

# PMI

# U.S. PRESIDENT'S MALARIA INITIATIVE

LED BY



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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**

**CAMBODIA**

**Malaria Operational Plan FY 2020**

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## ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AFRIMS	Armed Forces Research Institute of Medical Sciences
AL	Artemether-lumefantrine
ANC	Antenatal care
API	Annual parasite incidence
AS-MQ	Artesunate-mefloquine
AS-PYR	Artesunate-pyronaridine
BMGF	Bill and Melinda Gates Foundation
CDC	Centers for Disease Control and Prevention
CHAI	Clinton Health Access Initiative
CHW	Community health worker
CMEP	Cambodia Malaria Elimination Project
CNM	National Center for Parasitology, Entomology, and Malaria Control
CRS	Catholic Relief Services
CSO	Civil society organization
CY	Calendar year
DBS	Dried blood spot
DHA-Pip	Dihydroartemisinin-piperaquine
DHS	Demographic and Health Survey
DOT	Directly observed therapy
EIR	Entomological inoculation rate
ELISA	Enzyme-linked immunosorbent assay
EWS	Early warning system
FETP	Field Epidemiology Training Program
FY	Fiscal year
G6PD	Glucose-6-phosphate dehydrogenase enzyme
GHI	Global Health Initiative
GHSC-PSM	Global Health Supply Chain Procurement and Supply Management (GHSC PSM) project - Malaria
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
Hb	Hemoglobin
HC/HF	Health center/facility
hsRDT	Highly sensitive rapid diagnostic test
iDES	Integrated Drug Efficacy Surveillance
IEC	Information, education, communication
IPC	<i>Institut Pasteur of Cambodia</i>
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net

LLIHN	Long-lasting insecticide treated hammock nets
LLIN	Long-lasting insecticidal nets
LMIS	Logistics management information system
MEAF	Malaria Elimination Action Framework
MIP	Malaria in pregnancy
MIS	Malaria indicator survey
MMP	Migrant mobile population
MMW	Mobile malaria worker
MoH	Ministry of Health
MOP	Malaria Operational Plan
MSF	<i>Médecins Sans Frontières</i>
N/A	Not applicable
NMCP	National Malaria Control Program
NSP	National Strategic Plan
NTG	National treatment guidelines
OD	Operational district
OR	Operational research
PCR	Polymerase chain reaction
PHB	Promoting Healthy Behaviors
PHD	Provincial health district
PMI	U.S. President's Malaria Initiative
PQ	Primaquine
PSI	Population Services International
QA	Quality assurance
QC	Quality control
RAI2e	Regional Artemisinin-resistance Initiative 2 elimination
RCT	Randomized clinical trial
RDT	Rapid diagnostic test
RSC	Regional Steering Committee
SBC	Social and behavior change
SLD	Single low dose
SM&E	Surveillance, monitoring, and evaluation
SMC	Seasonal Malaria Chemoprevention
TBD	To be determined
TES	Therapeutic efficacy study
TPR	Test positivity rate
TQ	Tafenoquine
UNICEF	United Nations Children's Fund
UNOPS	United Nations Office for Project Services
URC	University Research Co. LLC

USAID	United States Agency for International Development
VMW	Village malaria workers
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 Cambodia to end malaria. PMI has been a proud partner of Cambodia since 2012, helping to decrease *Plasmodium falciparum* malaria cases by 73% and deaths to zero by 2019 through investments totaling almost \$49 million.

The proposed PMI fiscal year (FY) 2020 budget for Cambodia is \$9 million. This Malaria Operational Plan (MOP) outlines planned PMI activities in Cambodia 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 Royal Government of Cambodia as well as other donors and partners.

## Cambodia at a glance

- **Geography:** Southeast Asia bordering Thailand, Laos, and Vietnam
- **Climate:** Tropical with rainy season from May to November and dry season from December to April annually
- **Population in 2018:** 16,249,798<sup>1</sup>
- **Population at risk of malaria (2018):** 71%<sup>2</sup>
- **Principal malaria parasites:** *P. falciparum*, (58%), *P. vivax* (41%)<sup>2</sup>
- **Principal malaria vectors:** *An. dirus*, *An. minimus*, *An. maculatus*, *An. sundaicus*<sup>2</sup>
- **Malaria incidence per 1000 population:** 8.9 per 1000 population<sup>3</sup>
- **Under-five mortality rate:** 30.6 per 1000 live births<sup>3</sup>
- **World Bank Income Classification & GDI (Atlas):** Lower middle income; US\$1,380<sup>1</sup>
- **Political system:** Constitutional monarchy
- **Trafficking in Persons designations, 2016-2018:** Tier 2 (2016-2018); Tier 2 Watchlist (2019)<sup>4</sup>
- **Malaria funding and program support partners include (but are not limited to):**
  - Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund)
  - U.S. President's Malaria Initiative (PMI)
  - Bill and Melinda Gates Foundation (BMGF)
  - World Health Organization (WHO)
  - United Nations Office for Project Services (UNOPS)
- **PMI Support of National Malaria Elimination Action Framework (MEAF):** PMI activities in FY 2020 align with the Malaria Elimination Action Framework (MEAF) 2016–2020, and build on investments made by PMI and other partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), and investments from the Bill & Melinda Gates Foundation (BMGF) to improve and expand malaria-elimination activities. Specifically, the MEAF has set the goal of reducing the incidence of malaria to less than 1 infection per 1000 people at risk in each operational district and eliminating *P. falciparum* including multidrug resistance by 2020.  
(See III. Overview of PMI's support of Cambodia's Malaria Control Strategy for additional details)
- **PMI Investments:** Cambodia began implementation as a PMI focus country in FY 2012. The proposed FY 2020 PMI budget for Cambodia is \$9 million; that brings the total PMI investment to nearly \$58 million.

<sup>1</sup>World Bank, Population Estimates & Projections, 2018 Cambodia

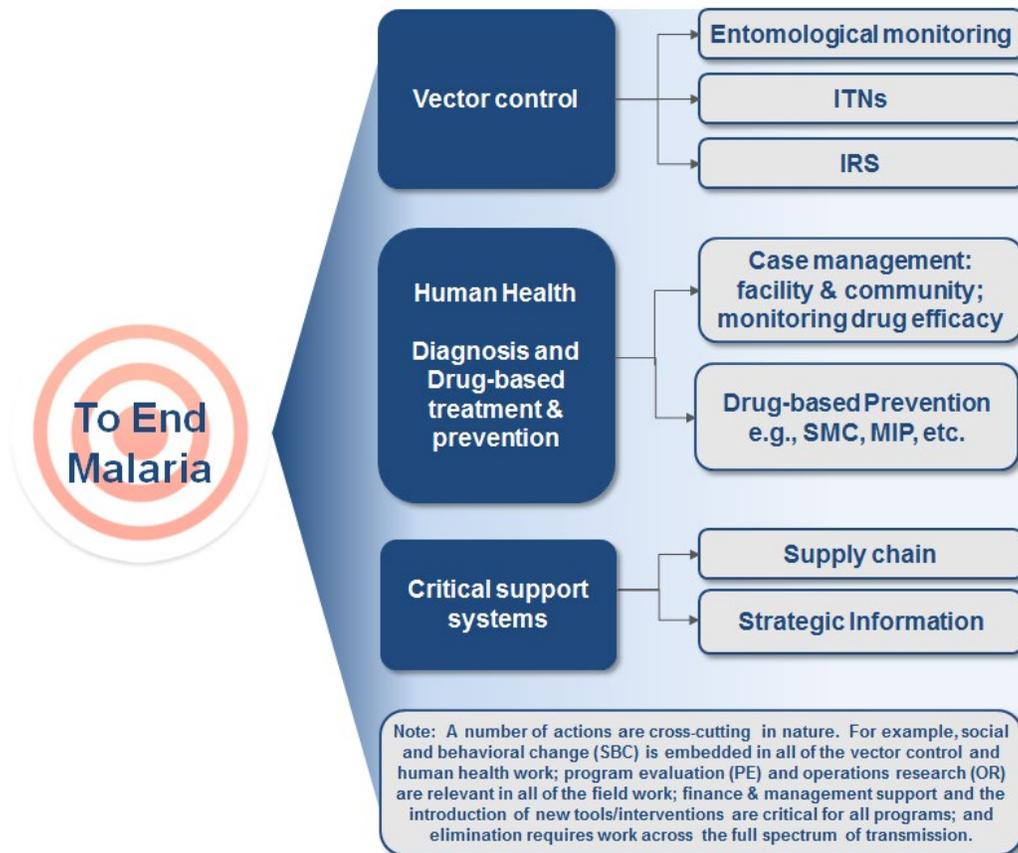
<sup>2</sup>World Health Organization, World Malaria Report 2018

<sup>3</sup>World Health Organization, World Health Statistics 2018

<sup>4</sup>Trafficking in Persons Report, U.S. Department of State, June 2019

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 Cambodia’s people and institutions – from the central level to communities – to effectively lead and implement evidence-based malaria control and elimination activities remains paramount to PMI. As denoted in Table 2 (the budget table), nearly all of PMI’s planned support for FY 2020 in the areas of vector control, human health, supply chain and strategic information contains elements of capacity building and system strengthening. PMI Cambodia will continue to rely on and engage with local partners such as the Cambodia Malaria Elimination Project (CMEP) and is expanding its local partner base to reach high-risk forest going populations.

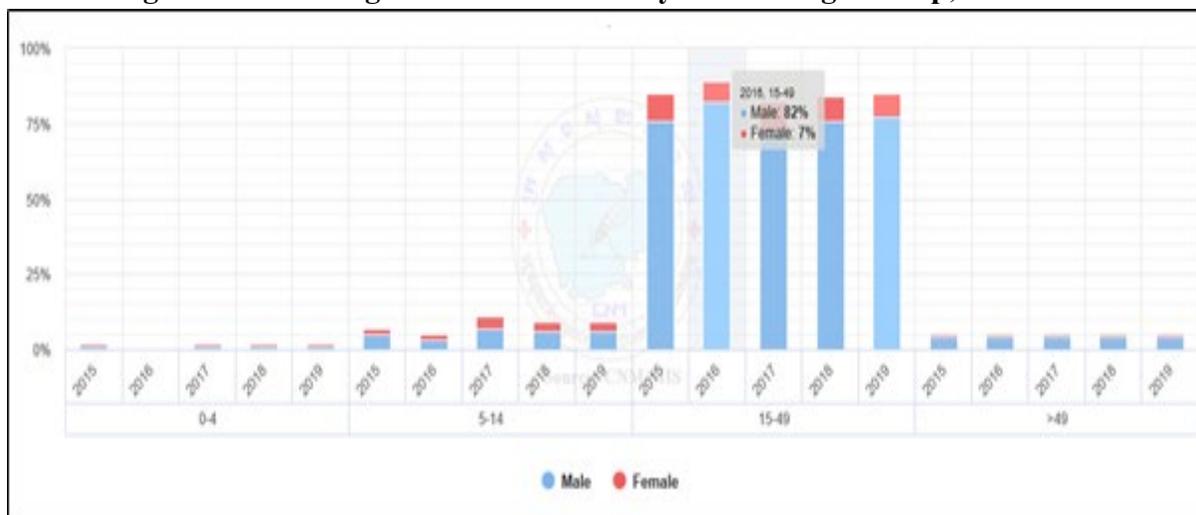
To accelerate the journey to self-reliance, PMI developed a programmatic inventory to assess the strengths and persistent challenges of Cambodia’s program (see Annex B). The activities proposed in this MOP are tailored to draw on these strengths and address the weaknesses, which will be monitored to evaluate the effectiveness of capacity building efforts. In addition, while PMI is cognizant that it will take time before Cambodia is capable of fully financing its

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

## II. MALARIA SITUATION AND MALARIA CONTROL PROGRESS IN CAMBODIA

In Cambodia, malaria predominantly affects males 15-49 years of age with annual parasite incidence (API) in adult males five times higher than adult females (Figure 2). In comparison only 3.7% of cases occur among children less than five years of age. Many malaria cases occur among migrant mobile populations (MMP), including forest workers who move from areas of low to high transmission areas yet lack access to essential malaria services and education making them vulnerable to malaria infection. Geographically, the API is highest in the northeastern and southwestern provinces of Cambodia. Annually peak malaria transmission is between July and November during the rainy season. The major vectors in Cambodia - *Anopheles minimus* and *Anopheles dirus* - are now found primarily in forest and forest-fringe areas.

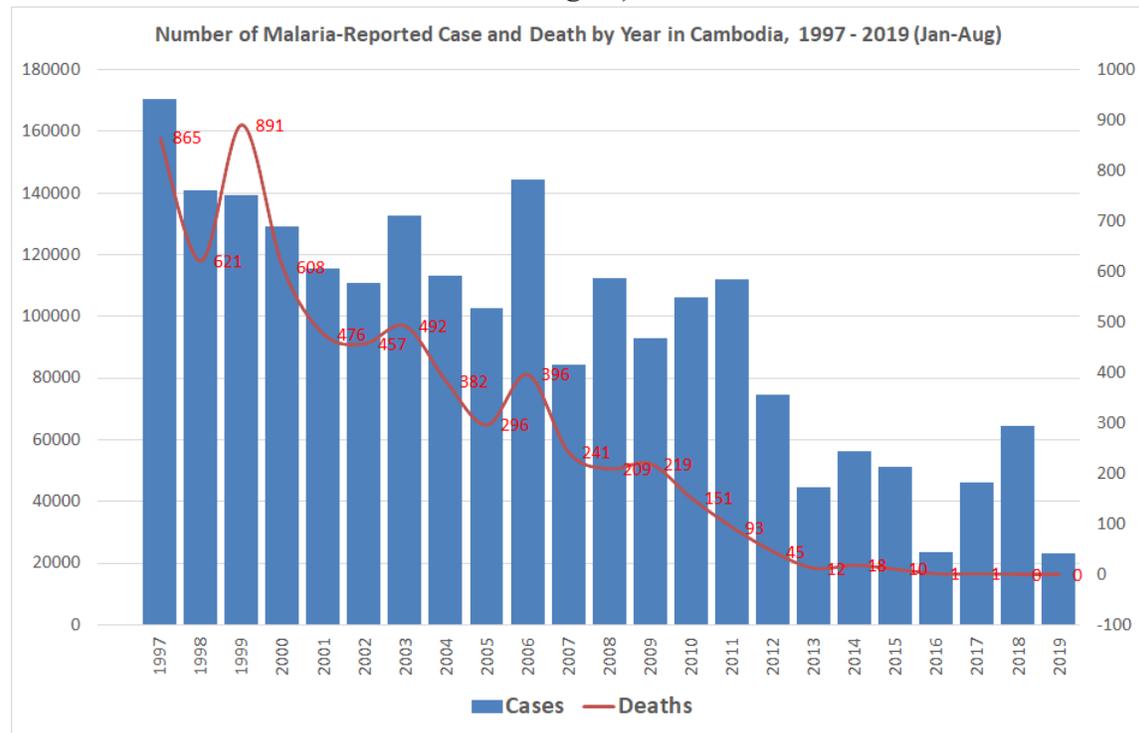
**Figure 2. Percentage of Malaria Cases by Sex and Age Group, 2015-2019**



Source: National Malaria Programme Review, Kingdom of Cambodia, August 2019

Malaria deaths in Cambodia have decreased dramatically from 219 deaths in 2009 to zero deaths in 2018 and 2019. In 2017, Cambodia began implementing malaria elimination activities in seven operational districts (ODs) in 2017; in 2018, an additional nine ODs started elimination activities. Currently, 13 malaria-endemic ODs have an API less than 1 per 1,000. Figure 3 shows the number of malaria cases and deaths by year in Cambodia.

**Figure 3. Number of malaria cases and deaths by year, 1997-2019 (January through August)**



Source: National Center for Parasitology, Entomology and Malaria Control (CNM)

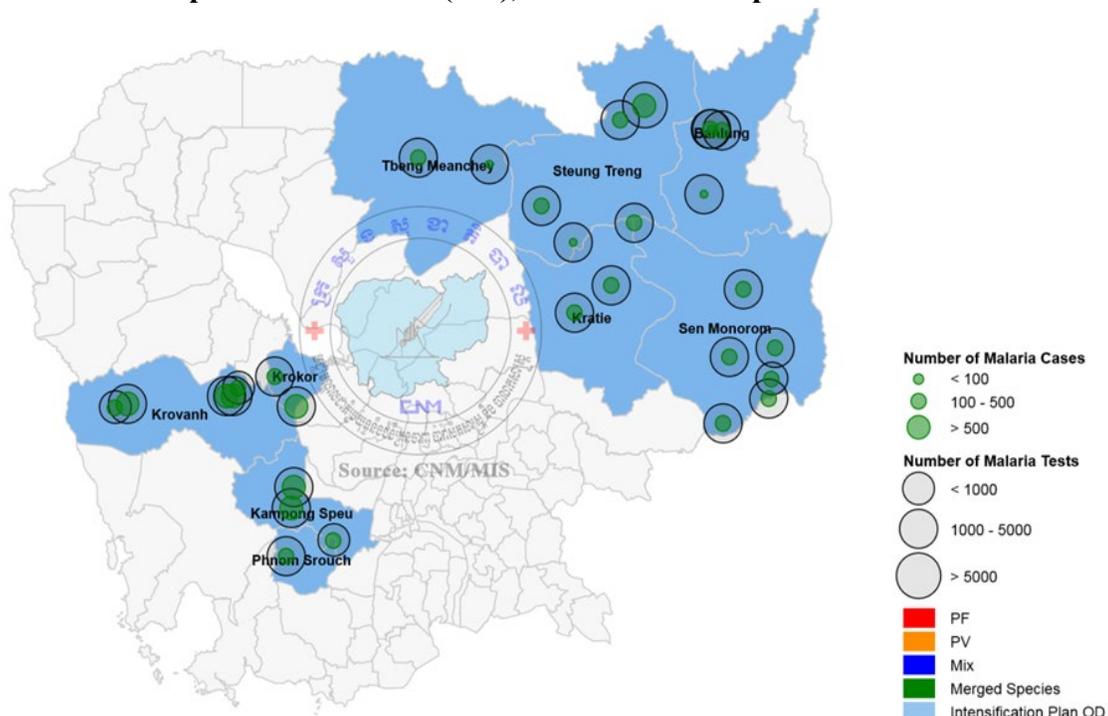
Due to an increase in malaria cases between 2017 and 2018 (as above), the Cambodian National Center for Parasitology, Entomology, and Malaria Control (CNM) worked with all malaria stakeholders to develop an intensification plan to prevent outbreak and reduce malaria interruption in the seven highest burden provinces: Kampong Speu, Kratie, Monduliri, Preah Vihear, Pursat, Ratanakiri, and Steung Treng. PMI funded the first phase of the intensification plan (October 2018-September 2019) in Pursat Province and Global Fund supported the remaining six provinces. As shown in Figure 4, the intensification plan catchment area included 30 health centers (HC) across 10 ODs in seven provinces that accounted for over 80% of the country’s case load.

The intensification plan included:

- 1) strengthening program coordination and ensuring full implementation of malaria elimination action framework interventions, and
- 2) implementing more aggressive approaches in populations with the highest risk, including forest goers and other MMPs. The intensification plan focused on the completion of seven key elements:
  - a. reliable monthly malaria epidemiological report and mapping analysis (up to village level);

- b. increased malaria testing during passive case detection activities according to CNM guidelines;
- c. adequate provision of key malaria commodities (artesunate-mefloquine [AS-MQ] treatment and rapid diagnostic tests [RDT]);
- d. mobile malaria workers (MMWs) to ensure better access to test and treatment of MMP and forest goers; (5) active testing of forest goers by MMW during forest outreach;
- e. continuous net distribution in villages and targeted net distribution to MMP; and
- f. distribution of forest packs to forest goers.

