

PMI

U.S. PRESIDENT'S MALARIA INITIATIVE

LED BY



USAID
FROM THE AMERICAN PEOPLE



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

SIERRA LEONE

Malaria Operational Plan FY 2020

U.S. President's Malaria Initiative Sierra Leone Malaria Operational Plan FY 2020. Retrieved from (www.pmi.gov)

TABLE OF CONTENTS

ABBREVIATIONS	4
I. INTRODUCTION	6
II. MALARIA SITUATION AND MALARIA CONTROL PROGRESS IN SIERRA LEONE	9
III. OVERVIEW OF PMI'S SUPPORT OF SIERRA LEONE'S MALARIA CONTROL STRATEGY	12
IV. PARTNER FUNDING LANDSCAPE	18
V. ACTIVITIES TO BE SUPPORTED WITH FY 2020 FUNDING	23
ANNEX A: INTERVENTION-SPECIFIC DATA	24
1. VECTOR CONTROL	24
1.A. ENTOMOLOGICAL MONITORING	27
1.B. INSECTICIDE-TREATED NETS (ITNs)	31
1.C. INDOOR RESIDUAL SPRAYING (IRS)	39
2. HUMAN HEALTH	42
2.A CASE MANAGEMENT in health facilities and communities	42
2.B. DRUG-BASED PREVENTION	56
2.B.i SEASONAL MALARIA CHEMOPREVENTION (SMC)	59
2.B.ii MALARIA PREVENTION IN PREGNANCY (MIP)	60
3. CROSS-CUTTING AND OTHER HEALTH SYSTEMS	67
3.A. SUPPLY CHAIN	67
3.B. SURVEILLANCE, MONITORING & EVALUATION (SM&E)	76
3.C. SOCIAL AND BEHAVIORAL CHANGE (SBC)	86
3.D. PROGRAM EVALUATION AND OPERATIONAL RESEARCH	93
3.E. OTHER HEALTH SYSTEMS STRENGTHENING	95
ANNEX B: COUNTRY PROGRAM INVENTORY	99

ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
ANC	Antenatal care
BMGF	Bill and Melinda Gates Foundation
CDC	Centers for Disease Control and Prevention
CHW	Community health worker
CRS	Catholic Relief Services
CY	Calendar year
DDMS	Directorate of Drugs and Medical Supplies
DHIS2	District health information system-2
DHMT	District health management team
DHS	Demographic and Health Survey
DPPI	Department of Policy, Planning, and Information
DRCH	Directorate of Reproductive and Child Health
EPI	Expanded program on immunization
EVD	Ebola virus disease
FETP	Field Epidemiology Training Program
FY	Fiscal year
Gavi	Gavi, the Vaccine Alliance (Global Alliance for Vaccines and Immunization)
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GoSL	Government of Sierra Leone
HMIS	Health management information system
HSS	Health systems strengthening
iCCM	Integrated community case management
IPTi	Intermittent preventive treatment for infants
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
LMIS	Logistics management information system
MECAT	Monitoring and Evaluation Capacity Assessment Toolkit
MICS	Multiple Indicator Cluster Survey
MIP	Malaria in pregnancy
MIS	Malaria indicator survey
MoHS	Ministry of Health and Sanitation
MOP	Malaria Operational Plan
MRA	Malaria research agenda
NMCP	National Malaria Control Program
NMSA	National Medicine Supplies Agency
NMSP	National Malaria Strategic Plan

OTSS+	Outreach Training and Supportive Supervision Plus
PBO	Piperonyl Butoxide
PHU	Peripheral health unit
PMI	U.S. President's Malaria Initiative
RBM	Roll Back Malaria
RDQA	Routine Data Quality Audit
RDT	Rapid diagnostic test
mRDT	Malaria rapid diagnostic test
RRIV	Report Request and Issue Voucher
SARA	Service Availability and Readiness Assessment
SBC	Social and behavior change
SM&E	Surveillance, monitoring, and evaluation
SP	Sulfadoxine-pyrimethamine
Stats SL	Statistics Sierra Leone
TBA	Traditional birth attendant
TES	Therapeutic efficacy study
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

I. INTRODUCTION

The 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 Sierra Leone to end malaria. PMI has been a proud partner of Sierra Leone since 2017, and through investments totaling almost \$45 million, have contributed to the 22 percent decrease in the under five year mortality from the 2013 Demographic and Health Survey (DHS) to the 2019 DHS (2019 Sierra Leone DHS Key Indicators Report).

The proposed PMI fiscal year (FY) 2020 budget for Sierra Leone is \$15 million. This Malaria Operational Plan (MOP) outlines planned PMI activities in Sierra Leone for FY 2020. Developed in consultation with the National Malaria Control Program (NMCP) and key stakeholders, proposed activities reflect national and PMI strategies, draw on best-available data, and align with the country context and health system. Proposed PMI investments support and build on those made by the Government Sierra Leone as well as other donors and partners.

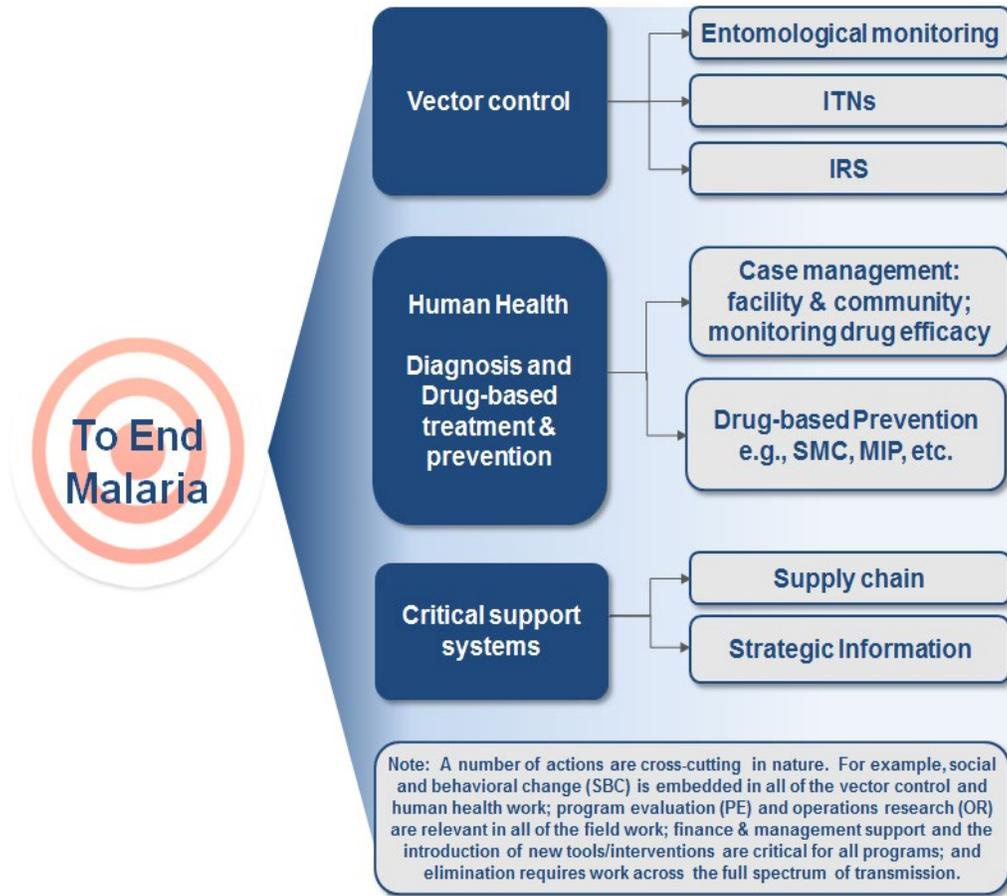
Sierra Leone at a glance

- **Geography:** Four regions: Coastal Guinean mangroves, wooded hill country, upland plateau and eastern mountains
- **Climate:** Tropical monsoon climate; 1400 mm of average annual rainfall (Climate-Data.org, 2019)
- **Population in 2019:** 7,901,454 (Statistics Sierra Leone (Stats SL), 2019)
- **Population at risk of malaria:** 7,901,454 (National Malaria Strategic Plan (NMSP) 2016-2020)
- **Principal malaria parasites:** *Plasmodium falciparum* (>90%), *P. ovale* and *P. malariae* (NMSP 2016-2020)
- **Principal malaria vectors:** *Anopheles gambiae* s.s., *An. funestus* and *An. melas* (NMSP 2016-2020)
- **Malaria incidence per 1000 population:** 311.7 (District health information system-2 (DHIS2) and Hospital Excel Database 2018)
- **Under-five mortality rate:** 122 deaths per 1,000 live births (DHS 2019)
- **World Bank Income Classification & GDP:** Low Income; \$4.00 billion (World Development Indicators Database, 2018)
- **Political system:** Presidential representative democratic republic
- **Trafficking in Persons designations, 2016-2018:** Tier 2 Watchlist (2018 Trafficking in Persons Report - Sierra Leone)
- **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)
- World Health Organization (WHO)
- United Nations Children's Fund (UNICEF)
- Catholic Relief Services (CRS)
- Comic Relief/GlaxoSmithKline partnership
- **PMI Support of National Malaria Control Strategy:** PMI supports National Malaria Control Program (NMCP) policy and strategy in the implementation of proven antimalarial interventions. The purchase of antimalarial commodities for the diagnosis and treatment of malaria, insecticide-treated nets (ITN) distribution and prevention of malaria in pregnancy are among PMI supported interventions implemented throughout Sierra Leone. In addition, PMI provides focused programming support in four high burden districts (Bo, Koinadugu, Port Loko and Pujehun) by implementing intensive supportive supervision and training to peripheral health units for malaria case management and malaria in pregnancy, systematically evaluating malaria behaviors to inform national strategy and through improvements to health management information system (HMIS) data collection and use by district health management teams (DHMTs). PMI supports monthly entomological surveillance and analysis in four sentinel districts to inform vector control initiatives. (See III. Overview of PMI's support of Sierra Leone's Malaria Control Strategy for additional details)
- **PMI Investments:** Sierra Leone began implementation as a PMI focus country in FY 2017. The proposed FY 2020 PMI budget for Sierra Leone is \$15 million; that brings the total PMI investment to nearly \$45 million.

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

Figure 1. PMI's Approach to End Malaria



PMI's approach is both consistent with and contributes to USAID's Journey to Self-Reliance framework. Building and strengthening the capacity of Sierra Leone'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/Sierra Leone will continue to rely on and engage with local partners such as CRS, Clinton Health Access Initiative, Concern Worldwide, and International Rescue Committee and is expanding its local partner base to reach non-governmental health providers like private hospitals, pharmacies, and traditional healers. Additionally, PMI/Sierra Leone will seek to develop collaborations with private sector partnerships.

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

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

II. MALARIA SITUATION AND MALARIA CONTROL PROGRESS IN SIERRA LEONE

All geographic areas of Sierra Leone are favorable to malaria transmission, which is stable and perennial. Malaria transmission has two peaks, one that begins during the rainy season in May and the second towards the end of the rainy season in October/November. The major parasite species are *Plasmodium falciparum* (>90 percent), *P. ovale*, and *P. malariae*. An estimated 2,240,000 outpatient visits are due to malaria every year, of which about 1,000,000 patients (45 percent) are children under five years of age. Pregnant women and children under five constitute 4.4 percent and 17.7 percent of the total population, respectively, and are the most vulnerable groups (NMSP 2016-2020). Malaria is considered a major impediment to socio-economic development, leading to poverty. The malaria parasitemia prevalence estimates in children under five years of age were 53 percent and 40 percent using rapid diagnostic test (RDT) and microscopy, respectively (Figure 2, Malaria Indicator Survey (MIS) 2016).

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

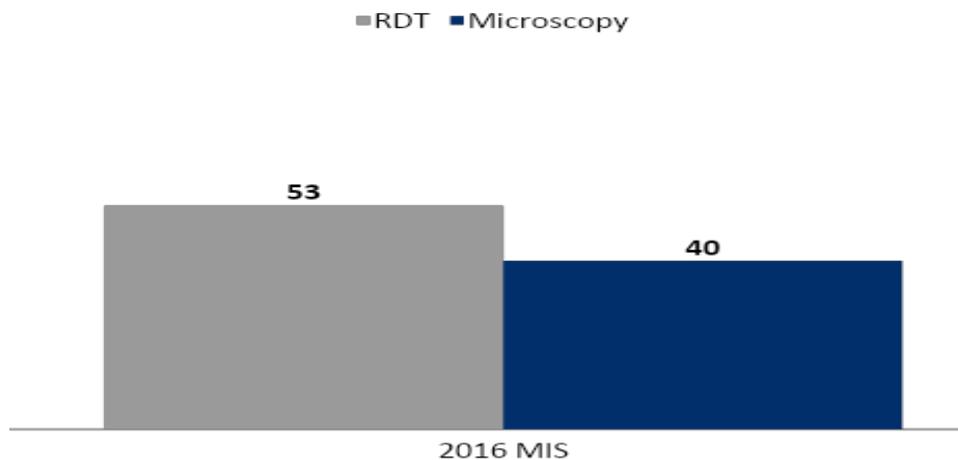


Figure 3. Trends in Prevalence of Low Hemoglobin, *Percent of Children Age 6-59 Months with Moderate-to-Severe Anemia (Hemoglobin <8.0 g/dl)*



Figure 4. Malaria Parasite Prevalence among Children Under Five Years of Age by District, 2016 MIS, *Percent of Children Age 6-59 Months Who Tested Positive for Malaria by Microscopy*

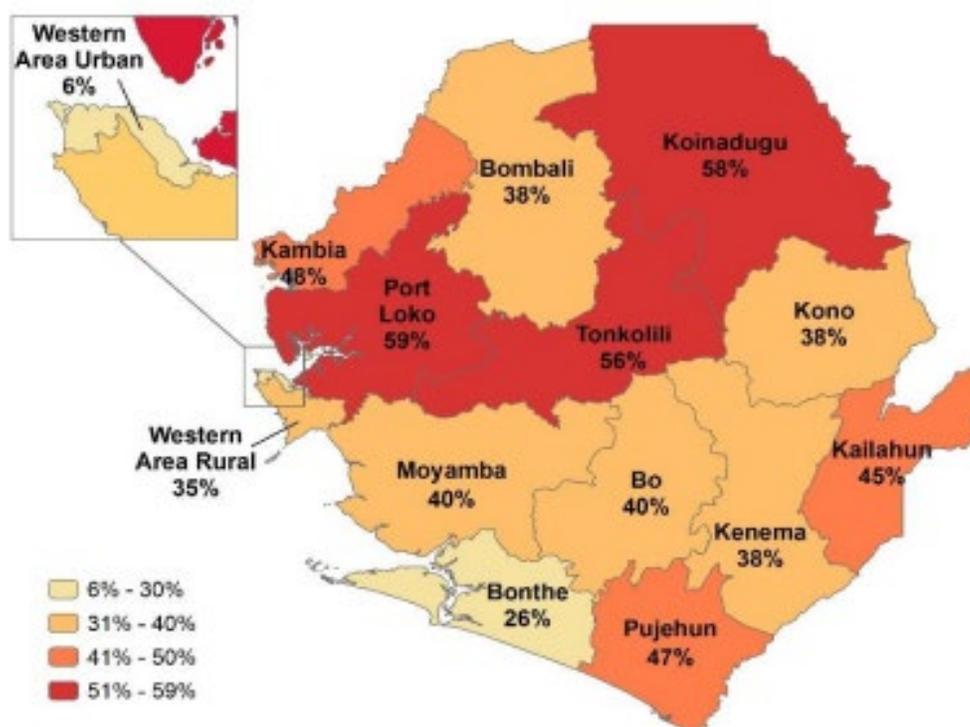


Figure 5. Key Indicators for Malaria Prevention and Treatment Coverage and Impact Indicators from Demographic Health Surveys (DHS) and Malaria Indicator Surveys (MIS) from 2013-2016.

