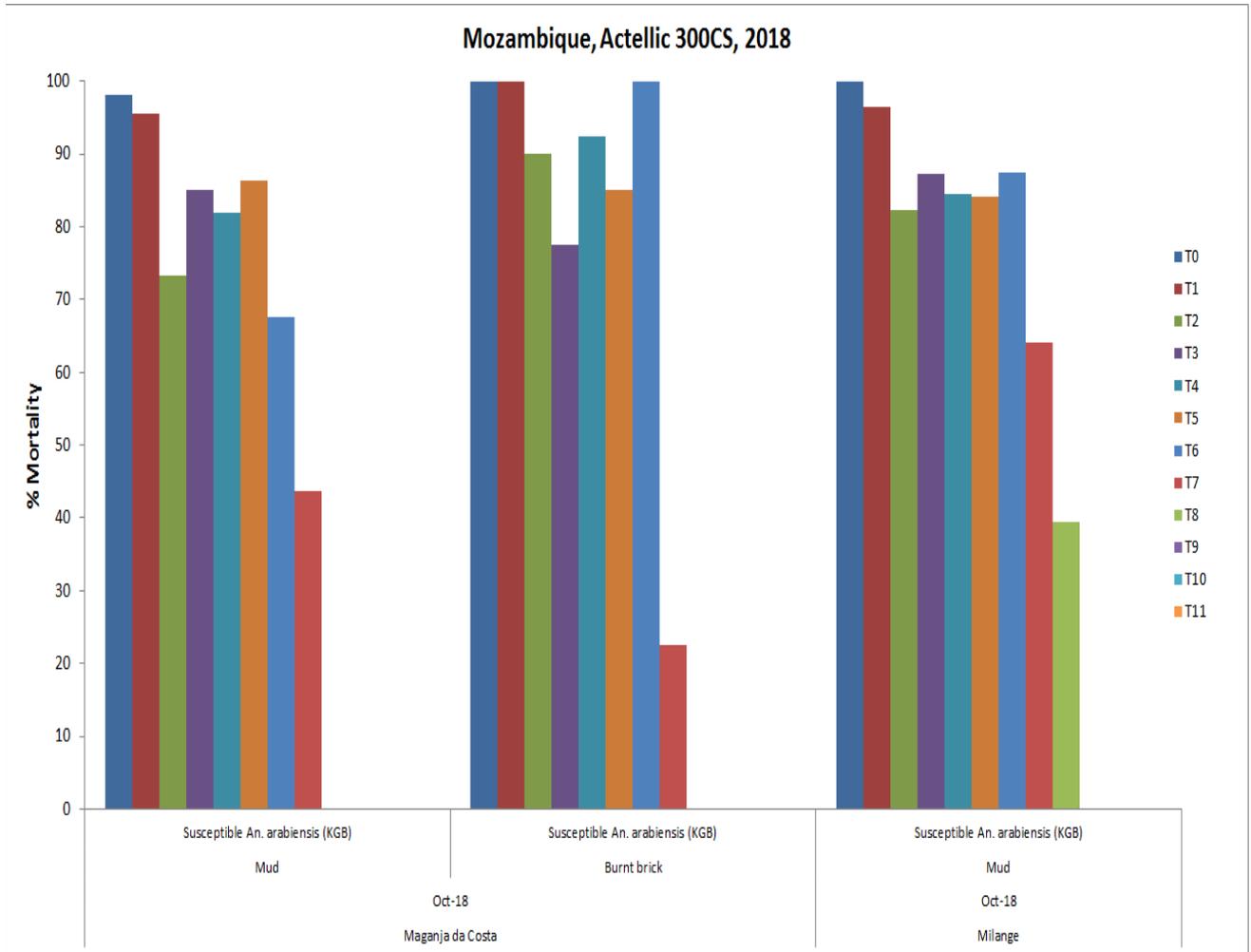
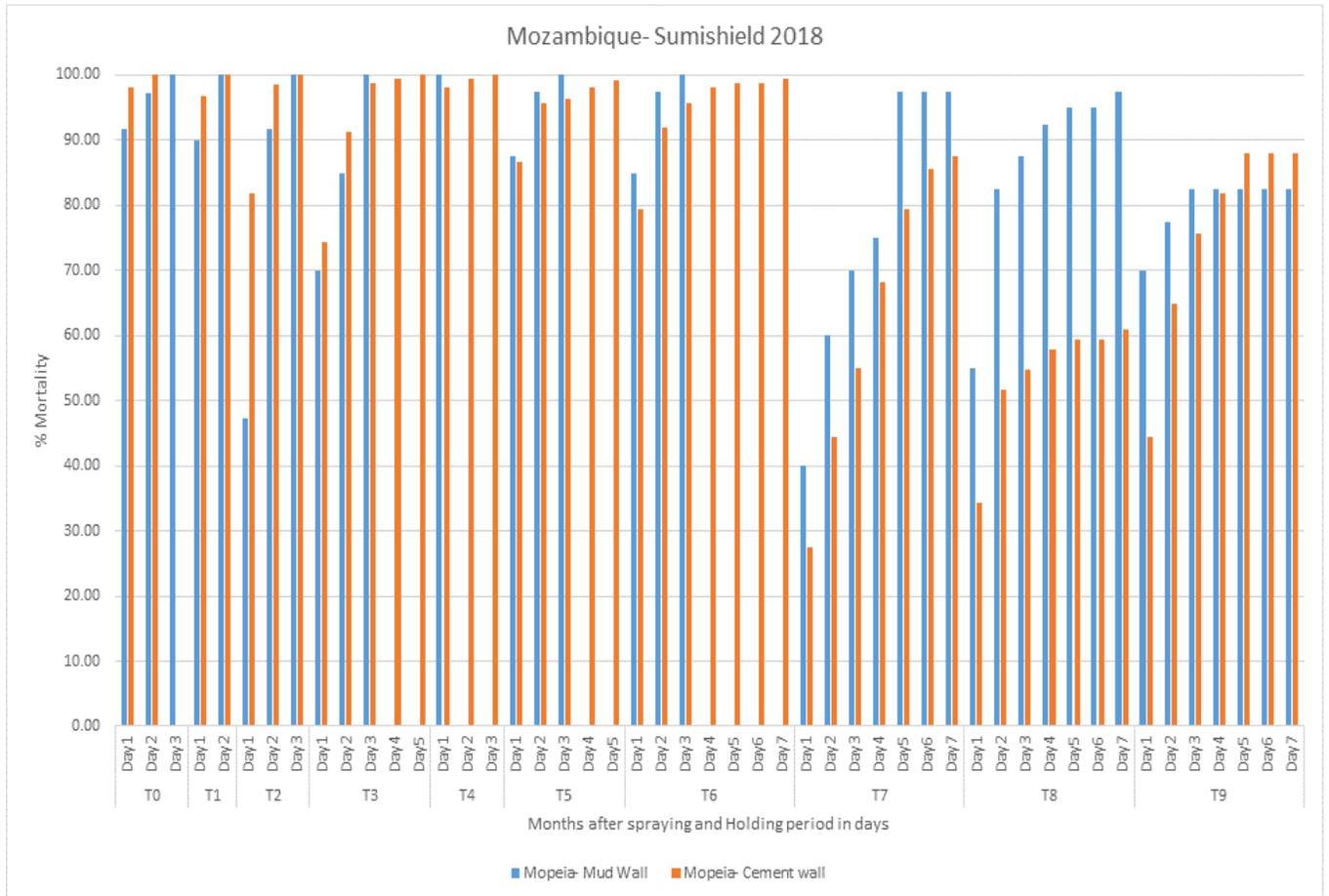


Figure A21. Cone Bioassay Mortality Results of Susceptible *Anopheles arabiensis* KGB strain on mud and cement in Mopeia for SumiShield 50WG



Note that T0 is immediately following spray, T1 is one month after spray, T2 is two months after spray, etc.

Conclusion

In 2018, the organophosphate Actellic was sprayed in four districts (Derre, Maganja da Costa, Milange and Molumbo) while the clothianidin SumiShield was sprayed in two districts (Mopeia and Morrumbala) in the Province of Zambézia.

The residual efficacy of Actellic was no longer than six months post spray, while the residual efficacy of SumiShield varied between seven- and eight-months post spray for both the mud and cement walls, but appears to have stabilized below 80% mortality at nine months post spray.

The efficacy of Actellic was shorter than SumiShield by three months, which indicates that the plan to switch to SumiShield and Fludora Fusion for the 2019 campaign is appropriate timing.

Key Question 4

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

Supporting Data

Figure A22. Plan for Insecticide Rotation

Year	Derre	Maganja da Costa	Milange	Mocuba	Molumbo	Mopeia	Morrumbala
2017	pirimiphos-methyl	pirimiphos-methyl	pirimiphos-methyl	pirimiphos-methyl	pirimiphos-methyl	pirimiphos-methyl	pirimiphos-methyl
2018	pirimiphos-methyl	pirimiphos-methyl	pirimiphos-methyl		pirimiphos-methyl	clothianidin	clothianidin
2019		clothianidin/deltamethrin	clothianidin/deltamethrin		clothianidin/deltamethrin	clothianidin	clothianidin
2020*		clothianidin/deltamethrin	clothianidin/deltamethrin		clothianidin/deltamethrin	pirimiphos-methyl	pirimiphos-methyl

*Denotes planned insecticide classes

Conclusion

Pirimiphos-methyl has been used for the past four years. In 2019 a switch was made to a clothianidin and a clothianidin/deltamethrin fusion product. In 2020 the same products should be used in Maganja da Costa, Milange and Molumbo. Mozambique's insecticide resistance management plan calls for rotating insecticides every two years, thus, for Mopeia and Morrumbala a switch back to pirimiphos-methyl will be necessary in 2020 to abide by the plan. The clothianidin/deltamethrin fusion product is considered to be a clothianidin insecticide according to PMI guidance despite being a fusion, this is why the switch in those two districts call for another class of insecticide.

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

There are no plans to withdraw from any PMI-supported IRS areas.

Conclusion

Not applicable.

Key Question 6

What are the in-country considerations (e.g. in-country staffing capacity, political climate, security concerns) that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

IRS remains a priority intervention for the government of Mozambique.

Conclusion

The need for a harmonized, cost-efficient, sustainable model and the introduction of non-pyrethroid ITNs has led to a more strategic PMI funding allocation for IRS in which PMI will provide direct financial support to the government of Mozambique for implementation costs and complementary support to an implementation partner for quality IRS implementation, monitoring and environmental compliance.

2. HUMAN HEALTH

2.A CASE MANAGEMENT in health facilities and communities

NMCP objective
The NMCP objective is to test 100% of suspected malaria cases and treat 100% of confirmed malaria cases at health facility & community level, as per national guidelines, by 2022.
NMCP approach
<ul style="list-style-type: none">• The national malaria treatment guidelines require parasitological diagnosis by RDTs or microscopy of all suspected cases before treatment with an antimalarial is provided.• RDTs are the preferred test for primary diagnosis of malaria, at all levels, and were rolled out nationally in 2011. Microscopy is reserved for suspected treatment failures, severe febrile illness, and cases referred from lower levels of care.• In addition to training and supervision, the malaria National Reference Laboratory also implements a proficiency testing screening for malaria diagnostics. This is implemented twice a year and includes 100 laboratories for RDTs and 156 laboratories for microscopy,

from across the country. NMCP and PMI also prioritize scaling up of quality-assured diagnostic testing through procurement of microscopes, lab supplies, reagents, and RDTs.

- It is estimated that the national health system (NHS) covers approximately 60% of the population. In 2011, Mozambique launched a revitalization of the community health program (known as the *Agente polivalente elementare*, APE, program) with the intent that this cadre of trained community health workers would extend the reach of the NHS and provide health-related care to the remaining 40% of the population. APEs provide both preventive and curative care under an integrated community case management platform. APEs are trained to perform RDT testing and to provide ACT treatment to those with positive test results. APEs are placed in rural areas and they receive a monthly salary of \$1,200.00 Meticaís (Approximately USD \$20). They also receive other non-monetary incentives such as bicycles and t-shirts. According to the NMCP annual report, in 2018 there were 5,374 APEs in across the country. These APEs reported 9.9% of the total number of malaria cases. The plan is to train an additional 1,700 APEs by the end of 2019. This training will be supported by UNICEF and the Global Fund.
- Although an estimated 85% of malaria cases are seen in the public sector, understanding and promoting the quality of services in the private sector is a component of the updated NMSP. However, the NMCP faces many challenges in engaging with the private service providers. These challenges include lack of a harmonized reporting system and absence of legislation requiring the private sector to follow national case management guidelines.
- PMI and the Global Fund have supported a national malaria case management refresher training. The target is to train about 12,886 clinicians from the 1,652 health facilities across all provinces.

PMI objective, in support of NMCP

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

- Procurement of RDTs, microscopes, laboratory supplies, and reagents;
- Procurement of ACTs;
- Supporting training and supervision;
- Scaling up quality assurance (QA)/ quality control (QC) systems for malaria diagnostics and treatment.

In line with the NMCP objectives, PMI aims to achieve the following objectives:

- Improve malaria case management, both at health facility and community level, through mentoring, supervision and training.

- Improve forecasting, allocation, distribution, stock management, and use of case management commodities (i.e., ACTs and RDTs) in the country.
- Improve QA/QC for both microscopy and RDTs.

PMI support is closely aligned with the NMCP national strategy and the Case Management strategy. PMI supports all of the technical interventions, but the geographic focus is limited to the provinces of Zambézia, Nampula, Cabo Delgado and Tete.