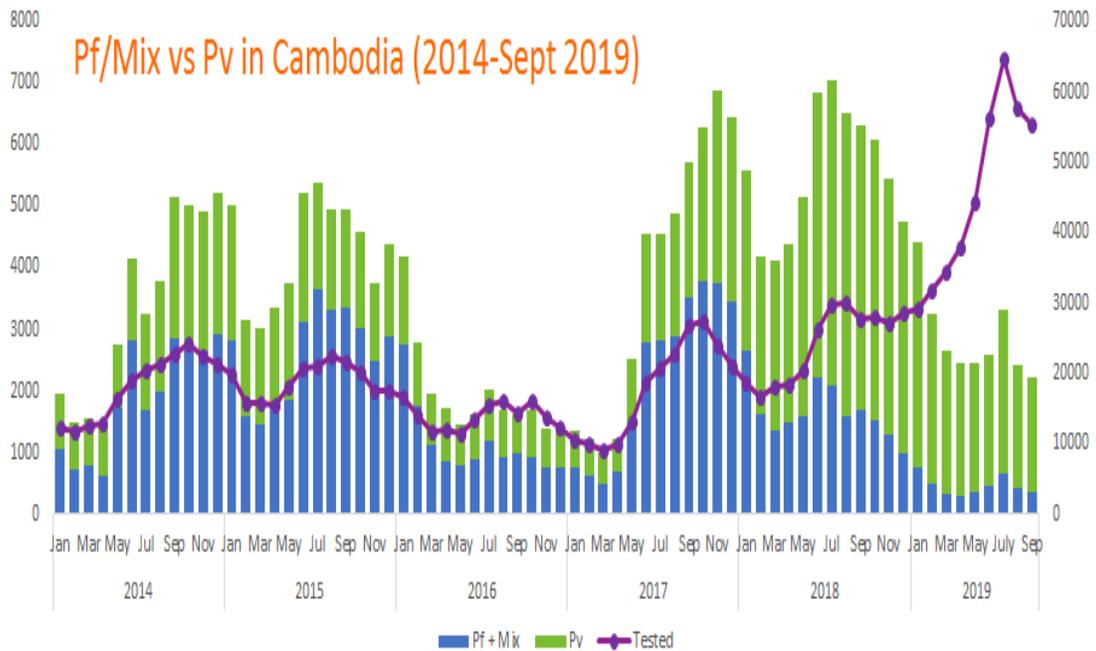
**Figure 4. Number of malaria cases and location of intensification plan activities by operational district (OD), October 2018-September 2019**



The intensification plan has resulted in a nearly 75% reduction in *P. falciparum* and mixed cases nationwide in 2019 compared to the same period in 2018. Furthermore, malaria testing at health facilities (HF) and in the community increased 2.5-fold (30,732 tests in 2018 to 78,770 tests in 2019), of which 84.5% had been conducted by MMWs and VMWs in targeted areas to improve testing among MMP (Figures 5 and 6).

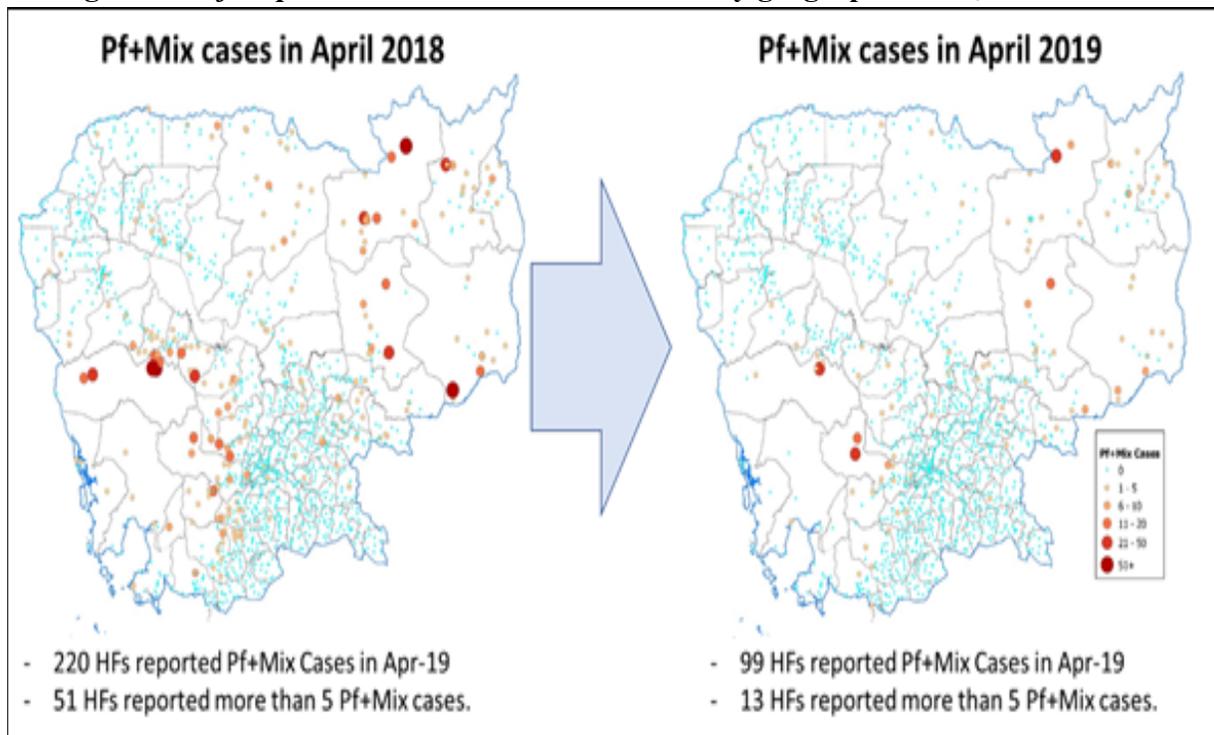
To achieve Cambodia's goal of eliminating *P. falciparum* by 2020, CNM has extended the intensification plan to phase two for an additional 15 months (October 2019-December 2020), which will continue this aggressive approach to target and mitigate the malaria burden among forest goers and other hard-to-reach populations.

**Figure 5. Malaria cases by species (*P. falciparum*, *P. vivax*, and mixed) and testing rates by month, 2014-2019**



Source: WHO Subregional Database

**Figure 6. *P. falciparum* and mixed malaria cases by geographic area, 2018 vs. 2019**



Source: National Malaria Programme Review, Kingdom of Cambodia, August 2019

**Figure 7. Key Indicators for Malaria Prevention and Treatment Coverage and Impact Indicators from Demographic Health Surveys (DHS) and Malaria Indicator Surveys (MIS) from 2005-2013**

Indicator	2005 DHS	2010 DHS	2014 DHS	2004 Malaria Survey	2007 Malaria Survey	2010 Malaria Survey	2013 Malaria Survey
% Households with at least one ITN <sup>1</sup>	5	n/a	n/a	36	43	75	90
% Households with at least one ITN for every two people	2	n/a	n/a	n/a	n/a	n/a	n/a
% Population with access to an ITN	3	n/a	n/a	n/a	n/a	n/a	n/a
% Population that slept under an ITN the previous night	3	n/a	n/a	29	25	53	60
% Children under five years of age who slept under an ITN the previous night	4	n/a	n/a	26	28	56	63
% Pregnant women who slept under an ITN the previous night	4	n/a	n/a	13	n/a	59	62
% Children under five years of age with fever in the last two weeks for whom advice or treatment was sought	82	n/a	n/a	n/a	n/a	n/a	n/a
% Children under five years of age with fever in the last two weeks who had a finger or heel stick	4	n/a	n/a	n/a	n/a	n/a	n/a
% Children receiving an ACT among children under five years old with fever in the last two weeks who received any antimalarial drugs	n/a	n/a	n/a	n/a	n/a	n/a	n/a
% Women who received two or more doses of IPTp during their last pregnancy in the last two years	n/a	n/a	n/a	n/a	n/a	n/a	n/a
% Women who received three or more doses of IPTp during their last pregnancy in the last two years	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Under-five mortality rate per 1,000 live births	83	54	35	n/a	n/a	n/a	n/a
% Children under five years of age with parasitemia (by <b>microscopy</b> , if done)	n/a	n/a	n/a	4	3	1	0.1
% Children under five years of age with parasitemia (by <b>RDT</b> , if done)	n/a	n/a	n/a	n/a	n/a	n/a	n/a
% Children under five years of age with severe anemia (Hb<8gm/dl)	5	n/a	n/a	n/a	n/a	n/a	n/a

<sup>1</sup> In household surveys, ITN indicators include conventional insecticide treated nets, LLINs and LLIHNs

**Figure 8. Evolution of Key Malaria Indicators Reported through Routine Surveillance Systems**

	2014	2015	2016	2017	2018
# Suspect malaria cases <sup>1</sup>	N/A	N/A	N/A	N/A	N/A
# Patients receiving diagnostic test for malaria <sup>2</sup>	247,725	226,008	166,570	209,032	281,820
Total # malaria cases <sup>3</sup> (confirmed and presumed)	49,157	52,383	23,627	45,991	65,114
# Confirmed cases <sup>4</sup>	48,530	51,336	23,367	45,183	64,479
# Presumed cases <sup>5</sup>	N/A	N/A	N/A	N/A	N/A
% Malaria cases confirmed <sup>6</sup>	99	98	99	98	99
Test positivity rate (TPR) <sup>7</sup>	20	23	14	22	23
Total # <5 malaria cases <sup>8</sup>	1,826	872	199	1,177	947
% Cases under 5 <sup>9</sup>	4	2	1	2	2
Total # severe cases	1,799	1,839	863	2,052	1,538
Total # malaria deaths <sup>10</sup>	13	8	1	1	0
# Facilities reporting <sup>11</sup>	1,243	1,274	1,270	1,361	1,327
Data form completeness (%) <sup>12</sup>	95	95	95	95	95

Data sources and comments: Data source is from HMIS; N/A = not available

Definitions:

<sup>1</sup> 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)

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

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

<sup>4</sup> # confirmed cases: Total diagnostically confirmed cases. All ages, outpatient, inpatient.

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

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

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

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

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

<sup>10</sup> Total # Malaria Deaths Reported: All ages, outpatient, inpatient, confirmed, and unconfirmed.

<sup>11</sup> Total # of health facilities reporting data into the HMIS/DHIS2 system for that year.

<sup>12</sup> 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).

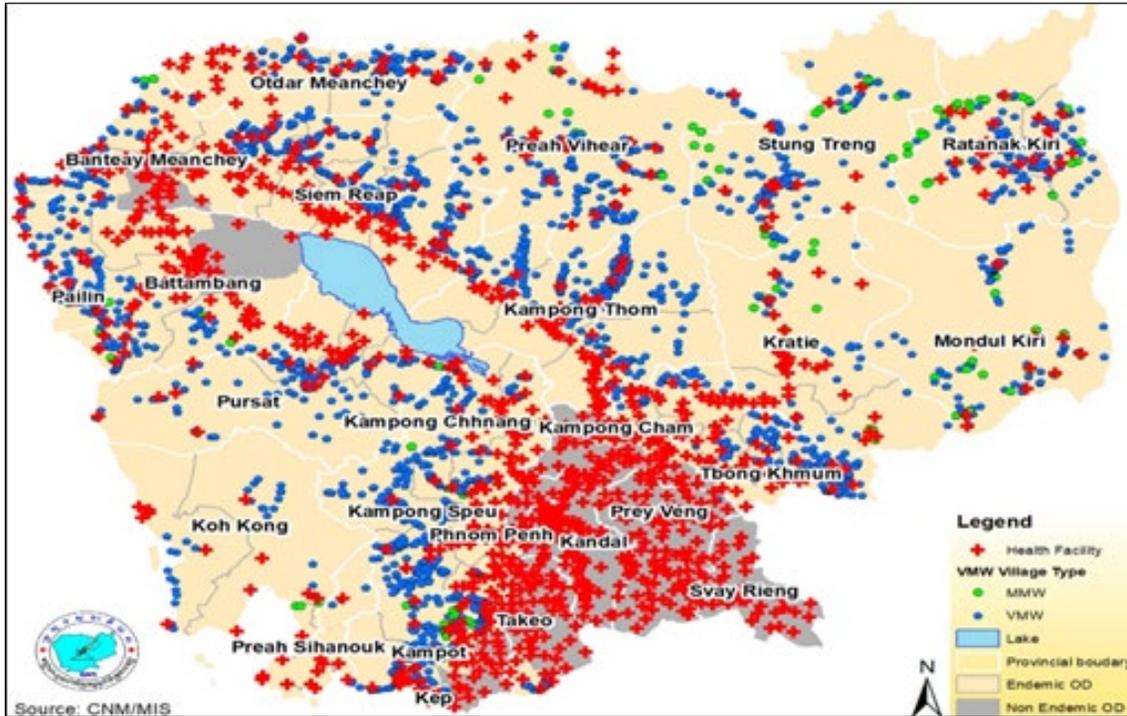
### III. OVERVIEW OF PMI'S SUPPORT OF CAMBODIA'S MALARIA CONTROL STRATEGY

Cambodia began implementation as a PMI focus country in FY 2012. The proposed FY 2020 PMI budget for Cambodia is \$9 million which will support activities which continue to align with the *National Strategic Plan (NSP) for Elimination of Malaria in the Kingdom of Cambodia, 2011-2025* and the *Malaria Elimination Action Framework (MEAF) 2016–2020*, the most updated plan from the National Malaria Control Program (NMCP) that considers the country's current epidemiological and programmatic context and changes in global and regional policy guidelines. The proposed activities also build on investments made by PMI and other partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), and investments from the Bill & Melinda Gates Foundation (BMGF) to improve and expand malaria-elimination activities.

Responsibility for the control and elimination of malaria rests with the National Center for Parasitology, Entomology, and Malaria Control (CNM), a specialized institution set up by the Ministry of Health (MoH), to function as the national department responsible for the control and elimination of vector-borne and parasitic diseases. CNM is evolving from a vertical program to a more decentralized and integrated program within the public health system. Responsibility for micro-planning of many activities has been devolved to staff at provincial health departments (PHDs) and ODs. The MoH also supports training for VMWs and MMWs to expand early diagnosis and treatment of malaria with dedicated provincial and district malaria teams.

VMWs and MMWs are the foundation of case detection, treatment, and surveillance for malaria elimination in Cambodia. Approximately 2,381 villages were covered by VMWs or MMWs at the end of 2018 and the total number of trained VMWs and MMWs was approximately 2,564 (see Figure 9).

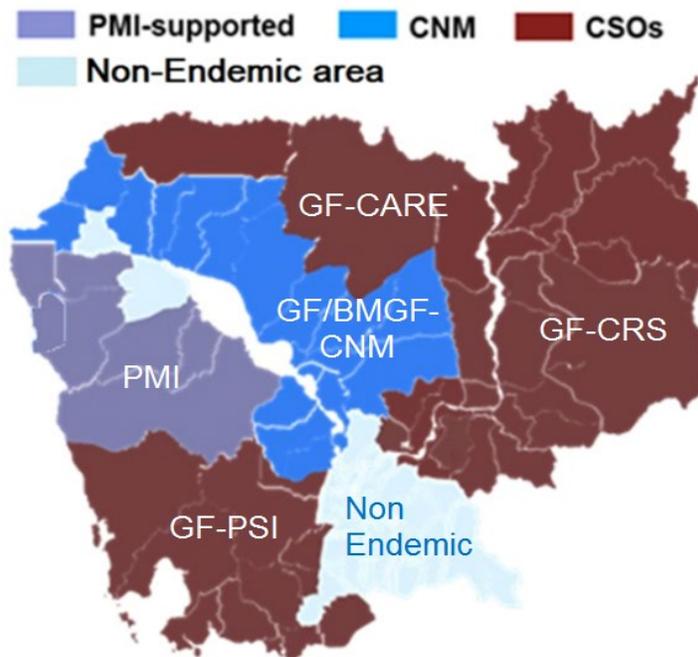
**Figure 9: Map showing VMW and MMW distribution in Cambodia, 2019**



Source: National Malaria Programme Review, Kingdom of Cambodia, August 2019

The main donors in Cambodia are Global Fund, PMI, and BMGF (Figure 10). The Global Fund has been the major donor for malaria control since 2005, most recently through the Regional Artemisinin-resistance Initiative 2 Elimination (RAI2e) grant awarded to the United Nations Office for Project Services (UNOPS) for activities implemented by CNM between 2018-2020. The Global Fund-supported activities have been divided geographically into five clusters; four clusters are supported by one of the four civil society organizations (CSOs); the fifth cluster is designated as a malaria elimination area and the activities are implemented by CNM, with technical assistance from the BMFG. PMI is the second largest donor supporting malaria control and elimination activities in Cambodia. It plays a key role in directly engaging each of the main donors to coordinate activities and leverage funding to more efficiently support CNM’s control and elimination activities. The BMGF supports CNM through technical assistance and capacity building on surveillance, monitoring and evaluation through activities implemented by the Clinton Health Access Initiative (CHAI).

**Figure 10. Major Donor Investments Broken Down by Geographical Region in Cambodia, 2019**

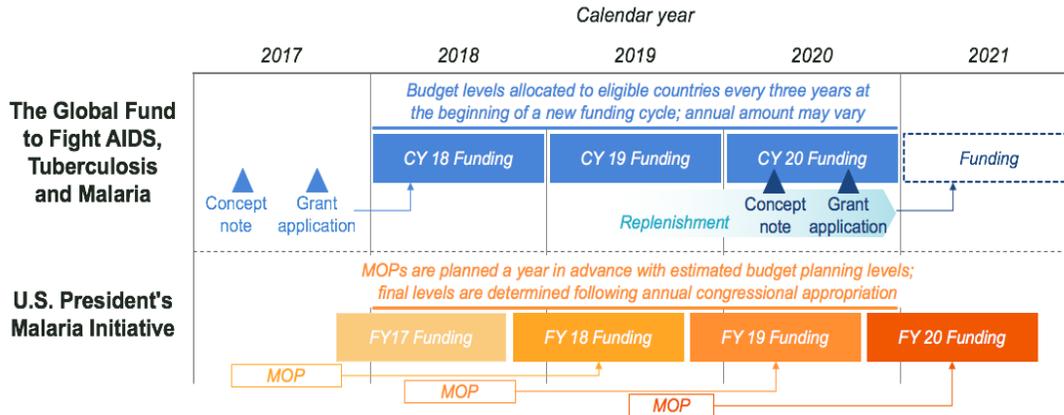


Global Fund (GF) operates through UNOPS for activities implemented through CNM and CSOs, including Population Services International (PSI), Catholic Relief Services (CRS) and CARE. PMI operates through implementing partner University Research Co. LLC (URC). The Bill & Melinda Gates Foundations supports CNM activities through the Clinton Health Access Initiative (CHAI). Modified from the National Malaria Programme Review Kingdom of Cambodia draft report, August 2019.

With FY 2020 funding, PMI will work with the CNM to support ongoing elimination activities in seven ODs in Battambang, Pailin, and Pursat Provinces in Western Cambodia, and to expand elimination activities in two ODs in Pursat Province. In addition, PMI will support the CNM to strengthen surveillance in five elimination ODs in Kampot, Kep, and Koh Kong Provinces. PMI will also support limited commodity gap filling, and provide technical assistance for surveillance, case management, supply chain management, social and behavior change (SBC), and capacity building for malaria elimination in Cambodia. In addition, PMI will support quality assurance (QA) of microscopy for malaria diagnosis, surveillance for antimalarial drug resistance, insecticide resistance, and vector monitoring activities.



**Figure 12. PMI and Global Fund Funding Cycle Alignment**



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

The tables below aim to summarize contributions by external partners and host country government in calendar years 2018-20, with the goal of highlighting total country investments. For Cambodia, data are available for PMI (FY 17-19) and Global Fund (CY 2018-20). Under the Global Fund RAI2E grant proposal for implementation in 2018-2020, Cambodia has been allocated a total of \$43 million over three years, which supports increased malaria service coverage for at-risk populations and strengthening of national surveillance systems.