Indicator	2013 DHS	2016 MIS
% Households with at least one ITN	64	60
% Households with at least one ITN for every two people	15	16
% Population with access to an ITN	38	37

Indicator	2013 DHS	2016 MIS
% Population that slept under an ITN the previous night	42	39
% Children under five years old who slept under an ITN the previous night	49	44
% Pregnant women who slept under an ITN the previous night	53	44
% Children under five years old with fever in the last two weeks for whom advice or treatment was sought ¹	72	71
% Children under five with fever in the last two weeks who had a finger or heel stick	40	51
% Children receiving an ACT among children under five years old with fever in the last two weeks who received any antimalarial drugs	37	97
% Women who received two or more doses of IPTp during their last pregnancy in the last two years ²	47	71
% Women who received three or more doses of IPTp during their last pregnancy in the last two years ²	21	31
Under-five mortality rate per 1,000 live births	156	n/a
% Children under five years old with parasitemia (by microscopy , if done)	n/a	40
% Children under five years old with parasitemia (by RDT , if done)	n/a	53
% Children under five years old with severe anemia (Hb<8gm/dl)	16	10

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

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

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

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

Indicator	2014	2015	2016	2017	2018
# Suspect malaria cases	2,647,375	2,337,297	3,633,275	3,807,161	4,011,921
# Patients receiving diagnostic test for malaria	2,122,999	2,251,067	3,596,227	3,760,405	3,996,065
Total # malaria cases (confirmed and presumed)	1,686,315	1,526,844	2,416,035	2,258,498	2,436,413
# Confirmed cases	1,374,476	1,483,376	2,260,056	2,234,230	2,400,159
# Presumed cases	311,839	46,468	155,979	24,268	36,254
% Malaria cases confirmed	72%	95%	94%	99%	99%
Test positivity rate (TPR)	65%	66%	63%	59%	60%
Total # <5 malaria cases	1,167,138	1,227,876	1,523,262	1,416,356	1,395,797
% Cases under 5	61%	78%	63%	63%	57%
Total # hospitalized with malaria	18,556	17,596	27,221	13,315	34,834 [#]

Indicator	2014	2015	2016	2017	2018
Total # malaria deaths	2848	1107	1345	1298	1348
# Facilities reporting	1210	1225	1242	1262	1279
Data form completeness (%)	89%	96%	98%	99%	99%

Data sources and comments: DHIS2 and Stand-alone Hospital Excel Database

Improved reporting from Private health facilities following signing of MOU

III. OVERVIEW OF PMI'S SUPPORT OF SIERRA LEONE'S MALARIA CONTROL STRATEGY

The NMSP 2016-2020 supports improvement of the health status of the population and the fight against poverty by reducing the burden due to malaria. The NMCP's overall vision is "access to malaria control interventions for all" with the mission to "direct and coordinate efforts towards a malaria-free Sierra Leone through effective partnerships."

Goal: By 2020, reduce malaria morbidity and mortality by at least 40% compared with 2015.

Objectives:

Objective 1a: *All suspected malaria cases should have access to confirmatory diagnosis*

Objective 1b: *All malaria cases to receive effective treatment*

The Ministry of Health and Sanitation (MoHS) endorses parasitological confirmation of malaria as part of good clinical practice to improve the quality of care of patients. Before treatment is instituted, confirmation should be done using microscopy or rapid diagnostic tests (RDTs) and prompt and effective treatment with Artemisinin-based combination therapy (ACT) with an enhanced role for community health workers (CHWs) to expand delivery. MoHS and partners have trained approximately 14,000 CHW volunteers and peer supervisors in 2018 as part of national implementation of integrated community case management (iCCM). NMCP seeks to strengthen the capacity of health workers both in the public and private health sectors to implement the new test-treat-and-track (T3) strategy by strengthening capabilities in prompt and targeted malaria case management; integration of quality assurance and quality control systems; incorporating malaria in pregnancy (MIP) into the maternal and child health strategy; improving the procurement and supply chain for the commodities for malaria prevention and treatment; proactive engagement of the private sector in malaria control, as well as community participation in diagnosing, treating and reporting malaria cases. NMCP conducted a therapeutic efficacy study (TES) in four districts in 2016/17 and plans on conducting regular TESs.

Annual ACT and rapid diagnostic test (RDT) needs are primarily covered by the Global Fund, but PMI has contributed to the national quantification gap, in addition to procuring severe malaria drugs. To help reduce malaria burden, PMI has started focusing on intensive supportive supervision in four districts and mentoring of health care workers, as well as improving the quality of malaria diagnosis and case management practices in public health facilities and at the

community level with a particular emphasis on severe malaria management. In addition, PMI is supporting the NMCP in a phased national roll-out of rectal artesunate suppositories for pre-referral treatment of severe malaria in children under six years of age.

Objective 2a: Provide access to 100% of the population at risk with preventive measures by 2017

Objective 2b: To protect at least 80% of pregnant women with IPTp3 and children under one year with IPTi by 2020

The strategic plan proposes to use three vector control strategies: ITNs, indoor residual spraying (IRS), and larval source management. Mass distribution campaigns will be repeated every three years and continuous ITN distribution through antenatal care (ANC) and expanded program on immunization (EPI) outlets will be done nationwide to maintain high levels of coverage during the entire period of the strategic plan. PMI has procured 675,000 ITNs for distribution through routine channels. A long-lasting ITN mass distribution campaign for universal coverage was conducted in June 2017 with another (referred to as PBO ITNs in this document) planned for April 2020 of which 2,500,000 million pyrethroid + Piperonyl butoxide (PBO) ITNs, have been procured by PMI. PBO ITNs are expected to have significantly improved effectiveness in mosquito vector control than traditional ITNs.

PMI has assisted the NMCP in building entomological capacity by establishing entomological and insecticide resistance monitoring programs at eight and four sentinel sites (respectively), refurbishing the insectary and establishing a colony of susceptible *An. gambiae*, Kisumu strain, recruiting and training entomological staff, supporting a review of the national insecticide resistance monitoring and management plan, and completing laboratory analyses of collected specimens. The elevated resistance to all pyrethroid insecticides by Sierra Leone mosquitoes discovered by PMI-funded entomological surveillance, led to NMCP's strategic decision to acquire PBO ITNs for the 2020 mass distribution campaign. Additionally, PMI assisted in establishing the malaria vector control and integrated vector management technical working groups, supported a review of the national integrated vector management guidelines, and created an entomological monitoring database.

The NMCP has proposed conducting district-wide IRS campaigns in two districts beginning in 2021 with PMI support. These districts have been selected because longitudinal entomological surveillance and insecticide susceptibility testing has been instituted within all four. However, due to cost, PMI will plan to support IRS in 2021 in just two (Bo and Bombali) of the four districts. Strengthened public-private partnerships will serve as an opportunity for resource mobilization to scale up implementation of IRS as recommended by the WHO. For example, prior to the Ebola virus disease (EVD) outbreak, there were discussions between the Government of Sierra Leone (GoSL) and private mining companies regarding the potential for IRS implementation. The NMCP has expressed an interest in exploring this possibility again although no further discussions have taken place at this time.

Reduction of larval sources through larviciding and environmental management nominally remains an option described in the NMSP, although there are no current plans to pursue implementation.

Intermittent preventive treatment for pregnant women (IPTp) is provided as part of the focused antenatal care package using the recommended drug, Sulfadoxine-pyrimethamine (SP). ANC clinic and other health providers have been trained on, and have begun implementing, the current policy recommending at least three doses of IPTp. PMI has supported the NMCP with updating the national policy and guidelines in line with the WHO IPTp policy recommendations and has assisted the NMCP and Division of Reproductive and Child Health (DRCH) in establishing a national MIP working group for addressing technical issues and challenges. To ensure health providers are familiar with the new guidelines, PMI will support the NMCP's plan to train peripheral health providers including health facility staff, community health workers, midwives, and public and private sector hospital staff on the updated MIP policy and guidelines.

The NMCP has also incorporated the 2010 WHO recommendation of Intermittent Preventive Therapy for Infants (IPTi) using SP into the national strategy, which has been approved for use in areas of year-round, moderate to high transmission and where resistance to SP is not high.¹ The intervention calls for the administration of a full dose of SP for infants at intervals corresponding to routine EPI vaccination activities at health facilities, specifically the second and third doses of Penta/DTP and measles/yellow fever vaccination (at 10 weeks, 14 weeks, and nine months of age, respectively). The NMCP endorsed a pilot study of IPTi activities in four districts (Kambia, Pujehun, Kenema, and Western Area Rural) from 2017-2018. Findings from the pilot informed the national scale-up that was completed in 2018. CDC/Sierra Leone supported ICAP to conduct an external evaluation of the IPTi pilot in Kambia district and final results will be available in early 2020. The IPTi pilot study and scale-up received technical and financial contributions including SP procurement from non-PMI partners and donors.

Objective 3: To provide knowledge to the population such that at least 80 percent of the population practices malaria prevention and treatment measures by 2018.

The strategic plan recognizes that the implementation and coordination of this multi-sectoral malaria control strategy by the MoHS will require a more vibrant social and behavior change (SBC) approach. The NMCP aims to engage Civil Society Organizations (CSOs) and Community Based Organizations (CBOs) to empower and encourage community demand for services, increase communities' knowledge about their health rights, and require accountability from change agents.

The NMCP supports activities that seek to reduce malaria morbidity and related mortality by motivating every Sierra Leonean to take recommended actions to prevent, diagnose, and treat malaria and to bring about sustainable social and individual behavioral change. It acknowledges

¹ Areas with high resistance to SP defined as having more than 50% prevalence of pfdhps 540 mutations associated with resistance in the *P. falciparum* parasite.

challenges in the areas of prevention and vector control, MIP, malaria in infants and case management and proposes strategies for effective communication with relevant stakeholders.

The NMCP and PMI are aligned in their goals to implement quality SBC activities that target behaviors such as consistent and correct use of ITNs, ANC attendance and IPTp uptake and delivery, prompt care-seeking for fever and for more severe disease symptoms, adherence to prescribed treatment, and overall knowledge about the cause of malaria. PMI has played a critical role in improving coordination of SBC activities emphasizing employing systematic, competency-based assessments of institutional SBC capacity as a means to inform the design of activities and to measure their impact through the Malaria Elimination Behavior Change Communication Strategy 2017-2022. On-going activities will also encourage health-seeking behavior at the community level, facilitate linkages between households and service facilities and, finally, strengthen providers to serve as a channel for behavior change.

Objective 4: By 2020, at least 95 percent of health facilities report routinely on malaria program performance.

The NMCP aims to achieve at least 95 percent of health facilities reporting routinely on malaria program performance. All districts are expected to report routinely on malaria program performance through the DHIS2 with the support of district monitoring and evaluation officers. At the district level, all data from the lower level health centers, in addition to the data on community-level health services delivered, are compiled and entered into the health database using DHIS2 software which is electronically transmitted to the national level. Most of the implementation of routine interventions takes place at the district level where activity reports are collected. As such, partners implementing at district level should also generate reports and submit them to the district. Strengthening of district level surveillance, monitoring and evaluation (SM&E) infrastructure to ensure that all HMIS data and activity reports are collected, analyzed and used. The DHIS2 platform was fully functional in 2017 and malaria program indicators are now being reported nationally from all public health facilities. NMCP reported 100 percent data completeness for expected reports and 99 percent timeliness in the most recent quarter report. Although data quality is imperfect, the NMCP continues to evaluate and work with DHMTs and facilities to improved quality. To monitor the progress attained and aid planning, regular monitoring through program reviews and surveys will be given a high priority.

PMI has focused on improving malaria data quality and timeliness by strengthening the capacity and infrastructure at the district and chiefdom levels, including appropriate use of data for decision making, and supportive supervisions from districts to health facilities. At the national level, PMI supports the NMCP SM&E team and Department of Policy, Planning, and Information in conducting supportive supervision to the peripheral level.

Objective 5: By 2020, maintain and strengthen capacity for program management, coordination and partnership to achieve malaria program performance at all levels.

The NMCP is expected to have more challenging issues that will need to be addressed during this period 2016-2020. Some of these include new innovative tools in diagnosis, treatment, and vector control that may be introduced during this period. The strategic plan provides a common framework for the accelerated nationwide scale-up of evidenced-led malaria reduction interventions by the government, its development partners, the private sector and all other stakeholders. A key addition to the strategic plan is the introduction of intermittent preventive treatment in infants (IPTi). Another key change in the revised NMSP which is informed by lessons learned from the control of EVD is the institution of measures to enhance preparedness for prompt and efficient intervention during epidemics and complex emergencies. All malaria policies will be guided by coordinated operational research on malaria.

Figure 7. Table of Select Donor and Partner Coverage by District¹ for Select Malaria Interventions, 2019.