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

- PMI and the Global Fund together continued to purchase all RDTs and ACT treatments needed in country. PMI supported procurement and distribution of 6 million RDTs and 5.7 million ACTs. Also, PMI provided support for distribution of 36,194 rectal artesunate treatments.
- However, the country continues to experience challenges in ensuring the continued availability of RDTs and ACTs at service delivery points. Data from the end-use verification survey (EUV), carried out between July and September 2018, showed that 64 (72%) of the 89 health facilities visited had at least one of the four presentations of AL. The data also showed that six percent of the health facilities had stockouts of all four AL presentations on the day of the visit, while only 22% had all presentations available. Thirteen percent of the health facilities also had stockouts of RDTs on the day of the visit.
- At the provincial and district level, PMI continued to provide support to supervision and training of health staff in the four targeted provinces of Zambézia, Nampula, Cabo Delgado and Tete. Across these four provinces, there are 66 districts with approximately 750 health facilities and 4,500 health workers. In the past 18 months, PMI supported training of 4,347 health workers in malaria case management. In the first three quarters of fiscal year 2019, PMI also provided support to supervision visits, covering 1,222 health providers from 118 health facilities, in 39 districts.
- Across the 62 targeted districts of the 4 provinces, there are approximately 150 laboratories. To strengthen laboratory capacity, PMI supported the training of 30 laboratory technicians in malaria microscopy.
- PMI also supported the National Reference Laboratory in conducting one round of diagnostic proficiency panels testing across the country. Of the 155 facilities which received malaria microscopy panels, 136 (87.7%) facilities returned results, and among these only 49 (36.0%) facilities had acceptable results. These results demonstrate the need to strengthen malaria microscopy in country.
- PMI continued to support the APE program by providing RDTs and ACTs and by supporting the kitting system through which these commodities are distributed to APEs. PMI also supported training and supervision of community health workers in Nampula, Zambézia, Tete and Cabo Delgado. PMI supported training of 148 APEs trainers who in turn provided

refresher training to 1,222 APEs in malaria case management. PMI also supported supervision visits to 191 APEs.

- Finally, PMI supported training of one laboratory technician, from the *Centro de Investigação em Saúde da Manhica* in molecular methods for assessing antimalarial resistance. The training was held at CDC under the PMI-supported Antimalarial Resistance Monitoring in Africa (PARMA) initiative.

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

- PMI and the Global Fund will continue to purchase most RDTs and ACT treatments needed in country.
- At the provincial and district level, PMI will continue to provide support to supervision and training of health staff in the four targeted provinces of Zambézia, Nampula, Cabo Delgado and Tete. This will include in-service training for provision of malaria diagnosis, treatment and counselling.
- PMI will support the National Reference Laboratory to conduct diagnostic proficiency panels testing across the country and laboratory strengthening in four targeted provinces.
- PMI will continue to support the APE program by providing RDTs and ACTs and by supporting the kitting system through which these commodities are distributed to APEs. It will also support the piloting of a pull-based system for APE commodities and the evaluation of this pilot.

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?

In FY2020, PMI Mozambique is planning over \$16 million dollars in case management commodity procurement and implementation support. While this level of support is higher than the FY2019 support, proposed levels for diagnostic and treatment commodities have increased to address the growing procurement needs defined by national quantification projections. Levels for implementation (i.e. training, supervision, etc.) have been maintained given the planned geographic coverage remains the same.

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

Key Question 1

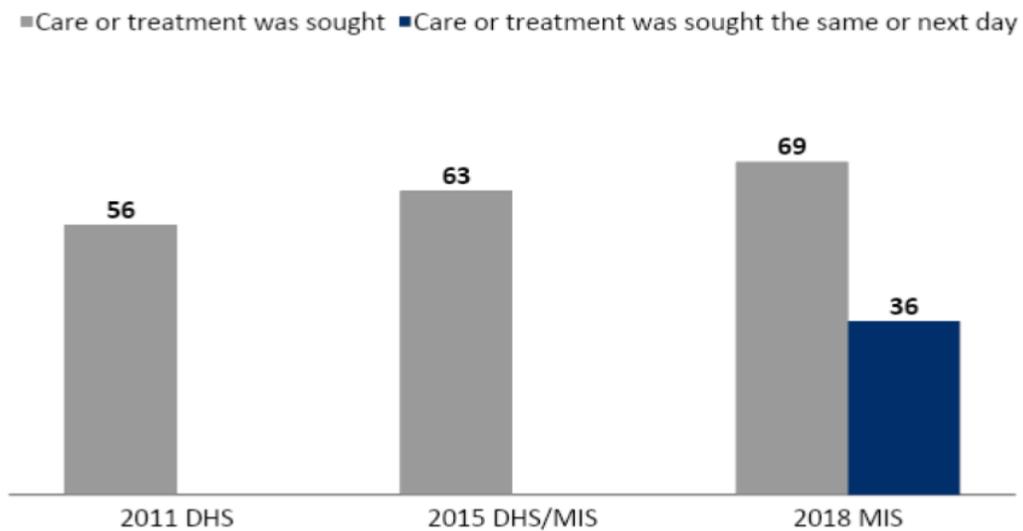
What is the status of care-seeking?

Supporting Data

Figure A23. Trends in Care Seeking for Fever

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

Since 2011, results from three national household surveys (2011, 2015, and 2018) have demonstrated a gradual increase in care/treatment seeking behavior among children under five years of age with a fever, with 69% seeking care/treatment in 2018. However, additional results from the 2018 MIS indicate that this drops to only 36% when considering if treatment was sought the same or next day. Minimizing the time between initial fever symptom and parasitological diagnosis is critical to ensuring prompt diagnosis and treatment, which decreases the likelihood of progression to severe disease. Since the start of PMI, SBC for prompt care-seeking and appropriate care provision have been priorities and these survey results demonstrate that these interventions are having some impact and underscore the importance of continued investment in addressing barriers to access to care, increasing prompt care seeking behaviors, and ensuring adequate stock levels of commodities.

Key Question 2

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

Supporting Data

While not included in the main report, the 2018 MIS included questions on why individuals did not seek care for a fever and who made the decision to seek care. PMI, the NMCP and the National Health Institute have begun to analyze these data to inform programming.

Conclusion

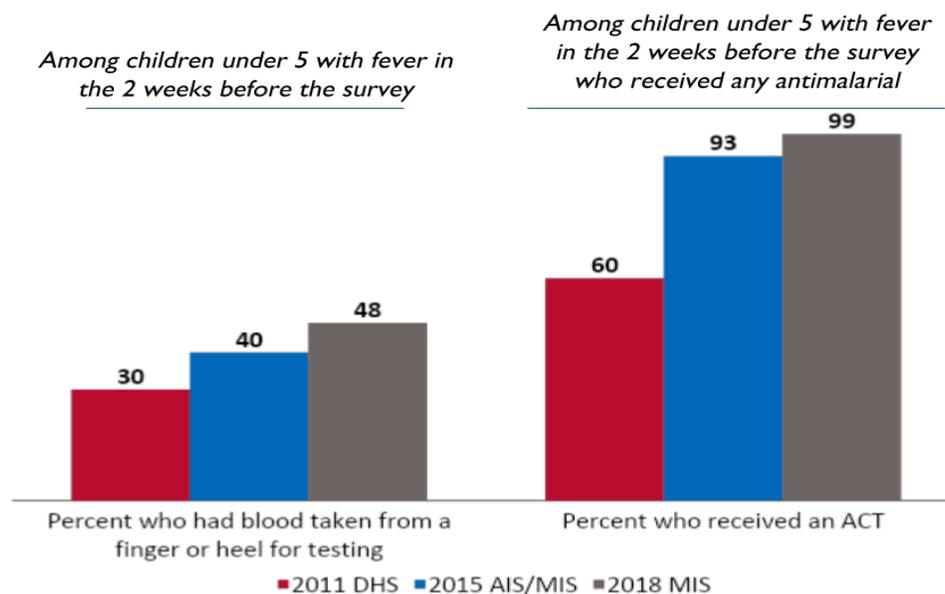
The PMI team is working to analyze survey data to identify barriers to care-seeking that can be addressed through SBC and case management interventions.

Key Question 3

How have malaria testing and treatment practices evolved over time?

Supporting Data

Figure A24. Trends in Diagnosis and Treatment of Children with Fever
Trends in Diagnosis and Treatment of Children with Fever



Conclusion

Since 2011, results from three national household surveys (2011, 2015, and 2018) have demonstrated a gradual increase in the percentage of children under five years of age with fever

receiving a diagnostic test for malaria, from 30% in 2011 to 48% in 2018, but this still indicates that over half of children with fever still do not. Among children under five years of age with fever receiving an antimalarial, the number receiving an ACT has increased significantly since 2011, from 60% to 99% in 2018. While the increase in access to ACT among those receiving treatment is very promising in terms of ensuring appropriate medicine is being prescribed, the confirmation of malaria with a parasitological test among those with fever remains lower than desired. These data demonstrate that promoting care-seeking, ensuring adequate stocks of RDTs and microscopy supplies, maintaining a cadre of well-trained health workers and laboratory technicians, and SBC targeting health workers to increase confidence in RDT results continue to be key objectives of PMI’s malaria programming.

Key Question 4

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

Supporting Data

Figure A25. Facilitators and Barriers to Testing and Treatment

Facilitator	Type of Factor <i>(Internal, Social, or Environmental)</i>	Data Source	Evidence
Training and Supervision of the provider can increase case management quality	Environmental / Internal	2018 Health Facility Survey	Supervision of HCWs in Maputo (OR: 4.3, 95% CI 1.1–18) and Cabo Delgado (OR: 1.9, 95% CI 1.1–3.5) was associated with better case management, while HCW training was associated with better case management in Zambézia (OR: 3.2, 95% CI 1.3–7.8).
Barrier	Type of Factor <i>(Internal, Social, or Environmental)</i>	Data Source	Evidence
Impact of transmission level on case management quality	Environmental	2018 Health Facility Survey	The quality of malaria case management was particularly low in Maputo, where only 29% of suspect cases were correctly managed. Maputo has the lowest transmission levels in the country.

Figure A26. Standard Key Indicators on Healthcare Worker Performance in Malaria Case Management, adapted from Candrinho et al., Malaria Journal 2019

Table 3 Standard key indicators on healthcare worker performance in malaria case management, as assessed in health facility surveys in Maputo, Zambézia, and Cabo Delgado Provinces, Mozambique, 2018

	Maputo		Zambézia		Cabo Delgado	
	%	95% CI	%	95% CI	%	95% CI
Suspect malaria cases receiving malaria test	33	24–43	62	53–70	69	60–77
< 5 years	34	21–51	70	60–79	68	54–79
RDT	29	15–49	66	53–77	67	54–79
Microscopy	5.1	0.9–24	4.1	1–12	0.4	0.1–1.6
≥ 5 years	32	21–46	53	42–64	71	59–81
RDT	24	13–40	51	40–62	68	55–78
Microscopy	11	5–24	3.9	2–9	7.1	3–16
Confirmed malaria cases treated with appropriate antimalarial	54	20–84	87	77–93	90	82–94
Suspect malaria cases negative for malaria* but treated with antimalarial	7.7	2–23	22	14–32	16	8–32
Suspect malaria cases not tested, treated with appropriate antimalarial	0	****	1.1	0.2–6.5	2.7	0.5–13
Suspect malaria cases managed correctly**	29	21–39	44	37–52	48	41–55
True malaria cases appropriately treated***	14	5–34	52	42–62	49	42–57

RDT, rapid diagnostic test; CI, confidence interval

* During re-examination

** Tested and treated with antimalarial with correct dose only if positive

*** Treated with first-line antimalarial with correct dose

**** CI not defined

Conclusion

The results from the 2018 health facility survey (Candrinho et al., Malaria Journal 2019) showed that despite making up the large majority of outpatients, less than half of suspect malaria cases were found to be appropriately managed for malaria in public health facilities in three provinces of Mozambique. Even after exclusion of fevers due to malaria, the majority of patients had a febrile illness. Despite this preponderance of measured fever amongst outpatients, measuring temperatures was rare and malaria testing of fever cases was suboptimal in all provinces, below 70% in high-transmission Zambézia and Cabo Delgado, and only 33% in low-transmission Maputo. High availability of RDT or microscopy and high rates of identification of fever cases suggests that clinicians are making the decision to not test patients that they know have a febrile illness. Non-testing was the main contributor to inadequate management of malaria cases in Maputo and Zambézia, and an important contributor in Cabo Delgado. Furthermore, counselling of patients prescribed an ACT was also shown to be poor.

Results of the risk factor analysis suggest that malaria case management would improve with better availability of commodities and additional training and supervision, as each of these were significantly associated with appropriate malaria case management in the risk factor analysis. Future training might benefit from an increased focus on universal testing of all fever cases and better counselling. However, training should be complemented by other activities as malaria case

management and counselling was poor even in Zambézia, which had high rates of HCWs who had undergone trainings.