In addition, as the Global Fund 2021-23 grant funding cycle is not yet underway at the time of this PMI FY 2020 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.

**Figure 13. Non-PMI funding landscape in Cambodia**

Funding Source	Total Budget in \$	Duration	Key Implementing Partners	Key Activities
Domestic	\$1M	Annually	CNM	Salaries, operational and maintenance costs, and IEC publications
Global Fund RAI2E (country component)	\$43M	2018-2020	UNOPS	Increased malaria service coverage for at-risk populations and strengthening of national surveillance systems

**Figure 14. Annual Budget by Level 1 Category**

Year <sup>1</sup>	Funder	Vector Control	Case Management	Drug-Based prevention <sup>2</sup>	Supply Chain <sup>3</sup>	Monitoring, Evaluation & Research	Other Cross-Cutting and Health Systems Strengthening	Total
FY17	PMI	\$2.5M	\$4.0M	-	\$0.4M	\$1.7M	\$1.4M	\$10.0M
	<b>Total</b>	<b>\$3.28M</b>	<b>\$7.0M</b>	-	<b>\$1.54M</b>	<b>\$2.1M</b>	<b>\$8.37M</b>	<b>\$23.3M</b>
FY18	PMI	\$1.8M	\$3.0M	-	\$0.6M	\$1.7M	\$2.9M	\$10.0M
	<b>Total</b>	<b>\$4.1M</b>	<b>\$8.0M</b>	-	<b>\$1.56M</b>	<b>\$2.45M</b>	<b>\$12.13</b>	<b>\$28.5M</b>
FY19	PMI	\$1.4M	\$4.4M	-	\$0.7M	\$1.2M	\$1.3M	\$9.0M
	<b>Total</b>	<b>\$2.2M</b>	<b>\$8.52M</b>	-	<b>\$1M</b>	<b>\$1.57M</b>	<b>\$9.7M</b>	<b>\$23.2M</b>

<sup>1</sup> PMI budget data accurate as of Sept 1, 2019.

<sup>2</sup> Drug-based prevention, including SMC and MIP where relevant;

<sup>3</sup> Covers management of in-country warehousing & distribution of malaria commodities, except for LLIN/LLIHNS which are separately captured under "Vector Control"

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

**Figure 15. Annual budget by Level 3 category, detailed breakdown for PMI**

Level 1 Category	Level 3 Category	FY17 <sup>1</sup>	FY18 <sup>1</sup>	FY19 <sup>1</sup>
		PMI	PMI	PMI
<b>Vector Control</b>	Procure LLIN/LLIHNS for Continuous Distribution	\$1.5M	\$0.7M	\$0.5M
	Distribute LLIN/LLIHNS via Continuous Distribution	\$0.4M	\$0.3M	\$0.2M
	Procure LLIN/LLIHNS for Mass Campaigns	-	-	-
	Distribute LLIN/LLIHNS via Mass Campaigns	-	-	-
	Other LLIN/LLIHN Implementation*	-	-	-
	IRS Implementation <sup>4</sup>	-	-	-
	Procure IRS Insecticide <sup>4</sup>	-	-	-
	Other IRS*	-	-	-
	Entomological Monitoring	\$0.7M	\$0.8M	\$0.8M
	SBC for Vector Control <sup>5</sup>	-	-	-
Other vector control measures	-	-	-	

Level 1 Category	Level 3 Category	FY17 <sup>1</sup>	FY18 <sup>1</sup>	FY19 <sup>1</sup>
		PMI	PMI	PMI
	Removing human rights- and gender-related barriers to vector control programs**	-	-	-
Case Management	Active Case Detection**	-	-	-
	Community-based case management	-	-	-
	Facility-based case management	-	-	-
	Private-sector case management	-	-	-
	Procure ACTs	\$0.1M	\$0.1M	-
	Procure Drugs for Severe Malaria	-	-	-
	Procure Other Diagnosis-Related Commodities	-	-	\$0.1M
	Procure Other Treatment-Related Commodities	-	-	-
	Procure RDTs	\$0.2M	\$0.3M	\$0.0M
	Therapeutic Efficacy	\$0.3M	\$0.3M	\$0.3M
	SBC for Case Management <sup>5</sup>	-	-	-
	Other Case Management	\$3.5M	\$2.4M	\$4.0M
Drug-Based Prevention <sup>2</sup>	Procure SMC-Related Commodities	-	-	-
	SMC Implementation	-	-	-
	Prevention of Malaria in Pregnancy Implementation	-	-	-
	Procure IPTp-Related Commodities	-	-	-
	IPTi**	-	-	-
	SBC for Drug-Based Prevention <sup>5</sup>	-	-	-
Supply Chain <sup>3</sup>	Other Prevention**	-	-	-
	In-Country Supply Chain <sup>3</sup>	-	-	-
	Supply Chain Infrastructure	-	-	-
	Ensuring Quality	-	-	-
	Pharmaceutical Management Systems Strengthening	\$0.4M	\$0.6M	\$0.7M

Level 1 Category	Level 3 Category	FY17 <sup>1</sup>	FY18 <sup>1</sup>	FY19 <sup>1</sup>
		PMI	PMI	PMI
	Supply Chain System Strengthening	-	-	-
<b>Monitoring, Evaluation &amp; Research</b>	Reporting, Monitoring, and Evaluation	\$1.2M	\$1.3M	\$1.0M
	Program and data quality, analysis and operations research	\$0.5M	\$0.4M	-
	Surveys	-	-	-
	Other Data Sources**	-	-	-
	Support for FETP*	-	-	\$0.2M
<b>Other Cross-Cutting and Health Systems Strengthening</b>	Integrated service delivery, quality improvement, and national health strategies**	-	-	-
	Financial management systems**	-	-	-
	Community responses and systems**	-	-	-
	Support for PCV and SPAs*	-	-	-
	Cross-Cutting Human Resources for Health**	-	-	-
	Central and Regional Program management <sup>6</sup>	\$0.2M	\$0.3M	\$0.3M
	In-Country Staffing and Administration*	\$0.8M	\$1.7M	\$0.7M
	Other Program Management**	-	-	-
	SBC Unspecified <sup>5</sup>	\$0.4M	\$0.9M	\$0.2M
<b>Total</b>		<b>\$10.0M</b>	<b>\$10.0M</b>	<b>\$9.0M</b>

<sup>1</sup> PMI budget data accurate as of Sept 1, 2019;

<sup>2</sup> Drug-based prevention, including SMC and MIP where relevant;

<sup>3</sup> Covers management of in-country warehousing & distribution of malaria commodities, except for LLIN/LLIHNS which are separately captured under "Vector Control";

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

<sup>5</sup> 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).

<sup>6</sup> PMI Proposed Activity "National-level support for case management" rolls up under "Case Management" Level 1

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

\* Category currently funded by PMI only

\*\* Category currently funded by Global Fund only

**Figure 16. Annual Budget, Breakdown by Commodity**

Year <sup>1</sup>	Funder	LLIN/LLIHNs for Continuous Distribution	LLIN/LLIHNs for Mass Distribution	IRS Insecticide <sup>3</sup>	ACTs	RDTs	Severe Malaria	SMC-Related	IPTp-Related	Total
FY17	PMI <sup>2</sup>	\$1.5M	-	-	\$0.1M	\$0.2M	-	-	-	\$1.7M
	<b>Total</b>	<b>\$1.5M</b>	-	-	<b>\$0.1M</b>	<b>\$0.2M</b>	-	-	-	<b>\$1.7M</b>
FY18	PMI <sup>2</sup>	\$0.7M	-	-	\$0.1M	\$0.3M	-	-	-	\$1.1M
	<b>Total</b>	<b>\$0.7M</b>	-	-	<b>\$0.1M</b>	<b>\$0.3M</b>	-	-	-	<b>\$1.1M</b>
FY19	PMI <sup>2</sup>	\$0.5M	-	-	-	\$0.03M	-	-	-	\$0.5M
	<b>Total</b>	<b>\$0.5M</b>	-	-	-	<b>\$0.03M</b>	-	-	-	<b>\$0.5M</b>

<sup>1</sup> PMI budget data accurate as of Sept 1, 2019;

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

<sup>3</sup> IRS insecticide; for PMI, IRS insecticide commodity costs may be inextricable from IRS implementation costs in historical data – field left blank where this is the case.

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

## V. ACTIVITIES TO BE SUPPORTED WITH FY 2020 FUNDING

Please see the FY 2020 budget tables (Tables 1 and 2) for a detailed list of activities PMI proposes to support in Cambodia with FY 2020 funding. Please refer to [www.pmi.gov/resource-library/mops](http://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

<b>NMCP objective</b>
CNM aims to cover at least 90% of populations at risk of malaria with an appropriate vector control intervention, which includes LLINs and LLIHNs for forest goers. The CNM target is to provide one LLIN per two persons and one LLIHN per household in at-risk areas.
<b>NMCP approach</b>
CNM stratifies malaria risk for each village annually to identify target areas for LLIN/LLIHN distribution. LLINs were distributed through mass campaigns in 2015 and 2018. In addition, LLINs/LLIHNs are distributed continuously through health centers and VMWs/MMWs to persons or households without LLINs or with LLINs in need of replacement. LLINs/LLIHNs are also distributed to places of employment, such as farms, plantations, and industrial sites as identified by the CNM. In addition, LLIHNs are distributed continuously to forest goers at selected access points near the forests.
<b>PMI objective, in support of NMCP</b>
<ul style="list-style-type: none"> <li>• PMI supports the procurement and distribution of LLINs/LLIHNs through various channels including mass campaigns and continuous distribution through health centers and VMWs/MMWs.</li> <li>• PMI also supported one site in Pursat province in 2018-2019 to identify primary and secondary vectors along the forest fringe; in CY 2020 PMI will support an additional two sites in transitional ODs in the northeast of the county.</li> </ul>
<b>PMI-supported recent progress (past ~12-18 months)</b>
<ul style="list-style-type: none"> <li>• PMI procured 192,409 LLINs and 134,035 LLIHNs for distribution in Cambodia. However, CNM reported a surplus of LLINs/LLIHNs through 2020 and orders for an additional 100,000 LLINs and 50,000 LLIHNs</li> <li>• PMI trained and supplied 1,167 forest rangers on the distribution of LLINs/LLIHNs to forest-goers. The forest rangers distributed 22,241 LLIHNs and 1,490 LLINs.</li> <li>• PMI conducted entomological monitoring at one site in Pursat Province to identify potential malaria vectors along the forest fringe.</li> <li>• With PMI support, CNM and other partners piloted foci investigations which included an entomological component to assess the risk of local transmission.</li> </ul>

<ul style="list-style-type: none"> <li>PMI also supported CNM to strengthen capacity to conduct entomological monitoring through short-term training of 26 malaria staff from PHDs and ODs in Battambang and Pursat Provinces. An additional 52 HC staff and VMWs were also provided training in basic entomology.</li> </ul>
<p><b>PMI-supported planned activities (next ~12-18 months, supported by currently available funds)</b></p>
<ul style="list-style-type: none"> <li>PMI will continue to support the distribution of LLINs and LLIHNs through HC, VMWs, and MMWs.</li> <li>Procurement of additional LLINs/LLIHNs are on hold given the surplus reported by CNM but PMI plans to procure LLINs for the 2021 mass campaign using FY20 MOP resources as Cambodia may experience a gap in Global Fund support between the end of the current funding cycle (RAI2e) and the start of the new award.</li> <li>PMI will continue to support entomological monitoring in three sites in Cambodia with an emphasis on insecticide resistance among the primary and secondary vectors.</li> </ul>

**1.A. ENTOMOLOGICAL MONITORING**

<p><b>Key Goal</b></p>
<p>Determine the geographic distribution, bionomics, and insecticide resistance profiles of the main malaria vectors in the country to inform vector control decision-making</p>

<p><b>Do you propose expanding, contracting, or changing any entomological monitoring activities? If so, why and what data did you use to arrive at that conclusion?</b></p>
<p>Entomological monitoring activities supported by PMI will remain the same although emphasis will be on obtaining insecticide resistance data to assess susceptibility status of primary vectors to pyrethroid insecticides used on LLINs/LLIHNs.</p> <p>Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.</p>

**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. Entomological Monitoring**

Province	Total sentinel sites	Activities	Supported by
Pursat	1	Vector bionomics, insecticide resistance monitoring	PMI (planned)
Mondulkiri	1	Vector bionomics, insecticide resistance monitoring	PMI (planned)
Steung Treng	1	Vector bionomics, insecticide resistance monitoring	PMI (planned)
Ratanakiri	1	Vector bionomics, insecticide resistance monitoring	Global Fund
Pailin	1	Vector bionomics, insecticide resistance monitoring	Global Fund
Koh Kong	1	Vector bionomics, insecticide resistance monitoring	Global Fund
Siem Reap	1	Vector bionomics, insecticide resistance monitoring	Global Fund

Entomological monitoring was conducted with PMI support in one province (Pursat Province) with plans to conduct additional monitoring in two other provinces (Mondulkiri and Steung Treng Provinces) beginning in late 2019. Global Fund provided support for entomological monitoring in four provinces, but these data are currently not available.

**Figure A2. Major and Minor Vectors by Site**

Site	Major Vector	Minor Vector	Peak Abundance	Preferred Biting Location	Preferred Resting Location	Preferred Host	Peak Sporozoite Rate	Annual EIR*
Pursat	<i>An. dirus</i>	<i>An. minimus</i> <i>An. maculatus</i> <i>An. hyrcanus</i>	July - September	Outdoors	Outdoors		NA	NA
Ratanakiri	<i>An. dirus</i>	<i>An. minimus</i> <i>An. maculatus</i> <i>An. barbirostris</i> <i>An. nivipes</i> <i>An. peditaeniatus</i>	July - September	Outdoors	Outdoors		NA	NA

\* Entomological Inoculation Rate

The primary vector in Cambodia is *An. dirus* which is predominantly a forest dwelling species. *An. minimus* and *An. maculatus* are considered secondary vectors that are often found in the forest fringe areas. However, recent studies suggest several additional species may be secondary vectors including *An. barbirostris*, *An. hyrcanus*, *An. nivipes*, and *An. peditaeniatus*. These species are more widespread and found outside forested areas. However, natural infection among these species has been observed in only a single published report and needs confirmation. Entomological monitoring in Pursat Province in 2018-2019 showed *An. dirus*, *An. maculatus* and *An. minimus* were uncommon but *An. barbirostris*, *An. hyrcanus*, *An. nivipes*, and *An.*

*peditaeniatus* were commonly found, although they were primarily collected in cattle baited traps. Sporozoite ELISAs to assess natural infection in these mosquitoes are currently on-going.

### **Conclusion**

The primary vectors of malaria in Cambodia are associated with the forest and forest fringe areas. However, recent evidence that additional secondary vectors may contribute to malaria transmission should be confirmed or ruled out. The results will have implications on where LLIN distribution should be focused in Cambodia.

### **Key Question 2**

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

### **Supporting Data**

The insecticide resistance profile of primary and secondary vectors in Cambodia is more than 10 years old. *An. dirus* and *An. minimus* are reported to be susceptible to pyrethroid insecticides while resistance has been observed in suspected vectors such as *An. barbirostris*, *An. epiroticus*, and *An. vagus*. Recent attempts to obtain insecticide resistance data have experienced challenges due to low numbers of mosquitoes. These data need updating to guide the most appropriate LLINs/LLIHNs for Cambodia.

### **Conclusion**

The insecticide resistance profile of the primary and secondary vectors of malaria in Cambodia need to be updated. These data are essential for guiding LLIN/LLIHN procurement decisions.

### **Key Question 3**

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

### **Supporting Data**

N/A

### **Conclusion**

N/A

## 1.B. INSECTICIDE-TREATED NETS (ITNs)

### PMI Goal

Achieve high coverage and usage of LLINs in villages with malaria risk and LLIHNs among forest goers. PMI aims to maintain high coverage and use through periodic mass campaigns and through continuous channels including HC, VMWs, and MMWs.

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

Funding for LLIN/LLIHNs decreased slightly in FY 2020 as Cambodia currently has a large surplus of nets that is expected to extend into 2021. However, PMI will continue to procure some LLIN/LLIHNs given the uncertainty if funding from the new Global Fund grant would be available for the next mass campaign.

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

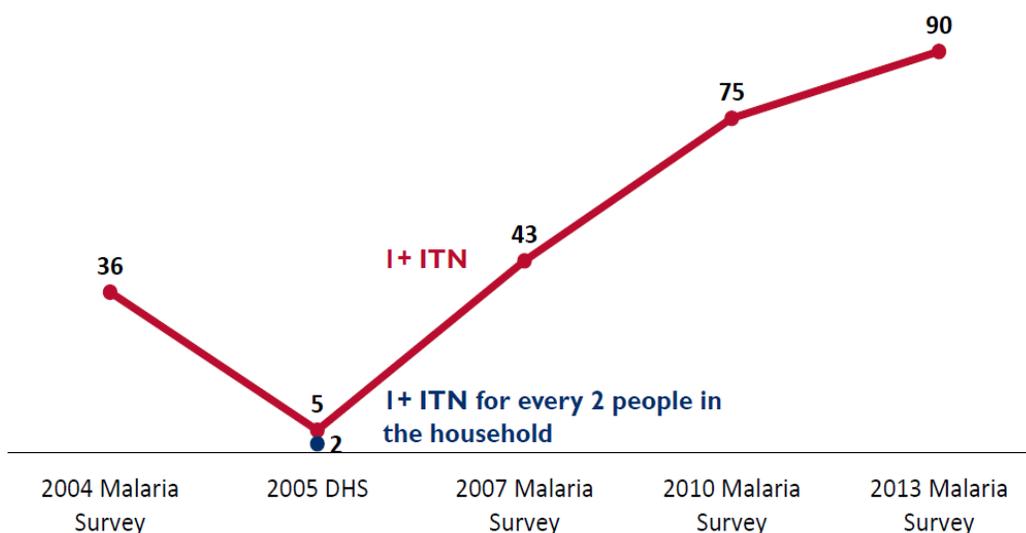
### Key Question 1

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

### Supporting Data

**Figure A3. Trends in ITN Ownership**

*Percent of households*



*Note: Household survey indicators for ITNs include conventional insecticide treated nets, LLINs, and LLIHNs.*

## Conclusion

Cambodia has made significant progress to increase the number of households at risk with at least one ITN (including LLINs, LLIHNs, and conventional treated nets), reaching 90% by 2013. Data from the most recent Cambodia Malaria Survey in 2017 have not been released. However, there was a mass campaign to distribute LLINs in 2018; therefore, net ownership is expected to remain high.

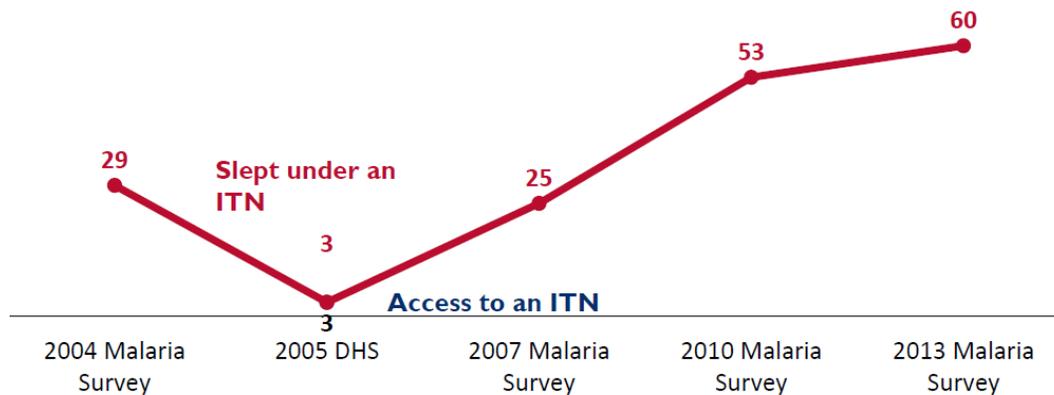
## Key Question 2

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

## Supporting Data

**Figure A4. 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*



*Note: Household survey indicators for ITNs include conventional insecticide treated nets, LLINs, and LLIHNs.*

## Conclusion

ITN use (including use of LLINs, LLIHNs, and conventional treated nets) has risen along with ITN ownership and reached 60% in the 2013 Cambodia Malaria Survey. Among different groups, ITN use was generally lower among the forest going populations that are at the highest risk of malaria suggesting the need for better targeting and SBC messaging. However, relatively few forest-going populations were surveyed in the 2013 malaria survey (n=879 of 16,698 individuals surveyed), limiting broad interpretation of these data. Better understanding of

optimal targeting and SBC messaging for this mobile population will be supported by PMI in MOP 2020 (as below).