District	Population	Entomological surveillance	ITN Distribution ²	Service Delivery at Facility and Community Level ³	Malaria commodities	Malaria SBC Activities
Bo	632,511	PMI	Global Fund / PMI	PMI / Global Fund / World Vision (WVI)	Global Fund / PMI	Global Fund / PMI
Bombali	666,611	PMI	Global Fund / PMI	Gavi	Global Fund / PMI	Global Fund
Bonthe	220,679		Global Fund / PMI	Doctors with Africa (CUAMM) / WVI	Global Fund / PMI	Global Fund
Kailahun	578,546		Global Fund / PMI	World Bank / Save the Children	Global Fund / PMI	Global Fund
Kambia	379,712		Global Fund / PMI	Irish Aid	Global Fund / PMI	Global Fund
Kenema	670,334		Global Fund / PMI	Global Fund	Global Fund / PMI	Global Fund

District	Population	Entomological surveillance	ITN Distribution ²	Service Delivery at Facility and Community Level ³	Malaria commodities	Malaria SBC Activities
Koinadugu	449,943		Global Fund / PMI	PMI /World Bank	Global Fund / PMI	Global Fund / PMI
Kono	556,257	PMI	Global Fund / PMI	Gavi / Partners in Health	Global Fund / PMI	Global Fund
Moyamba	350,162		Global Fund / PMI	Global Fund / Goal Sierra Leone	Global Fund / PMI	Global Fund
Port Loko	676,363		Global Fund / PMI	PMI / Global Fund / Development Initiative Program (DIP) / Sierra Leone Red Cross / BRAC International	Global Fund / PMI	Global Fund / PMI
Pujehun	380,797		Global Fund / PMI	PMI / Global Fund / Save the Children / WVI / CUAMM	Global Fund / PMI	Global Fund / PMI
Tonkolili	584,103		Global Fund / PMI	Global Fund	Global Fund / PMI	Global Fund
Western Rural	488,299	PMI	Global Fund / PMI	Global Fund	Global Fund / PMI	Global Fund
Western Urban	1,160,615		Global Fund / PMI	Global Fund / Comic Relief / Action against Hunger	Global Fund / PMI	Global Fund

Source: Government of Sierra Leone, Ministry of Health and Sanitation, Jan 2019.

¹This table represents the previous 14 Sierra Leone districts. Beginning in late 2019, two additional districts, Falaba and Karene were being established from Koinadugu and Bombali Districts respectively.

²Both routine and mass campaign distribution channels.

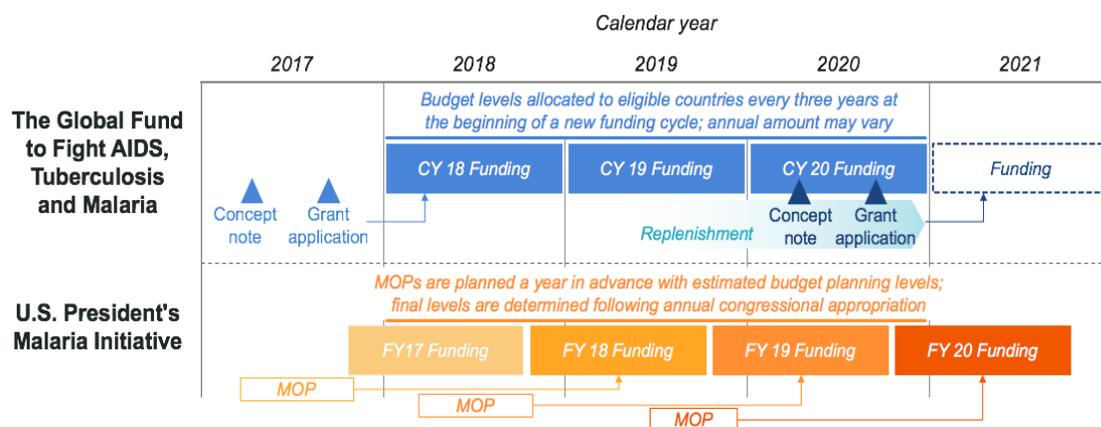
³List of donors and providers is not comprehensive.

IV. PARTNER FUNDING LANDSCAPE

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

Figure 8 visualizes the annual cycle of PMI funding and the MOP implementation year. As the figure illustrates, any given FY MOP funds activities that take place during the next FY. For example, a FY18 MOP funds implementation during FY19. Whereas Global Fund funding (and often, other partners and host country governments) is based on a three-year grant cycle on a calendar year (CY) timeframe during which activities were implemented. Annual PMI country budget allocations depend largely on the U.S. Congress' total overall malaria funding appropriation to USAID in a given fiscal year, as well as other considerations (e.g. previous funding levels, activity and program pipelines, other donor contributions, known commodity needs/gaps, progress on ongoing PMI-supported activities, clear evidence of continued government commitment to malaria control).

Figure 8: PMI and Global Fund Funding Cycle Alignment



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

The tables below summarize contributions by external partners and host country government in calendar years 2018-20, with the goal of highlighting total country investments. For Sierra Leone, data is available for PMI (FY 18) and Global Fund (CY 2018-20). As the Global Fund 2021-23 grant funding cycle is not yet underway at the time of this PMI FY20 MOP development, Global Fund country investments for the 2021 implementation period and beyond are not yet known. Note that the host country government invests substantial funding into the national-to-local infrastructure and service delivery for malaria and many other programs.

However, there has not been a standardized method for attributing those investments to malaria specifically. Thus, it may not yet be possible in the FY 2020 MOP cycle to attribute funding from the host country government. There may be similar challenges for other partners.

Figure 9. Annual Budget by Level 1 Category

Year ¹	Funder	Vector Control	Case Management	Drug-Based prevention ²	Supply Chain ³	Monitoring, Evaluation & Research	Other Cross-Cutting and Health Systems Strengthening	Total
FY17/CY18	PMI	\$6.4M	\$4.1M	\$0.4M	\$0.8M	\$1.2M	\$2.1M	\$15.0M
	Global Fund*	-	-	-	-	\$0.02M	\$0.9M	\$1.0M
	Total	\$6.4M	\$4.1M	\$0.4M	\$0.8M	\$1.2M	\$3.0M	\$16.0M
FY18/CY19	PMI	\$8.0M	\$4.5M	\$0.4M	\$0.4M	\$0.3M	\$1.4M	\$15.0M
	Global Fund*	-	-	-	-	\$1.2M	\$1.4M	\$2.6M
	Total	\$8.0M	\$4.5M	\$0.4M	\$0.4M	\$1.5M	\$2.8M	\$17.6M
FY19/CY20	PMI	-	-	-	-	-	-	-
	Global Fund*	-	-	-	-	\$0.03M	\$1.2M	\$1.2M
	Total	-	-	-	-	\$0.03M	\$1.2M	\$1.2M

Footnotes

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

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

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

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.

*Please, note that the Global Fund data is incomplete and does not accurately reflect their contribution to Sierra Leone.

Figure 10. Annual Budget by Level 3 Category, Detailed Breakdown for PMI and Global Fund

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund*	PMI	Global Fund*	PMI	Global Fund*
Vector Control	Procure ITNs for Continuous Distribution	\$1.8M	-	-	-	-	-
	Distribute ITNs via Continuous Distribution	\$0.9M	-	-	-	-	-

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund*	PMI	Global Fund*	PMI	Global Fund*
	Procure ITNs for Mass Campaigns	\$1.2M	-	\$7.7M	-	-	-
	Distribute ITNs via Mass Campaigns	-	-	\$0.3M	-	-	-
	Other ITN Implementation*	-	-	-	-	-	-
	IRS Implementation ⁴	-	-	-	-	-	-
	Procure IRS Insecticide ⁴	-	-	-	-	-	-
	Other IRS*	-	-	-	-	-	-
	Entomological Monitoring	\$2.5M	-	\$0.1M	-	-	-
	SBC for Vector Control ⁵	-	-	-	-	-	-
	Other vector control measures	-	-	-	-	-	-
	Removing human rights- and gender-related barriers to vector control programs**	-	-	-	-	-	-
Case Management	Active Case Detection**	-	-	-	-	-	-
	Community-based case management	-	-	-	-	-	-
	Facility-based case management	-	-	-	-	-	-
	Private-sector case management	-	-	-	-	-	-
	Procure ACTs	\$0.6M	-	\$0.7M	-	-	-
	Procure Drugs for Severe Malaria	\$0.8M	-	\$0.8M	-	-	-
	Procure Other Diagnosis-Related Commodities	-	-	-	-	-	-
	Procure Other Treatment-Related Commodities	-	-	-	-	-	-
	Procure RDTs	\$0.5M	-	\$0.8M	-	-	-
	Therapeutic Efficacy	-	-	-	-	-	-

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund*	PMI	Global Fund*	PMI	Global Fund*
	SBC for Case Management ⁵	-	-	-	-	-	-
	Other Case Management	\$2.3M	-	\$2.3M	-	-	-
Drug-Based Prevention²	Procure SMC-Related Commodities	-	-	-	-	-	-
	SMC Implementation	-	-	-	-	-	-
	Prevention of Malaria in Pregnancy Implementation	\$0.4M	-	\$0.4M	-	-	-
	Procure IPTp-Related Commodities	-	-	-	-	-	-
	IPTi**	-	-	-	-	-	-
	SBC for Drug-Based Prevention ⁵	-	-	-	-	-	-
	Other Prevention**	-	-	-	-	-	-
Supply Chain³	In-Country Supply Chain ³	-	-	-	-	-	-
	Supply Chain Infrastructure	-	-	-	-	-	-
	Ensuring Quality	-	-	-	-	-	-
	Pharmaceutical Management Systems Strengthening	\$0.8M	-	\$0.4M	-	-	-
	Supply Chain System Strengthening	-	-	-	-	-	-
Monitoring, Evaluation & Research	Reporting, Monitoring, and Evaluation	\$0.8M	-	\$0.3M	-	-	-
	Program and data quality, analysis and operations research	-	\$0.02M	-	\$0.03M	-	\$0.03M
	Surveys	\$0.5M	-	-	\$1.2M	-	-
	Other Data Sources**	-	-	-	-	-	-
	Support for FETP*	-	-	-	-	-	-
Other Cross-Cutting and Health Systems Strengthening	Integrated service delivery, quality improvement, and national health strategies**	-	-	-	-	-	-

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund*	PMI	Global Fund*	PMI	Global Fund*
	Financial management systems**	-	-	-	-	-	-
	Community responses and systems**	-	\$0.6M	-	\$0.7M	-	\$0.6M
	Support for PCV and SPAs*	\$0.0M	-	-	-	-	-
	Cross-Cutting Human Resources for Health**	-	-	-	-	-	-
	Central and Regional Program management ⁶	\$0.3M	\$0.01M	-	\$0.02M	-	\$0.02M
	In-Country Staffing and Administration*	\$1.4M	-	\$1.0M	-	-	-
	Other Program Management**	-	\$0.3M	-	\$0.7M	-	\$0.6M
	SBC Unspecified ⁵	\$0.5M	-	\$0.5M	-	-	-
Total		\$15.0M	\$1.0M	\$15.0M	\$2.6M	-	\$1.2M

Footnotes

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

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

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

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

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

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

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

*Please note that the Global Fund data is incomplete and does not accurately reflect their contributions to Sierra Leone.

Figure 11. Annual budget, breakdown by commodity

Year ¹	Funder	ITNs for Continuous Distribution	ITNs for Mass Distribution	IRS Insecticide ⁵	ACTs	RDTs	Severe Malaria	SMC-Related	IPTp-Related	Total
FY17/CY18	PMI ²	\$1.8M	\$1.2M	-	\$0.6M	\$0.5M	\$0.8M	-	-	\$4.9M
	Global Fund ^{3&4}	-	-	-	-	-	-	-	-	-
	Total	\$1.8M	\$1.2M	-	\$0.6M	\$0.5M	\$0.8M	-	-	\$4.9M

Year ¹	Funder	ITNs for Continuous Distribution	ITNs for Mass Distribution	IRS Insecticide ⁵	ACTs	RDTs	Severe Malaria	SMC-Related	IPTp-Related	Total
FY18/CY19	PMI ²	-	\$7.7M	-	\$0.7M	\$0.8M	\$0.8M	-	-	\$9.9M
	Global Fund ^{3&4}	-	-	-	-	-	-	-	-	-
	Total	-	\$7.7M	-	\$0.7M	\$0.8M	\$0.8M	-	-	\$9.9M
FY19/CY20	PMI ²	-	-	-	-	-	-	-	-	-
	Global Fund ^{3&4}	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-

Footnotes

1. Each year's figures represent the FY for PMI and CY for Global Fund that most closely align. Global Fund budget data accurate as of July 1, 2019. PMI budget data accurate as of Sept 1, 2019 ;
2. PMI commodity costs are fully loaded, including costs for the ex-works price of the commodity, quality control, freight, insurance, and customs.
3. Global Fund commodity costs in table above only include ex-works commodity value in a given year.
4. **Note that the Global Fund data is incomplete and does not accurately reflect their contributions to Sierra Leone;**
5. 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 Sierra Leone with FY 2020 funding. Please refer to www.pmi.gov/resource-library/mops for the latest tables. Key data used for decision-making can be found in Annex A.

ANNEX A: INTERVENTION-SPECIFIC DATA

1. VECTOR CONTROL

NMCP objective
<ul style="list-style-type: none">• Sierra Leone’s 2016-2020 National Malaria Strategic Plan (NMSP 2016-2020) includes three vector control interventions: insecticide treated nets (ITNs), indoor residual spraying (IRS) and larval source management (LSM). The strategy states that these interventions will be deployed according to the current risk stratification context in Sierra Leone.• Although larval source management is part of the current malaria control strategy in Sierra Leone, it has never been implemented.
NMCP approach
<p>ITNs:</p> <ul style="list-style-type: none">• NMCP endeavors to provide universal ITN access through mass campaigns conducted every three years, following WHO guidelines of one ITN for every two people, with up to three ITNs per household (World Malaria Report 2019). Mass campaigns are the main distribution method, reinforced by routine distribution of ITNs to pregnant women during their first ANC visit and to children during their Penta-3 EPI visit.• The NMCP has conducted four rounds of mass ITN distribution campaigns (2006, 2010, 2014, and 2017). In 2006, the NMCP distributed 1.1 million ITNs in a mass campaign for children under one year of age alongside a measles vaccination campaign. In 2010, the NMCP distributed a total of 3,264,927 ITNs for scaling-up to achieve universal coverage. In 2014, the NMCP distributed a total of 3,523,873 ITNs to maintain and achieve universal coverage as part of the malaria response to the Ebola Virus outbreak. In 2017, the NMCP distributed a total of 4,186,517 ITNs for scaling-up to achieve universal coverage.• The next mass ITN campaign is scheduled for 2020 in which a total of 4.6 million ITNs are planned for distribution targeting universal coverage. Through the Global Fund grant, the NMCP has procured 2.1 million ITNs and PMI will contribute 2.5 million ITNs. All 4.6 million procured ITNs are pyrethroid + PBO synergist ITNs and will be distributed nationwide during the campaign.• In spite of the ITN mass campaigns and routine distribution, some key challenges remain to achieving and maintaining universal coverage, including periodic stockouts of ITNs for the routine distribution channels.• To promote proper ITN use, the NMCP supports SBC efforts on the use and maintenance of ITNs in households, which are conducted prior to the mass campaigns and continuously for routine distribution.