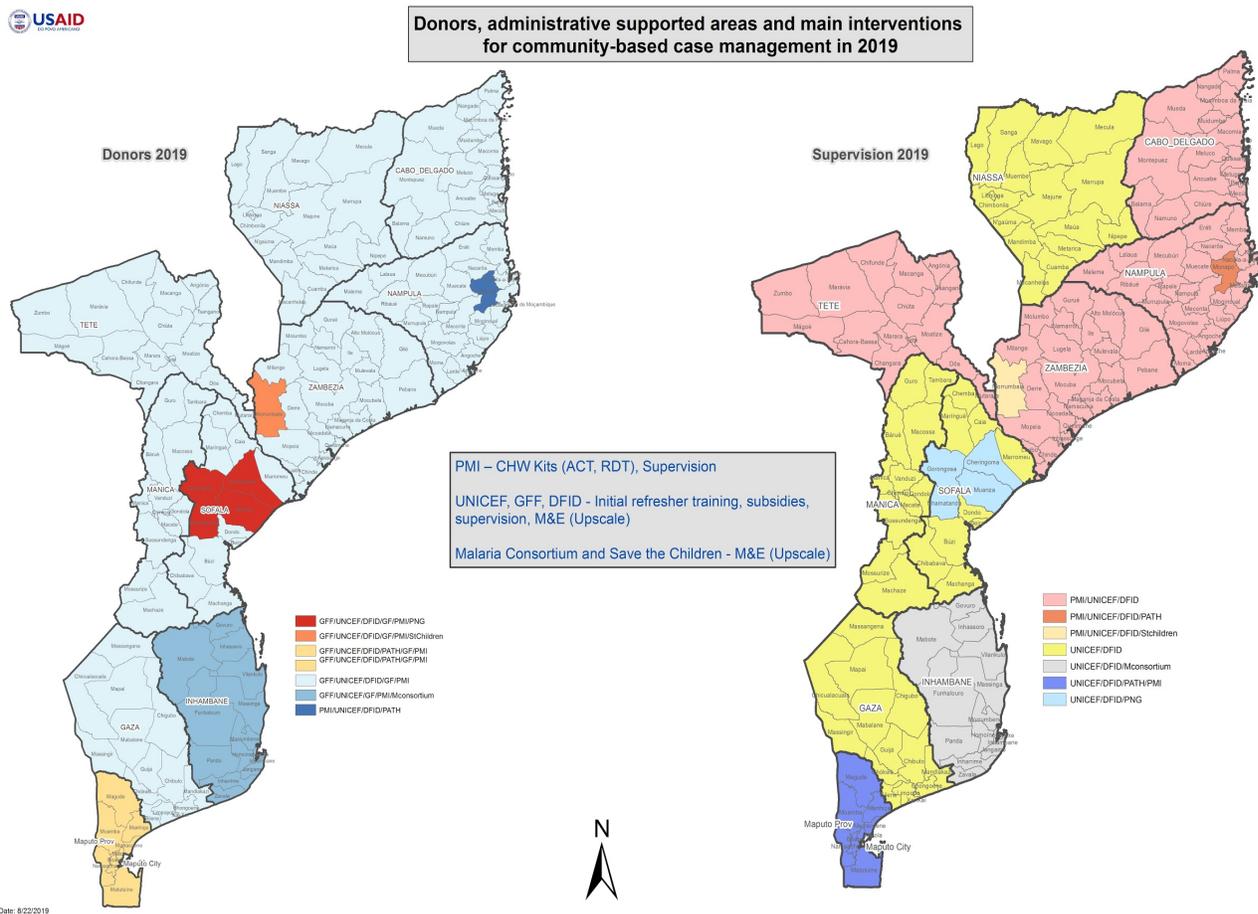
Finally, future health facility surveys should include more questions on knowledge, attitude, and practices to better identify barriers.

Key Question 5

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

Supporting Data

Figure A27. Geographic Coverage for Community Health Worker Support



While PMI and the Global Fund support commodity distribution to the entire country, the map above shows that PMI supports case management training and supervision in the provinces of

Nampula, Zambézia, Tete, and Cabo Delgado. Global Fund supports the MoH to implement training and supervision in the remaining provinces.

Conclusion

The wide geographic distribution of CHWs in Mozambique and recent increase in their number has improved access to malaria care services at the community level. CHWs now represent an important service provider and diagnosed almost 10% of the malaria cases in 2018.

Key Question 6

What is the estimated need for RDTs for FY 2020?

Supporting Data

Figure A28. Estimated RDT Need for FY 2020

Calendar Year	2019	2020	2021
RDT Needs			
Total country population	29,365,271	30,093,007	30,820,744
Population at risk for malaria ¹	29,365,271	30,093,007	30,820,744
PMI-targeted at-risk population	29,365,271	30,093,007	30,820,744
Total number of projected fever cases	57,271,600	58,583,815	59,885,041
Percent of fever cases tested with an RDT	36%	41%	50%
Total RDT Needs ²	22,400,631	25,137,315	29,663,084
Partner Contributions (to PMI target population if not entire area at risk)*			
RDTs carried over from previous year	17,676,910	18,697,020	18,584,036
RDTs from Government	0	0	0
RDTs from Global Fund	17,710,741	4,707,567	7,500,000
RDTs from other donors	0	0	0
RDTs planned with PMI funding	5,710,000	20,316,764	22,000,000
Total RDTs Available	41,097,651	43,721,351	48,084,036
Total RDT Surplus (Gap)	18,697,020	18,584,036	18,420,952

Footnotes: Population age bands per 2017 Population and Housing Census, Population Projection Trends. Fever cases that are suspected as malaria per age group, patients with fever seeking healthcare, percentage of patients seeking healthcare in public sector, and fever with diagnostic are based on Malaria Indicator Survey 2018.

2020 RDTs from Global Fund are estimates to be updated when the new GF Grant 2021-2023 is finalized.

¹Geographic coverage: 100% of population

Conclusion

Quantification of the need for RDTs was based on sources of data including the 2017 Population and Housing Census and 2018 Malaria Indicator Survey. When calculating the estimated gap per

year and considering the necessary commodity stock levels, PMI will be procuring a significant amount of RDTs using reprogrammed FY2019 and proposed FY2020 funding. The combined procurements of PMI and the Global Fund will cover the RDT commodity needs for calendar years 2020 and 2021.

Key Question 7

What is the estimated need for ACTs for FY 2020?

Supporting Data

Figure A29. Estimated ACT Need for FY2020

Calendar Year	2019	2020	2021
ACT Needs			
Total country population	29,365,271	30,093,007	30,820,744
Population at risk for malaria	29,365,271	30,093,007	30,820,744
PMI-targeted at-risk population ¹	29,365,271	30,093,007	30,820,744
Total projected number of malaria cases	11,271,796	11,859,571	12,479,313
Total ACT Needs ²	17,161,487	17,644,334	18,142,489
Partner Contributions (to PMI target population if not entire area at risk)¹			
ACTs carried over from previous year	12,974,945	14,515,530	14,191,506
ACTs from Government	0	0	0
ACTs from Global Fund	14,382,012	6,260,970	5,500,000
ACTs from other donors	107,010	0	0
ACTs planned with PMI funding	4,213,050	11,059,340	13,500,000
Total ACTs Available	31,677,017	31,835,840	33,191,506
Total ACT Surplus (Gap)	14,515,530	14,191,506	15,049,017

Total Country Population and Population at Risk the same as RDT. Total projected number of malaria cases based on RDT Positivity from HMIS (SISMA-DHIS) 2019 - 54.5%; 2020 - 49.1%; 2021 - 42.1%. Total ACT needs account for AL dispensed without positive diagnosis and without diagnosis at 17% (Health Facility Survey 2018), with projected decrease to 10% by 2022, also includes 16% factor for irrational use due to inconsistent availability of all AL formulations at the time of dispensing.

All assumptions are in line with NMCP Strategic Plan and utilized in national quantification.

¹Geographic coverage: indicate if this target is the entire target area at risk (i.e., a national quantification), or if this is restricted to areas of the country where PMI targets its commodities. The partner contributions need to be estimated for the areas targeted by PMI (same as for the needs) if not national.

²Indicate if the needs to fill the pipeline are included. This is the amount of stock that needs to be sitting in warehouses along the supply chain to avoid stock outs at the facility level. This should be reassessed each year.

Conclusion

Quantification of the need for ACTs was based on sources of data including the 2017 Population and Housing Census, and 2018 Health Facility Survey. The total projected number of malaria cases was based on RDT Positivity data from HMIS (SISMA-DHIS): 2019 - 54.5%; 2020 -

49.1%; 2021 - 42.1%. The estimates also accounted for ACTs dispensed without positive diagnosis and without diagnosis at 17%, with a projected decrease to 10% by 2022 with improved case management prescribing behaviors. When calculating the estimated gap per year and considering the necessary commodity stock levels, PMI will be procuring a significant amount of ACTs using reprogrammed FY2019 and proposed FY2020 funding. This will include the procurement of 1 million doses of Dihydroartemisinin-piperaquine (DP) for exclusive use by CHWs. This will be a shift in procurement which will result in a different ACT being used at the community level. It is expected that this will help protect commodities meant for CHWs from being diverted at the facility level as was extensively documented in the 2018 CHW survey (Davlantes, et al., 2019). Additionally, DP has a substantially longer prophylactic effect post-treatment than AL. The combined procurements of PMI and the Global Fund will cover the ACT commodity needs for calendar years 2020 and 2021.

Key Question 8

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

Supporting Data

Figure A30. Projected Need for Severe Malaria Treatments 2019 - 2021

Calendar Year	2019	2020	2021
Injectable Artesunate Needs			
Projected Number of Severe Cases ¹	77,606	81,646	85,906
Projected # of severe cases among children	35,306	36,814	38,360
Projected # of severe cases among adults	42,300	44,833	47,546
Total Injectable Artesunate vials Needs²	978,236	1,306,588	1,380,576
Partner Contributions			
Injectable artesunate vials carried over from previous year	341,549	357,418	114,939
Injectable artesunate vials from Government	0	364,109	600,000
Injectable artesunate vials from Global Fund	776,547	0	0
Injectable artesunate vials from other donors	0	0	500,000
Injectable artesunate vials planned with PMI funding	217,558	700,000	300,000
Total Injectable Artesunate vials Available	1,335,654	1,421,527	1,514,939
Total Injectable Artesunate vials Surplus (Gap)	357,418	114,939	134,363

Footnotes: Projected Needs are based on Malaria Indicator Survey 2018. Significant projected increase from 2019 to 2020 expected due to peripheral rural health facilities who will begin to administer Injection Artesunate before referring patients to higher level health facilities

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

² This is the number of vials needed. Specify average number of vials needed per case and what percent of cases are expected to be treated with injectable artesunate. Indicate if the needs to fill the pipeline are included. This is the amount of stock that needs to be sitting in warehouses along the supply chain to avoid stock outs at the facility level. This should be reassessed each year.

Conclusion

Quantification of the need for severe malaria drugs was based on sources of data including the 2017 Population and Housing Census and 2018 Malaria Indicator Survey. The total number of

estimated vials needed has a significant projected increase from 2019 to 2020 due to accounting for peripheral rural health facilities who will begin to administer injectable artesunate before referring patients to higher level health facilities. When calculating the estimated gap per year and considering the necessary commodity stock levels, PMI will be procuring severe malaria drugs with reprogrammed FY2019 and proposed FY2020 to complement the Government of Mozambique’s planned investments. However, due to budget constraints it will not be feasible to cover all the needs of rectal artesunate. PMI will consider covering at least part of this gap, through a later reprogramming request. In addition, rectal artesunate is being rolled out in a phased approach; this will allow enough time to adequately train all CHWs on the use of this medication and to better estimate the amount to be delivered to each CHW, in order to reduce overstock.

Key Question 9

Are the first-line ACTs effective and monitored regularly?

Supporting Data

Figure A31. Completed and Ongoing ACT 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
2015 ¹	Montepeuz, Dondo, Chokwe, and Moatize	AL	Yes	
2018-2019	Montepuez, Ribaue, Mopeia, and Massinga	AL, ASAQ	Pending	PARMA, CDC Malaria Branch, June-July 2019

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

1: Salvador, ActaTropica 2017

Conclusion

The effectiveness of ACTs is monitored regularly in Mozambique, about every three years. Results from the 2018-2019 therapeutic efficacy study of both AL and ASAQ are still pending, but in 2015, the ACPR for AL demonstrated adequate drug efficacy (above 90%). PMI continues to support the monitoring of ACTs, while also improving the in-country technical capacity to conduct such analyses.

Key Question 10

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

Supporting Data

PMI has historically supported the National Reference Laboratory for Blood Parasites. The support included refurbishment of the laboratory, procurement of laboratory consumables used for QC activities and development of QA testing practices and of supervision guidelines for malaria diagnosis. PMI also supported the accreditation process of the laboratory and the certification of malaria laboratory technicians. Given the need to continuously support malaria diagnosis, PMI will continue to support the Reference Laboratory with the rollout of the national quality assurance/quality control system, building of central level laboratory capacity, and in maintaining the certification of the laboratory and of the laboratory technicians.

The role of the private sector in malaria case management is very limited and the private sector providers are concentrated in a few urban centers of the country.

Conclusion

There is a need to continue to support laboratory strengthening, both to the National Reference Laboratory and to peripheral laboratories. PMI should continue to focus its support to the public sector.

Key Question 11

What are the in-country considerations (e.g. in-country staffing capacity, political climate, security concerns) that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

Not applicable.

Conclusion

The reduction in government and other donor support for commodity procurement has resulted in PMI increasing its allocation for commodity procurement. For example, the government of Mozambique historically procured a large proportion of the injectable artesunate needs, but the financial situation in Mozambique has led to a discontinuation of this support resulting in the need for a large increase in PMI support.

Similarly, donors such as the World Bank and DFID which historically have supported procurement of RDTs, ACTs and SP have stopped or significantly reduced their contribution.