### 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 A5. Key Barriers and Facilitators to ITN Use**

Facilitator	Type of Factor	Data Source	Evidence
Knowledge about Malaria Transmission	Social	Malar J. 2017; 16: 378.	More than 94% of respondents among mobile migrants reported knowing how malaria is transmitted and using a net the previous night.
Social Norms of Net Use	Social	Cambodia Malaria Survey 2013	Approximately 26% of nets are purchased rather than provided by government or non-government sources through mass campaigns and routine distribution of ITNs including LLINs.
Barrier	Type of Factor	Data Source	Evidence
Perception of Risk of Mosquito Bites	Internal	PSI/PHB Partner report	Surveys of net usage indicate that usage can be seasonal and associated with perceived risk of mosquito bites, with lower use during the dry season when mosquito densities are lower.
Attributes of LLINs	Internal	PSI/PHB Partner report	In surveys of net usage, net owners expressed a preference for large polyester nets and were less likely to appreciate and use nets that were made from polyethylene or were considered too small.
Inconvenience of Net Use in Forest Areas	Internal	Discussions with Forest Goers	Use of LLINs/LLIHNs was reported to be low by forest goers interviewed on a site visit. The LLINs/LLIHNs were an additional item to carry into the forest and it was difficult to hang them in the forest. Furthermore, forest goers were often working at the time of peak biting and reported biting throughout the day.

## Conclusion

Knowledge about the benefits of sleeping under an ITN is high and there is a culture of net use. However, many users prefer conventional nets that can be purchased on the local market due to preferences for large polyester nets. Net use also fluctuates seasonally as the perceived risk of mosquito bites either increases or declines. Lastly, forest goers especially may be less likely to use LLIN/LLIHNs due to the inconvenience of carrying nets to the forest and finding a suitable place to hang them.

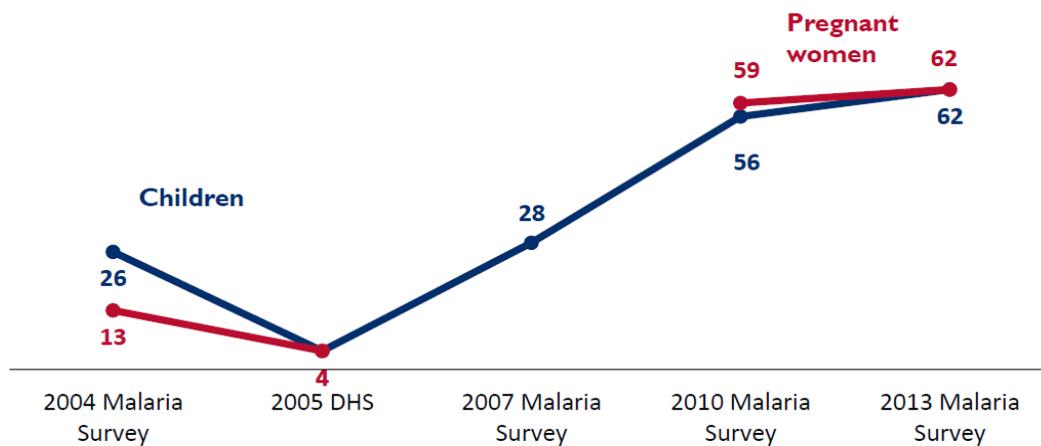
## Key Question 4

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

## Supporting Data

**Figure A6. Trends in ITN Use among Children and Pregnant Women**

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



*Note: Household survey indicators for ITNs include conventional insecticide treated nets, LLINs, and LLIHNs.*

## Conclusion

ITN use by pregnant women and children tracks similarly to overall ITN use even though pregnant women and children are not specifically targeted in Cambodia.

## Key Question 5

What channels are used to distribute LLIN/LLIHNs?

## Supporting Data

LLINs and LLIHNs are distributed through periodic mass campaigns and through routine community-based distribution through HC, VMWs, MMWs, and forest rangers.

**Figure A7. LLIN/LLIHN Distribution Channels 2015 - 2021**

	2015	2016	2017	2018	2019	2020	2021
EPI							
ANC							
Schools							
Community		165,240	214,000	117,387	153,511	153,511	153,511
Mass Campaign				2,230,363	264,004		X

## Conclusion

Currently LLINs and LLIHNs are distributed through community-based channels (HC, VMWs, and MMWs) and periodic mass campaigns. PMI will support net procurement to fully meet the needs for continuous distribution. Net needs for the next mass campaign have not yet been quantified. While it is expected that Global Fund will support the next mass campaign, PMI will provide a buffer should funding from the Global Fund not be available for timely procurement of nets.

## Key Question 6

What was the estimated need for LLINs and LLIHNs during calendar year? What are the estimated LLIN/LLIHN needs over calendar years 2020 and 2021? What volume of LLINs and LLIHNs are available from partners and the public sector for the next three calendar years?

## Supporting Data

**Figure A8. Estimated LLIN/LLIHN Needs**

Calendar Year	2019	2020	2021
Total Targeted Population <sup>1</sup>	3,069,754	3,117,028	3,165,030
<b>Continuous Distribution Needs</b>			
Channel #1: ANC	0	0	0
Channel #2: EPI			
Channel #3: Village Malaria Workers <sup>2</sup>	153,511	153,511	153,511
Channel #4: MOE and MAFF (Distribution to MMP)	30,000	0	0
Estimated Total Need for Continuous Channels <sup>3</sup>	183,511	153,511	153,511

Calendar Year	2019	2020	2021
<b>Mass Campaign Distribution Needs</b>			
Mass distribution campaign <sup>4</sup>			
Estimated Total Need for Campaigns <sup>4</sup>	0	0	
<b>Total ITN Need: Routine and Campaign</b>	<b>183,511</b>	<b>153,511</b>	<b>153,511</b>
<b>Partner Contributions</b>			
ITNs carried over from previous year	1,051,250	1,194,183	1,265,672
ITNs from Government	0	0	0
ITNs from Global Fund	0	0	0
ITNs from other donors	0	0	0
ITNs planned with PMI funding <sup>5</sup>	326,444	225,000	0
<b>Total ITNs Available</b>	<b>1,377,694</b>	<b>1,419,183</b>	<b>1,265,672</b>
<b>Total ITN Surplus (Gap)</b>	<b>1,194,183</b>	<b>1,265,672</b>	<b>1,112,161</b>

**Footnotes:**

<sup>1</sup> Source of data: Temple Garden Foundation (TGF) funding request indicated population targeted for LLIN/LLIHN distribution based on targeted villages on the basis of Annual Parasite Index (API)

<sup>2</sup> No ITNs are distributed through ANC. Pregnant women and newborns are covered through continuous distribution by VMWs

<sup>3</sup> Distribution targets were sourced from TGF grant- refer to the quantification in the beginning of grant application shared by UNOPS. In 2021, this is just estimated number. The needs include 10% buffer stock.

<sup>4</sup> Mass net campaigns are usually conducted every three years with the last campaign in 2018. Although the next campaign is projected to be in 2021, it is dependent on the availability of Global Fund funding. As the Global Fund application is currently under development, forecasting data are not currently available and a specific number cannot be included at this time.

<sup>5</sup> Data source for 2019: ARTMIS. The 326,444 nets are expected in November 2019. Data source for 2020: MOP2019.

## Conclusion

Currently LLINs and LLIHNs are distributed through community-based channels (HC, VMWs, and MMWs) and periodic mass campaigns. PMI will support net procurement to fully meet the needs for continuous distribution. Net needs for the next mass campaign have not yet been quantified. While it is expected that Global Fund will support the next mass campaign, PMI will provide a buffer should funding from the Global Fund not be available for timely procurement of nets.

## Key Question 7

What is the current status of durability monitoring?

## Supporting Data

**Figure A9. Durability Monitoring Plan 2018 - 2020**

Campaign Date	Sites	Brands	Baseline	12-month	24-month	36-month
February 2018	Battambang, Pursat	DawaPlus 2.0	X	X		

**Conclusion**

Durability monitoring is currently ongoing; conclusions will be presented at the end of the monitoring activity.

**Key Question 8**

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

**Supporting Data**

N/A

**Conclusion**

N/A

## 2. HUMAN HEALTH

### 2.A CASE MANAGEMENT in health facilities and communities

<b>NMCP objective</b>
CNM's case management objectives (MEAF 2016-2020) are: <ul style="list-style-type: none"><li>• Strengthen the parasitological detection of malaria infections</li><li>• Ensure prompt efficacious treatment of all confirmed uncomplicated malaria cases to prevent progression to severe disease and death, as well as the emergence of drug resistance</li><li>• Place VMW in all villages in malaria risk areas</li><li>• Strengthen quality assurance (QA) and quality control (QC) systems for malaria diagnosis and for antimalarial drugs</li></ul>
<b>NMCP approach</b>
<ul style="list-style-type: none"><li>• Cambodia has already made great progress toward achieving universal coverage of case management services, ensuring 100% parasitological diagnosis of all suspected cases, and provision of effective treatment of all confirmed cases, particularly at the community level through a network of VMW and MMW established in 2004. As of 2018, approximately 2,564 VMWs and MMWs have been trained in malaria case management. As a result, VMW and MMW are predominantly the first access points for diagnosis and treatment of uncomplicated malaria.</li><li>• The first line drug for all species malaria is AS-MQ. Single low dose primaquine (SLD PQ) is recommended for <i>P. falciparum</i>.</li><li>• For <i>P. vivax</i>, if a patient's glucose-6-phosphate dehydrogenase (G6PD) enzyme testing result is normal, 14 days of primaquine (PQ), in addition to AS-MQ, is recommended for radical cure. G6PD testing and radical cure for <i>P. vivax</i> is currently being piloted in four provinces (Battambang, Kampong Chhnang, Kampong Speu, and Pailin).</li><li>• Since May 2018, the MOH has banned all malaria diagnosis and treatment in the private sector; private providers are expected to refer patients with suspected malaria to public facilities.</li></ul>
<b>PMI objective, in support of NMCP</b>
<ul style="list-style-type: none"><li>• The activities that PMI supports align with the MEAF 2016-2020. PMI works with the CNM to support elimination and transition to elimination activities in provinces in Western Cambodia. PMI supports gap-filling for malaria case management commodities, integrated drug efficacy surveillance (iDES), therapeutic efficacy studies (TES), and quality microscopy.</li></ul>

- Furthermore, PMI is supporting the development of new communication tools and job aids for health care providers to help improve acceptance and implementation of elimination activities especially for diagnosis, case investigation, and treatment.

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

- PMI continues to support training and supervision of 560 VMWs and staff from 125 public health facilities in PMI-targeted areas. This includes specific training on the management of severe malaria, radical cure treatment for *P. vivax*, G6PD testing and malaria during pregnancy. In the past 12 months, 42,264 patients tested for malaria received malaria key messages from HF staff and VMWs in the five elimination ODs through SBC support from PMI. Furthermore, VMWs reached and provided malaria key messages to 30,425 mobile migrant persons (usually at farms) during monthly ITN use monitoring meetings. Also, PMI supported Battambang PHD to produce and broadcast public service announcements to provide information on malaria treatment and testing for at-risk populations during peak seasons. Due to reductions in the number of malaria cases in this province, the PSAs stopped broadcasting in January 2019.
- PMI procured 85,000 RDTs for CNM in the last 12 months; most commodities are procured for the Cambodia NMCP by the Global Fund under the RAI2e grant. This procurement provided continuity of RDT supply while CNM was awaiting supplies from the Global Fund.
- PMI supported WHO and CNM to conduct therapeutic efficacy studies (TES) in five provinces (Kratie, Mondulkiri, and Pursat Provinces - TES for AS-MQ; Kampong Speu and Ratanakiri Provinces - TES for AS-PYR). Clinical efficacy at 42 days was estimated to be 100% for AS-MQ and 98% for AS-PYR.
- Pilot testing of iDES began in June 2019 in Takeo Province; preliminary results are expected later this year.
- PMI is supporting radical cure for *P. vivax* via G6PD testing and PQ (if normal G6PD) in two provinces (Battambang and Pailin Provinces) through the Cambodia Malaria Elimination Project (CMEP). Training has been completed and G6PD RDTs have arrived in Cambodia; piloting of this approach will commence in December 2019.
- Lastly, PMI supported CNM, through WHO, to strengthen the QA of malaria diagnosis. This was done through a comprehensive review and update of CNM's QA activities, including development of an operations manual that includes protocols on how to conduct: (1) microscopy trainings; (2) supervision and monitoring of malaria laboratories; (3) slide-checking and validation of slides; (4) and management of CNM's national malaria slide bank.

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

- PMI will procure RDTs for malaria diagnosis and new point-of-care G6PD RDTs to expand implementation of radical cure of *P. vivax* infections and support facility and community-based case management.
- In addition, PMI will support CNM, through WHO, to perform TES in five provinces (Kratie, Mondulkiri, and Pursat Provinces - TES for AS-MQ; Kampong Speu and Ratanakiri Provinces - TES for AS-PYR) and to expand pilot testing of iDES in Takeo Province to four other provinces (Banteay Meanchey, Kratie, Mondulkiri, and Steung Treng - all testing for AS-MQ effectiveness).
- PMI will support development and implementation of effective SBC approaches for target elimination and control ODs. Careful consideration will be given to training of health workers and VMWs, and tailoring of SBC messages according to identified risk factors. PMI will assist the CNM to identify those risk factors and to refine approaches in support of the National SBC Strategy. In elimination areas, SBC efforts will also focus on increasing acceptance of reactive/active case detection in the context of declining infections. In control areas, PMI will continue supporting SBC activities (IEC and media) to reach the highest risk groups by focusing on improving coverage and use of malaria prevention measures (LLINs/LLIHs), increasing awareness of MIP, dangers of counterfeit antimalarials, as well as ensuring prompt diagnosis and effective treatment.
- Regarding diagnostic quality assurance, PMI will support wide dissemination of the QA operations manual including tools developed for supervision and cross-checking of slides and the curriculum developed for microscopy training and assessment of microscopists. Furthermore, lot testing of malaria RDTs through the WHO-FIND Lot Testing Programme will be supported.

**PMI Goal**

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

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

Many of the activities in FY 2020 will remain the same as in FY 2019 MOP. However, slightly less funding will be going to case management and slightly more funding will be going to SM&E to support elimination efforts.

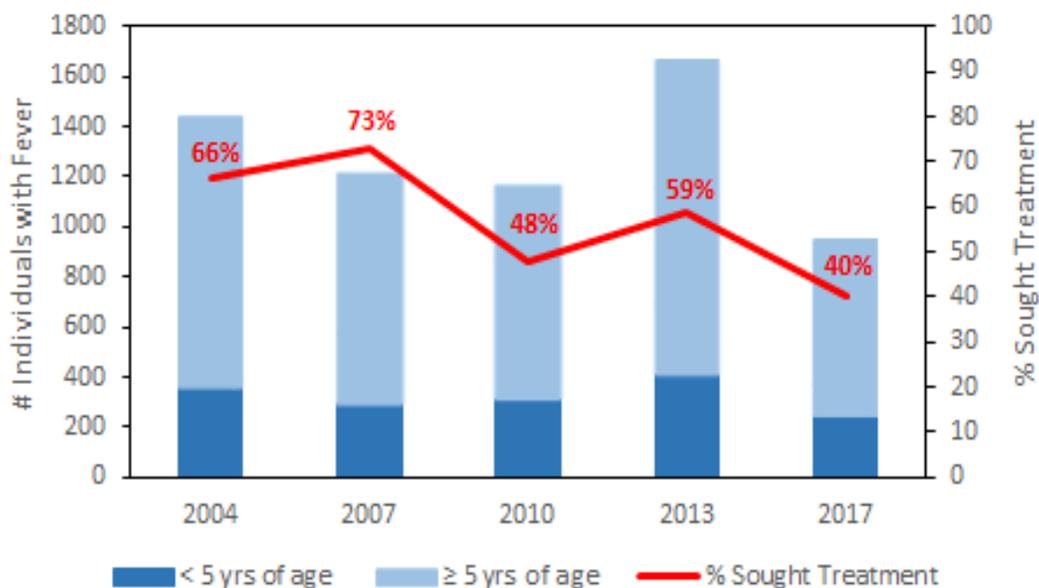
Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

## Key Question 1

What is the status of care-seeking?

## Supporting Data

Figure A10. Trends in Care-Seeking for Fever



Note: Data obtained from Cambodia Malaria Surveys. Data reported for 2004, 2007, and 2019 is percent that sought treatment within 48 hours. Data reported for 2013 and 2017 is within 204 hours.

## Conclusion

According to the 2004, 2007, and 2010 Cambodia Malaria Surveys, 66 percent, 73 percent, and 48 percent of individuals sought medical attention for fever within 48 hours. Of those with fever, 59 percent and 40 percent sought medical attention for fever within 24 hours in 2013 and 2017, respectively. The decline from 2013 to 2017 is concerning.

## Key Question 2

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

## Supporting Data

**Figure A11. Key Barriers and Facilitators to Care Seeking**

Facilitator	Type of Factor	Data Source	Evidence
Favorable Attitudes toward Treatment Seeking	Internal	Cambodia Malaria Survey 2017	Ninety percent of individuals with fever sought treatment at any time.
Increased Access to Malaria Services	Environmental	CNM Cambodia Malaria Control Program Review Report	Implementation of an intensified response plan began in October 2018 focusing on seven of the highest burden provinces to increase malaria control intervention and supervision in the catchment areas of the 30 health centers in 10 ODs with 80% of total malaria cases in Cambodia. This has helped increase access among those most at risk. Similarly, a recent malaria program review found that are VMW in 1,400 villages in 18 provinces.
Barrier	Type of Factor	Data Source	Evidence
Limited awareness of the need for malaria testing	Environmental	Cambodia Mobile and Migrant Population Survey 2017	The 2017 Cambodia Mobile and Migrant Population Survey showed that 37% of the MMPs reported to have had at least one episode of fever within the last three months preceding the survey. Of those with fever, 89% had sought medical advice or treatment for the fever, but only 32% of them were tested for malaria.
Limited awareness of need to seek treatment within 24 hours	Social	Cambodia Malaria Survey 2017	The 2017 Cambodia Malaria Survey showed although treatment seeking behavior for fever was high at 90%, only 40% sought treatment within 24 hours.