IRS:

- Sierra Leone has a history of IRS trials from as early as 1940 and a modest IRS program that was carried out until the 1950s.
- More recently, a WHO-funded pilot of IRS was conducted in selected Chiefdoms of four districts (Bo, Bombali, Kono, and Western Rural) in two phases between 2010 and 2012. The aim of the pilot was to assess feasibility and community acceptability and to generate evidence for scaling up IRS in Sierra Leone as a key component of the NMCP's Integrated Vector Management strategy. Spraying was carried out by the NMCP and the Department of Environmental Health and Sanitation of Sierra Leone, with the involvement of the four districts. Pilot results were described in PMI Sierra Leone FY18/19 MOP. There have been no IRS activities implemented by the NMCP or the private sector following this pilot due to the lack of financial commitment and resources.
- The NMCP plans on implementing IRS activities beginning in 2021 in two districts with PMI support.
- Criteria for the selection of districts for IRS will complement the use of ITNs in areas with high malaria prevalence (Policy Guidelines for Integrated Vector Management 2019, GoSL)

Entomology:

- Key pillars within NMCP's vector control strategy are to strengthen capacity in entomological surveillance, to conduct insecticide resistance monitoring, and to characterize vector bionomics.
- According to the strategy, entomological surveillance is conducted in four districts (Bo, Bombali, Kono and Western Rural Area) representing the four geographic regions of Sierra Leone (Western, Eastern, Northern and Southern regions). One rural and peri-urban sentinel site in each district are sampled on a monthly basis in order to provide annual information on vector composition, vector behavior, entomological inoculation rates, and vector susceptibility to insecticides. In future years, the NMCP will expand entomological surveillance to at least six districts. ITN durability monitoring (attrition, physical integrity, and insecticide effectiveness/longevity) will be part of NMCP's approach, but is not currently implemented.

PMI objective, in support of NMCP

PMI's objectives align with the NMCP's vector control strategy and PMI is helping to build capacity to equip the NMCP with the knowledge and skills needed for implementing an informed, evidence-based vector control program. PMI aims to:

- Support the implementation of the vector control strategy by ensuring sustained ITN coverage through both routine and campaign channels;

- Support collection and use of quality entomological data;
- Support an evidence-based approach to IRS that results in a more cost-effective and efficient, targeted strategy and an impact on malaria burden; and
- Strengthen the capacity of the MoHS-led entomology, IRS, and ITN programs.

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

- PMI procured approximately 675,000 ITNs to contribute to the annual ITN need for routine distribution channels in 2019 and procured an additional 2.5 million pyrethroid + PBO ITNs for the 2020 mass campaign.
- PMI assisted the NMCP in building entomological capacity by establishing entomological and insecticide resistance monitoring sites at eight and four sentinel locations, respectively, refurbishing the insectary and laboratory in Makeni, establishing a colony of susceptible *An. gambiae*, Kisumu strain, recruiting and training entomological staff, and beginning laboratory analyses of collected specimens. The PMI-supported training included 29 environmental health officers from Bo, Bombali, Kono and Western Rural Area as well as four NMCP staff members and focused on entomological monitoring including *Anopheles* collection, identification and insecticide susceptibility testing.
- PMI supported the establishment of the malaria vector control and integrated vector management technical working groups, supported reviews of the national integrated vector management guidelines and the national insecticide resistance monitoring and management plan, and is helping to create an entomological monitoring database.
- PMI supported the NMCP in conducting insecticide resistance monitoring, including testing of mosquito specimens for insecticide resistance. Monthly vector bionomics monitoring was also conducted in four sentinel districts (Bo, Bombali, Kono and Western Rural Area) using Human Landing Catches, CDC Light Traps and Pyrethrum Spray Catches. The results from the insecticide resistance monitoring informed PMI and Global Fund's ITN procurement decisions.
- PMI implemented the Malaria Behavior Survey (MBS), a cross-sectional household survey designed to measure malaria-related behaviors and their behavioral determinants across intervention areas, in October 2019. One component of the survey gathered data to determine the factors related to ITN use which will be used to inform the communication strategy used for the 2020 mass campaign and activities to increase uptake of consistent ITN use and maintenance. The survey also gathered data on the acceptance of IRS which will be used to inform 2021 IRS implementation in two districts. It is important to note that Sierra Leone is the first post-Ebola country to implement IRS. Thus, additional sensitization activities may be needed in IRS implementation areas to promote acceptance.

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

- PMI will support procurement of 535,000 pyrethroid + PBO ITNs for distribution through the routine channels to pregnant women and fully immunized children.
- PMI will support prospective ITN durability monitoring, following ITN distribution during the 2020 universal coverage campaign and collect information on ITN survivorship and physical integrity, bio-efficacy of insecticides, and insecticidal content.
- PMI will strengthen SBC for ITN use in support of the 2020 mass campaign as well as the continuous distribution channels.
- PMI will continue to provide entomological technical assistance to support training, planning, monitoring, and implementation of vector control activities in Bo, Bombali, Kono and Western Rural Area.
- Two additional sentinel districts will be added for monthly vector bionomics monitoring.
- PMI will support preparations for the 2021 spray operations conducted in two districts including planning, procurement of insecticides, payment of spray operators, environmental compliance, community mobilization, epidemiological and entomological monitoring, etc. IRS implementation will be guided by best practices and expertise in the field.

1.A. ENTOMOLOGICAL MONITORING

Key Goal

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

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

Routine monthly entomological surveillance will be expanded to two additional districts by 2021, resulting in a total of 12 sites (two per district). Selection of expansion districts will be based on criteria that include areas with high malaria burden and other epidemiological and entomological factors and will inform the implementation of vector control interventions. Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

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

Supporting Data

Figure A1. Entomological Monitoring Sites in Sierra Leone

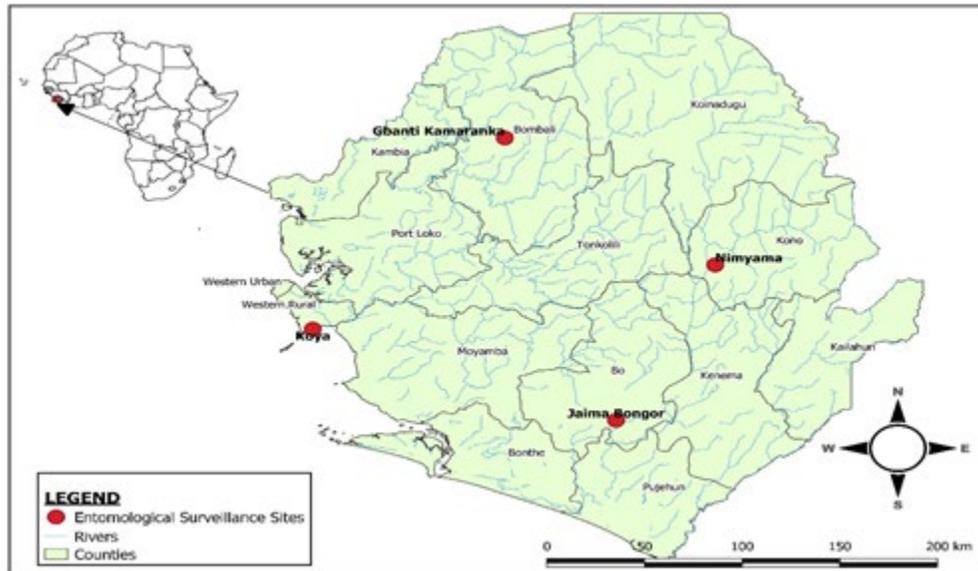


Figure A2. PMI-Supported Resistance Monitoring

Province	Total sentinel sites	Activities	Supported by
Northern	2	Insecticide resistance monitoring Vector bionomics monitoring	PMI
Eastern	2	Insecticide resistance monitoring Vector bionomics monitoring	PMI
Southern	2	Insecticide resistance monitoring Vector bionomics monitoring	PMI
Western	2	Insecticide resistance monitoring Vector bionomics monitoring	PMI

Figure A3. Entomological Monitoring of *An. Gambiae s.l*

Site	Major Vector	Minor Vector	Peak Abundance	Preferred Biting Location	Preferred Resting Location	Preferred Host	Peak Sporozoite Rate*	Annual EIR**
Masongbo (Bombali) peri-urban site	<i>An.gambiae s.l.</i>		Indoor : 189 bites/person/night (June) Outdoor : 187.5 bites/person/night (June)	Outdoor	N/A	N/A	Indoors:10% (Nov & Jan) Outdoors: 29% (Jan)	EIR indoor : 91.97 infective bites/person/year (ib/p/y) EIR outdoor: 389.17 (ib/p/y)

Site	Major Vector	Minor Vector	Peak Abundance	Preferred Biting Location	Preferred Resting Location	Preferred Host	Peak Sporozoite Rate*	Annual EIR**
Kamaranka (Bombali) rural site	<i>An.gambiae</i> s.l.		Indoor : 148.88 bites/person/night (June) Outdoor : 106.75 bites/person/night (June)	Indoor	N/A	N/A	Indoors:50% (Jan) Outdoors: 26% (Nov)	EIR indoor : 90.12 infective (ib/p/y) EIR outdoor: 233 (ib/p/y)
Sori-town (Kono) peri-urban site	<i>An.gambiae</i> s.l.	<i>An. funestus</i> s.l.	Indoor : 45.50 bites/person/night (June) Outdoor : 45.13 bites/person/night (June)	Indoor	N/A	N/A	Indoors: 8% (Aug & Sept) Outdoors: 17% (Nov)	EIR indoor :60.43 (ib/p/y) EIR outdoor: 54.71 (ib/p/y)
Teikor (Kono) rural site	<i>An.gambiae</i> s.l.	<i>An. funestus</i> s.l.	Indoor : 30.38 bites/person/night (August) Outdoor : 22.75 bites/person/night (August)	Indoor	N/A	N/A	Indoors:25% (Oct) Outdoors: 8% (May & Oct)	EIR indoor : 116.47 (ib/p/y) EIR outdoor: 49.84 (ib/p/y)
Gerihoun (Bo) peri-urban site	<i>An.gambiae</i> s.l.	<i>An. funestus</i> s.l.	Indoor : 85.63 bites/person/night (June) Outdoor : 60.50 bites/person/night (June)	Indoor	N/A	N/A	Indoors: 9% (July) 10% (Dec) Outdoors: 7% (Sep)	EIR indoor : 114.94 (ib/p/y) EIR outdoor: 38.5 (ib/p/y)
Lagon (Bo) rural site	<i>An.gambiae</i> s.l.		Indoor : 81.25 bites/person/night (June) Outdoor : 52.25 bites/person/night (June)	Indoor	N/A	N/A	Indoors: 27% (Aug) 29% (Oct) Outdoors: 25% (Oct)	EIR indoor : 279.87 (ib/p/y) EIR outdoor: 77.73 (ib/p/y)
Sand Sand Water (Western Rural Area) rural site	<i>An.gambiae</i> s.l.		Indoor : 40.19 bites/person/night (August) Outdoor : 31.13 bites/person/night (August)	Indoor	N/A	N/A	Indoors: 18% (Feb) Outdoors: 10% (Feb) 9% (Aug, Sep and Oct)	EIR indoor : 147.26 (ib/p/y) EIR outdoor: 172.44 (ib/p/y)
Tombo (Western Rural Area) peri-urban site	<i>An.gambiae</i> s.l.		Indoor : 9.38 bites/person/night (July) Outdoor : 12.88 bites/person/night (July)	Outdoor	NA	NA	Indoors: 25% (Nov) Outdoors: 50% (Nov)	EIR indoor : 29.71 (ib/p/y) EIR outdoor: 135.77 (ib/p/y)

*Percentage/proportion of *An. gambiae* s.l. positive for *P. falciparum* sporozoite out of those tested by site, month and location of collection

(Indoors/Outdoors). The months with the highest positivity rate are indicated for each site and location. The monthly positivity rates results should be cautiously interpreted because when the results are disaggregated by site, month and location, the number tested could be too small to make a meaningful conclusion. However, overall, sporozoite rates were highest in October (8/87; 9.2%) indoors and in November (9/79; 11.4%) outdoors.

**Specific months of data are listed in the individual cells

Conclusion

- *An. gambiae s.l.* is the main malaria vector in Sierra Leone, although some *An. funestus* were collected in Bo and Kono districts. EIRs were high in all surveillance sites and the highest annual EIR was recorded in Masongbo; Bombali district peri-urban site (91.97 (In) + 389.17 (Out) / 2 = 240.6 infective bites/person/year).
- Since there is substantial indoor, preferred, biting location of the main malaria vector, ITN use and IRS should have a significant impact on malaria transmission reduction. Because the mosquito abundance and rate of biting rate of *An. gambiae s.l.* begins in and is highest in June, IRS should be implemented April-May during future campaigns, before the peak of malaria transmission.

Key Question 2

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

Supporting Data

Strong resistance to pyrethroids (deltamethrin, permethrin, alpha-cypermethrin) was observed at all sites. Pre-exposure of the mosquitoes to Piperonyl butoxide (PBO) increased the mortality of deltamethrin from seven percent to 67 percent in Kono, 15 percent to 72 percent in Bo, 17 percent to 60 percent in Western and 37 percent to 65 percent in Bombali districts in 2019. Similar results were observed with permethrin, where PBO pre-exposure increased mortality from 10 percent to 77 percent in Kono, 22 percent to 70 percent in Bo, 33 percent to 75 percent in Western and 30 percent to 74 percent in Bombali districts in 2019. Likewise, the mortality of *An. gambiae s.l.* to alpha-cypermethrin in 2018 increased from 22 percent to 78 percent in Kono, 32 percent to 82 percent in Bombali and 23 percent to 64 percent in Bo district after pre-exposure to PBO (data for Western Rural district is not currently complete). *An. gambiae s.l.* remain fully susceptible to Pirmiphos methyl, chlorfenapyr and clothianidin. The Kdr-w allele mutation was found in 98 percent of the samples tested while mutations for *kdr-e* and *ace-1* allele were only observed in 2.3 percent and 13 percent of the samples tested, respectively, while the allele frequency for N1575Y was 9 percent among specimens tested.

Conclusion

- There is significant resistance to all pyrethroids observed at all surveillance sites. As the four sites represent all four regions, it is likely that there is significant resistance to all pyrethroids throughout the country.
- The mortality rate of mosquito vectors was substantially higher at all sites after pre-exposure to PBO for permethrin, deltamethrin and alpha-cypermethrin. Therefore,

pyrethroid + PBO ITNs should be preferentially procured in the future over pyrethroid only ITNs. The mortality rate with PBO pre-exposure was still less than 90 percent for all locations, which might indicate that a monooxygenase-based resistance mechanism is partially involved in mosquito resistance in Sierra Leone.

- The main malaria vector remains susceptible to clothianidin, chlorfenapyr and Pirimiphos-methyl and therefore IRS with Pirimiphos-methyl or clothianidin and the use of dual active ingredient ITNs containing chlorfenapyr should be considered for insecticide resistance management in Sierra Leone.