2.B. DRUG-BASED PREVENTION

NMCP objective
The objective of the NMCP is to improve coverage of intermittent preventive treatment for pregnant women (IPTp) to reach all eligible pregnant women attending the ANC services.
NMCP approach
<ul style="list-style-type: none"> • Mozambique has been implementing the WHO updated guidelines on IPTp since 2014, which recommend administering IPTp as early as possible starting in the second trimester (13 weeks) and at each scheduled ANC visit until the time of delivery, as long as there has been an interval of at least one month since the last SP dose. • The national guidelines also state that SP is contraindicated in women receiving cotrimoxazole HIV/AIDS preventive treatment.
PMI objective, in support of NMCP
PMI supports the procurement of SP for national distribution and the delivery of IPTp to all eligible pregnant women at all eligible ANC visits in the target provinces of Zambézia, Nampula, Cabo Delgado and Tete.
PMI-supported recent progress (past ~12-18 months)
<ul style="list-style-type: none"> • At the central level, PMI provided logistical and technical support to the quarterly meetings of the MIP working group. The group is chaired by the NMCP and includes participants from the maternal child health (MCH) department. • PMI supported training and supervision of 2,545 MCH nurses in MIP, including IPTp, in the four target provinces of Nampula, Zambézia, Cabo Delgado and Tete. • PMI also continued to provide support for the procurement of SP by purchasing 4.3 million tablets. However, data from the last EUV report showed continued reports of stockouts at the health facility level. In fact, 22% of the 89 health facilities and 4 of the 25 sub-national warehouses visited during the last quarter of FY 2018, reported stockouts of SP on the day of the visit.
PMI-supported planned activities (next ~12-18 months, supported by currently available funds)
<ul style="list-style-type: none"> • Currently, PMI continues to support the MIP working group, at the central level, and on-the-job training and supervision of MCH nurses in the four target provinces. • With the FY 2019 funds, PMI plans to provide support to: <ul style="list-style-type: none"> ○ Central level planning and coordination of MIP activities; ○ Provincial-level support for training and supervision of MCH nurses; ○ Procurement of SP; ○ Strengthening of supply chain system to improve SP availability, as described within the supply chain section .

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

PMI Goal

Support the national strategy for MIP, which includes provision of ITNs at first 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 the 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?

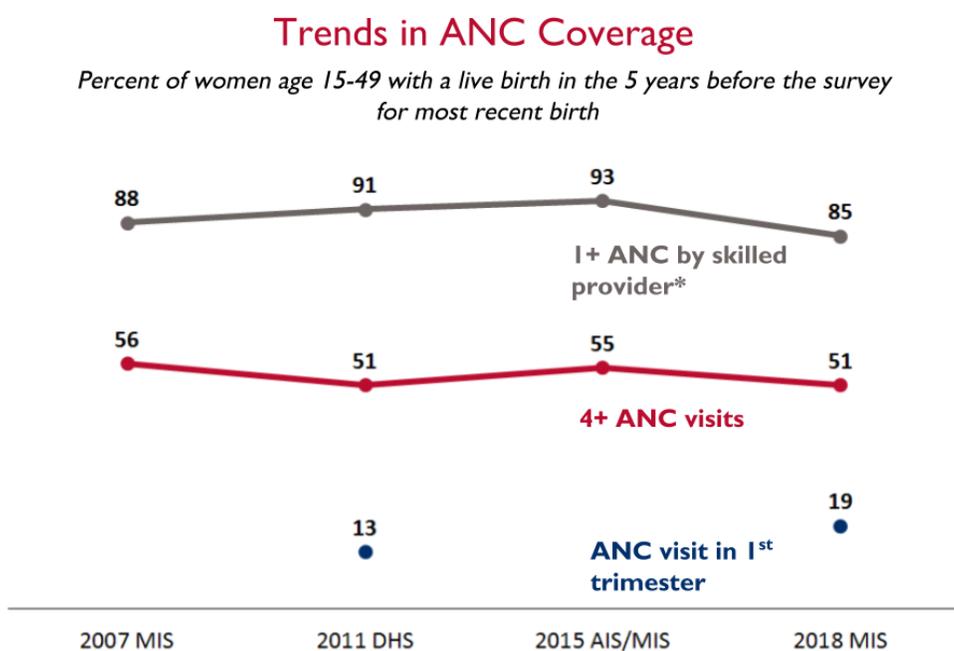
The team proposes to increase the funding level for MIP activities, from the initial \$350,000 in FY 2019 to \$660,000 in FY 2020. This increase was driven by the need to expand procurement of SP and the training and supervision activities to cover all districts in the focus provinces.

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 A32. Trends in ANC Coverage



*Skilled provider includes doctor, nurse, or midwife.

Conclusion

Results from the national household surveys (2007, 2011, 2015, and 2018) show that coverage for at least one ANC visit is high, at 85 percent or more. However, coverage of at least four ANC visits remains low, around 50 percent. In addition, less than 20 percent of women start their ANC during the first trimester of pregnancy.

Mozambique has adopted the 2016 WHO ANC guidance and the national guidelines recommend a minimum of eight ANC visits. The country policy also supports early initiation of IPTp between 13 and 16 weeks. However, the fact that most women start ANC later in their pregnancy, coupled with the fact that most women do not return for the follow up visits, poses serious challenges to the implementation of this policy.

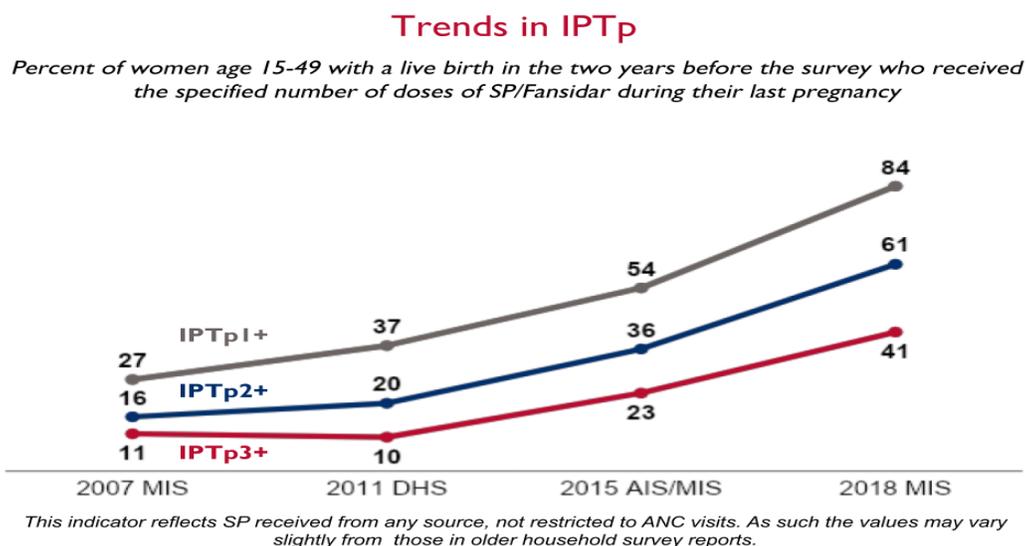
To address these challenges, it is important to: (1) understand the barriers for early ANC attendance and devise a set of interventions, focusing on health promotion, to address them; (2) understand the health system barriers that prevent women to return for follow up visits and devise a set of interventions to improve the quality of health care; and, (3) understand community barriers that prevent women to return for follow up visits and devise a set of health promotion activities to address them. PMI will support an evaluation in calendar year 2019 that will look at barriers to IPTp provision.

Key Question 2

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

Supporting Data

Figure A33. Trends in IPTp



Conclusion

Since 2007, results from four national household surveys (2007, 2011, 2015, and 2018) have demonstrated a gradual increase in the uptake of IPTp. The proportion of women receiving at least one dose of IPTp increased from 27% in 2007 to 84% in 2018, while the proportion of women receiving at least three doses of IPTp increased from 11% in 2007 to 41% in 2018. These data demonstrate the need to ensure that pregnant women return for follow up ANC visits and the need to ensure that they receive all ANC services, particularly IPTp, but also demonstrate that important progress has been made to date.

Key Question 3

What is the gap between ANC attendance and IPTp uptake (e.g. missed opportunities for providing IPTp at ANC)? What barriers and facilitators exist, especially among providers?

Supporting Data

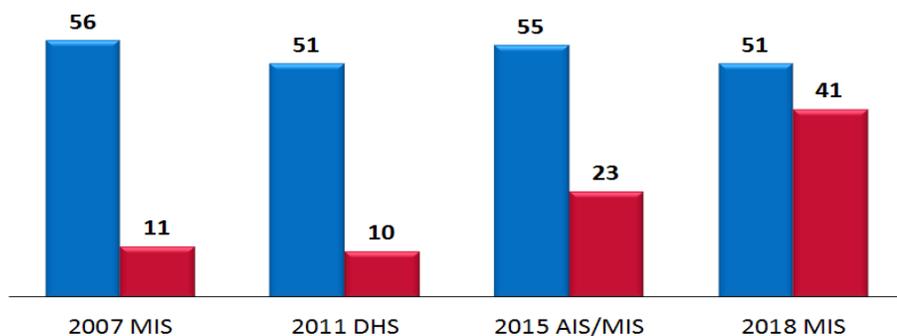
There is limited data in Mozambique on the barriers and facilitators to IPTp coverage, especially among providers. Low IPTp uptake has been associated with non-institutional deliveries, first ANC visit after 28 weeks, low awareness of IPTp and having no or only primary education (Arnaldo *et al.*, 2018, Malaria Journal). To address this gap, PMI is supporting an analysis of barriers to IPTp coverage in CY 2019.

Figure A34. Trends in Missed Opportunities for IPTp

Trends in Missed Opportunities for IPTp

Percent of women age 15-49

- With a live birth in the past 5 years who received 4+ ANC visits
- With a live birth in the past 2 years who received 3+ doses of IPTp



Conclusion

The data above show that the gap between ANC attendance and IPTp uptake is narrowing. However, there is still a need to improve provision of IPTp at all ANC visits to ensure that all pregnant women are covered. The CY 2019 study will provide evidence on what specific interventions might be appropriate to improve coverage.

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

There is limited data in Mozambique on the diagnosis and treatment of malaria in pregnancy. In order to address this gap, PMI is supporting an analysis of barriers to IPTp coverage in CY 2019. This study will also include retrospective abstraction of data as to whether women were diagnosed and treated during pregnancy.

Conclusion

These data are not currently available. PMI will work with the NMCP to improve availability, analysis and use of data on malaria diagnosis and treatment among pregnant women, including those from the forthcoming study.

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 A35. IPTp Commodity Need Projections 2019 - 2020

Calendar Year	2019	2020	2021
Total Population at Risk (see footnote 1)	29,365,271	30,093,007	30,820,744
SP Needs			
Total number of pregnant women (see footnote 1)	1,500,087	1,548,977	1,597,415
Total SP Need (in treatments) (see footnote 2)	4,421,573	4,691,987	4,968,969
Partner Contributions			
SP carried over from previous years	366,417	0	2,894,013
SP from Government (see footnote 3)	0	3,586,000	3,586,000
SP from Global Fund	0	0	0

Calendar Year	2019	2020	2021
SP from Other Donors	0	0	1,000,000
SP planned with PMI funding (see footnote 4)	3,553,650	4,000,000	1,000,000
Total SP Available	3,920,067	7,586,000	8,480,013
Total SP Surplus (Gap)	-501,507	2,894,013	3,511,044

Footnotes: Add any additional explanations/footnotes in this section to clearly explain the entries in your table. Remember to explain how numbers are derived and specify data sources. Please draw from a validated national malaria quantification if it exists for your country.

1) The total number of pregnant women is estimated at 5.1% of the total population. Population percentages per age category based on 2017 Population and Housing Census, Population Projection Trends. Final 2019-2040 population projections from this census have not been published yet, however, GHSC-PSM pulled the data from the following Province based data. Assumes 2.4% annual population growth. All disease area quantification technical working groups are using these same populations figures to establish their commodity procurement needs. <https://drive.google.com/drive/u/0/folders/1LDrOU6COQsvN2zxywIGtKq8bPe4zzh5L?fbclid=IwAR1BVfgMx3UjM-paZjNi8r05dMFLnpduvZcVeA4TxqkJFAZqDkb0dkXmYdY>

2) This includes a correction for unmet need and wastage based on data collected from CY2019 EUV.

3) These are currently planned MOH procurements.

4) GHSC-PSM currently has a planned order for arrival in March 2020.

Conclusion

There was a considerable gap of SP for calendar 2020 due to reduced government and other donor procurements and PMI had to increase its contribution in order to cover that gap. PMI will continue to work with the NMCP and with other donors in order to advocate for their increased contribution to cover SP needs in 2021.

Key Question 6

What are the in-country considerations (e.g. in-country staffing capacity, political climate, security concerns) that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

Mozambique is going through a severe economic crisis since the discovery of undisclosed government loans worth up to \$2bn in April 2016. Most donors have significantly reduced their contributions, both to the state budget and the health sector budget. For example, the health sector support decreased from approximately \$100 million dollars in 2015 to less than \$20 million in 2018. This has affected the country's ability to procure malaria related commodities, including SP, and to pay for warehousing and transportation of commodities. In this context, even with adequate funding, the government lacks sufficient suitable public warehousing space and lacks the transportation equipment infrastructure to move commodities. In addition, the MoH continues to face challenges in executing the funds allocated by the Global Fund, for training and supervision of health staff. This has resulted in delays in the implementation of the MIP activities at provincial and district level.

Conclusion

PMI will continue to work with the Ministry of Health to advocate for funds to cover the SP needs. PMI will also continue to work with other USG initiatives, the Global Fund and other relevant stakeholders to improve the capacity of the MoH to execute and manage the available funds.