## Conclusion

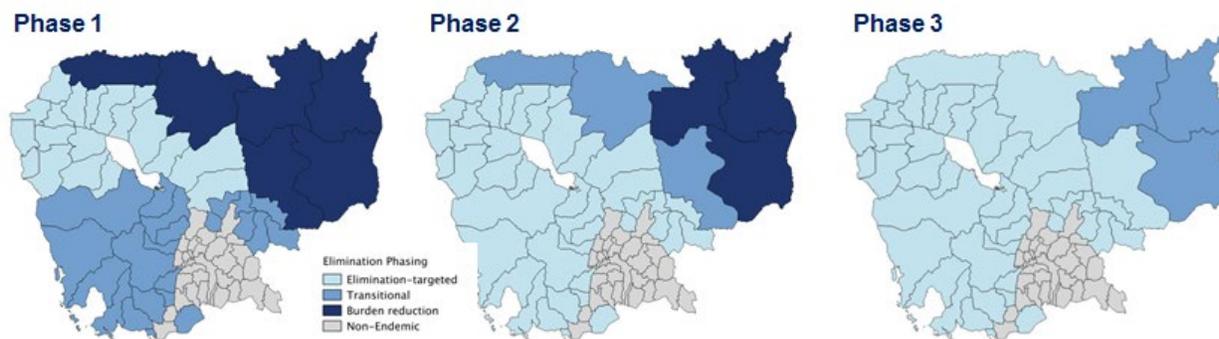
In FY 2020, PMI will provide technical assistance to strengthen SBC specifically for MMP to improve care-seeking behavior. Information, education, and communication (IEC) materials for each person will also be tailored to specific risk behaviors of individual patients, households, and villages. New communication tools and job aids aligned with national SBC strategies will also be developed for healthcare providers to help improve acceptance by MMP for malaria diagnosis and treatment. Lastly, in the PMI-focus areas supporting CNM's intensification plan, additional MMWs will be recruited to ensure better access to testing and treatment especially during forest outreach activities.

### Key Question 3

How have malaria testing and treatment practices evolved over time?

### Supporting Data

Figure A12. Phased Approach to Malaria elimination in Cambodia



.Source: CNM

### Conclusion

As part of the MEAF 2016-2020, Cambodia planned to progressively implement malaria elimination activities over a five-year period. ODs in malaria-risk areas are divided into three sub-strata:

- 1) Burden Reduction,
- 2) Elimination-Targeted, and
- 3) Transitional. Further risk stratification down to the village level was proposed to efficiently target those at highest risk using finite resources.

In elimination-targeted ODs, all confirmed cases reported at the HF, VMW, and MMW network level are subject to an epidemiological investigation. All cases are classified to identify the likely source of infection (e.g. village of residence; same catchment area, but not the same village, etc.). Diagnosis primarily relies on point-of-care RDTs with blood smears being collected and read within 48 hours by an HC/RH microscopist to identify additional infections missed by RDT. Treatment using AS-MQ (as per national treatment guidelines) is provided via Directly Observed Therapy (DOT) with subsequent follow-up on day 7 and day 28 following diagnosis in elimination ODs. A blood smear is collected during follow-up and read by a microscopist to ensure parasite clearance. HC staff investigate malaria cases by testing household members or co-travelers using RDTs (or less commonly microscopy if evaluated at HC) and treat with AS-MQ as indicated. In the other non-elimination ODs (i.e. ODs in transitional and burden reduction strata) where malaria infection remains common (above 10 malaria infections per 1000 population at risk per year), it is not possible to investigate each malaria case individually.

Prior to 2015, first-line treatment for uncomplicated *P. falciparum* malaria was Dihydroartemisinin-piperaquine (DHA-Pip). However, due to increased treatment failures with DHA-Pip, as well as TES in 2016 showing only 44% adequate clinical-parasitological response to DHA-Pip in Kampong Speu, 83% in Ratanakiri, and 70% in Steung Treng, the CNM amended the malaria National Treatment Guidelines (NTG) in 2015 to recommend AS-MQ in areas where treatment failures to DHA-Pip had been identified (i.e. the Western and Northern Provinces) and continuation of DHA-Pip in areas where treatment failures have not been identified. However, the treatment guidelines were further updated in 2018 to recommend AS-MQ as first-line treatment nationwide. IV artesunate continues to be the first line treatment for severe malaria.

In addition to the 2018 recommendation of AS-MQ for all cases of malaria, CNM also began recommending single low-dose primaquine (SLD PQ) as part of the treatment of *P. falciparum*. Radical cure (high dose primaquine) for *P. vivax* infections coupled with G6PD testing via RDT will be scaled up in 2020.

Since 2016, PMI has supported CNM’s strategy to achieve malaria elimination in Cambodia through direct support of elimination activities in the northwest of the country. Initially targeting five ODs in two provinces elimination activities have expanded to two ODs in Pursat Province in 2019 and will be expanding to an additional five ODs in three other provinces (Kampot, Kep, and Koh Kong Provinces) in 2020.

#### Key Question 4

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

#### Supporting Data

**Figure A13. Key Barriers and Facilitators to Appropriate Testing and Treatment Practices**

Facilitator	Type of Factor	Data Source	Evidence
Access to Updated Case Management Guidelines	Environmental	2017 Cambodia Malaria Survey	Seventy-five percent of public health facilities have a copy of the NTG (55% with the 2014 version).
Strong Oversight of Health Facilities	Environmental	2017 Cambodia Malaria Survey	Forty-two percent of public health facilities have had a supervisory visit by the Province Health Department and eighty-four percent by the Operational District.

High Levels of Knowledge of Recommended Treatment for Uncomplicated Malaria	Internal	2017 Cambodia Malaria Survey	Seventy-eight percent of staff in public health facilities know the recommended drug for uncomplicated malaria.
Barrier	Type of Factor	Data Source	Evidence
Limited Availability of Malaria Diagnostics in Public Sectors	Environmental	2017 Cambodia Malaria Survey	Only seventy-four percent of public health facilities are equipped to provide malaria diagnostic services.
Limited Malaria-Specific Training of Health Staff and VMWs and MMWs	Social	2017 Cambodia Malaria Survey	Twenty-eight percent of health facility staff received training in case management (19% in lab diagnosis, 10% in rational antimalarial drug use, and 5% in management of severe malaria), while only 1.4% of VMWs and MMWs have received training.
Referrals from Private Providers to Public Facilities	Social	N/A	Since May 2018, the MOH has banned all malaria diagnosis and treatment in the private sector. Private providers are expected to refer patients with suspected malaria to public facilities. However, little is known about whether this is occurring, as the policy has limited data collection from private providers, making it difficult to understand how malaria services and referral patterns have changed.

**Conclusion**

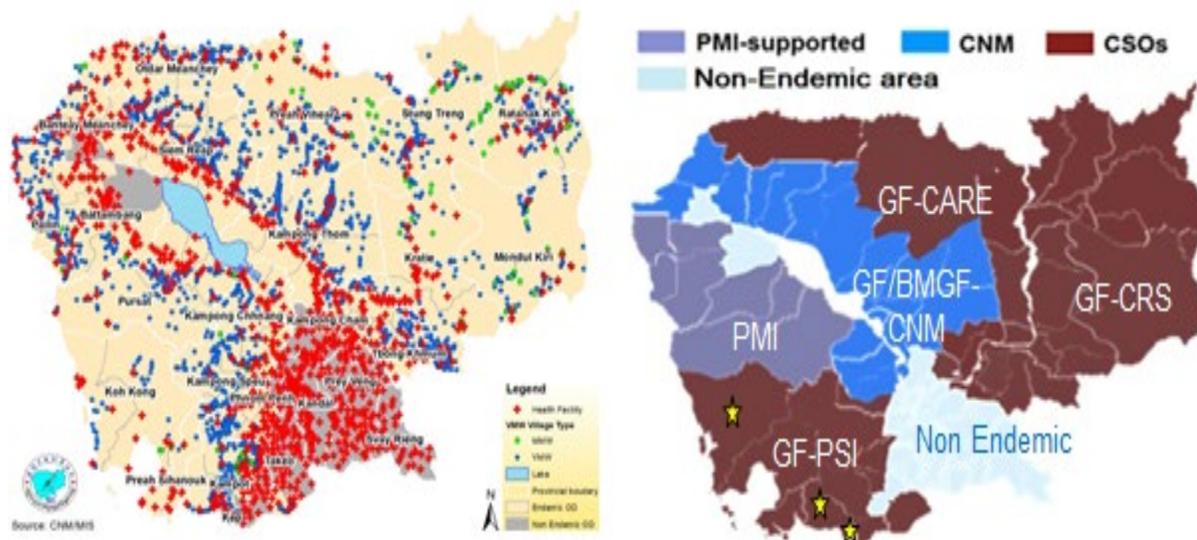
In general, public health facility staff have adequate knowledge of malaria drugs and case management. In May 2018, the MOH banned all malaria diagnosis and treatment in the private sector, yet it is unclear if these activities have completely halted. As VMWs and MMWs are the foundation of case detection, treatment, and surveillance for malaria elimination in Cambodia, training of these personnel is essential. In the upcoming year, PMI will support training of 560 VMWs and staff at 125 health facilities in Battambang, Pailin, and Pursat Provinces.

**Key Question 5**

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

## Supporting Data Cambodia-specific

**Figure A14. Current and Planned Support for Case Management**



## Conclusion

The main donors in Cambodia are Global Fund, PMI, and BMGF. In FY 2020, PMI will work with CNM to support elimination activities in seven ODs in Battambang, Pailin, and Pursat Provinces in Western Cambodia, and to transition to elimination activities in two ODs in Pursat Province. In addition, PMI will support CNM to strengthen surveillance in five elimination ODs in Kampot, Kep, and Koh Kong provinces (noted with yellow stars).

## Key Question 6

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

## Supporting Data

**Figure A15. Estimated needs for RDT 2019 - 2021**

Calendar Year	2019	2020	2021
<b>RDT Needs<sup>1</sup></b>			
Total country population	16,702,842	16,960,065	17,221,250
Population at risk for malaria <sup>2</sup>	9,246,087	9,388,477	9,533,059
PMI-targeted at-risk population	9,246,087	9,388,477	9,533,059
Estimated needs for Outreach Activities <sup>3</sup>	89,651	656,144	656,144
Total number of projected fever cases <sup>4</sup>			

Calendar Year	2019	2020	2021
Percent of fever cases tested with an RDT <sup>4</sup>			
Target RDT needs <sup>5</sup>	1,255,838	1,207,575	735,000
<b>Total RDT Needs</b>	<b>1,345,489</b>	<b>1,863,719</b>	<b>1,391,144</b>
<b>Partner Contributions (to target population if not entire area at risk)*</b>			
RDTs carried over from previous year <sup>6</sup>	300,049	279,410	173,971
RDTs from Government	0	0	0
RDTs from Global Fund	1,239,850	1,733,280	0
RDTs from other donors	0	0	0
RDTs planned with PMI funding <sup>7</sup>	85,000	25,000	0
<b>Total RDTs Available</b>	<b>1,624,899</b>	<b>2,037,690</b>	<b>173,971</b>
<b>Total RDT Surplus (Gap)</b>	<b>279,410</b>	<b>173,971</b>	<b>-1,217,173</b>

**Footnotes:**

<sup>1</sup> All the data for estimating RDT Needs are taken from the Quantification report (20190801 Quantification 2019 RDT ASMQ Summary V7). The quantification covers the needs for 18 months (6 month in 2019 and 12 months in 2020). The need for 2021 is estimated similar to that for 2020.

<sup>2</sup> Data source: Global Fund funding request 2018-2020. Note: malaria is endemic in 21 of 25 provinces nationally, but is not present in Phnom Penh, Cambodia's largest city, or its surrounding provinces. Thus, this represents the population residing in provinces endemic for malaria.

<sup>3</sup> In 2019, the need for outreach activities is low as it only for 4 months, whereas in 2020 it is estimated for a full year.

<sup>4</sup> Estimated fever cases are not used for forecasting RDT needs.

<sup>5</sup> In 2019, the annual need is doubled from the 6 months' forecast (627,919\*2) which includes buffer stock (584,200). In 2020, the annual needs include 735,000 basic need and 10 months' buffer stock (472,575). In 2021, the estimate is the same as 2020 basic need. The needs for 2021 would be reviewed and adjusted in the next quantification.

<sup>6</sup> Carry over for 2019: the stocks on hand based on the CMS and UNOPS reports at the end of December 2018.

<sup>7</sup> The PMI contribution in 2019 is based on pipeline data. The contribution for 2020 is based on MOP19.

## Conclusion

Overall 1,624,899 RDTs are available in 2019 through all partners in Cambodia; in comparison the RDT needs were an estimated 1,345,489 tests resulting in a surplus of 279,410 tests. Estimated needs for 2020 are 1,863,719 RDTs leaving a surplus of 173,971 tests being anticipated. For 2021 the estimated number of RDTs available through partners will depend largely on the next Global Fund award cycle (2021-2023) after the current Global Fund Grant ends in 2020. But it is anticipated that the Global Fund will continue to be the major contributor of commodities in the near future.

## Key Question 7

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

## Supporting Data

**Figure A16. Estimated Needs for ACT 2019 – 2021**

Calendar Year	2019	2020	2021
<b>ACT Needs<sup>1</sup></b>			
Total country population	16,702,842	16,960,065	17,214,466
Population at risk for malaria <sup>2</sup>	9,246,087	9,388,477	9,533,059
PMI-targeted at-risk population <sup>2</sup>	9,246,087	9,388,477	9,533,059
Estimated needs for Outreach Activities <sup>3</sup>	17,278	65,334	65,334
Target ACT needs <sup>4</sup>	128,694	96,536	96,536
<b>Total ACT Needs</b>	<b>145,972</b>	<b>161,870</b>	<b>161,870</b>
<b>Partner Contributions (to PMI target population if not entire area at risk)</b>			
ACTs carried over from previous year	91,065	24,053	0
ACTs from Government	0	0	0
ACTs from Global Fund	78,960	135,851	0
ACTs from other donors	0	0	0
ACTs planned with PMI funding	0	0	0
<b>Total ACTs Available</b>	<b>170,025</b>	<b>159,904</b>	<b>0</b>
<b>Total ACT Surplus (Gap)</b>	<b>24,053</b>	<b>-1,966</b>	<b>-161,870</b>

**Footnotes:**

<sup>1</sup> All the data for estimating ACT Needs are taken from the Quantification report (20190801 Quantification 2019 RDT ASMQ Summary V7). The quantification covers the needs for 18 months (6 month in 2019 and 12 months in 2020). The needs for 2021 are estimated similar to that for 2020.

<sup>2</sup> Data source: Global Fund funding request 2018-2020. Note: malaria is endemic in 21 of 25 provinces nationally, but is not present in Phnom Penh, Cambodia's largest city, or its surrounding provinces. Thus, this represents the population residing in provinces endemic for malaria.

<sup>3</sup> In 2019, the need for outreach activities is low as it only for 4 months, whereas in 2020 it is estimated for a full year.

<sup>4</sup> In 2019, the annual need is doubled from the 6 months' forecast (64,347\*2). In 2021, the estimate is the same as 2020 basic need.

## Conclusion

Overall an estimated 145,972 ACTs were needed in 2019. Based on the availability of 170,025 ACTs from all partners, a surplus of 24,053 ACTs remained. In 2020 an estimated 161,870 ACTs will be needed with a supply of 159,904 ACTs being available resulting in a 1,966 gap being anticipated. As all ACTs in Cambodia are procured with Global Fund support, the estimated number of ACTs available in 2021 will depend largely on the next Global Fund award cycle (2021-2023) after the current Global Fund Grant ends in 2020. But it is anticipated that Global Fund will continue to be the major contributor toward commodity procurement in the near future.

## Key Question 8

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

### Supporting Data

Approximately 1000-2000 cases of severe malaria occur nationally in Cambodia every year. There have been no deaths since 2017. Given the limited severe malaria cases, the Ministry of Health procures all commodities for the treatment of severe malaria within the national procurement system. These procurement estimates are not shared with external partners.

### Conclusion

The Cambodian MoH procures all commodities for treatment of severe malaria under their national procurement system and is able to support the full annual needs of the program internally.

## Key Question 9

Are the first-line ACTs effective and monitored regularly?

### Supporting Data

**Figure A17. Recently Completed and Ongoing Antimalarial Therapeutic Efficacy Studies**

Year	Sites	Treatment arms	PCR-corrected ACPR>90%?	Where molecular resistance work was completed or the plan, if any, for molecular resistance work
2017	1. Oral, Kampong Speu	AS-MQ	100%	IPC: All day 0 DBS were tested for K13, pfmdr copy no and Plasmepsin2
	2. Veal Veng, Pursat	AS-MQ	100%	Note: all results are PCR corrected to differentiate recrudescence from reinfection, done at IPC
	3. Siem Pang, Steung Treng	AS-MQ	100%	
	4. Veun Sai, Ratanakiri	AS-PYR	96.70%	
	5. Koh Nhek, Mondulakiri	AS-PYR	98.40%	

Year	Sites	Treatment arms	PCR-corrected ACPR>90%?	Where molecular resistance work was completed or the plan, if any, for molecular resistance work
2018	1. Veun Sai, Ratanakiri	AS-PYR	98.10%	IPC: All day 0 DBS were tested for K13, pfmdr copy no and Plasmepsin2
	2. Koh Nhek, Mondulkiri	AS-MQ	100%	Note: all results are PCR corrected to differentiate recrudescence from reinfection, done at IPC
	3. Ksim, Kratie	AS-MQ	100%	
	4. Trapaing Chau, Kampong Speu	AS-PYR	98.30%	
	5. Veal Veng, Pursat	AS-MQ	100%	
2019	1. Veun Sai, Ratanakiri	AS-MQ	On-going	Molecular assays to be done in IPC
	2. Oreal, Kratie	AS-MQ		
	3. Oral, Kampong Speu	AS-MQ		
	4. Trapaing Chau, Kampong Speu	AS-MQ		
	5. Chhue Tom, Pursat	AS-MQ		

## Conclusion

As of 2018, AS-MQ and AS-PYR remain efficacious in Cambodia for the treatment of *P. falciparum* infection. Pilot activities for radical cure of *P. vivax* infection after G6PD testing via RDT have started in four provinces in late 2019.

## Key Question 10

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

## Supporting Data

N/A

## Conclusion

N/A

## Key Question 11

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

## Supporting Data

N/A

## Conclusion

N/A

## 2.B. DRUG-BASED PREVENTION

<b>NMCP objective</b>
Neither SMC nor IPTp are recommended for Cambodia and are not included in the national strategy nor implemented.
<b>NMCP approach</b>
<ul style="list-style-type: none"><li>• Given the very low prevalence of malaria overall and that malaria primarily affects adult and adolescent males who work in forested areas, IPTp is not recommended.</li><li>• Prevention/management of malaria in pregnancy, therefore, focuses on ensuring access and use of LLIN/LLIHNS for all persons at risk, including women of child-bearing age, and rapid diagnosis and treatment of malaria at community and health facility level.</li></ul>
<b>PMI objective, in support of NMCP</b>
<ul style="list-style-type: none"><li>• PMI supports distribution of LLINs to all persons at risk, including women of child-bearing age through VMWs and MMWs in its target provinces.</li><li>• PMI supports training and supervision of VMWs, MMWs and HF staff on the appropriate diagnosis, treatment, and referral of pregnant women with fever/malaria.</li></ul>
<b>PMI-supported recent progress (past ~12-18 months)</b>
There were no activities specifically targeted toward pregnant women. Both LLIN/LLIHN distribution and training and supervision of health workers is conducted in an integrated fashion with broader programmatic activities.
<b>PMI-supported planned activities (next ~12-18 months, supported by currently available funds)</b>
There will not be any activities specifically targeted toward pregnant women; please refer to broader activities described in the ITN and case management sections.

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

### PMI Goal

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

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

PMI will not be supporting activities in FY 2020 specifically targeted toward pregnant women. LLIN/LLIHN distribution and training and supervision of health workers are conducted in an integrated fashion with broader programmatic activities. Please refer to ITN and case management sections for information on those integrated activities.

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

### Key Question 1

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

### Supporting Data

N/A

### Conclusion

N/A

### Key Question 2

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

### Supporting Data

N/A

### Conclusion

N/A

### **Key Question 3**

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

#### **Supporting Data**

N/A

#### **Conclusion**

N/A

### **Key Question 4**

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

#### **Supporting Data**

Malaria occurring in women of child-bearing age is extremely uncommon. Data are not collected on malaria in this population.