Key Question 3

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

1.B. INSECTICIDE-TREATED NETS (ITNs)

PMI Goal

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

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

No changes in ITN activities are proposed. PMI will continue to support procurement for routine ITN distribution channels, but with an increased budget to secure PBO ITNs compared to previous investment in standard ITNs. PMI FY 19 funds that were described in the FY 18/19 Sierra Leone MOP have been reprogrammed to increase the purchase of ITNs for distribution through routine channels. This increase in FY 19 funding for ITNs is budgeted for distribution in 2020 and a portion of 2021 routine distribution. The updated FY 19 budget tables are available publicly at pmi.gov.

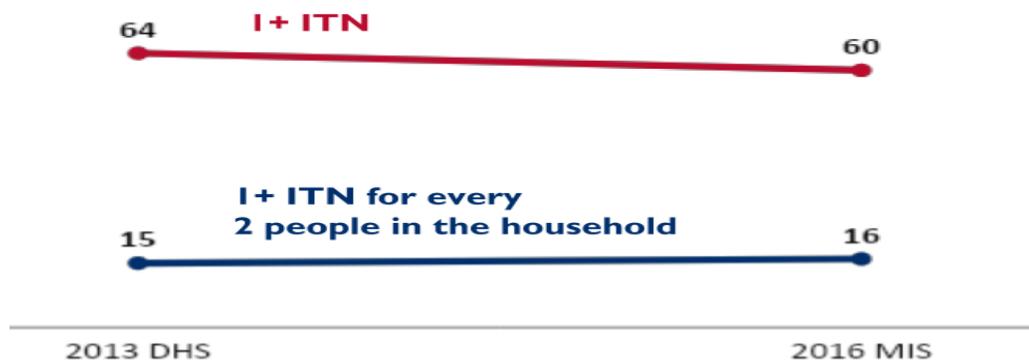
Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

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

Supporting Data

Figure A4. Trends in ITN Ownership, *Percent of Households*



Conclusion

- According to the MIS 2016 results, 60 percent of households owned an ITN, but only 16 percent of households owned enough ITNs (defined as at least one ITN for every two people) to cover all household members. There has been no substantial change in household-level ITN ownership in Sierra Leone as measured by the 2013 DHS and the 2016 MIS. This may be due in part to the major disruption of normal public health systems in Sierra Leone during the 2014-2015 West Africa regional Ebola epidemic that affected all communities in Sierra Leone.
- Timing, scope and size of past ITN mass campaigns was described in the PMI Sierra Leone FY 18/19 MOP.
- The Ebola epidemic decreased care seeking behaviors like visiting the health clinic and might partially explain the lack of improvement in these indicators.
- The DHS planned for 2018 was delayed until 2019 and now completed; the full report will be available in 2020. These reports will help show if recent investments and work in vector control and SBC have led to improved ITN indicators.

Key Question 2

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

Supporting Data

Figure A5. Trends in ITN Access and Use, *Percent of Household Population with Access to an ITN and Who Slept Under an ITN the Night Before the Survey*

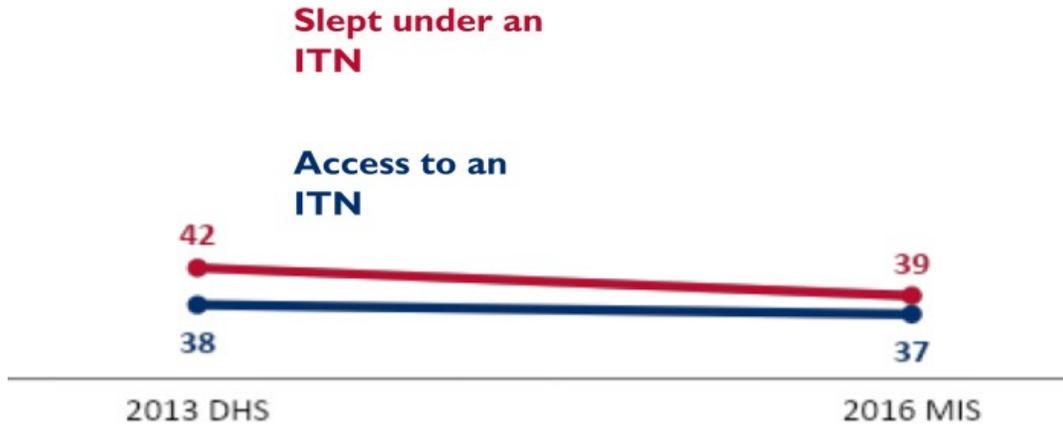


Figure A6. Sierra Leone ITN Use: Access Ratio

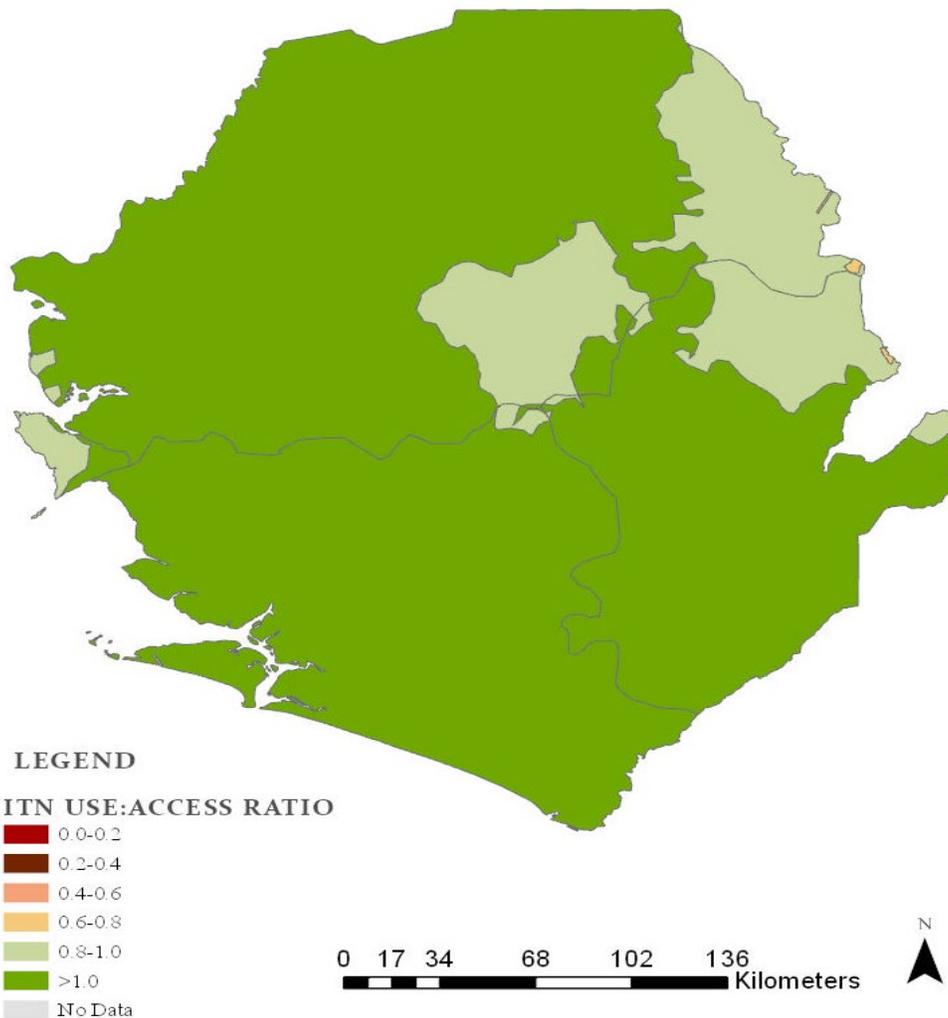


Figure A7. Household Possession of ITNs

Table 16 Household possession of insecticide-treated nets

Percentage of households with at least one insecticide-treated net (ITN); average number of ITNs per household; and percentage of households with at least one ITN per two persons who stayed in the household last night, according to background characteristics, Sierra Leone DHS 2019

Background characteristic	Percentage of households with at least one insecticide-treated net (ITN) ¹	Average number of insecticide-treated nets (ITNs) ¹ per household	Number of households	Percentage of households with at least one insecticide-treated net (ITN) ¹ for every two persons who stayed in the household last night	Number of households with at least one person who stayed in the household last night
Residence					
Urban	60.0	1.1	5,680	20.7	5,670
Rural	73.7	1.5	7,719	28.1	7,715
Province					
Eastern	78.8	1.5	2,852	29.1	2,849
Northern	73.4	1.6	2,568	24.8	2,568
North West	65.1	1.4	2,195	24.4	2,193
Southern	75.0	1.5	2,641	29.0	2,640
Western Area	49.3	0.8	3,142	18.3	3,134
Wealth quintile					
Lowest	68.7	1.2	2,879	25.7	2,877
Second	75.4	1.6	2,568	28.1	2,566
Middle	76.9	1.7	2,461	28.1	2,461
Fourth	62.6	1.2	2,704	22.8	2,703
Highest	57.2	1.1	2,787	20.6	2,778
Total	67.9	1.3	13,399	25.0	13,384

¹ Percentage of de facto household population who could sleep under an ITN if each ITN in the household were used by up to two people

Source: DHS 2019 Key Indicator Report, <https://dhsprogram.com/what-we-do/survey/survey-display-545.cfm>

Conclusion

- According to the MIS 2016 results, 60 percent of households own an ITN, 37 percent of the population has access to at least one ITN, and 39 percent of the population used an ITN resulting in a use: access ratio of 1.04. In essence, this indicates households do use an ITN when they have access. Yet, in spite of the ITN mass campaigns and routine distribution, overall ITN-access remains low as indicated by key indicator results from the 2019 DHS showing 25 percent of households have at least one ITN per two people.
- To address the ITN access gap, PMI and NMCP will continue to support continuous distribution channels and increased access through the 2020 mass campaign. Additionally, PMI will work with NMCP and within districts to promote SBC activities that emphasize maintaining ITN use and promoting ITN care as access improves.

Key Question 3

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

Supporting Data

Figure A8. Key Barriers and Facilitators to ITN Use

Facilitator	Type of Factor	Data Source	Evidence
Knowledge of ITNs as a malaria prevention strategy	Internal	MBS 2019; preliminary results (Bo and Port Loko districts)	96.8% of those surveyed reported that sleeping under an ITN can prevent malaria.
Positive attitude towards ITNs	Internal	MBS 2019; preliminary results (Bo and Port Loko Districts)	94.4% of those surveyed reported a positive attitude towards using ITNs.
Perceived ability to use an ITN correctly	Internal	MBS 2019; preliminary results (Bo and Port Loko districts)	96% of those surveyed reported high perceived self-efficacy to use an ITN correctly.
Barrier	Type of Factor	Data Source	Evidence
Perception that ITNs do not prevent malaria (response efficacy)	Internal	MBS 2019; preliminary results (Bo and Port Loko Districts)	37.2% of survey respondents reported they perceive ITNs are not effective in preventing malaria.
ITNs irritate skin	Internal	CRS 2017 Barrier Analysis (Koinadugu, Kenema, Pujehun, Western Area Rural)	Those that do not use ITNs are 6.8 times more likely to report that is more difficult to sleep inside an ITN because it hurts their skin compared to those that regularly use ITNs.

*Note: Access to ITNs is low according to the 2016 MIS with no region having access greater than 50 percent. Across the four regions, access is as follows: Western 22 percent, Southern 47 percent, Northern 35 percent, Eastern 45 percent. Data presented in the table below is in areas where access is low.

Conclusion

- Data collection for the MBS was completed October 2019. While some preliminary data exists for barriers and facilitators to ITN use, more data from the MBS will be analyzed in the coming months to fully assess internal and social factors at the community level. Data gathered will be used to help further inform the key behavioral factors for which PMI investments should focus.
- However, based on preliminary results, PMI SBC activities should prioritize continued promotion of consistent ITN use given high knowledge, positive attitudes, and high perceived self-efficacy to use ITNs. Additionally, PMI activities should address the perception that ITNs do not prevent malaria given 37 percent of household respondents reported low-perceived response efficacy.

- To further inform the communication strategy for the 2020 mass campaign, PMI will prioritize the analysis of MBS results related to ITN uptake, consistent use, and care.

Key Question 4

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

Supporting Data

Figure A9. Trends in ITN Use among Children and Pregnant Women, Percent of Children Under 5 and Pregnant Women Age 15-40 Who Slept Under an ITN the Night Before the Survey



Conclusion

- From the 2016 MIS, national percentages of ITN use among children under five years and pregnant women in all households (with and without an ITN) were low at 44 percent for both groups and actually demonstrates a decrease in overall ITN usage from previous surveys and inadequate access to ITNs for children and pregnant women in Sierra Leone.
- Interestingly, while overall ITN-access is low, ITN-use appears to be high in households with at least one ITN. The percentage of children and pregnant women sleeping under an ITN (in households with an ITN) was 71 percent and 75 percent, respectively (MIS 2016). Similar results were reported in the DHS 2013. While 64 percent of households owned an ITN, 69 percent of children under five years of age and 76 percent of pregnant women used an ITN (in households with at least one ITN). Thus, PMI will promote ITN access through the upcoming 2020 mass campaign and through continuous distribution channels while SBC activities will promote maintenance of ITN use and ITN care as access increases.

Key Question 5

What channels are used to distribute ITNs?

Supporting Data

Figure A10. ITN Distribution Channels

Channel	2015*	2016*	2017*	2018*	2019	2020	2021
EPI	212,455	230,943	226,981	235,051	261,960	270,343	278,994
ANC	227,421	247,527	240,178	264,106	342,538	353,499	364,811
Schools	0	0	0	0	6,000	18,000	TBD
Community	-	-	-	-	-	-	-
Mass Campaign			4,186,517			4,610,419	

*2015-2018 data source: DHIS2

Conclusion

- Distribution of ITNs is conducted through the typical channels of mass campaigns and through routine continuous distributions through ANC and EPI clinical visits. Support will be maintained for these channels, and improvements in logistics and monitoring and evaluation of ITN stocks can make these modes of distribution even more efficient. NMCP also supports other distribution methods to increase ITN coverage. SBC activities will focus on uptake of continuous ITN use in areas where access is low and promote ITN care and repair in those areas where ITN use is high.
- In addition to PMI support, Child Fund distributed 6,000 ITNs to schools in three districts (Bombali, Kailahun and Koinadugu) in 2019 and in collaboration with NMCP, plan to expand school-based distribution to 18,000 ITNs in 2020. At this time, PMI is not supporting school-based ITN distribution.