3. CROSS-CUTTING AND OTHER HEALTH SYSTEMS

3.A. SUPPLY CHAIN

NMCP objective
<ul style="list-style-type: none">• To ensure that all malaria case management and prevention commodities are available at all service delivery points
NMCP approach
<ul style="list-style-type: none">• Medicines and other health commodity products are a core component of a functioning healthcare system. Recognizing the critical need to ensure access to medicines, the MoH adopted, in 2013, the Strategic Plan for Pharmaceutical Logistics (PELF). Given the current and future needs of medicines in the National Health Service (NHS), the PELF aimed to ensure that safe and effective, quality-approved, vital and essential medicines and products are available in sufficient quantities, when and where they are needed to prevent, diagnose, or treat priority health problems. It also aimed to do this at the lowest possible cost to the patient and her/his community. To achieve this goal, PELF established several reforms based on global best practices, such as supply chain optimization design by establishing three regional warehouses and 30 intermediate warehouses.• Central Medical Stores (CMAM) is the national entity with primary responsibility within the MoH for all central-level supply chain functions, including procurement of all pharmaceuticals and related health supplies. In collaboration with NMCP, CMAM will continue to manage all functions related to forecasting malaria commodities and commodity supply planning, procurement, storage, inventory management and distribution, except ITNs, from the central level to provincial warehouses, including intermediate warehouses as they are opened.• Malaria drugs and RDTs are distributed by CMAM via two logistics systems, the prepackaged kit and the Classic Way. PMI currently supports the local production process of malaria drug kits for APEs at CMAM facilities and their distribution is in conjunction with the essential medicines kit. The kit system was developed in response to the bulky ACT packaging, which made it difficult to fit into the essential medicine kit. Malaria medicines kits are distributed to APEs through NHS health facilities using a push system. The second logistics system, the Classic Way, distributes medicines (including ACTs and SP) and RDTs

quarterly. Products are stored in regional warehouses in Maputo, Beira and Nampula, from which central hospitals are supplied, and then to the still existing 11 provincial warehouses and the one open intermediate warehouse. Each of the ten provincial warehouses supplies the provincial, general and rural hospitals and district warehouses. Malaria drugs are administered within this system, which requires the use of logistics management information systems (LMIS) to generate consumption, stock, loss and adjustment data. These systems provide the supply chain and NMCP with data for informed management decision making. Despite these two distribution systems, facility-level stock out challenges persist.

- To strengthen the supply chain, CMAM and NMCP have started the implementation of the supply chain strategic plan, the PELF, in particular the intermediary warehouse concept which consists of eliminating one of the four levels (regional, provincial and district warehouses in addition to health facilities) of the in-country supply chain and combining the current 11 provincial warehouses and 144 district warehouses into 30 intermediary warehouses optimally located across the territory. In FY 18, one regional warehouse was open in south (Vilanculos district – Inhambane province). This is one of the PELF key reforms that will increase quality of services, decrease cost and increase sustainability of operations. Additionally, PMI is supporting the distribution of ITNs to district and health facilities in 4 provinces, improving the availability of this commodities at the last mile.
- End-Use Verification Surveys: The EUV survey continued to be implemented quarterly in Mozambique. The last available report from the EUV is for July to September 2018. The data from that survey show continuing challenges on the regular availability of ITNs, RDTs and ACTs at warehouses and health facilities. Case management indicators showed malaria accounting for 25% of cases seen. Children under five years of age accounted for 50% of cases and all were treated with an ACT.
- One of the biggest challenges that has undermined the effective availability of malaria products at service delivery points is the mismatch between the limited state of development and sophistication of the supply chain infrastructure and what is needed to cope with the pressure imposed by the expansion of health programs, including malaria.
- On the other hand, the current fragmentation of supply chain responsibilities, infrastructure and budgeting, has resulted in supply chain inefficiency and inefficacy, as well as delays in the management related processes. All of this has had a direct negative impact on the availability of medicines.

PMI objective, in support of NMCP

In alignment with the NMCP, PMI aims to achieve the following objectives:

1. Develop more effective public sector medical supplies/commodity forecasting, support for commodities and supply planning and procurement capacity.
2. Improve public sector warehousing and distribution at all levels.
3. Improve the use of medicines and develop more effective pharmaceutical services.

4. Strengthen the Central Medical Stores' strategic planning and management capacity.
5. Strengthen overall regulatory capacity.

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

- During the past year, PMI continued to provide support to CMAM through the provision of technical assistance, support for commodities and supply planning, procurement and support to the ACT and RDT kitting system. PMI also continued to support supervision of health facilities through the implementation of the end-use verification (EUV) tool. During visits to health facilities, the EUV survey teams provide on the job training in the use of standard operating procedures for commodity management. This is contributing to improvements in the logistics management information systems (LMIS) by improving data flow and data quality.
- During the past year, 520 health facilities and 111 warehouses were visited through the implementation of the EUV tool. The EUV survey carried out during the last quarter of calendar year 2018 included 114 facilities in 28 districts, covering 10 provinces of the country. The 114 facilities included 25 warehouses and 89 service delivery points showed that only 5.6% of all the facilities visited had stockouts of all four AL presentations on the day of the visit while 22.5% had all presentations available. All the warehouses visited had no stock out of ITNs for more than 7 days in the last three months, and 92% had at least one of the four presentations, indicating high availability at the provincial level. These last quarter EUV results indicate an increase in commodity availability at the facility level.
- PMI continued to provide support to the Medicines Technical Working Group (*Grupo Técnico de Medicamentos*). This group is chaired by CMAM and it is composed of various U.S. Government implementing partners, MoH officials, and other donors. The group covers several technical areas, including malaria, and it meets quarterly to review the quantification tables, and monthly to monitor the shipments of commodities, and track commodity consumption data to support the management and oversight of health commodities via regular supply plan updates.
- Other activities supported by PMI included; district and provincial quarterly meetings to review and improve supply chain and logistics data and performance; and training and supervision on logistics standard operating procedures and data quality to the district and facility staff. Much of the quarterly meeting and training activities were carried out by partner provincial coordinators who worked closely with the MoH provincial warehouse to strengthen the capacity of logistics management of health commodities in the province. Such activities were also in response to specific provincial needs and training strategies and focused on inventory control, warehousing and storage, distribution, and supply chain monitoring and evaluation. In Q4, FY 18, PMI provided on the job training to 120 health workers at SDPs during supervision visits and trained 221 MOH staff on the third edition of

the logistics management of health commodities' SOP in Manica, Niassa, Sofala, Nampula, Cabo Delgado and Maputo provinces.

- Currently PMI is supporting procurement quality control (including ensuring that products are WHO-certified, have pre-shipment inspection and are registered), storage (including rental of warehouse, maintenance and equipping of warehouses, support for warehouse information systems and management), and distribution of malaria commodities, specifically such as ITNs, ACTs, RDTs and SP, and assembling of malaria kits for APEs. PMI provides distribution support of these products to the regional level in order to improve availability of products at the provincial level and reduce delays from port to end-user.

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

- PMI will continue to support procurement, quality control, storage, and distribution of malaria commodities, specifically ITNs, ACTs, RDTs and SP, and will continue with this support from the ports of entrance to provincial warehouse
- PMI will continue to support the APE program by providing RDTs and ACTs and by supporting the kitting system through which these commodities are distributed to APEs. It will also support the piloting of a pull-based system for APE commodities and the evaluation of this pilot.
- EUV surveys will be replaced with on-site supervision focusing on data quality assessments of commodity stock information through the health-facility level digital LMIS system

PMI Goal

Ensure continual availability of quality products needed for malaria control and elimination (ACTs, RDTs, SP, Art. Inj., 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?

PMI funding for supply chain will decrease. Some prior activities such as EUV and CHW kitting has been removed as the national LMIS system has strengthened facility-level visibility of commodities and the country transitions to a pull-based CHW commodity system. 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 A36. Central Stock Levels for ACTs

Central Stock Levels for ACTs

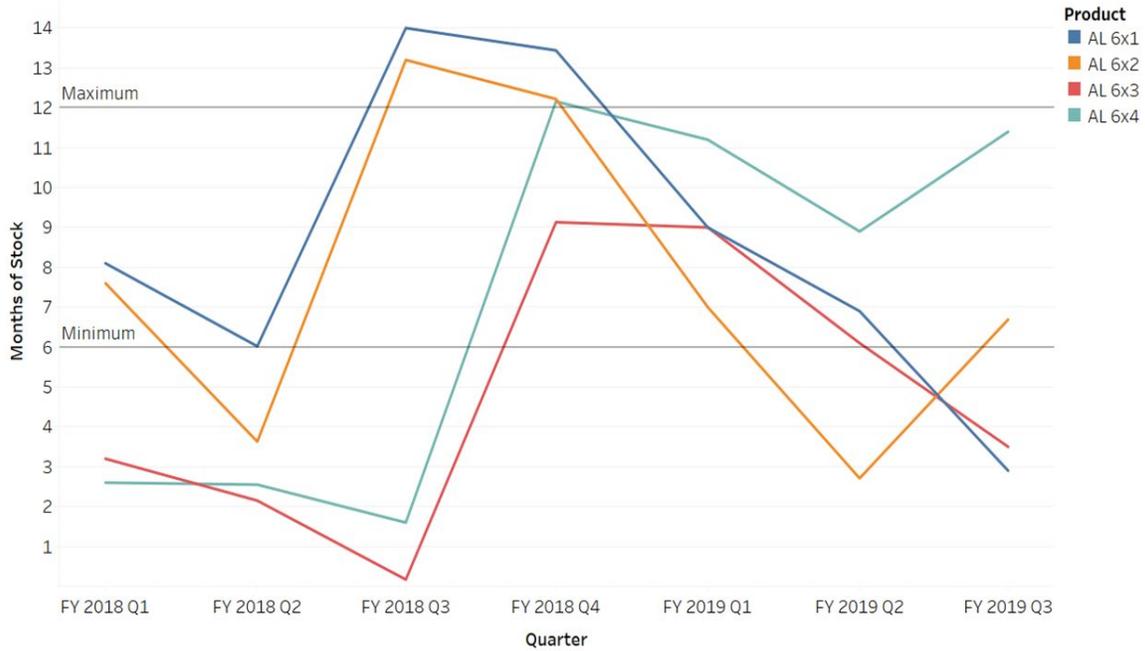


Figure A37. Central Stock Levels for RDTs and SP

Central Stock Levels for RDTs and SP

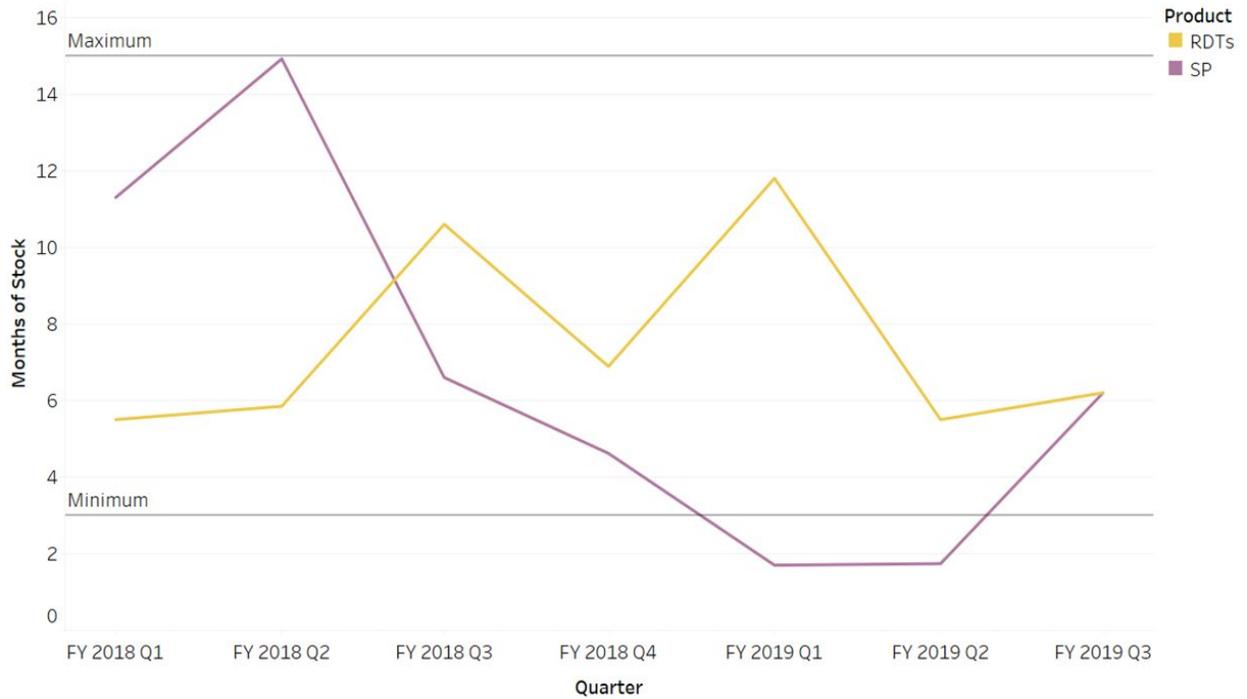
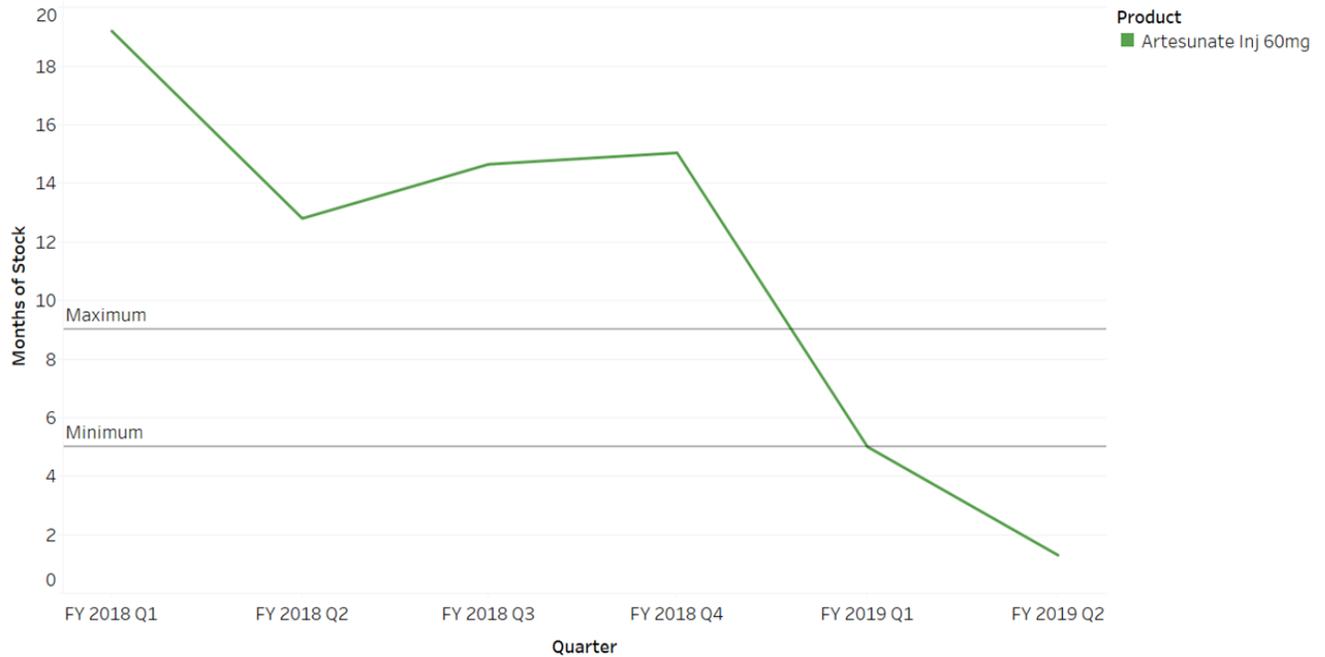


Figure A38. Central Stock Levels for Injectable Artesunate 60mg

Central Stock Levels for Injectable Artesunate 60mg



Conclusion

There have been challenges in maintaining adequate stocks of several malaria commodities at central level. Delays in the arrival of shipments and reductions in government and other donor procurements are important causes, but PMI is working with Global Fund, the NMCP and CMAM to conduct a system evaluation in CY 2020 to better understand other causes and inform response. Additionally, the quantification assumptions have been reviewed to strengthen and more adequately project commodity needs.