#### **Conclusion**

N/A

### **Key Question 5**

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

#### **Supporting Data**

N/A

#### **Conclusion**

N/A

### **Key Question 6**

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

## Supporting Data

N/A

## Conclusion

N/A

### 3. CROSS-CUTTING AND OTHER HEALTH SYSTEMS

#### 3.A. SUPPLY CHAIN

<b>NMCP objective</b>
The NMCP aims to ensure a responsive supply chain system that provides an uninterrupted supply of malaria commodities for malaria activities across the country.
<b>NMCP approach</b>
<ul style="list-style-type: none"><li>• The MEAF objective 1 is to provide effective program management and coordination at all levels to efficiently deliver a combination of targeted interventions for malaria elimination. The MEAF M&amp;E plan includes two indicators for objective 1 related to procurement and supply management.</li><li>• In Cambodia, the Central Medical Stores is responsible for distributing essential medicines and medical commodities to PHDs and ODs on a quarterly basis. Health facilities re-stock their commodities using a “pull” system from OD warehouses. In general, stocks are relatively well maintained through this system.</li><li>• Product quantification for malaria commodities is conducted annually based on beneficiary targets, service statistics, and stock information. National programs lead the quantification process with outside technical assistance. Patient data (service statistics), program targets, and stock availability at the Central Medical Stores are the main data sources for quantification.</li><li>• For warehouse and distribution, the Central Medical Stores is the single point of receipt for the country. Cambodia uses an integrated distribution and delivery system triggered by reports and requests, which are initiated at the facility and OD levels. The delivery of products from the Central Medical Stores to PHDs occur on a quarterly basis and are based on group routes(G1, G2, and G3) using different timelines. This helps the MoH to maximize the available delivery trucks and human resources throughout the year.</li><li>• In the Cambodian health logistics management information system (LMIS), consumption and stock balance data are initiated at service delivery points (HCs, ODs, referral hospital, and national hospitals). There are different processes with a mix of paper-based and electronic</li></ul>

systems for each type of service delivery point. The paper-based approvals introduce delays and require reconciliation when there are variances. Furthermore, detailed information remains at lower-level sites and is not generally visible or centrally used. At higher decision-making levels in the MoH, only aggregate data are routinely accessed.

- Lack of visibility of HF-level consumption data is a well-noted issue for CNM. PMI provides support to CNM's Pharmacy Unit and LMIS team to make interim arrangements for accessing HF-level monthly consumption data while the country makes plans to replace the current LMIS system.
- While PMI provides limited support to strengthen the commodity usage and stock information feeding into the Malaria Information System in Cambodia, other USG-supported programs are working with the MoH in strengthening the LMIS given the above-mentioned challenges. PEPFAR has been supporting an eLMIS pilot project (mSupply) in five provinces since 2018. The effectiveness and usability of the system will be evaluated in FY 2020 for potential scale-up by MoH in the future.

#### **PMI objective, in support of NMCP**

- PMI procures a limited quantity of antimalarial products (LLINs, LLIHNs, RDTs, antimalarial drugs) to fill procurement gaps by other donors, to ensure target populations in PMI-supported ODs have access, and in emergency situations should the need arise. This approach has largely ensured a continuous supply of commodities at service points in PMI-supported ODs.
- Given the limited role that PMI has played in supplying commodities, PMI support for commodity management has been mainly focused on the support for quantification of malaria commodities, as well as monitoring pipelines, so potential bottlenecks in procurement and distribution of malaria commodities (including Global Fund-financed commodities) can be quickly addressed.

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

- PMI supported technical assistance to CNM to develop a fully functional forecasting and supply planning tool, which systematically determines national malaria commodity requirements, estimates their costs, and coordinates fulfilment of these needs to support the continuous availability of commodities.
- With the aim of ensuring an uninterrupted supply of malaria commodities for Cambodia, PMI, through GHSC-PSM, provided technical assistance to CNM in stock analysis and distribution plans to prevent sub-national level stock-outs. PMI-supported routine stock analyses provided feedback to CNM and partners on distribution quantities for ODs, HF, MMWs, and VMWs and worked in partnership with CNM, CHAI, UNOPS, and other CNM

stakeholders to finalize the quantification of CNM commodity demand (especially for ACTs and RDTs) in 2019 and 2020.

- PMI worked closely with CNM and their Pharmacy Unit to strengthen supply chain planning and coordination through establishing the PSM Sub-working group for malaria.
- PMI worked with CNM, UNOPS, and other partners in a technical advisory role to strengthen sub-national inventory management level in 10 high burden ODs and to develop a malaria commodity distribution strategy for MMPs.
- With an aim of building the national capacity in supply chain management, PMI conducted a 3-day training on the fundamental principles of quantification to six CNM staff. In addition, PMI held a 3-day workshop on Forecasting and Annual Quantification with the CNM Pharmacy Unit.
- To promote improved availability and quality of malaria commodity data, PMI supported the development of a logistics management module (the stock module) for the Malaria Information System and trained 383 drug store staff from the OD-level to use the system.
- PMI trained 648 people on sub-national level warehousing and distribution.

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

- PMI will scale-up impactful interventions such as engaging CNM leadership in supply chain strategic plan discussions and encourage greater collaboration between programmatic management and supply chain activities.
- PMI will support CNM in malaria commodity forecasting, quantification, supply planning, and improving the collection, review and reporting of consumption data. In addition, PMI will provide technical advice to CNM and partners on strengthening subnational level warehousing, distribution, and inventory management.
- PMI will assist CNM to develop an early warning system (EWS) that will detect occurrences of potential stock-outs to allow CNM and supply chain partners to react in a timely manner and conduct the necessary redistribution, reallocation or emergency procurement of commodities.
- PMI will support limited procurement of LLINs and RDTs to ensure there is an adequate supply available for distribution during the next LLIN mass campaign and for ad hoc distribution in case of delays in procurement during the period between the end of the current Global Fund grant (2020) and the availability of funding from the next Global Fund award.
- LLIHNs may be procured and distributed among forest workers and mobile populations in malaria endemic areas. PMI will also support CNM in developing tailored provincial distributions plans for MMPs.

- In 2020, GHSC-PSM plans to support CNM develop a comprehensive stock dashboard at the national level in the Malaria Information System. The dashboard is to give visibility to the current stock status, months of stock, stock-on-hand, pipeline, and wastage to address any supply chain challenges promptly and effectively. These data will also support future quantification and forecasting exercises.
- Starting in the second quarter of 2020, GHSC-PSM plans to restart feeding Cambodia data into the PPMRm.

### PMI Goal

Ensure continual availability of quality products needed for malaria control and elimination (ACTs, RDTs, SP, Art. Inj., and LLIN/LLIHNS) at health facilities and community level.

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

PMI will continue to support supply chain activities as in the previous year.

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

The data necessary to determine if the central level has been stocked with ACTs and RDTs according to plan is not available to PMI but will be in CY 2020. For data on whether the quantities of ACTs and RDTs are sufficient to meet needs in CY 2019, please see gap analysis tables in section 1.B. Insecticide-treated Nets and section 2.A Case Management for additional detail.

### Conclusion

The Global Fund procures the vast majority of malaria commodities for Cambodia. According to projections, RDTs are in sufficient stock until 2021. PMI will plan to procure RDTs in 2020 for use in 2021 in case there are gaps in Global Fund procurement. Approximately 150,000 to 160,000 ACTs will be needed annually. Current Global Fund contributions in 2019 and 2020 will cover these needs. Historically all ACTs have been procured with Global Fund support; it is anticipated that Global Fund will continue to support ACT procurement in the near future. So, PMI is not proposing to allocate FY 2020 funding to procure ACTs for Cambodia.

## **Key Question 2**

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

## **Supporting Data**

N/A

## **Conclusion**

Currently, health facility-based consumption data is not readily accessible in Cambodia. CNM does not have a systematic method to review malaria cases, commodity consumption and programmatic coverage information periodically to update forecasting of malaria commodity needs at the national level and stock analysis at the health facility level. With seasonal variation of malaria commodity consumption and lack of evidence-based analysis of stock, this often leads to suboptimal inventory management and near stock out situations in high-burden areas, while sufficient stocks exist at the central level. PMI is coordinating with the PSM sub-working group to institutionalize the regular review of forecasts and stock analyses and is supporting capacity building in stock management at all levels.

## **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**

These data are not available for Cambodia.

## **Conclusion**

N/A

## **Key Question 4**

What are the trends in LMIS reporting rates?

## **Supporting Data**

Historically, CNM relied on monthly service-level data that is collected in the Malaria Information System for commodity forecasting. Beginning in January 2019 GHSC-PSM contributed its support to CNM to develop a Stock Module for the Malaria Information System. This module has been rolled out and allows HFs to report stock/inventory data. On a monthly

basis, this module extracts the following information from OD-level data: the stock on hand at the OD level, as well as the stock on hand and consumption data at the health facility level. The extraction is from the legacy system (the Drug Inventory Database) and data is then manually entered into the MIS at the OD level. The consumption data collected is currently for malaria commodities only. These data have also been collected retroactively to include data dating back to January 2014. In addition to OD and HC-level data, CNM enters stock data from the Central Medical Stores into the Malaria Information System on a monthly basis.

### **Conclusion**

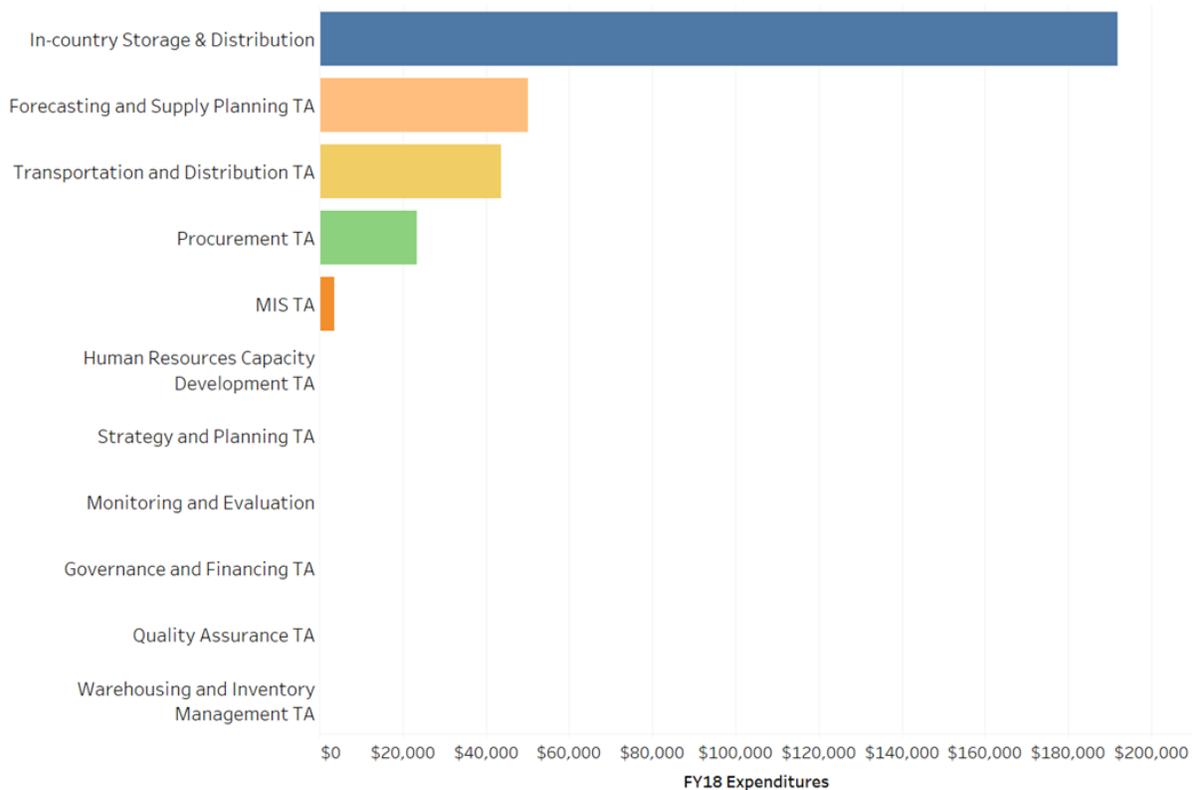
Altogether the Malaria Information System has the following data for provinces, ODs, and HCs: the receiving stock, outgoing stock, balance, expiry, average monthly consumption, months of stock. However, access to these data is limited as the Stock Module lacks an external pointing interface. To allow greater visibility of these data, GHSC-PSM will support CNM to develop a comprehensive stock dashboard at the national level within the Malaria Information System. The dashboard will allow users to visualize current stock status, months of stock, stock-on-hand, pipeline, and wastage to address any supply chain challenges promptly and effectively. These data will also support future quantification and forecasting exercises.

### **Key Question 5**

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

## Supporting Data

**Figure A18. FY 18 Supply Chain Investments**



## Conclusion

Most PMI FY 2018 investments supported in-country distribution of LLIN/LLIHN, in addition to collection of facility consumption data to inform forecasting. PMI does not expect this to change in FY 2019 or FY 2020.

## Key Question 6

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

## Supporting Data

N/A

## Conclusion

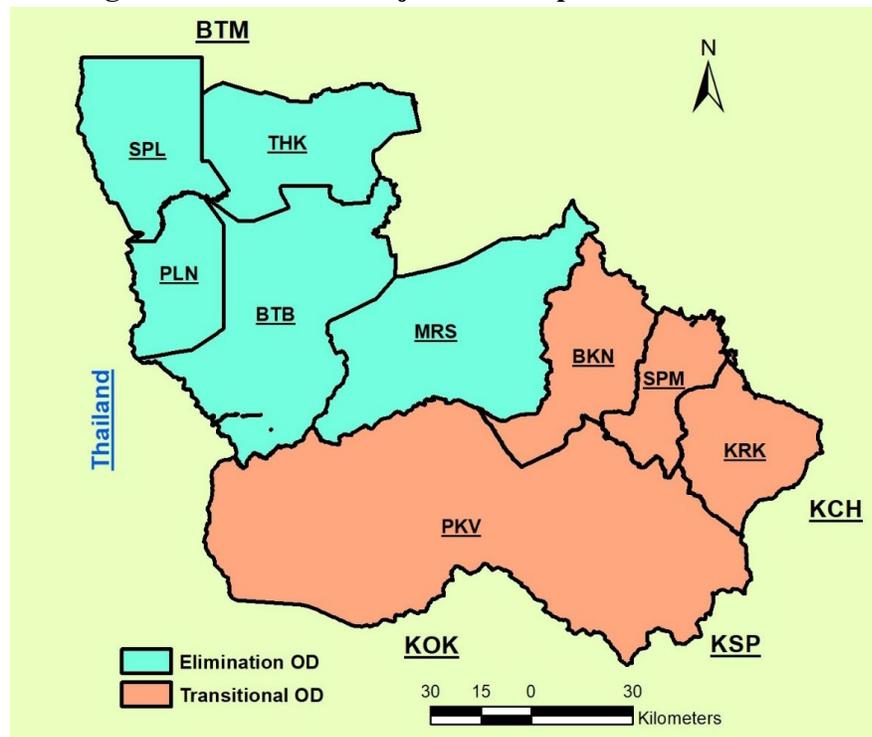
N/A

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

<p><b>NMCP objective</b></p>
<p>Enhance the surveillance system to detect, immediately notify, investigate, classify and respond to all cases and foci to move toward malaria elimination (MEAF 2016-2020)</p>
<p><b>NMCP approach</b></p>
<ul style="list-style-type: none"> <li>• CNM has adopted a “Day 0 surveillance” system as the foundation for real-time case reporting in all low endemic ODs targeted for elimination. When a case is diagnosed, service providers utilize mobile phone/tablet for real-time reporting of case details, including geolocated data, through mobile phone network to CNM’s malaria information system. Then the Malaria Information System triggers an alert to malaria response teams at CNM and PHD/OD/HC staff of relevant catchment area. This system has been implemented in six provinces in Cambodia in 2018 (Banteay Meanchey, Battambang, Kampong Chhnang, Kampong Thom, Pailin, and Siem Reap Provinces) with additional scale-up real-time case reporting being planned in a phased approach across all endemic ODs as malaria declines in these areas.</li> <li>• Upon diagnosis of malaria (<i>P. falciparum</i> and mixed cases), cases are to be reported within 24 hours; investigated by HC staff and classified as indigenous or imported within 3 days; and response activities completed within 7 days (including distribution of LLINs as needed and screening household members with fever and co-travelers). Although elimination-targeted ODs are showing significant improvement reaching these timeline targets, this 1-3-7 approach requires intensive human resources for response to each indigenous case.</li> <li>• Supplied with the geolocated data collection, the Malaria Information System provides malaria case data down to the village level allowing for identification of high-risk villages. CNM continues to strengthen its capacity to target foci of ongoing malaria transmission.</li> </ul>
<p><b>PMI objective, in support of NMCP</b></p>
<ul style="list-style-type: none"> <li>• In the context of malaria elimination, accurate and timely data are essential to identify cases, mount a timely response, inform policy decisions, and focus resources to areas of ongoing malaria transmission. PMI provides technical support to the CNM to continue strengthening the existing surveillance system to detect and immediately notify all malaria cases, and investigate, classify, and respond to <i>P. falciparum</i> cases and foci to move toward malaria elimination.</li> <li>• At the local level, PMI is working with CMEP to scale-up an evidence-based elimination model piloted in Sampov Loun OD to eliminate indigenous malaria cases and prevent re-introduction. This model, which incorporates 1-3-7 surveillance and response along with DOT for all cases (including <i>P. vivax</i> in elimination ODs) and follow-up microscopy at 28 days, has produced substantial reductions in the number of <i>P. falciparum</i> and mixed cases in</li> </ul>

Sampov Loun OD; the last indigenous case was reported in 2016. This model was expanded to four additional elimination ODs in Battambang and Pailin provinces in 2018 (another four ODs in Pursat province are supported as transitional OD).

**Figure A19: CMEP Project Area Operational Districts**



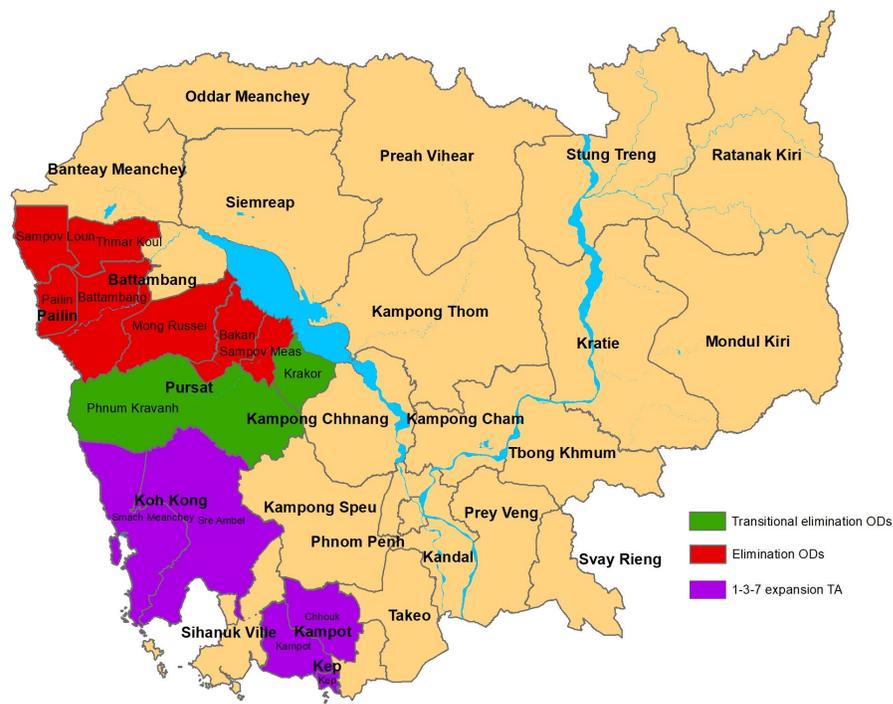
**PMI-supported recent progress (past ~12-18 months)**

- CMEP has expanded program activities to four new elimination OD (five OD total including Sampov Loun OD) and four other transitional OD.
- 560 VMW and staff at 125 HF have been trained on the 1-3-7 surveillance program. During the last 12 months, VMW and HF staff have reported 87% of cases within 1 day, investigated 84% of cases within 3 days, and completed 97% of response activities within 7 days.
- In 2018 there were 16,610 malaria cases (*P. falciparum*, *P. vivax*, and mixed) identified in these 9 ODs with 92% of these (15,536 cases) being identified in the four transitional ODs. Of note, the two ODs with the highest number of malaria cases (Krokor OD and Kravanh OD) are being included in CNM’s intensification plan focused on strengthening MMW and targeting forest going populations for 2019-2020.
- 87% of all malaria cases in the five elimination ODs completed DOT.