Key Question 6

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

Supporting Data

Figure A11. Gap Analysis of ITNs 2019 - 2021

Calendar Year	2019	2020	2021
Total Targeted Population	8,025,731	8,282,554	8,547,596
Continuous Distribution Needs			
Channel #1: ANC ¹	342,538	353,499	364,811
Channel #2: EPI ²	261,960	270,343	278,994
<i>Estimated Total Need for Continuous Channels</i>	604,498	623,842	643,805

Calendar Year	2019	2020	2021
Mass Campaign Distribution Needs			
2020 mass distribution campaign(s) ³	0	4,601,419	0
<i>Estimated Total Need for Campaigns</i>	0	4,601,419	0
Total ITN Need: Routine and Campaign	604,498	5,225,261	643,805
Partner Contributions			
ITNs carried over from previous year ⁴	565,148	635,650	546,174
ITNs from MOH	0	0	0
ITNs from Global Fund	0	2,101,419	0
ITNs from other donors (UNICEF)	0	0	0
ITNs planned with PMI funding ⁵	675,000	3,034,366	97,631
Total ITNs Available	1,240,148	5,771,435	643,805
Total ITN Surplus (Gap)	635,650	546,174	0

⁽¹⁾ 4.4% of total population are pregnant women (based on 2015 Population Census), and 97% of pregnant women receive ANC care (one or more visits) from a trained provider at a health facility where LLINs would be provided (the 2013 DHS).

⁽²⁾ 4% of total population are children under 1 year of age (based on 2015 Population Census), and the estimated children accessing EPI are: 80% universal coverage + 1.6% returning defaulters.

⁽³⁾ Taking into consideration procurement lead time, the need for the June 2020 LLINs mass campaign will be procured with previous years' funding.

⁽⁴⁾ The carry over in 2020 was from the physical count done on 30th September 2019 subtracting the 4th quarter distribution quantity done in October.

⁽⁵⁾ The PMI quantity in 2020 is the sum of 2,500,000 (for mass distribution campaign) and 534,366 (for routine distribution). The source of funding for the mass campaign ITNs was the PMI FY 2018 MOP, and the ITNs for routine distribution will be sourced from PMI FY 2019 MOP funding.

Conclusion

- PMI and UNICEF provided support to routine ITN distribution through procurements of standard ITNs, and filled the estimated needs through calendar year 2020.
- PMI plans to fill the remaining commodities gap for routine distribution in calendar year 2021 with additional procurements of PBO ITNs, as indicated in FY 2019 and FY 2020 budget tables.
- The commodity needs for the universal PBO ITN campaign to be held in calendar year 2020 are covered by PMI and Global Fund resources.

Key Question 7

What is the current status of durability monitoring?

Supporting Data

A durability monitoring activity was completed following the 2017 ITN mass campaign (not funded by PMI). Assessment of ITNs was completed 12 months after conclusion of the campaign. No baseline assessment was completed and additional follow-up was not done.

Key results

- The NMCP conducted durability monitoring of ITNs distributed during the 2017 mass campaign at sentinel sites in the same four districts where entomological monitoring is being conducted (Bo, Bombali, Kono, and Western Rural). In order to measure ITN attrition approximately 12 months post-distribution, a semi-structured household questionnaire was administered to determine the number of ITN that a household received during the campaign and whether any of them have since been lost (and if lost, the reasons for the loss).
- Additionally, one randomly selected ITN from each household was collected (and replaced with a new ITN) in order to measure the physical integrity of the ITN by counting the number and size of the holes. No baseline data was collected during the 2017 mass campaign and monitoring activities are not ongoing. The mean ITN attrition rate in all four districts was 19 percent, indicating that 81 percent of ITNs distributed during the campaign were still present. For the physical integrity assessment, 63 percent of ITNs were found to either have no holes or be in good condition, 25 percent were damaged but still usable (therefore 88 percent in at least serviceable condition), and 12 percent were considered unusable.
- The factors contributing to diminishing physical integrity of the ITNs were the presence of rats in the home and the use of natural, rough grasses for bedding.

Conclusion

PMI and NMCP will be conducting systematic ITN durability monitoring for the 2020 ITN mass campaign at baseline and every twelve months for three years. Durability monitoring will be conducted on both brands of PBO ITNs that will be distributed in the 2020 campaign.

Key Question 8

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

1.C. INDOOR RESIDUAL SPRAYING (IRS)

Key Goal

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

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

PMI proposes to support the NMCP in conducting IRS in Bo and Bombali districts in 2021, with a slight reduction in estimated population reached due to government redistricting.

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

Key Question 1

What areas are targeted for IRS and why?

Supporting Data

Figure A12. IRS Target Sites

Districts	Funder	Insecticide to be used ¹
Bombali	PMI (planned)	TBD
Bo	PMI (planned)	TBD

¹ Insecticide to be confirmed during insecticide selection meeting in early 2020.

Conclusion

- PMI in consultation with NMCP, based on entomological data collected and programmatic considerations like population, plans to support IRS operations in two districts (Bo and Bombali) prior to the start of the rainy season in April/May 2021. The two districts were selected for the initiation of IRS activities in Sierra Leone based on a couple factors. Bo and Bombali are two of the districts with active entomologic surveillance and active insecticide resistance monitoring that is necessary for the proper selection of insecticide.
- Both districts (like all districts outside of Western region) have very high malaria prevalence (at least 38 percent in 2016 Sierra Leone MIS) and represent two of the larger population centers in Sierra Leone demonstrating diversification of malaria prevention in multiple Sierra Leone communities/regions.

Key Question 2

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

Supporting Data

Not applicable.

Conclusion

No sustained IRS campaign has been conducted in Sierra Leone. NMCP plans on beginning IRS in 2021 in two districts.

Key Question 3

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

Supporting Data

Not applicable.

Conclusion

These assays have not yet been performed since PMI-supported IRS has not yet been implemented.

Key Question 4

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

Supporting Data

Not applicable.

Conclusion

PMI-supported IRS has not yet been implemented. If conducted, insecticides for IRS would be selected based on evidence found in-country and rotated every two years.

Key Question 5

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

Supporting Data

Not applicable.

Conclusion

IRS is currently not being conducted in Sierra Leone.

Key Question 6

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

2. HUMAN HEALTH

2.A CASE MANAGEMENT in health facilities and communities

NMCP objective
<ul style="list-style-type: none">• The revised 2016-2020 Malaria Control Strategic Plan highlights two key case management objectives: (1) all suspected malaria cases should receive confirmatory diagnosis, and (2) all malaria cases should receive effective treatment.• The malaria test-treat-and-track (T3) policy was introduced in 2010, with a focus on RDT use in most health facilities and in the community.• The 2015 Guidelines for Case Management of Malaria and the 2016-2020 National Quality Assurance Management Plan both outline NMCP objectives to improve the coverage and quality of case management practices, in addition to improving the training, supervision, and quality control to accompany those practices at the facility and community levels.• Another strategic objective of the NMCP is to scale up and strengthen community case management of malaria (CCMm), as part of an integrated (or iCCM) platform. The NMCP contributes to the iCCM strategy by supporting the production of CHW training materials, coordinating supervision efforts of CHWs, ensuring supply of RDTs, ACTs, equipment, registers, treatment algorithms, and job aids in collaboration with implementing partners, DHMTs, and Peripheral health unit (PHU) staff. This objective aligns with PMI’s objective to strengthen and improve the quality of community-based efforts in malaria case management, specifically through standardized training and supervision.
NMCP approach
<p>Diagnostic and treatment policies, guidelines, and practices:</p> <ul style="list-style-type: none">• GoSL introduced free diagnosis and treatment of malaria in the public and private sectors and in 2019, expanded free health care through the universal health coverage (UHC) initiative.• NMCP actively promotes diagnosis of suspected malaria cases using microscopy based on the diagnostic capacity of the health facility, and RDT at facility level as well as at community level through community health workers and private health facilities.<ul style="list-style-type: none">○ Though there is limited capacity for malaria microscopy, NMCP is working with PMI and partners to strengthen malaria microscopy in all hospitals and selected community health centers (CHCs).○ NMCP promotes the use of RDTs for malaria diagnosis in all health facilities and at the community level. This ensures that suspected malaria cases are promptly diagnosed and treated in instances where malaria microscopy is not available or not feasible.

- According to the national policy, antimalarial treatment should be limited to only cases that test positive, and patients with negative test results should be reassessed for other conditions and treated appropriately. However, in recognition of the challenges with diagnosis, presumptive treatment can be considered when a parasitological diagnosis is not possible.
- The 2015 Guidelines for Case Management of Malaria as amended in 2018, outline the recommended first-line drug for uncomplicated malaria is artemether-lumefantrine (AL), except for pregnant women in their first trimester who should receive oral quinine-clindamycin. For severe malaria cases, the NMCP advises treatment with parenteral artesunate as first option and artemether injection as second option, and rectal artesunate suppositories (RAS) for pre-referral treatment for children age six and under.

Supervision:

- NMCP supports regular supportive supervision visits to health workers (at facility and community levels) to provide hands-on coaching and mentoring of health workers to fill knowledge and skill gaps.
 - Annually, the NMCP's target is to: train two health workers per primary health care unit (1,300 PHUs) totaling 2,600 health workers in malaria case management and prevention (including MIP); train 240 health workers drawn from all hospitals in Freetown both private and public in malaria case management and prevention (including MIP); train 60 health workers drawn from all hospitals outside of Freetown in malaria case management and prevention (including MIP).
 - NMCP conducts quarterly on-site supportive supervision of health facilities and supports monthly by DHMTs to complement off site trainings.

Other Quality Assurance Activities:

- Currently the MoHS has limited capacity to conduct external quality assurance of malaria diagnostic testing in the country. NMCP and partners are working to establish a malaria reference laboratory equipped with slide bank and accredited microscopists to support QA/QC activities of malaria diagnosis.

Community Health Workers (CHWs):

- CHWs play an important role in health promotion and community-based surveillance in addition to their existing roles in direct basic service delivery. In Sierra Leone, approximately 14,000 CHWs are trained and deployed to provide iCCM, family planning/reproductive health services in the community to all population groups (not only to children under five).
- In line with the iCCM strategy, NMCP supports the CHW hub under the primary healthcare directorate to train and equip CHWs to test and treat malaria cases in the community.

- CHWs are provided with ACTs and RDTs to test and treat malaria in all ages (except for pregnant women and infants).
- Through partners' support, CHWs are provided with cash payments for their work.
- CHWs are also provided with medicine boxes, bicycles, rain gear and torch lights.
- CHWs are trained on management of malaria, pneumonia, diarrhea, health education, EPI mental health awareness, etc.
- In 2019, a national CHW program assessment was conducted, and will be used to inform future programming. Major challenges faced by CHWs that were identified included stockouts of essential iCCM drugs and lack of user-friendly registers.

Private Sector:

- According to the 2016 MIS, 8 percent of the population seek treatment for fever management from private service providers (private health facilities and private pharmacies/drug stores). These establishments are important points of malaria service delivery in urban settings especially. The majority of the private sector uses RDTs for malaria testing and ACTs for treatment of confirmed cases. However, the quality of some ACTs provided by private practitioners are questionable, and MoHS has limited capacity to conduct pre- and post-entry market quality monitoring. NMCP is partnering with private facilities/pharmacies to ensure they have the right knowledge and support to provide quality malaria services. A summary of engagements undertaken so far are:
 - NMCP signed MOUs with 36 private health providers (health centers and pharmacies) for provision of anti-malaria commodities, RDTs and offered them training/job aids/register, etc...
 - In return, these private providers submit health information data to NMCP/MoHS.
 - In addition, private providers committed to not sell anti-malaria medicines and charge fees for RDT tests supplied by NMCP/MOHS.

PMI objective, in support of NMCP

- In 2017, PMI began its partnership with the MoHS through the NMCP to support its efforts to bolster access to quality malaria services including testing and treatment of malaria cases.
- PMI supports training of health workers to properly test and treat malaria cases. Interventions include:
 - supporting the NMCP to train health workers,
 - conducting supportive supervision of health workers to reinforce knowledge and skills for quality malaria service delivery,
 - strengthening lab services, and

- establishing a malaria microscopy quality assurance system.
- PMI supports NMCP for adequate quantification, procurement, and distribution of ACTs, RDTs, and malaria microscopy equipment and supplies.
- The support of PMI also focuses on revision of policies guidelines and job aids for malaria diagnosis and treatment.

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

- PMI procured over 600,000 ACTs, over 700,000 RDTs, 300,000 vials of injectable artesunate, and 6,000 rectal artesunate suppositories (RAS).
- PMI implemented the MBS, a cross-sectional household survey designed to measure malaria-related behaviors and their behavioral determinants across intervention areas, in October 2019. A full analysis of the data is forthcoming and will be used to determine the behavioral factors that are related to prompt and appropriate treatment (among other behavioral determinants).
- PMI implemented a qualitative provider behavior assessment in October 2019. Data from the assessment will be used to inform service delivery activities at the health facility.
- In March 2019, PMI supported a malaria diagnosis capacity assessment in the four PMI focus districts examining diagnostic infrastructure, equipment, procedures, supplies and human resources. The assessment determined that Sierra Leonean technicians needed microscopy training and that an infrastructure to sustain human and technical capacity needed to be developed in country. The findings from this assessment were disseminated to stakeholders and recommendations are used by the NMCP to tailor interventions for malaria laboratory diagnostics. A training and quality improvement and maintenance plan focused on malaria microscopy is being implemented. Initial steps include:
 - With PMI’s support, selected malaria microscopists have been identified in 16 districts for a planned training of trainers (TOT) with PMI procured microscopes and laboratory supplies.
 - PMI will support a system in which MoHS expert microscopists, once adequately trained, will be able to conduct external quality assessments and improvements in facilities in all Sierra Leone districts.
 - In order to ensure adequate QA/QC, NMCP is setting up a storage system for the malaria slide bank at a central facility.
- With support from PMI, the National Malaria Diagnosis Policy, job aids for treatment of uncomplicated malaria for women of childbearing age, and RDT job aids have been revised and now awaiting MoHS validation.

- PMI supported the NMCP on the development of Rectal Artesunate (RAS) implementation plan. This is a newly introduced strategy planned to be rolled out in a phased approach.

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

- Roll out outreach training and supportive supervision “plus” (OTSS+) in all PMI focus districts, plus an additional district in FY2019, which incorporates new electronic checklists and data-informed targeting of health worker training, supervision, and mentoring in malaria case management and malaria in pregnancy.
- Support district in-charges meetings to develop response to malaria service delivery challenges.
- Conduct malaria microscopy training-of-trainers (TOT) and refresher trainings.
- Work with NMCP and focus districts to strengthen the management of severe malaria including phase one roll out of pre-referral treatment using RAS.
- Support NMCP and MOHS to validate/revise all job aids/guidelines and to print such materials and distribute to health facilities in PMI focus districts.
- Complete recruitment and deployment of Clinical Training Officers (CTOs) to all focus districts.
- Support SBC activities that target provider behavior change. These activities will be informed by the qualitative provider assessment and MBS.