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 A39. ACT Stockout Rates

ACT Stockout Rates

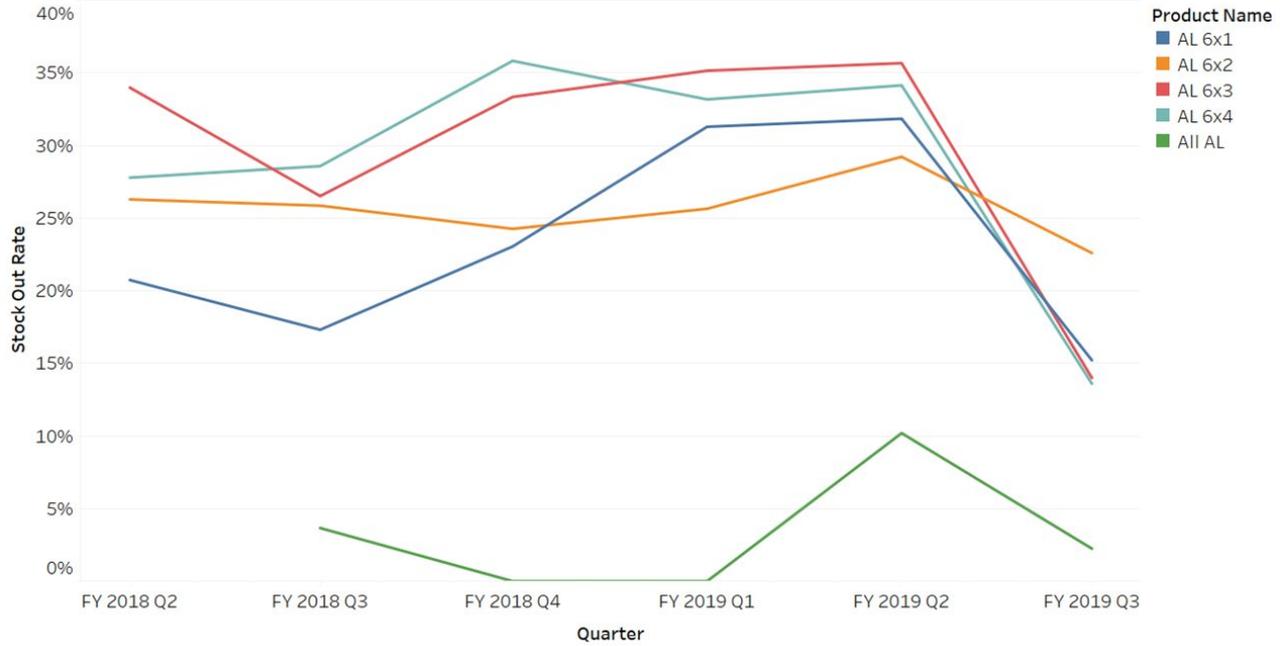
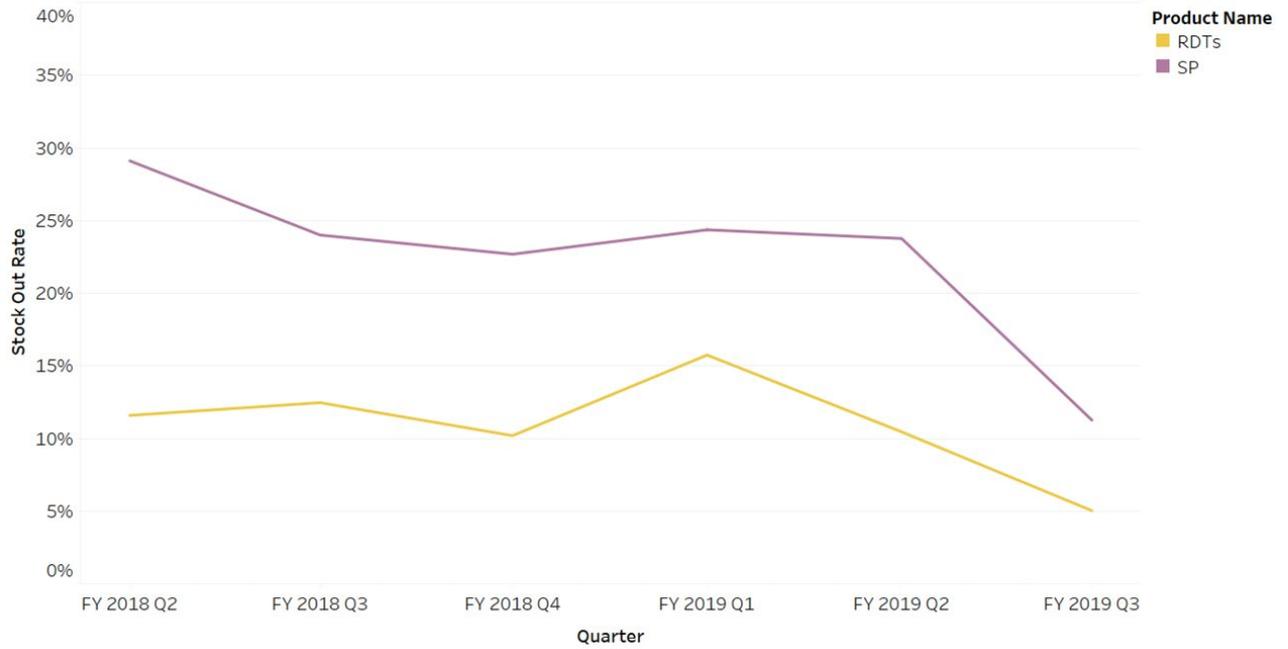


Figure A40. SP and RDT Stockout Rates

SP and RDT Stockout Rates



Conclusion

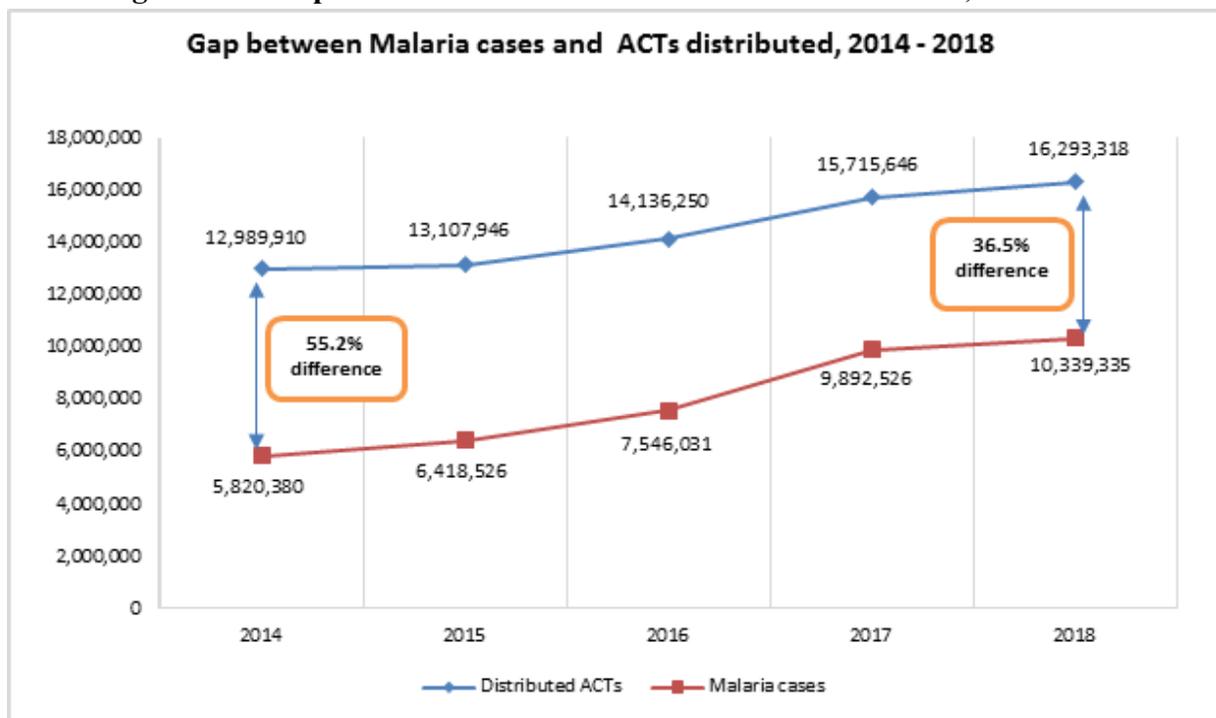
There have been challenges to maintain adequate stocks of several malaria commodities both at central and sub-central level. Delays in the arrival of shipments are the major cause for this situation. Delayed arrivals at central level can result in stockouts at service delivery points due to the time that it takes for transportation of commodities from port to province, province to district, and district to facility and community levels. Additionally, higher commodity consumption and accessibility constraints during the higher transmission season have resulted in stock outs at the service delivery points. PMI is working with Global Fund, the NMCP and CMAM to conduct a system evaluation in CY 2020 to better understand other causes and inform response.

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

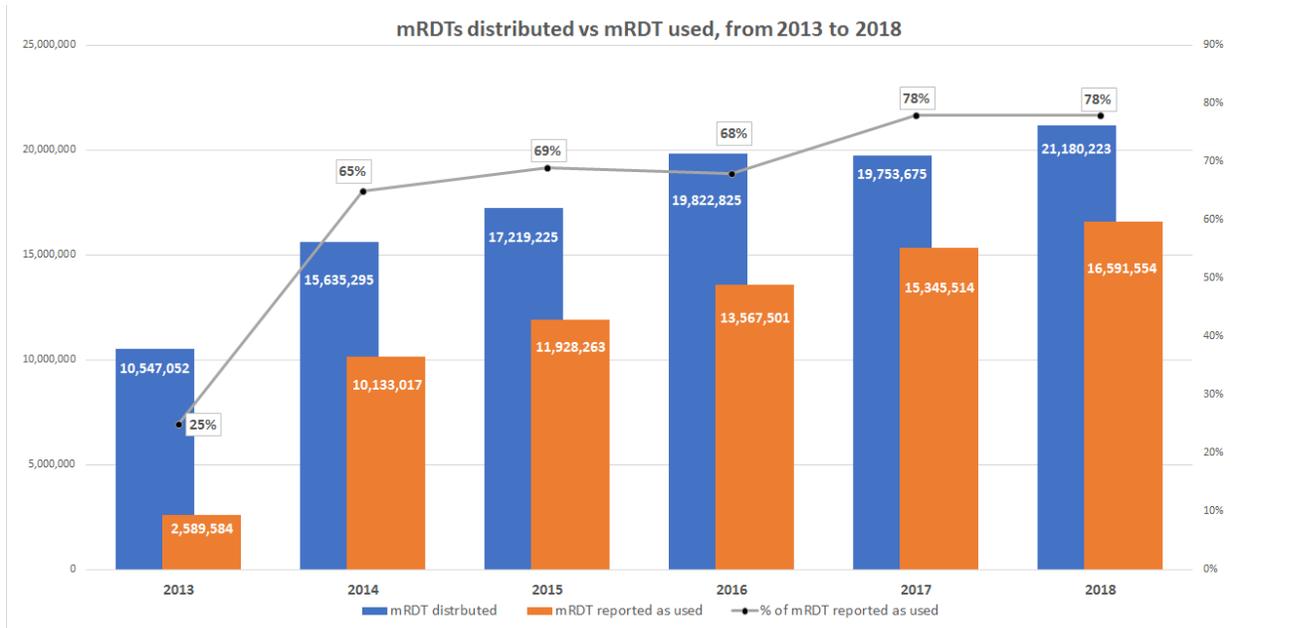
Figure A41. Gap between Malaria Cases and ACTs Distributed, 2014 - 2018



The gap between ACTs distribution and malaria cases reported remains high but has been decreasing over the years as a result of improved data collection, data-driven ACT distribution planning, and decreased misuse of the ACT formulations during the dispensing. The difference between the reported malaria cases and ACT consumption decreased from 55.2% in 2014 to 36.5% in 2018. Factors contributing to this continued 36.5% difference include treatment of

patients testing negative and of patients not tested (Candrinho *et al.*, 2019), incorrect distribution of ACT formulations and under-reporting.