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

- During the next 12 months, CMEP will train VMW and HF staff in two transition ODs in Pursat Province on the 1-3-7 elimination model and will begin elimination activities.
- VMW and HF staff in five additional ODs in three new provinces (Kampot, Kep, and Koh Kong Provinces) will also be trained to start 1-3-7 elimination activities.
- CMEP will increase active outreach among migrant mobile populations (MMP) including forest goers to improve malaria diagnosis and treatment in this high-risk group.
- Strengthen health education and referral services among private providers to public HF for diagnosis and treatment.

**Figure A20 Planned 1-3-7 Elimination Activities**



**PMI Goal**

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

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

The existing award for SM&E activities will be concluding at the end of the next 12 months. A follow-on project will build on the progress of current PMI-supported activities. Program activities under the new award will expand elimination activities to current transition ODs and six additional ODs in two new provinces (Kampong Speu and Takeo Provinces) based on the request from CNM. 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**

Many of these surveys are not applicable to Cambodia’s malaria response.

**Figure A21. Data Sources and Collection Activities 2015 -2023**

<i>Data Source</i>	<i>Data Collection Activities</i>	<i>Year</i>									
		2015	2016	2017	2018	2019	2020	2021	2022	2023	
<i>Household Surveys</i>	<i>Demographic Health Survey (DHS)</i>						(X)*				
	<i>Cambodia Malaria Survey</i>			X*							
	<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>Other Health Facility Survey</i>			X*							
<i>Other Surveys</i>	<i>EUV</i>										
	<i>School-based Malaria Survey</i>										
	<i>Other (Knowledge, Attitudes and Practices Survey, Malaria Behavior Survey)</i>		X*								

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

\*Asterisk denotes non-PMI funded activities; x denotes completed activities and (x) denotes planned activities.  
 Note: The 2017 Cambodia Malaria Survey has been completed, but has not been publicly released.

**Conclusion**

Surveys in Cambodia are generally supported with Global Fund resources. CNM has a robust Malaria Information System which allows case numbers and API to be visualized to the village level. PMI does not provide any funding support for this information system.

**Key Question 2**

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

**Supporting Data**

At the national level, PMI provides technical support to CNM to continue strengthening the existing surveillance system to detect and immediately notify all malaria cases, and to investigate, classify, and respond to *P. falciparum* cases and foci to move toward malaria elimination. At the local level, PMI is working with CMEP to scale-up an evidence-based elimination model piloted in Sampov Loun OD to eliminate indigenous malaria cases and prevent re-introduction. This model, which incorporates 1-3-7 surveillance and response along with DOT for all cases (including *P. vivax* in elimination ODs) and follow-up microscopy at 28 days, has produced substantial reductions in the number of *P. falciparum* and mixed cases in Sampov Loun OD; the last indigenous case was reported in 2016. This model was expanded to four additional elimination ODs in Battambang and Pailin provinces in 2018 (another four ODs in Pursat province are supported as transitional OD).

The existing award for surveillance activities will be concluding at the end of the next 12 months. A follow-on project will build on the progress of current PMI-supported activities. Program activities under the new award will expand elimination activities to current transition ODs and six additional ODs in two new provinces (Kampong Speu and Takeo Provinces) based on the request from CNM.

**Figure A22. PMI-Supported Surveillance Activities**

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		
<b>Central Level</b>					
Register, tools (e.g. checklists, indicator glossary), job aids (design, indicators, definition of data elements, data dictionary, system support)				X	
Data quality assessments (separate from supervision – funding for travel to lower levels)					
Program monitoring and technical assistance (funding for travel to lower levels)				X	
Training (funding for central level to conduct training at lower levels, capacity building, i.e. on the job training for central level staff)				X	
Human Resources (secondment of person in NMCP for SM&E, office/team for SM&E)					
Data Use (analysis, interpretation, visualization (dashboards, bulletins, dissemination/feedback to lower levels, decision-making)					X BMGF
Policy guidelines and coordination (updating policies, guidelines, supporting sub-committee meetings, supporting participation in sub-committee meetings)				X	
External relations/Communications/Outreach (support travel to international meetings and publications)					
Support to annual operational plans for national malaria program				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		
Desk review to catch “logic errors system” (provide TA to catch logic errors)					
<b>Provincial Level - PMI supports activities in three provinces.</b>					
Registers (warehousing, printing, distribution)	X	X	X		
Data quality assessments (separate from supervision – funding for travel to lower levels)	X	X	X		
Program monitoring and technical assistance (funding for travel to lower levels)	X	X	X		
Training (funding for Provincial staff to conduct training at lower levels, capacity building (i.e. on the job training for Provincial level staff)	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		
Adaptation of national policy guidelines and coordination (adapting policies, guidelines, supporting sub-committee meetings, supporting participation in sub-committee meetings)	X	X	X		
Adaptation of checklists and job-aides	X	X	X		
Participation in national meetings (support for travel costs)	X	X	X		
Support to Annual Operational Plans for PHD Malaria Program	X	X	X		
<b>District level</b>					
Data entry, summary, and transmission (training, re-training, computers, internet, tools)	X	X	X		
Supervision (training, traveling, supervision tools/checklists, create/design system for organized/methodical supervision)	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		
Data validation (data validation activities before monthly data submission - organize health facilities)	X	X	X		
Monthly/Quarterly data quality review meetings (venue, meeting support)	X	X	X		
Data Use (analysis, interpretation, visualization (i.e. dashboards), dissemination/feedback to facilities, decision-making)	X	X	X		
Human Resources (secondment of person for malaria SM&E, office/team for SM&E)					
Annual planning with PHD staff (support travel)	X	X	X		
<b>Facility Level</b>					
Data collection/entry, summary, and transmission(training, re-training, computers, internet, tools)	X	X	X		
Supervision of CHWs (training, traveling, administering supervision tools/checklists of community health workers)	X	X	X		
Data use (analysis, interpretation, visualization (dashboards), dissemination/feedback to CHWs, decision-making)	X	X	X		
Monthly/Quarterly data quality review meetings (support for travel)	X	X	X		
<b>Community Level</b>					
Data collection/entry and transmission (training, re-training, tools)	X	X	X		
Data use (analysis, interpretation, decision-making)	X	X	X		
Monthly/quarterly data quality review meetings (support for travel)	X	X	X		

## Conclusion

PMI through their partner CMEP provides substantial support to the NMCP through activities at the provincial level down to the community level. This activity has provided good quality data to support the implementation and monitoring of the 1-3-7 surveillance system.

## Key Question 3

What are the outcomes of surveillance strengthening efforts?

## Supporting Data

Internal data quality assessments were conducted in two ODs in FY 2019. Overall providers submitted 93% of surveillance data on time according to national guidelines. VMWs had slightly lower timely reporting rates with 91% of them submitting surveillance data on time compared with HF staff submitting 99.7% on time.

**Figure A23. OD Data Quality Assessments**

		FY 2018	FY 2019
Timeliness	% of reports received on time	88%	93%
Completeness	"Confirmed malaria cases of all ages" was reported in X% of facility-months	100%	100%

**Accuracy of data reports** Indicator: Number of LLINs and LLIHNs purchased by USG funds that were distributed with USG funds by VMW. This is an example to allow comparison across years.

**Figure A24. FY 2018 Accuracy of Data Reports**

Operational District	Summary Reported Result FY18 Q4	Recounted Result	Variance %
Krakor (LLINs)	324	324	0%
Krakor (LLIHNs)	586	589	0.5%
Maung Russey (LLINs)	616	620	0.6%
Maung Russey (LLIHNs)	630	611	-3.0%

**Figure A25. FY 2019 Accuracy of Data Reports (Draft Data)**

Operational District	Summary Reported Result Q4	Recounted Result	Variance %
Bakan (LLINs)	638	638	0%
Bakan (LLIHNs)	265	265	0%
Pailin (LLINs)	806	806	0%
Pailin (LLIHNs)	818	818	0%

**Conclusion**

PMI-supported refresher training within regular meetings for OD/HF staff and VMWs have produced significant improvement in timeliness of surveillance reports being submitted, and have maintained high levels of completeness and accuracy.

**Key Question 4**

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

**Supporting Data**

N/A

**Conclusion**

N/A

**3.C. SOCIAL AND BEHAVIORAL CHANGE (SBC)**

NMCP Objective
<p>The MEAF 2016-2020 detailed key social and behavior change (SBC) goals to achieve:</p> <ul style="list-style-type: none"> <li>• At least 90% of people seeking treatment for fever within 24 hours at a health facility or a qualified care provider;</li> <li>• At least 85% of at-risk population utilizing an appropriate protection tool.</li> <li>• In 2017, the National SBC Strategy was revised and linked to the MEAF to incorporate key SBC interventions: (1) increase consistent use of LLIN/LLIHNs among target communities, (2) improve health-seeking behaviors among at-risk populations, (3) improve compliance with treatment regimes, and (4) increase awareness of risks related to artemisinin monotherapies.</li> </ul>

## **NMCP Approach**

CNM first developed a National SBC Strategy for 2013-2015, which was updated in 2017 to align with the MEAF 2016-2020. Currently, CNM is developing the second phase of the MEAF for 2021-2025, which will define an SBC strategy under the three pillars:

1. case management,
  2. focal interventions to interrupt malaria transmission in endemic areas, and
  3. surveillance.
- There is a Behavior Change Communication Working Group that is organized and chaired by CNM. The working group continues to identify challenges of how to reach high-risk populations including forest goers.
  - In Cambodia, SBC efforts play a crucial role in reaching hard-to-reach populations, such as forest goers and other MMP, which are also at the highest risk of malaria. High-risk populations include residents of forested areas, new settlers, internal migrant workers, and people crossing border areas. CNM's intensification plan includes strategies to target MMPs by tailoring SBC interventions to migrants at four stages/settings:
    - 1) where they live prior to migration,
    - 2) en route along the migration path,
    - 3) at arrival points, and
    - 4) at cross-border areas.

In each OD, CNM is working with partners to identify sources of communities for MMPs, mapping MMP community locations, and training MMWs to provide testing and treatment for malaria at entry points to the forest. Forest packs (which include a LLIHN, raincoat, and a pair of boots and are procured by Global Fund) are being distributed to those MMPs through MMWs.

## **PMI Objective in Support of NMCP**

PMI support with national SBC strategies and provides innovative approaches to improve LLIN/LLIHN use among vulnerable MMPs. PMI has supported several innovative approaches targeting MMPs, including:

- 1) mass media,
  - 2) interpersonal communication by MMWs who provide malaria services at the entry points to the forest, and
  - 3) messaging through taxi drivers around migrant corridors.
- New communication tools and job aids are being developed for health care providers to help improve acceptance and implementation of elimination activities especially for diagnosis,

case investigation, and treatment. Individualized IEC for each patient will be tailored to specific risk behaviors of individual patients, households, and villages. PMI will focus SBC efforts and messages to serve both control and elimination goals. Toward that goal, PMI is also providing technical assistance to CNM on updated SBC guidelines and the development of the National SBC Strategy for the MEAF 2021-2025.

- More locally, PMI supports SBC efforts in the two elimination provinces (Battambang and Pailin Provinces) and one transition province (Pursat Province), while Global Fund supports SBC activities in the remainder of the country, especially in non-PMI-supported ODs selected for the intensification plan where there is a high burden of malaria. PMI is working with UNOPS/Global Fund and other malaria stakeholders to develop targeted SBC messages specific to the highest risk MMPs within elimination ODs where reactive/active case detection efforts have increased.

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

- With FY 2018 funding, building upon the success of prior years, PMI intensified SBC efforts, particularly IEC among MMPs. In FY 2019, a total of 92,515 residents and 8,288 migrant workers received malaria messaging. As PMI is supporting elimination activities in the seven ODs and control activities in two additional ODs, SBC activities have been streamlined to focus less on control efforts across large geographic areas. Kravanh and Krokor ODs are included in the next phase of CNM's intensification plan; therefore, SBC activities in these ODs will specifically target MMP. Furthermore, PMI trained MMW to provide malaria services and education to MMP at entry points to the forest.
- A variety of SBC materials have been produced for VMWs, MMPs, and health care providers, including posters, leaflets, flipcharts, stickers, t-shirts, banners, bags, signboards, and billboards. Training on early diagnosis and treatment has been provided to staff from 125 HF and 560 VMWs/MMWs. As of September 2019, in collaboration with CNM, PMI supported IEC and counseling trainings for 773 staff in the nine ODs.
- As noted above, MMWs are providing LLIN/LLIHNs, health education, and malaria services at entry points to the forest. However, complete information on the risk behaviors of MMPs and the determinants of malaria infection among forest going MMPs is lacking. In addition, it is unclear whether MMPs use the LLIN/LLIHNs that they receive when they are in the forest. CNM has requested all malaria stakeholders to conduct risk behavior assessments among this group in order to develop specific SBC messages to educate MMPs further on how to prevent malaria infection.
- PMI supported a desk review of the available literature on the determinants of key malaria-related behaviors of forest-going populations. However, the data were very limited and lacked applicability to Cambodia's MMPs.

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

- Given the lack of findings from the above-mentioned desk review, PMI will support formative work to better understand the key determinants of malaria-related behaviors of forest-going populations, including the internal and social factors that influence forest workers' individual and group perceptions and behaviors regarding malaria prevention and treatment in Cambodia. The results from this formative work will be used to inform the design of future SBC activities.
- Furthermore, with available funding, PMI will continue supporting implementation of comprehensive and effective SBC approaches for control and elimination activities, both at community and service provider levels. At the community level, SBC messaging will target care-seeking behavior, adherence to treatment regimens, and use of appropriate prevention tools, particularly LLIN/LLIHNS. For service providers at public facilities and in the community, SBC approaches will focus on early detection and prompt treatment of individual cases, conducting case notification, and case investigations with timely responses to the cases.

**PMI Goal**

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

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

With FY 2020 funding, PMI will support the use of information collected from the formative work among MMPs to refine SBC efforts aimed at addressing the barriers to key malaria-related behaviors of forest-going populations. In addition, PMI will continue to provide technical support to CNM to facilitate evidence-based development and use of effective communication strategies, tools, and appropriate SBC approaches to sustain community involvement, promote healthy behaviors, and reduce risk-taking in the context of malaria elimination in targeted areas of Cambodia.

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 A26. Prioritized Populations and Behaviors with FY2020 Funds**

Target Population	Behavior	Geographic Focus	Justification
MMPs, including forest goers	LLIN/LLIHN and Personal Protection Use	PMI-supported areas with high numbers of forest-going populations	With FY 2020 funding, PMI will support the use of information collected from the formative work among MMPs to refine SBC efforts aimed at addressing the barriers to key malaria-related behaviors of forest-going populations.
Community members in endemic areas (i.e., local residents and MMPs)	LLIN/LLIHN Use, Prompt Care-Seeking, and Adherence to Treatment Regimens	TBD (Cambodia Bilateral Follow-On Project)	PMI will support the development and implementation of effective SBC approaches in target elimination and control ODs. Careful consideration will be given to training of health workers and VMWs, and tailoring of SBC messages according to identified risk factors. PMI will assist CNM to identify those risk factors and to refine approaches in support of the National SBC Strategy. In elimination areas, SBC efforts will also focus on increasing acceptance of reactive/active case detection among MMPs. In control areas, PMI will continue supporting SBC activities (IEC and media) to reach the highest risk groups by focusing on improving coverage and use of malaria prevention measures (LLINs/LLIHNs), dangers of counterfeit antimalarials, as well as ensuring prompt diagnosis and effective treatment.

## Conclusion

Understanding of the optimal SBC strategies for high-risk MMPs including forest goers are lacking. Therefore, PMI will support the use of information collected from the formative work among MMPs to refine SBC efforts aimed at addressing the barriers to key malaria-related behaviors of forest-going populations.

## 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**

As noted above, PMI supported a comprehensive desk review of the available literature on the determinants of key malaria-related behaviors of forest-going populations. However, the data were very limited and lacked applicability to Cambodia's MMPs.

## **Conclusion**

Given the lack of findings from the above-mentioned desk review, PMI will support formative work to better understand the determinants including facilitators and barriers of key malaria-related behaviors of forest-going populations. The results from this formative work will be used to inform the design of SBC activities in FY 2020.

## **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**

The NMCP's Health Education Unit is responsible for developing and delivering educational messaging, including the production of supporting materials such as billboards, posters, educational leaflets and radio spots. A number of CSOs organize messaging campaigns, generally in collaboration with CNM.

The current national malaria communication strategies are not fully implemented. Furthermore, much of the community mobilization efforts have not been fully successful at targeting those most at risk, specifically MMPs, due to their absence in villages during outreach activities. In many cases, males in the community, generally the family members who travel to the forest, do not attend community mobilization activities. As a result, a substantial gender gap in educational outreach and mobilization efforts exists. Lastly, different segments of the Royal Government of Cambodia provide education and training separately from those in the NCMP. For example, the Ministry of National Defence and the Ministry of the Interior train their own troops and their families on malaria prevention and treatment.

## **Conclusion**

The previous National SBC Strategy is being replaced with an updated strategy to include SBC for malaria elimination. PMI is providing technical assistance to CNM on updated SBC guidelines and the development of the National SBC Strategy for the MEAF 2021-2025. The strategy is still under development and provides an opportunity to target those at highest risk. It will be important to understand the risk behaviors for MMPs, especially forest goers. The proposed PMI activities will guide this better understanding so that SBC materials can be developed to efficiently target MMPs.

#### Key Question 4

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

#### Supporting Data

N/A

#### Conclusion

N/A

### 3.D. PROGRAM EVALUATION AND OPERATIONAL RESEARCH

<b>NMCP objective</b>
CNM has identified several priority research topics including the need for new sensitive field diagnostics, improved surveillance for malaria drug resistance, and scale-up of cost-effective personal prevention measures. (MEAF 2016-2020)
<b>NMCP approach</b>
In the MEAF 2016-2020, CNM described several steps to strengthen operational research (OR) for malaria and plans for several activities to improve coordination. These plans include: 1) to review and finalize the Policies and Guidelines to Conduct Malaria Research in Cambodia; 2) to identify a focal point for coordinating all OR for malaria; 3) to collaborate with partners to conduct trainings for all staff on research design and implementation, once guidelines are established; 4) to establish a malaria research working group to review protocols and provide technical input and direction for the country's research agenda; and 5) to require all partners to submit research data on a regular basis and share information widely to inform changes in strategy.
<b>PMI objective, in support of NMCP</b>
PMI has supported key OR activities in line with CNM's goals to address key programmatic and policy needs in Cambodia. Prior OR studies have included a field evaluation of a qualitative RDT to screen for G6PD deficiency, a qualitative study to identify determinants of net preference and acceptability, and an assessment of the safety and tolerability of low-dose primaquine in patients with uncomplicated <i>P. falciparum</i> infections who are G6PD-deficient and non-deficient.
<b>PMI-supported recent progress (past ~12-18 months)</b>
PMI is supporting an assessment of highly sensitive RDTs (hsRDT) in the context of foci identification/investigation. Since the study began a total of 37 malaria index cases and 160

secondary cases (relatives, co-workers, or co-travelers of index case patients) have been tested using hsRDTs. To date hsRDT has shown good concordance with conventional RDTs.