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?

In consideration of the recent geographic redistricting in Sierra Leone and the country’s desire to gradually expand the OTSS+ platform, PMI plans to increase its geographic scope for service delivery activities and support to six districts in FY 2020.

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

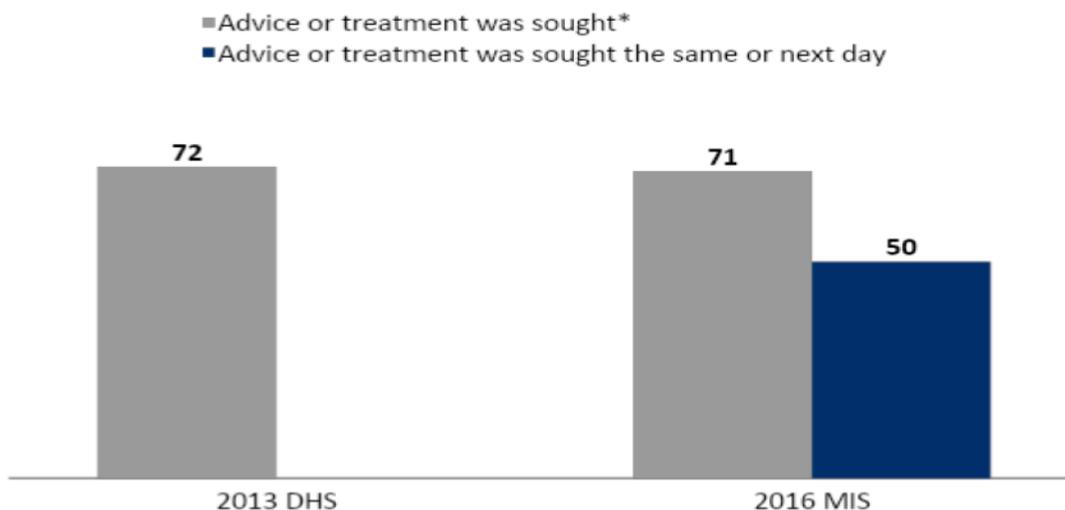
Key Question 1

What is the status of care-seeking?

Supporting Data

Figure A13. Trends in Care-Seeking for Fever

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



*Note: This indicator has been recalculated according to the newest definition, advice, or treatment from any source, excluding traditional practitioners.

Conclusion

- Household survey results from 2013 and 2016 suggest that advice or treatment is sought for around 70 percent of children under five years of age with a fever. Early care-seeking is still an area to improve upon to minimize opportunity for progression to severe disease.
- PMI aims to continue investments in social behavior change around care-seeking, as well as ensuring facility-based and community-based health workers are trained and equipped with key malaria commodities. See Key Question 2 below for preliminary findings from the MBS regarding care-seeking behaviors. Full analysis of results is forthcoming.

Key Question 2

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

Supporting Data

Figure A14. Key Barriers and Facilitators to Care Seeking

Facilitator	Type of Factor	Data Source	Evidence
Correct knowledge of malaria	Internal	2016 Malaria Indicator Survey	85% of women of reproductive age know the symptoms, preventive measures, and treatment for malaria.

Positive attitude towards care-seeking	Internal	MBS 2019; preliminary results (Bo and Port Loko districts)	95% of survey respondents reported a positive attitude (belief) regarding care seeking for malaria.
Positive perception that malaria treatment works	Internal	MBS 2019; preliminary results (Bo and Port Loko districts)	80.3% of survey respondents reported a belief that malaria treatment medicine works to treat malaria.
Barrier	Type of Factor	Data Source	Evidence
Harsh encounters with health workers	Environmental	CRS 2017 Barrier Analysis (Koinadugu, Kenema, Pujehun, Western Area Rural)	Caregivers that reported they do not actively seek treatment at the onset of fever were 2.8 times more likely to report that being treated rudely by health workers are a disadvantage of taking their child to the health facility

Conclusion

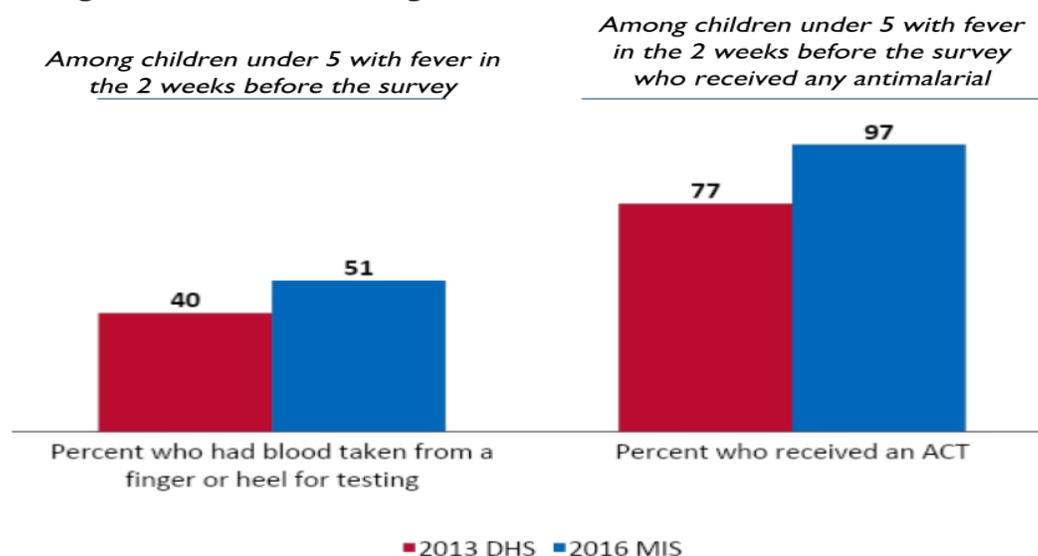
- Knowledge of malaria symptoms has remained relatively high across household survey data; however, high knowledge of fever as a symptom of malaria has not translated to prompt care seeking. There is also little evidence of the specific behavioral factors that are influencing prompt care-seeking (e.g., self-efficacy, attitudes, response efficacy, perception of health workers, distance to health facility, etc.).
- However, preliminary results from the MBS show that 95 percent of those surveyed had positive attitudes towards care seeking and that 80 percent believe malaria treatment works. Alternatively, negative encounters with health facility staff has been identified as a barrier. A full analysis report of the MBS results will be available in the coming months and will be used to determine the most appropriate behavior change approach (factors to address, target audience, messages, etc.) for PMI supported SBC activities.

Key Question 3

How have malaria testing and treatment practices evolved over time?

Supporting Data

Figure A15. Trends in Diagnosis and Treatment of Children with Fever



Conclusion

- Household survey data from 2013 and 2016 indicate that around half of children under five with a fever reported receiving a diagnostic test for malaria. In 2016, almost all children under five with a fever and received an antimalarial received an ACT as appropriate treatment.
- PMI will continue to invest in availability of ACTs and RDTs and supply chain strengthening to ensure appropriate treatment and diagnostic tests are available at health facility and community levels, in addition to increasing attention to supportive supervision to ensure health workers are testing and treating patients appropriately.

Key Question 4

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

Supporting Data

Figure A16. Key Barriers and Facilitators to Appropriate Testing and Treatment Practices

Facilitator	Type of Factor	Data Source	Evidence
Adherence to case management guidelines	Internal	2017 SARA Survey	74.5% of providers adhere to national malaria case management (diagnosis and treatment) guidelines

Facility readiness to provide malaria services	Environmental	2017 SARA Survey	81% of health facilities had available diagnosis and treatment commodities to provide malaria services.
Barrier	Type of Factor	Data Source	Evidence
Incorrect or no recorded dosage of ACTs	Social	2017 SARA Survey	Among the four regions in Sierra Leone, The Northern region had the highest proportion of test positive cases receiving an incorrect dose of ACT (36.1%) and the Eastern region had the highest proportion of cases where the ACT dose was not recorded (13.8%)

Conclusion

- While there is some available information on barriers to care-seeking within the community, there is little available data to understand the influence of provider behavior and service communication on prompt care-seeking. Nonetheless, the available data from the 2017 Service Availability and Readiness Assessment (SARA) survey shows that roughly 75 percent of health providers adhere to case management guidelines and 81 percent of health facilities have the available commodities to provide services.
- Through ongoing data collection efforts (Malaria Behavior Survey, OTSS+) we hope to gather additional insight into provider practices around adherence to case management guidelines and the extent to which service communication influences care seeking behavior.

Key Question 5

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

Supporting Data

- According to 2018 HMIS data, 99 percent of all malaria cases in Sierra Leone were parasitologically confirmed at facility level. RDTs are used across all levels of the health system, including at the community level by CHWs with a test positivity rate of 71 percent. Microscopy capacity primarily exists at the hospital level and, in the 2018 HMIS data, accounted for around 3 percent of all confirmed malaria cases.
- To achieve gains in the reduction of malaria mortality and morbidity within the available resources provided, it is crucial that a cadre of well resourced, motivated and competent health workers are available in health facilities and communities to deliver quality malaria services. To this end NMCP conducts regular in service training for health workers in malaria case management with current and planned support from PMI and Global Fund:

- Health facilities and CHWs are supplied antimalarial commodities.
- Diagnostic materials are provided to both health facilities and CHWs.
- Provision of training for health workers and CHWs, complemented with supportive supervision.
- Provision of job aides, registers, manuals and treatment guidelines.

Figure A17. PMI-Supported Case Management at Health Facilities and by CHWs

	Current	Future
PMI-supported districts for service delivery (facility and community-level)	Port Loko, Pujehun, Bo, and Koinadugu	By 2021 (proposed): expand to two additional districts (TBD)

Note: Refer to Figure 7 for a table demonstrating other select donor and partner coverage by district for key malaria interventions, including service delivery and facility and community-level, as of 2019.

Conclusion

- Alongside Global Fund and other partners, PMI provides support in quantification and procurement of antimalarials and diagnostics commodities and in service delivery activities. In spite of the progress made in malaria case management, some key challenges remain in order to achieve NMCP’s goal to provide quality services and free treatment.
- Going forward, MoHS needs to improve in the following areas: quantification and forecasting, knowledge gaps among health workers on malaria case management, regular supportive supervision, provision of necessary materials and job aides in all health facilities, increased engagement with private health facilities and pharmacies to further expand access to malaria case management, and monitoring and reporting of CHW activities.
- PMI will continue to work with the NMCP to identify how to best complement the work of other partners in these areas.

Key Question 6

What was the estimated need for RDTs during calendar year 2019 (and were those needs met, if not why)? What are the estimated RDT needs over calendar years 2020 and 2021?

Supporting Data

Figure A18. Gap Analysis of RDT Needs

Calendar Year	2019	2020	2021
RDT Needs			
Total country population	8,025,731	8,282,554	8,547,596
Population at risk for malaria ¹	8,025,731	8,282,554	8,547,596

Calendar Year	2019	2020	2021
PMI-targeted at-risk population	8,025,731	8,282,554	8,547,596
Total number of projected fever cases ²	4,011,921	4,132,279	4,356,247
Percent of fever cases tested with an RDT ²	3,813,469	4,014,178	4,225,450
Total RDT Needs ³	3,936,766	5,550,300	5,716,800
Partner Contributions (to PMI target population if not entire area at risk)			
RDTs carried over from previous year ⁴	2,687,254	1,650,888	0
RDTs from Government	0	0	0
RDTs from Global Fund	2,170,400	2,907,084	5,008,113
RDTs from other donors	0	0	0
RDTs planned with PMI funding ⁵	730,000	992,328	1,715,040
Total RDTs Available	5,587,654	5,550,300	6,723,153
Total RDT Surplus (Gap)	1,650,888	0	1,006,353

¹ Geographic coverage: 100% of the population is at risk of having malaria

² The total number of projected fever cases is reported suspected malaria cases in the HMIS (4,011,921), adjusted by an annual increase of 3% population growth. Note that only 95% (3,813,469) of all fever cases reported in 2019 was tested with an RDT. The NMCP projected that 4.7 million RDTs were used in 2019, which more reflects the need presented in 2020 and 2021.

³ Consumption data was used for forecasting for 2020 and 2021, with the previous quantification in 2019. The 2018 and 6 months of 2019 (January to June) data were analyzed and adjusted for under-reporting. Also, for district that have a very low reporting rate (less than 10%) another district (with similar population) data was used as a proxy. A 3% annual increase based on population growth was used. The pipeline or buffer stock is not added.

⁴ The carry over in 2020 was from the physical count done on 30th September 2019 subtracting the 4th quarter distribution quantity done in October.

⁵ For calendar year 2019, 1,000,000 RDTs were planned but only 730,000 were procured.

Conclusion

The Global Fund and PMI remain the primary donors for RDT procurement, filling estimated RDT needs for calendar years 2020 and 2021.

Key Question 7

What was the estimated need for ACTs during calendar year 2019 (and were those needs met, if not why)? What is the estimated need for ACTs over calendar years 2020 and 2021?

Supporting Data

Figure A19. Gap Analysis of ACT Needs

Calendar Year	2019	2020	2021
ACT Needs			
Total country population	8,025,731	8,282,554	8,547,596
Population at risk for malaria	8,025,731	8,282,554	8,547,596
PMI-targeted at-risk population	8,025,731	8,282,554	8,547,596

Calendar Year	2019	2020	2021
Total projected number of malaria cases ¹	2,400,159	2,472,164	2,655,513
Total ACT Needs ²	3,299,598	3,739,530	3,851,716
Partner Contributions (to PMI target population if not entire area at risk)¹			
ACTs carried over from previous year ³	1,301,563	982,321	0
ACTs from Government	0	0	0
ACTs from Global Fund	2,337,930	2,091,153	3,198,301
ACTs from other donors	0	0	0
ACTs planned with PMI funding ⁴	642,426	666,056	1,155,514
Total ACTs Available	4,281,919	3,739,530	4,353,815
Total ACT Surplus (Gap)	982,321	0	502,099

¹ The 2,400,159 reported as projected number of malaria cases is an estimate of the number reported in the HMIS. This number is an underestimation of the total cases as not all confirmed cases are captured in the HMIS. For 2020 and 2021 this number was adjusted by 3% (annual population growth). A quantification exercise will be done in 2020 to update the gap analysis data with a more accurate information.

² Consumption data was used for forecasting. The 2018 and 6 months of 2019 (January to June) data were analyzed and adjusted for under-reporting. Also, for districts that have a very low reporting rate (less than 10%) another district (with similar population) data was used as a proxy. A 3% annual increase based on population growth was used. The pipeline or buffer stock is not added.

³ The carry over in 2020 was from the physical count done on 30th September 2019 subtracting the 4th quarter distribution quantity done in October.