Figure A42. mRDTs Distributed vs mRDT used, 2013 - 2018



The gap between reported mRDTs distribution and reported as used has been decreasing over the years with improved data collection and provider training. It was 22% for 2018.

Conclusion

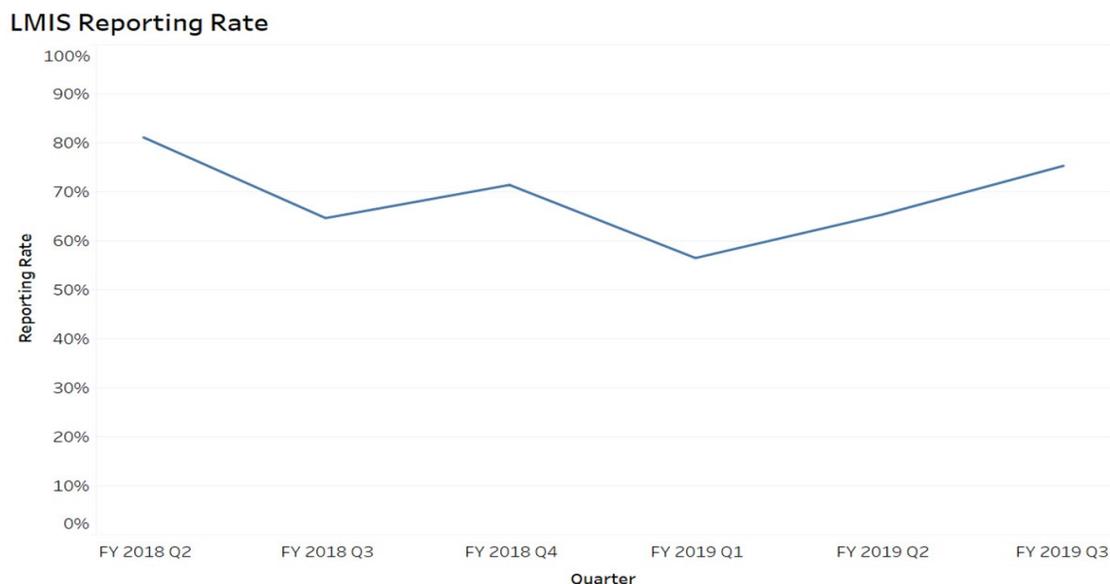
The alignment between logistical data (consumption "SIMAM ") and programmatic ("SISMA" cases), has improved considerably over the years, but key factors remain such as use of different formulations when one is stocked out. This is one of the aspects that will be explored in the Global Fund, PMI, NMCP, CMAM supply system evaluation in CY 2020.

Key Question 4

What are the trends in the LMIS reporting rates?

Supporting Data

Figure A43. LMIS Reporting Rate, 2018 - 2019



Conclusion

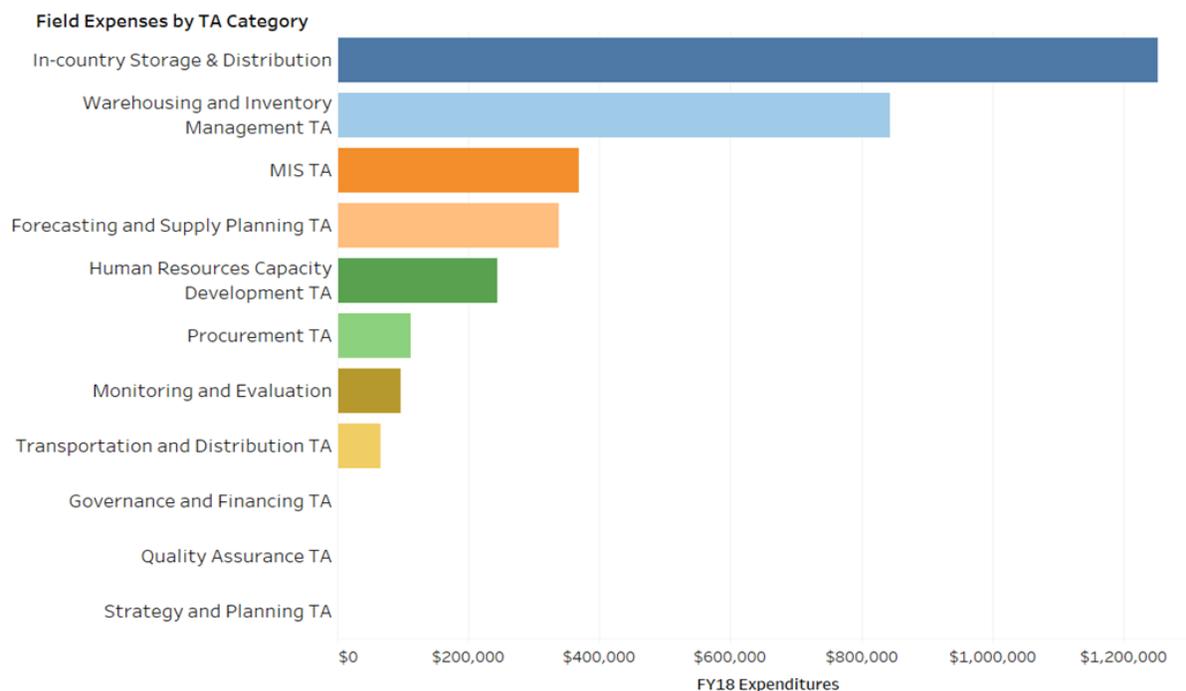
LMIS reporting has remained relatively stable as new LMIS systems has been rolled out. Despite upgrading the eLMIS, reporting rates remained stable, but the speed, accessibility and visibility of the data improved. As such, the focus is to now improve reporting rates in order to take advantage of the benefits of the eLMIS, including supporting commodity data use to action.

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 (e.g. increasing visibility of demand at health facilities)? In areas performing well, is it dependent on PMI/donor funding (e.g. PMI and GF pay for warehousing and distribution) and so should be maintained?

Supporting Data

Figure A44. PMI Supply Chain Investments in FY 2018



Conclusion

PMI predominantly supports storage, distribution, warehousing and inventory management. This emphasis on distribution and management is aligned with and responsive to the problems with stockout at the service delivery points and LMIS reporting, such as commodity stockouts and low reporting, noted above.

Key Question 6

What are the in-country considerations (e.g. in-country staffing capacity, political climate, security concerns) that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

Mozambique is going through a severe economic crisis since the discovery of undisclosed government loans in April 2016. Most donors have significantly reduced their contributions, both to the state budget and the health sector budget. For example, the health sector support decreased from approximately \$100 million dollars in 2015 to less than \$20 million in 2018. This has affected the country's ability to procure malaria related commodities and to pay for warehousing

and transportation of commodities. This situation is aggravated by the inability of the MoH to execute the available funds.

Conclusion

PMI will continue to work with the MoH to advocate for funds to cover malaria commodities. PMI will also continue to work with other US Government (USG) initiatives, the Global Fund and other relevant stakeholders to improve the capacity of the MoH to execute and manage the available funds.

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

NMCP objective
The objective of the NMCP is to strengthen the surveillance system so that all health facilities and districts are reporting complete, timely and quality data by 2020.
NMCP approach
In order to achieve its objective, the NMCP will: <ul style="list-style-type: none"> ● Improve malaria M&E capacity at all levels; ● Establish a data quality assurance (DQA) system; ● Establish a comprehensive integrated malaria information storage system at all levels; ● Establish a system and strategy for outbreak responses in epidemic prone areas ● Establish a system to ensure implementation and operational research are conducted and the results are used to inform program activities in real time.
PMI objective, in support of NMCP
In alignment with the NMCP objectives, PMI aims to: <ul style="list-style-type: none"> ● Support the strengthening of malaria M&E capacity focusing in the four target provinces of Nampula, Zambézia, Cabo Delgado and Tete; ● Support data quality in the four target provinces; ● Support the implementation of operational research activities and the dissemination and use of its results.
PMI-supported recent progress (past ~12-18 months)
Routine Health Information System <ul style="list-style-type: none"> ● PMI support has focused on strengthening the quality of routine data. PMI conducted M&E refresher training for 81 district technical staff from Nampula. The purpose of the refresher training was to update participants on malaria M&E and the HMIS contents and indicators. Trainees were also trained in the new data quality assessment tool. PMI, in collaboration with

other partners, also supported the NMCP to finalize the national DQA tool and the training of provincial staff in its use.

- In Zambézia and Nampula provinces, PMI also supported data discussion meetings in nine districts. Districts were selected because they reported an increase in malaria cases, or because they had large data discrepancies, between the number of malaria cases reported and the number of ACTs dispensed. The main findings of this exercise showed that, in almost all health facilities, there were not enough registers; there were large discrepancies between the data in the registers and that in the monthly summaries. PMI is now supporting the districts and provinces to develop action plans to address the issues above. It has also coordinated with the NMCP and other donors to address the register needs.
- PMI continued to support a data manager who was seconded to the NMCP. This data manager is an integral member of the NMCP SM&E working group and provides technical support to the NMCP for data access, data use and production of annual reports.

Surveys

National Level Surveys – Data collection for the Malaria Indicator was carried out between March and June 2018. The final report has been finalized. The results of the survey show that although there were improvements in the coverage of some interventions, such as ITN ownership, ITN use, IPTp uptake and care-seeking among children with fever, malaria prevalence has remained stable between 2011 and 2018.

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

PMI will continue to support the same SM&E activities as were implemented in the last 12-18 months.

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?

PMI will continue a similar funding allocation for SM&E activities in FY2020, as strengthening surveillance systems in the country continues to be a priority.

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 A45. Available Intervention Data

<i>Data Source</i>	<i>Data Collection Activities</i>	<i>Year</i>								
		<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>	<i>2021</i>	<i>2022</i>	<i>2023</i>
<i>Household surveys</i>	<i>Demographic Health Survey (DHS)</i>							<i>X*</i>		
	<i>Malaria Indicator Survey (MIS)</i>	<i>X</i>			<i>X</i>					
	<i>Multiple Indicator Cluster Survey (MICS)</i>									
	<i>EPI survey</i>									
<i>Health Facility surveys</i>	<i>Service Provision Assessment (SPA)</i>									
	<i>Service Availability Readiness Assessment (SARA) survey</i>				<i>X</i>					
	<i>Other Health Facility Survey</i>				<i>X*</i>			<i>X*</i>		
<i>Other Surveys</i>	<i>EUV</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>					
	<i>School-based malaria survey</i>									
	<i>Other (Knowledge, Attitudes and Practices Survey, Malaria Behavior Survey)</i>									
	<i>Other (Malaria Impact Evaluation)</i>									
<i>Malaria Surveillance and Routine System Support</i>	<i>Support to parallel malaria surveillance system</i>									
	<i>Support to HMIS</i>	<i>X</i>								

Data Source	Data Collection Activities	Year								
		2015	2016	2017	2018	2019	2020	2021	2022	2023
	Support to Integrated Disease Surveillance and Response (IDSR)	X	X	X	X	X	X	X	X	X
	Other (Electronic Logistics Management Information System (eLMIS))	X	X	X	X	X	X	X	X	X
	Other (Malaria Rapid Reporting System)									

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

Conclusion

PMI has robustly invested in a full range SM&E activities in Mozambique, and will continue to do so for the foreseeable future.

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 A46. HMIS-Supported Activities in Mozambique, FY 2018 – FY 2020

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
Central Level					
Register, Tools (e.g. checklists, indicator glossary), Job-aides (design, indicators, definition of data elements, data dictionary, system support)					X
Data Quality Assessments (separate from supervision – funding for travel to lower levels)	X	X	X	X	X
Program Monitoring and Technical Assistance (funding for travel to lower levels)	X	X	X	X	X

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
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	X
Human Resources (secondment of person in NMCP for 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	X
Policy Guidelines and Coordination (updating policies, guidelines, supporting sub-committee meetings, supporting participation in sub-committee meetings)	X	X	X	X	X
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	
Desk review to catch “logic errors system” (provide TA to catch logic errors)					
Admin Level 1 (Province). PMI supports activities in 4 provinces while Global Fund supports activities in 11 provinces.					
Registers (warehousing, printing, distribution)		X		X	X
Data Quality Assessments (separate from supervision – funding for travel to lower levels)	X	X	X	X	X
Program Monitoring and Technical Assistance (funding for travel to lower levels)	X	X	X	X	X
Training (funding for district staff to conduct training at lower levels, capacity building (i.e. on the job training for district level staff)	X	X	X	X	X
Human Resources (secondment of person for malaria SM&E, office/team for SM&E)					
Data Use (analysis, interpretation, visualization (dashboards, bulletins), dissemination/feedback to lower levels, decision-making)	X	X	X	X	X

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
Adaptation of National Policy Guidelines and Coordination (adapting policies, guidelines, supporting sub-committee meetings, supporting participation in sub-committee meetings)	X	X	X	X	X
Adaptation of Checklists and Job-Aides	X	X	X		X
Participation in national meetings (support for travel costs)	X	X	X	X	X
Support to Annual Operational Plans for Provincial Malaria Program				X	X
Admin 2 Level (District)					
Data entry, Summary, and Transmission (training, re-training, computers, internet, tools)	X	X	X	X	X
Supervision (training, traveling, supervision tools/checklists, create/design system for organized/methodical supervision)	X	X	X	X	X
Data Validation (data validation activities before monthly data submission - organize health facilities)	X	X	X	X	X
Monthly/Quarterly Data Quality Review Meetings (venue, meeting support)	X	X	X	X	X
Data Use (analysis, interpretation, visualization (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)					X
Annual planning with Province (support travel)					
Facility Level					
Data collection/entry, Summary, and Transmission (training, re-training, computers, internet, tools)	X	X	X		X
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)	X	X	X		X
Monthly/quarterly data quality review meetings(support for travel)	X	X	X		X

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
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)					X

Conclusion

PMI has robustly invested in a full range SM&E activities at all levels of the health system in Mozambique, matching substantial investment from other donors.