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

PMI is funding a study evaluating point-of-care SD Biosensor and Carestart quantitative G6PD assays among Cambodians with *P. vivax* malaria and without. This study is being conducted in Kampong Speu province, Cambodia and will include: 1) a cross-sectional study of adults from randomly selected villages and 2) a prospective cohort study of adults and older children presenting with a febrile illness to selected health centers. Accuracy and reliability of these point-of-care G6PD assays will be determined against standard laboratory-based spectrophotometric methods as well as a novel qualitative assay to determine severe G6PD deficiencies.

**PMI Goal**

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

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

No OR activities are being proposed with FY 2020 funding.

**Key Question 1**

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

**Supporting Data**

The partners represented on the Regional Steering Committee (RSC) of the Regional Artemisinin-resistance Initiative (RAI) have recently established a sub-committee to review plans, progress, and outcomes of OR research being conducted in the Greater Mekong Subregion. The goal of the sub-committee is to review technical issues and bottlenecks with ongoing OR studies and potential problems with OR proposals. The first meeting was held in March 2019 and the second in October 2019. The RSC OR Subcommittee will continue to meet approximately every six months and report summary findings back to the RSC.

**Figure A27. 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
Global Fund	Population Services International (PSI)	Assessing the relationship between LLIN material and LLIN usage in Myanmar and Cambodia	Data analysis is being completed and results will be disseminated soon.
Global Fund	Health and Social Development in affiliation with London School of Tropical Medicine	Implementation pilot of PQ and qualitative G6PD RDT testing at the village-level in Pursat Province, Cambodia	Started study preparations in January 2019
Global Fund	CNM/WHO	Implementation pilot of PQ and qualitative G6PD RDT testing	Started September 2019
Médecins Sans Frontières (MSF)	MSF	Anthropologic study of forest workers in Preah Vihear province	Planned
USG/PMI	CMEP	Assessment of highly sensitive RDTs (hsRDT) compared to conventional RDTs in the context of foci identification and investigation.	Started August 2019
USG/PMI	PSI/Impact Malaria	Assessment of point-of-care SD Biosensor and Carestart quantitative G6PD assays among Cambodians with <i>P. vivax</i> malaria and without.	Planned
USG/Department of Defence	Armed Forces Research Institute of Medical Sciences (AFRIMS)	Randomized controlled trial (RCT) along the Cambodian-Thai border with the following objectives: 1. To evaluate G6PD screening tests that can be deployed in resource-limited settings, under field conditions; 2. To improve access to treatments with PQ or tafenoquine (TQ) to eliminate <i>P. vivax</i> malaria 3. To strengthen pharmacovigilance systems to support safer deployment of chemoprophylaxis as well as PQ and/or TQ in resource-limited settings	Planned

## Conclusion

PE/OR activities supported by PMI and by other donors/partners in Cambodia are focusing on two priority areas for CNM: 1) targeting MMP including forest-goers to improve prevention, diagnosis, and treatment of malaria in these high-risk populations and 2) evaluations of safety and feasibility for *P. vivax* radical cure including improved G6PD testing strategies. As Cambodia continues to reduce the number of *P. falciparum* malaria cases throughout the country, these questions will remain pertinent to overcoming barriers toward CNM's goal of elimination of all human malaria by 2025.

## 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

N/A

## Conclusion

N/A

## Key Question 3

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

## Supporting Data

N/A

## Conclusion

N/A

### 3.E. OTHER HEALTH SYSTEMS STRENGTHENING

NMCP objective
The MoH's Third Health Strategic Plan (2016–2020) sets out an operational framework that ensures the Cambodian health strategy is consistently implemented across all health institutions at all levels of the health system and available resources are targeted to priority areas in their operations. This framework identifies four priority program areas and five cross-cutting health system strategies. The four priority program areas include: reproductive, maternal, newborn, child health, and nutrition;

communicable diseases (including HIV/AIDS, tuberculosis, malaria, dengue, neglected tropical diseases, and other emerging infectious diseases); non-communicable diseases and public health concerns; and health system strengthening. One of the objectives in the four focus areas is to reduce morbidity and mortality mainly due to HIV/AIDS, tuberculosis, and malaria by 2020. The five health system strategies include: health service delivery; health care financing; human resources; health information systems; and health system governance.

**NMCP approach**

CNM will build the capacity of community and facility-based health care workers to actively find malaria cases and improve case management. In addition, CNM will need to strengthen surveillance and information systems to meet the need for real-time data to support the elimination strategy laid out in the Malaria Elimination Action Framework 2.

**PMI objective, in support of NMCP Infrastructure**

PMI works in close partnership with the CNM to build capacity in the form of technical assistance and training to the CNM, PHD, and OD staff. PMI also supports VMWs as these staff are critical extensions of the public health system and are essential for the treatment of malaria cases at the community level – where the burden of disease remains highest. Although some improvements have been made in the healthcare system, Cambodia still faces many challenges, such as decentralization and integration of malaria control into existing health care services, which places an additional management burden on the provincial and district levels. Low salaries of government health staff result in limited availability of public services. VMWs who provide front-line services in communities for early detection and treatment of malaria are covering most malaria-endemic parts of the country, but receive insufficient support from district and provincial management. In addition, quality of care with regard to diagnostics and treatment faces many challenges in both the public and private sectors. PMI’s capacity building efforts are also complemented by broader health systems strengthening activities using other U.S. Government funding. For example, USAID is also providing technical assistance to implement and expand Cambodia’s social health protection scheme; to strengthen the health management information system (HMIS) and LMIS; to support the MoH in licensing and registration of private health care providers; and to develop new health financing approaches. USAID is supporting reproductive, maternal, newborn, and child health, nutrition, HIV/AIDS, tuberculosis, and neglected tropical diseases activities as well. All USAID and PMI supported health systems work is in line with the MoH’s Third Health Strategic Plan (HSP3) and the soon to be finalized HSP4.

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

- PMI strengthened the capacity of national and subnational malaria teams to implement and manage the national malaria surveillance system and provide appropriate monitoring and evaluation for malaria elimination and control activities.

- PMI supported training for provincial and district malaria teams to strengthen the quality of data for reporting and analysis. As result, more than 95% of healthcare providers in PMI supported areas, including public facilities, community health workers, and private providers reported malaria cases in a timely manner.
- As malaria cases drop and lab technicians examine fewer and fewer microscopy samples, maintaining lab skills amount technicians can be a challenge. To address this, PMI provided support for microscope training to 12 lab technicians to improve the quality of malaria diagnosis via microscopy examination. PMI also supported quarterly supervision visits by a regional lab technician for selected health facilities.
- PMI supported training to health care providers for G6PD RDT testing, radical treatment of *P. vivax*, and rigorous monitoring of patient treatment response.
- PMI built the capacity of provincial and district teams to develop their annual operational plan, implement activities and monitor progress. To promote improved availability and quality of malaria commodity data, PMI supported the development of a logistics management module (the stock module) for the Malaria Information System and trained 383 drug store staff from the OD-level to use the system.

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

- PMI plans to support CNM in malaria commodity forecasting, quantification, supply planning, and improving the collection, review and reporting of consumption data. In addition, PMI will provide technical advice to CNM and partners on strengthening subnational level warehousing, distribution, and inventory management.
- PMI plans to assist CNM to develop an early warning system (EWS) that will detect occurrences of potential stock-outs to allow CNM and supply chain partners to react in a timely manner and conduct the necessary redistribution, reallocation or emergency procurement of commodities.
- In 2020, GHSC-PSM plans to support CNM develop a comprehensive stock dashboard at the national level in the Malaria Information System. The dashboard is to give visibility to the current stock status, months of stock, stock-on-hand, pipeline, and wastage to address any supply chain challenges promptly and effectively. These data will also support future quantification and forecasting exercises.
- PMI will continue to build the capacity of CNM to manage activities and transition towards malaria elimination. PMI will strongly engage provincial and district staff in joint planning, implementation, and monitoring malaria activities through Annual Operational Plans (AOP).
- PMI will continue to provide technical assistance at subnational level on data management, reporting and use. PMI will provide technical assistance to build capacity of district teams in

five additional target-elimination ODs. This will include support for malaria surveillance and ensuring every case is notified, investigated and responded to.

- PMI will support district malaria teams in conducting entomological monitoring, including vector insecticide resistance status in their area.
- PMI will provide case management training and support to CNM/PHD/OD teams for the scale up of radical cure for *P. vivax*.

## PMI Goal

The PMI Strategy 2015-2020 guiding document emphasizes building capacity and strengthening health systems as one of the five core areas of strategic focus. Since the beginning of the initiative, PMI has been strongly supporting countries to develop and implement their own programs by focused on building human capacity, including engaging communities to participate in malaria control, and addressing gaps in country health systems in the key areas of supply chain management, training and supervision of health workers, and monitoring and disease surveillance systems.

## Key Question 1

What other opportunities exist for health system strengthening and capacity building?

## Supporting Data

As Cambodia continues to make progress toward elimination of malaria, rapid identification and investigation of foci will become more critical to prevent spread or reintroduction of malaria into areas previously declared malaria-free. This will require advanced training of CNM, OD, and PHD staff to learn how to respond to malaria “outbreaks.” Field epidemiology training programs (FETP) are one source of such training. Limited staffing at CNM and ODs/PHDs and a weak epidemiology training program in Cambodia has prevented the malaria control program from utilizing such opportunities in the past. But given both increased staffing numbers and an improvement in the FETP program itself, CNM may see the FETP as a valuable part of their malaria control program in the future.

## Conclusion

PMI will continue discussions with CNM to identify how CNM and our PHD/OD colleagues may benefit in the future from the new Frontline FETP program in Cambodia.

## Key Question 2

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

**Supporting Data**

N/A

**Conclusion**

N/A

## **ANNEX B: COUNTRY PROGRAM INVENTORY**

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

### **Key:**

Example score
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**Figure B1. Category: Vector Control**

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

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

**Figure B2: Category: Case Management**

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

**Figure B3. Category: Drug-Based Prevention**

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

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

**Figure B4. Category: Supply Chain**

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

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

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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	Logistics Management Information System	<p>System to aggregate, analyze, validate and display data (from all levels of the logistics system) that can be used to make logistics decisions and manage the supply chain not institutionalized or followed</p> <p>No facility level records or not maintained. Low reporting rates. No visibility into CHW supplies. No visibility by central level on facilities and none by facility level on central level.</p>	<p>Stand-alone, program specific LMIS processes and structures defined but no formal or ongoing monitoring or measurement protocol exists.</p> <p>Some visibility of facility level inventory and consumption, low reporting rates, mostly paper-based</p>	<p>The country has documented LMIS processes and structures. The structures are functional. Metrics for performance monitoring, quality improvement, and evaluation are systematically used.</p> <p>Migration of data collection and reporting from a paper system to an electronic system at the district level and above. A documented mechanism is in place for maintaining data quality throughout the data supply chain.</p>	<p>Government and stakeholders use the national LMIS systems for key performance monitoring and follow standard practices.</p> <p>Facility inventory and consumption data is digital at facility level, upstream data available to facilities, System alerts for low stock/expiry, use of master product list and master facility list</p> <p>Interoperability with other information systems (e.g., warehouse management, medical records, laboratory management, enterprise resource planning systems, and health information management systems)</p>	<p>Near real time visibility into inventory and consumption data at all levels, data from multiple systems feed into common platform/control tower (automated process), predictive analytics.</p> <p>The government and stakeholders routinely review interoperability activities and modify them to adapt to changing conditions.</p> <p>Compliance with standards for data exchange, messaging, and security is regularly reviewed. The regulatory framework is reviewed and updated to reflect best practices for data exchange, messaging, and systems security.</p>

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	Regulatory, Policy and Governance	<p>Legal basis to enable a medicines (and related health commodities - e.g., devices, vaccines, etc.) regulatory agency to function is absent or inappropriate</p> <p>Formal organizational structure regarding in-country stakeholders and relevant agencies to whom authority is delegated, is absent or inadequate (e.g., up-to-date organogram of MOH).</p> <p>Human and financial capacity to enable regulatory functionality, weak or absent</p> <p>No approved supply chain strategic plan</p>	<p>Medicines framework exists and is sufficient to support basic regulatory functions including clinical dossier review (licensing) and marketing authorization with registration.</p> <p>Documented domestic financial support to enable regulatory activities - including human resources</p> <p>Approved supply chain strategic plan but not updated recently. Poorly implemented strategic plan</p>	<p>All SDP levels have in place policies that address STG, quality assurance and HR.</p> <p>Management policies for the supply chain system are in place at the MOH level.</p> <p>Policy and strategic leadership is not always translated into robust implementation plans, and supportive supervision, capacity building and guidance to managers within the system.</p> <p>No consistent approach to pharmacovigilance or a standard reporting structure for pharmacovigilance events</p> <p>Overall quality management system in place to support interface of product licensing, registration, manufacturing, post-marketing surveillance.</p> <p>Approved (and up to date) supply chain strategic plan. Partially implemented</p>	<p>Strong policy and strategic leadership by government, with firm grasp of budgets and financial sustainability</p> <p>Robust implementation plans, and supportive supervision, capacity building and guidance to managers within the system.</p> <p>Regulatory and policy bodies in alignment to support quality product availability</p> <p>National and standardized Pharmacovigilance or a standard reporting structure for pharmacovigilance events in place, not fully functional.</p> <p>Approved (and up to date) supply chain strategic plan (contains clear roles and responsibilities, stakeholder mapping, costs).</p>	<p>The MOH leads strategic functions such as, policy formulation, quality assurance and overseeing the funds required for policy implementation.</p> <p>Ability to ensure product quality, automated drug registration process, clear/transparent importation process, robust post-market surveillance system and, track and trace regulations developed and/or in the process of implementation.</p> <p>Approved (and up to date) supply chain strategic plan (contains clear roles and responsibilities, stakeholder mapping, costs). Includes risk mitigation plan.</p>

**Figure B5. Category: Strategic Information**

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

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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	Data use	Activities (analysis, interpretation, visualization) to ensure data use are rarely implemented	Limited data use activities are implemented (bulletin has been developed but analysis and interpretation for decision- making needs to be strengthened)	Country conducts regular data use activities (review meetings, bulletin at least quarterly, at least at the central level).	Country conducts regular data use activities at all levels (review meetings, bulletins, dashboard at least quarterly).	Country has developed their own high- quality dashboard to facilitate data use, and data-informed decision making is evident at all levels, on a frequent basis.
OR/PE	PMI in-country OR experience	No previous PMI OR experience in country	PMI team has prepared concept notes (CNs) but has not completed protocols or conducted OR	PMI team has completed protocols and received approval for OR; studies in planning, underway, or recently completed	PMI team and/or other country partners have completed a OR study and prepared and shared reports	Multiple OR studies completed in country that address malaria program implementation bottlenecks with publication and sharing of results, with involvement from MOH co-investigators
	Country mechanisms for OR/PE review	No in-country process for research review, determination or IRB processes	Limited in-country processes for research review, determination and IRB oversight	Processes in place for research and IRB review with federal-wide assurance approval; no previous PMI in-country OR experience	Processes in place for research and IRB review with federal-wide assurance approval; previous PMI in-country OR experience	Full complement of research review, approval, oversight processes including data safety and monitoring boards and systems for results sharing
	In-country partnerships for OR	No in-country partners (academic, NGO, or other) with OR experience	1-2 in-country partners with OR experience, but no malaria specific experience	3+ in-country partners with OR experience; 1+ with some malaria expertise; no current PMI-linked OR work	3+ in-country partners with OR experience; 1+ with malaria expertise; current or recent work with PMI OR	Multiple in-country partners with specific malaria experience in PMI OR, including completed past work and reporting on malaria OR

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	Conceptualization of problems needing scientific evaluation	No experience	Some but limited experience in identifying programmatic problems and prioritization	Experience with identifying program problems and prioritizing PE and OR	Experience with identifying problems needing PE or OR and developing study approaches with partners	Extensive experience with problem identification, prioritization, proposal development and conducting PE or OR

**Figure B6. Category: Support Systems**

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
<b>SBC</b>	National Malaria SBCC Strategy used to guide design and implementation of malaria SBC activities	No strategy exists.	Strategy exists but there is no evidence that it has been used to guide design or implementation.	Strategy exists and is used from time-to-time to guide design and implementation, but is of poor quality and does not include any of the key elements identified in the RBM SBCC Working Group National Malaria SBCC Strategy Template.	Strategy is used from time-to-time to guide design and implementation, but lacks alignment with the broader National Malaria Strategy and only incorporates a couple of the key elements identified in the RBM SBCC Working Group National Malaria SBCC Strategy Template.	Strategy is well aligned with the broader National Malaria Strategy, includes the key elements identified in the RBM SBCC Working Group National Malaria SBCC Strategy Template, and is used to guide design and implementation.
	SBC Technical Working Group coordinates effectively	No technical working group exists.	The SBC Technical Working Group exists on paper, but has not been operationalized.	The SBC Technical Working Group has significant resource and staffing gaps and does not have clear pathways for coordination.	The SBC Technical Working Group lacks some needed resources/staff and generally only coordinates at the national level only.	The SBC Technical Working Group is well resourced and staffed and engages in regular coordination at both the national and sub-national level.

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	High-quality formative assessments used to inform intervention design	No high-quality, formative assessment conducted in the last five years.	Formative assessment conducted, but significant quality issues in the design and no evidence that data was used to inform intervention design.	High-quality, formative assessment conducted, but no evidence that data was used to inform intervention design.	Data from prior projects used exclusively to guide intervention design; no new data collected.	High-quality, formative assessment conducted and data used to inform intervention design.
<b>Elim (relevant only for countries actively pursuing elimination)</b>	Elimination planning to implementation	No elimination or pre-elimination targets in the national strategic plan	Risk stratification conducted using latest incidence data and interventions targeted	Readiness assessment/ capacity inventory conducted	Capacity built and systems in place to initiate elimination activities	Elimination activities implemented fully in targeted areas
	Surveillance system readiness to track all cases	Monthly, aggregate data from public sector only	At least monthly, aggregate data from public, private, and community levels	Case-based reporting initiated	Real-time, case-based surveillance inclusive of all sectors and levels in targeted areas	Real-time, case-based reporting and response activities implemented
<b>Additional Health Systems Strengthening</b>	Staffing	No staff	Manager and a few technical staff; not all intervention areas are covered	Manager and technical staff for each intervention area; many staff have limited training and experience ; limited program support staff	Full staffing of program areas and support systems but some staff need further training to optimize their effectiveness; limited plans and opportunities for such training	Fully staffed with personnel with relevant training and experience; complete plan for professional development

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
Office space, transport	Office space, transport	No office space or transport	Office space exists but is insufficient for staff; Transport available at intervals but limited for program needs	Office space adequate for current staff but no growth possible; office not well positioned for access to MOH leadership. Transport available but not covering all needs and not well managed/maintained	Office space adequate for current staff and some technical areas (e.g., lab) but not fully adequate for growth and all technical services. Transport covers most needs.	Office space is fully adequate for current staff and technical needs (lab, insectary, meeting space, etc.) and some growth and well positioned in the MOH; Transport is fully available for needed purposes -- trucks and 4-wheel drive vehicles where needed - all maintained and managed.
	Internet connectivity	No Internet connectivity	Intermittent connectivity; poor bandwidth; challenging maintenance; very little budget	Mostly connected with some outages; ok but not ideal bandwidth; irregular maintenance; modest budget	Generally stable connections, adequate bandwidth for most work, fair to good maintenance and sufficient budget	Fully connected, maintained, good bandwidth for all needs, and sufficient budget including all needed hardware and software
	NMCP placement within Ministry of Health	NMCP exists but is barely visible in the MOH structure	NMCP is visible in the MOH structure but NMCP manager reports to supervisor who is still low in the MOH system	NMCP is visible and manager reports to high level leader in MOH (e.g., Director of Public Health or Permanent Secretary for Health)	NMCP (or NMEP) is highly visible and reports at a high level in MOH and has some access to other ministry leadership (e.g., education, agriculture, community development)	NMCP (or NMEP) is highly visible within MOH and with all other relevant ministries and has ready access to country leadership (e.g., the president/prime minister; and parliament)