Key Question 3

What are the outcomes of HMIS strengthening efforts?

Supporting Data

Figure A47. HMIS Strengthening Efforts in Mozambique 2017 - 2018

		2017	2018
Timeliness	% of reports received on time	80.1	94.8
Completeness	"Confirmed malaria cases for children under five years of age" was reported in X% of facility-months	92.7	98.8
Accuracy	Populate with most recent DQA data	Not available	Not available

Conclusion

Completeness is already at near saturation levels, but likely belies lower completeness in reality due to counting of blank fields as completed. Timeliness has improved from 2017 to 2018. Accuracy results are not yet available from the DQA activities due to their early stage as well as lack of analysis plan for definition of a standard accuracy indicator. Continued PMI investment in strengthening and standardizing the DQA should yield more relevant data in the coming years.

Key Question 4

What are the in-country considerations (e.g. in-country staffing capacity, political climate, security concerns) that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

There are no additional in-country considerations beyond what is already laid out above.

Conclusion

Not applicable.

3.C. SOCIAL AND BEHAVIORAL CHANGE (SBC)

NMCP Objective
Implement an effective SBC approach to ensure at least 70% of people seek appropriate and timely healthcare and at least 85% of the population uses an appropriate protection method, by 2022
NMCP Approach
<ul style="list-style-type: none">• Mozambique is currently finalizing an updated, national SBC strategy that includes strategic communication interventions for advocacy, malaria prevention and appropriate case management.• There is an active SBC TWG which meets on a monthly basis to coordinate partner activities, review SBC materials, plan commemorative activities, and support the NMCP strategic planning.• The other main donor that supports SBC activities is the Global Fund. Its partners provide trainings for teachers and community leaders in targeted districts throughout the country and disseminate SBC messages through community radio.
PMI Objective in Support of NMCP
PMI support is closely aligned with the NMCP national strategy and the SBC strategy. PMI supports all of the technical interventions, but the geographic focus is limited to the provinces of Zambézia, Nampula, Cabo Delgado and Tete.

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

- In the past year PMI has supported central-level strategic planning, including the development of a new national SBC strategy and the development and finalization of national SBC packages for IRS, MIP, facility-based case management, journalists and community leaders. Development of this package is expected to facilitate a unified, quality SBC implementation by partners throughout the country and will also reduce future partners' duplication of efforts to design new materials.
- Implementation of SBC activities by PMI partners has been very limited due to the end of one award and delays in strategic planning and intervention package finalization with another.

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

Implementation will resume before the end of calendar year 2019. This will include implementation of community dialogues, community radio messaging, health facility and community-based health talks, influential leader training and door-to-door visits using the standardized malaria SBC package in targeted communities in Zambézia, Nampula, Cabo Delgado and Tete. These interventions target community members, and influential community members to improve malaria prevention and care-seeking behaviors. It also targets supervision of SBC at health facilities and addresses availability of print job aids to improve the quality of malaria care counseling. Additionally, PMI will support partner implementation of an integrated malaria, nutrition, maternal and child health and HIV/AIDS package.

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?

PMI will reduce its funding allocation for SBC in FY 2020 to \$1,000,000. This remains an important programmatic area for PMI and it will fully fund the work plans of its two SBC implementation partners to continue to implement evidence-based SBC to target priority behaviors. Costs will be slightly reduced as the partners focus on maintaining existent scale of intervention in districts targeted with FY 2019 rather than incurring start-up costs. 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 A48. Behavior Prioritizations and Proposed SBC Programming

Behavior	Target Population	Geographic Focus	Justification
ITN care	General population	Zambézia, Nampula, Tete, Cabo Delgado	Median survival time of ITNs in the PMI-funded durability study was close to three years in two provinces, but was only 2.4 years in Nampula. Risk factors for damage were relatively high in all study sites. Wear and tear was an important factor related to durability, underscoring the need for improved net care practices (PMI VectorWorks, 2019).
Quality provider counseling	Care providers	Zambézia, Nampula, Tete, Cabo Delgado	Only 58-62% of patients with malaria in the 2018 health facility survey could correctly recite dosing schedule and even fewer (11-40%) reporting being instructed to take treatment with food or milk (Candrinho et al., 2019).
Prompt care-seeking	Care providers	Zambézia, Nampula, Tete, Cabo Delgado	Care-seeking for fever ranged from 54% among household members over 60 years old to 68% in household members who were 40-49 years old. A total of 69% of children under 5 years old sought care, but only 36% sought care within 24 hours (MIS, 2018).

The three priority target behaviors that PMI will address through its SBC programming are ITN care, quality provider counseling and prompt care-seeking. These priority behaviors were selected because of evidence from surveys that they remain suboptimal, as shown in the table above. The national package of SBC materials for malaria prevention, developed with PMI support, includes a strong emphasis on ITN care and existent community-level investments are expected to improve uptake of this behavior. Additionally, poor patient counseling practices were documented throughout the country in the health facility survey (Candrinho et al., 2019) which may compromise appropriate treatment completion. Lastly, prompt care-seeking remains suboptimal which may contribute to increased malaria morbidity and mortality.

Conclusion

These data demonstrate that while important progress has been made in key malaria behaviors in Mozambique such as ITN use and care-seeking, there is still a clear need for further improvements in key behaviors such as ITN care. PMI will maintain implementation of the

national SBC package in its target provinces at the community and facility-level in order to improve the delivery and appropriate use of malaria prevention and treatment services, but will specifically target these behaviors based off of the local epidemiological context.

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 A49. Behavioral Determinants Associated with ITN Care

Facilitator	Type of Factor <i>(Internal, Social, or Environmental)</i>	Data Source	Evidence
Positive ITN care attitude	Internal	VectorWorks, 2019	A forthcoming article on the findings from three years of monitoring ITN durability in three provinces of Mozambique noted that, “Factors that were associated with better survival were exposure to social and behavioral change communication, a positive net care attitude, and folding up the net during the day”. It is notable that the prevalence of positive net care attitude was low across all provinces and survey points.
Barrier	Type of Factor <i>(Internal, Social, or Environmental)</i>	Data Source	Evidence
Household risk factors	Environmental	VectorWorks, 2019	Presence of rodents was reported as very high across three study provinces and highest in PMI focal province, Nampula, where 89-98% of survey respondents reported presence of rodents at each of the four data collection points. This may have been associated with the common practice of food storage in sleeping rooms. Additionally, washing of ITNs with detergents / bleaches and not folding and tying of ITNs was common.
Community norms	Social	VectorWorks, 2019	Discussion of net repair was reported to be relatively low in three provinces.

There is strong evidence of poor counselling practices in Mozambique (Candrinho et al., 2019), but limited evidence on the behavioral determinants of these practices. Anecdotal evidence suggests that poor counseling is associated with environmental factors such as limited time

available for providers to counsel patients, lack of norms supporting this behavior, and limited provider self-efficacy.

Conclusion

The barriers and facilitators documented in the 2018 MIS, health facility survey and ITN durability monitoring are key intervention targets for the implementation and monitoring of the national SBC package and associated materials.

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

There is currently limited SBC capacity within the NMCP and partners. This is evidenced by the large dependence on external support for the development of strategic documents and intervention packages. Implementation capacity for SBC programming at the community level, however, is strong as shown by the large number of community-based organizations, faith-based organizations and community services organizations that have been able to successfully implement complex SBC programs in recent years.

Conclusion

SBC strategic planning remains a gap, but once developed, local organizations are able to successfully execute programming. PMI has already invested heavily in these strategic planning and material development exercises so it will now focus its resources on ensuring that these materials are extensively used by the highly skilled local organizations in its target provinces. It will also continue to support the strategic vision and capacity at the central level by supporting a robust, appropriately trained, central technical working group.

Key Question 4

What are the in-country considerations (e.g. in-country staffing capacity, political climate, security concerns) that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

Not applicable.

Conclusion

Not applicable.

3.D. PROGRAM EVALUATION AND OPERATIONAL RESEARCH

NMCP objective
Ensure relevant evaluations and operation research are conducted and that results are rapidly used to inform programmatic decision-making.
NMCP approach
In August 2019 the NMCP, with PMI support, hosted a two-day consultative meeting to review the research that had been conducted in-country and to determine a prioritized research agenda. This was organized by technical area and included a review of global and national published and unpublished work to both ensure that these results were disseminated, and that the new agenda built upon these previous findings and investments. The meeting included a diverse set of stakeholders from academia, the government, research institutions, partner organizations and donors. The list of research questions are now being prioritized and will orient future government and partner research.
PMI objective, in support of NMCP
Support the NMCP to define and execute technically sound operations research and evaluations in order to inform programming.
PMI-supported recent progress (past ~12-18 months)
<ul style="list-style-type: none"> • PMI supported the NMCP and its partners to conduct the aforementioned operations research dissemination and agenda setting meeting. • Cost-effectiveness randomized control trial of IRS in context with high ITN coverage (Recently completed) • Cost-effectiveness observational study of IRS in context with high ITN coverage and partial prior IRS exposure (in progress) • Pilot evaluation of school-based distribution of ITNs (recently completed) • ITN durability study (recently completed)
PMI-supported planned activities (next ~12-18 months, supported by currently available funds)
<ul style="list-style-type: none"> • Malaria interpersonal communication cost-effectiveness study: a community randomized control trial (in progress) • Assessment of barriers to uptake of IPTp in Mozambique (in progress)

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.

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?

PMI will maintain a \$0 allocation for operations research. Mozambique has recently supported the implementation of multiple, globally relevant studies. The focus is now on translation of that research into evidence-based programming.

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

During the aforementioned operations research dissemination and agenda-setting meeting, key questions were identified by groups of subject matter experts based on consensus. This was done after reviewing the existing evidence and the priority programmatic needs of the NMCP. It is anticipated that following the meetings donors such as PMI will discuss and identify areas of individual and shared interest to support.

Figure A50. PE/OR currently conducted in country with USG, GF, multilaterals or other major donors.

Source of Funding	Implementing institution	Research Question/Topic	Current status/timeline
USG, UNITAID	CISM	What is the cost-effectiveness of IRS in area with high ITN coverage?	Recently completed
UNICEF	MoH	What is the current quality of malaria case management services offered in public health facilities in Mozambique?	Recently completed
USG	Mozambique Monitoring and Evaluation Mechanism and Services	Cost-effectiveness of different SBC interventions	2019-2020
TIP TOP	Jhpiego, CISM	Community-based distribution of IPTp	Currently being implemented
BOHEMIA	CISM	Ivermectin for malaria control	2020-2022

Conclusion

PMI supported the development of the malaria research agenda. It will continue to closely coordinate with the MoH and other donors to provide technical guidance for implementation and data use. It is also supporting implementation and analysis of studies that are well-aligned with the national research agenda.

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 (e.g. in-country staffing capacity, political climate, security concerns) that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

There are strong local research institutions, but the number of researchers and funding is not commensurate with the programmatic information needs.

Conclusion

The need for programmatically relevant data remains an important area for advocacy by the MoH and PMI.

3.E. OTHER HEALTH SYSTEMS STRENGTHENING

NMCP objective
Not applicable
NMCP approach
Not applicable.
PMI objective, in support of NMCP Infrastructure
One of the objectives of the National Malaria Strategic Plan is to strengthen the program management skills at central, provincial and district levels in order to effectively achieve the other NMSP strategic objectives. Five main strategies were defined to achieve this objective: (i) establish the NMCP organigram and ensure program staff at all levels have the required capabilities to perform their roles; (ii) ensure effectiveness of program management; (iii) establish appropriate internal mechanisms for effective communications and coordination within the NMCP, partners, the private sector and the Malaria Technical Advisory Committee; (iv) establish effective and accountable partners to secure adequate resources and their appropriate use; and (v) ensure effective coordination and communications on procurement and supply chain management.
PMI-supported recent progress (past ~12-18 months)
<ul style="list-style-type: none"> • PMI continued to provide technical and financial support for Field Epidemiology Laboratory Training Program (FELTP) residents. Currently, there are two FELTP residents, who are working on projects utilizing routine HMIS and entomological data. They were also involved in an investigation into an increase of malaria cases in Quelimane. PMI is also supporting the onboarding of two new FELTP residents. • PMI also continued to support Peace Corps volunteer (PCV) malaria-related projects. Key activities have included support to three malaria regional workshops. These workshops were held with volunteers and their counterparts who were brought together to discuss current activities and resources across sectors (Health and Education) and from various provinces, with the end goal of developing strategies to combat malaria in their communities.
PMI-supported planned activities (next ~12-18 months, supported by currently available funds)
<ul style="list-style-type: none"> • PMI will continue to support two new FELTP residents who will work with the malaria program to address programmatic needs. • PMI will continue to support the implementation of PCVs' malaria-related activities through support for one third year PCV and continued provision of PMI-supported small project assistance grants for PCV projects.

PMI Goal

Not applicable.

Key Question 1

What are the in-country considerations for infrastructure support?

Supporting Data

Not applicable.

Conclusion

Not applicable.

Key Question 2

What are the in-country considerations (e.g. in-country staffing capacity, political climate, security concerns) that impact your funding allocation in this category? If there is a specific budget line item in Table 2 that is not covered by the above questions, please address here.

Supporting Data

Not applicable.

Conclusion

Not applicable.