Conclusion

The Global Fund and PMI remain the primary donors for ACT procurement, filling estimated ACT needs for calendar years 2020 and 2021.

Key Question 8

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

Supporting Data

Figure A20. Gap Analysis of Injectable Artesunate Needs

Calendar Year	2019	2020	2021
Injectable Artesunate Needs			
Projected Number of Severe Cases ¹	120,730	122,050	123,293
Projected # of severe cases among children <5 y/o	43,372	44,374	45,358
Projected # of severe cases among 5 y/o and above	77,358	77,676	77,935
Total Injectable Artesunate vials Needs ²	708,305	713,687	718,573
Partner Contributions			
Injectable artesunate vials carried over from previous year ³	403,405	169,619	0
Injectable artesunate vials from Government	0	0	0

Calendar Year	2019	2020	2021
Injectable artesunate vials from Global Fund	174,519	244,068	718,573
Injectable artesunate vials from other donors	0	0	0
Injectable artesunate vials planned with PMI funding	300,000	300,000	0
Total Injectable Artesunate vials Available	877,924	713,687	718,573
Total Injectable Artesunate vials Surplus (Gap)	169,619	0	0

¹ Five percent of malaria cases are expected to progress to severe malaria disease.

² 3 vials for < 5 years, 6 vials for 5-14 years, 9 vials for 14+ years of age; The needs to fill the pipeline are included.

³ The carry over in 2020 was from the physical count done on 30th September 2019 subtracting the 4th quarter distribution quantity done in October.

Figure A21. Gap Analysis of Artesunate Suppository Needs

Calendar Year	2019	2020	2021
Artesunate Suppository Needs			
Number of severe cases expected to require pre-referral dose ¹	not yet calculated	not yet calculated	not yet calculated
Total Artesunate Suppository Needs ²	6,000	6,000	
Partner Contributions			
Artesunate suppositories carried over from previous year	0	0	0
Artesunate suppositories from Government	0	0	0
Artesunate suppositories from Global Fund	0	0	0
Artesunate suppositories from other donors	0	0	0
Artesunate suppositories planned with PMI funding ³	6,000	6,000	0
Total Artesunate Suppositories Available	6,000	6,000	0
Total Artesunate Suppositories Surplus (Gap)	0	0	0

¹ There is no data because it is in a pilot stage in four districts.

² The number of suppositories needed is a planned quantity for the pilot stage. It does not reflect the real needs nation-wide.

Conclusion

- Sierra Leone currently estimates the number of severe malaria cases at five percent of all malaria cases. PMI and partners are working with the NMCP to improve data collection, monitoring of severe malaria cases, quantification of malaria commodities and overall case management quality.
- The Global Fund and PMI remain the primary donors for injectable artesunate procurement, filling estimated injectable artesunate needs for calendar years 2020 and 2021. PMI has procured 6,000 rectal artesunate suppositories to support phase one roll-out of the product's introduction into the system and plans for an additional procurement in calendar year 2020 to support phase two, pending results from phase one and clarity on government roll-out plans.

Key Question 9

Are the first-line ACTs effective and monitored regularly?

Supporting Data

Figure A22. 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
2016 ¹	Bo, Kenema, Freetown, Makeni	AL, AS-AQ, DP	Yes	Institut Pasteur, Paris
2021	TBD	AL, AS-AQ, DP	NA	TBD (Global Fund-funded)

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

Conclusion

Current evidence suggests that AL, ASAQ, and DP continue to be effective in Sierra Leone.

Key Question 10

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

Supporting Data

The following reflects recommendations identified during the PMI-supported laboratory strengthening assessment:

- Need to establish and sustain a robust, country-wide QA/Quality Control (QC) system; establish and monitor accreditation of laboratories for performance of malaria tasks and referral services to lower level laboratories in the country.
- Urgent need to expand and improve water and electricity supply and laboratory space in order to facilitate diagnosis of malaria and increase coverage of malaria diagnosis in Sierra Leone.
- Need for additional laboratory staff at Community Health Clinics (the highest echelon of primary healthcare clinics) and at secondary and tertiary healthcare facilities to ensure availability of laboratory services on a 24-hour basis.
- Need to produce, update, and disseminate diagnostic guideline documents and Standard Operating Procedures (SOPs) for malaria diagnostics to all appropriate health facilities and laboratories.

- All laboratories performing malaria tests should receive regular OTSS visits, which will provide opportunity for onsite training and mentoring based on problems identified during supervision
- Pre-service laboratory training curricula should be reviewed and revised on a regular basis to include current international standards for malaria microscopy, including parasite quantification.

Conclusion

- Despite the 2015 National Malaria Control Policy guidance stating that only microscopy should be used in tertiary facilities for severe malaria diagnosis, there is limited capacity to provide quality malaria microscopy services in Sierra Leone. The PMI-funded laboratory capacity assessment highlighted the poor microscopy capacity in all assessed hospitals. Poor microscopy capacity results in delays and unreliable diagnosis.
- PMI advocates for an increase in human resources and availability of laboratory supplies in tertiary facilities. In addition, an increase in quantities of malaria rapid diagnostic tests (mRDTs) supplied to tertiary facilities would decrease mRDT stockouts and improve accurate and timely diagnosis.

Key Question 11

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

2.B. DRUG-BASED PREVENTION

NMCP objective
<ul style="list-style-type: none"> • The NMCP supports the WHO multi-pronged approach toward MIP with the provision and use of an ITN during pregnancy, IPTp with SP, and prompt and effective case management of malaria and anemia. Sierra Leone’s NSP (2016-2020) aims to protect at least 80 percent of pregnant women with three doses of IPTp-SP by 2020. • Seasonal malaria chemoprevention (SMC) is not a strategy currently adopted or recommended in Sierra Leone per WHO guidelines. • The NMCP supports intermittent preventive therapy in infants (IPTi) as part of the national control strategy. The NMCP aims to protect at least 80 percent of children under one year with three doses of IPTi-SP by 2020.

NMCP approach

- The NMCP adopted the 2012 WHO IPTp policy recommendations, ensuring pregnant women receive IPTp-SP doses starting early in the second trimester of pregnancy (13 weeks) and continue to receive IPTp-SP until delivery with a minimum interval of one month between doses.
- ITNs and IPTp are provided to pregnant women as part of the antenatal care package of services at health facilities aimed at making pregnancy safer. ITNs are provided for free to pregnant women at first ANC visit and to the fully immunized child through EPI. The national treatment policy for the treatment of uncomplicated malaria cases during pregnancy is oral quinine plus clindamycin in the first trimester and an ACT in the second and third trimesters.
- The NMCP supports the full integration of MIP within the MoHS's DRCH. The NMCP is responsible for updating guidelines and job aids on IPTp, orienting health workers on updated IPTp guidelines, producing integrated data collection tools for MIP, procuring SP for the public and private sector and mobilizing communities on antenatal care attendance in collaboration with the DRCH.
- In 2017, the MOH adopted the 2016 WHO ANC Guidelines including the recommended eight ANC contacts during pregnancy. With the updated ANC guidelines, the MOH recommends an additional ANC contact early in the second trimester (between 13 to 16 weeks) to administer SP as early as possible to pregnant women.
- The NMCP also supports the provision of SP-IPTp at the community level through trained traditional birth attendants (TBAs). Although this approach has been scaled up nationally, the monitoring and supervision of this practice has been limited and TBAs have reported frequent stockouts of SP supplies at the community level. While PMI supports training and supervision of TBAs, PMI does not currently support the implementation of SP-IPTp at the community level per PMI policy.
- Although the public hospitals provide ANC services to pregnant women, training and supervision of hospital staff as well as other private health providers in ensuring quality of MIP and IPTp services has been limited.

PMI objective, in support of NMCP

- PMI supports the NMCP in implementing the multi-pronged approach to MIP including strengthening MIP services (ITNs and IPTp) at ANC and ensuring prompt diagnosis and effective treatment of malaria during pregnancy.
- PMI supports the NMCP's plan to ensure updated MIP policies and guidelines are available in all facilities and peripheral health providers have been trained in their use including health facility staff, community health workers (including TBAs), midwives and public and private

sector hospital staff. PMI supports integrated supportive supervision in focus districts to ensure the quality of service delivery as well as support the implementation of the NMCP's approach to on-the-job training, through mentoring and coaching of staff including CHW peer supervisors for improving IPTp coverage.

- TBAs are considered part of the CHW cadre. TBAs help identify pregnant women in the community and accompany pregnant women to attend ANC visits and deliveries at the health facility. NMCP encourages TBAs in remote communities to provide SP for IPTp to pregnant women after the first dosing at a health facility; however, this practice has not been scaled up systematically nationwide. PMI is not supporting TBAs with the provision of SP for IPTp per PMI policy.
- PMI will work with NMCP and stakeholders to technically assist with any refresher trainings to ensure the training curriculum for CHWs and TBAs is up to date.
- PMI also supports the close collaboration between NMCP and Reproductive Health Directorate; to this end, PMI supports the NMCP with establishing the national MIP task force for ensuring regular meetings and coordination of MIP efforts among the two national programs as well as key malaria stakeholders.
- Based on initial findings from a pilot study completed in June 2019, the NMCP rolled out IPTi nationwide to all districts through the national EPI program platform. PMI recognizes other partners engaged in supporting IPTi activities; therefore, PMI's primary focus is on strengthening MIP and IPTp implementation.

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

- PMI supported efforts with the NMCP and DRCH to reinvigorate the MIP technical working group (TWG), including the development of a comprehensive terms of reference for the TWG which was amended and adopted by the group.
- PMI supported strengthening of supervisory visits by field testing the OTSS+ checklist among facility level providers, which includes an assessment of ANC and MIP services at facility level in three districts. The tool will be used to support the NMCP's plan to train health providers in the updated MIP guidelines including health facility staff, community health workers and TBAs, midwives and public and private sector hospital staff.
- PMI implemented the MBS, a cross-sectional household survey designed to measure malaria-related behaviors and their behavioral determinants across intervention areas, in October 2019. A full analysis of the data is forthcoming and will be used to determine the behavioral factors that are related to IPTp uptake (among other behavioral determinants).

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

- PMI will continue to support the national MIP TWG with a focus on sharing data for decision making to guide activities and monitor progress. PMI will support NMCP and DRCH to implement the action plans developed as part of the MIP TWG.
- PMI will continue to improve facility level health worker knowledge and skills in MIP and IPTp at public and private health facilities through the development and implementation of the integrated OTSS+ tool which includes an MIP module and checklist.
- PMI will support strengthening of SBC MIP activities including MIP behavior change messages used at community and facility levels based on findings from the Malaria Behavior Survey conducted in two districts in October 2019.

2.B.i SEASONAL MALARIA CHEMOPREVENTION (SMC)

PMI Goal

SMC is not in the NMCP strategy in Sierra Leone, in accordance with WHO recommendations.

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

SMC is not in the NMCP strategy in Sierra Leone, in accordance with WHO recommendations. No funding is planned for this intervention. Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

Key Question 2

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

Key Question 3

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

Key Question 4

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

Supporting Data

Not applicable.

Conclusion

Not applicable.

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

PMI Goal

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

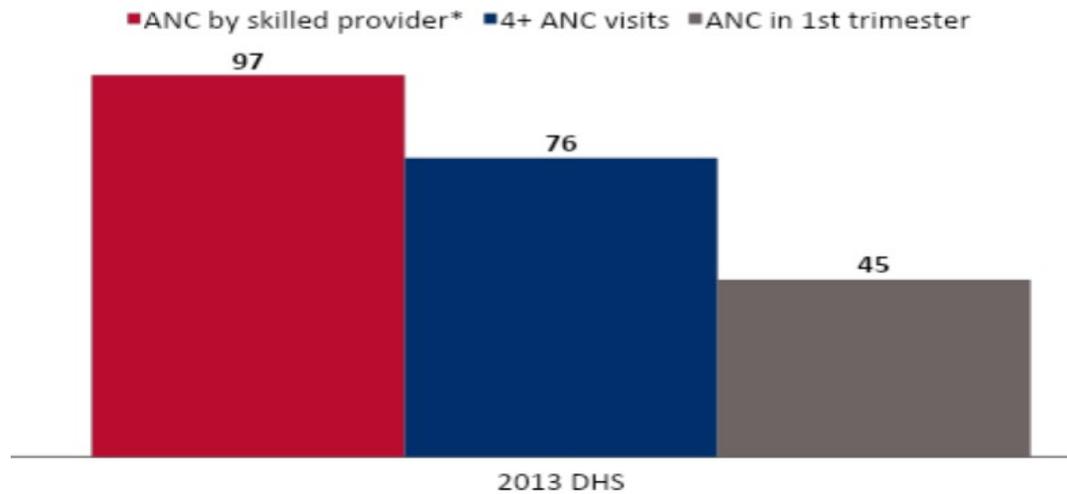
PMI proposes to maintain funding allocation levels for this activity based on the data provided below. Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

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

Supporting Data

Figure A23. ANC Coverage, Percent of Women Age 15-49 with a Live Birth in the 5 Years Before the Survey for Most Recent Birth



*Skilled provider includes doctor, nurse, midwife or MCH aide.

Figure A24. Key Barriers and Facilitators to ANC Attendance

Facilitator	Type of Factor	Data Source	Evidence
Data not yet available			Data not yet available
Barrier	Type of Factor	Data Source	Evidence
Distance and accessibility	Environmental	Treacy L, Bolkan HA, Sagbakken M (2018) Distance, accessibility and costs. Decision making during childbirth in rural Sierra Leone: A qualitative study. PLoS ONE 13(2): e0188280. https://doi.org/10.1371/journal.pone.0188280	Despite the introduction of the free health care initiative for pregnant women, many women still continue to deliver at home, with few having access to a skilled birth attendant. In addition, inequalities between rural and urban areas in accessing and utilizing health facilities persist.

Costs of services	Environmental	Sierra Leone 2013 DHS	The leading barrier to health care for women in Sierra Leone is concern over getting money for costs of services (67%) including services related to ANC. Only IPTp is offered for free while other services need to be paid for.
Quality of ANC services	Environmental	Koroma, M.M., Kamara, S.S., Bangura, E.A. <i>et al.</i> The quality of free antenatal and delivery services in Northern Sierra Leone. <i>Health Res Policy Sys</i> 15, 49 (2017) doi:10.1186/s12961-017-0218-4	The quality of services was poor. Based on national standards, only 27% of women were examined, 2% were screened on their first antenatal visit and 47% received interventions as recommended.

Conclusion

- ANC attendance is generally high in Sierra Leone; the 2013 DHS reported 97 percent of women attended at least one ANC visit during their pregnancy and 76 percent completed all four recommended ANC visits. However, 45 percent of women made their first ANC visit in the first trimester of pregnancy, 42 percent made their first ANC visit between four and five months during pregnancy, and 10 percent of women made their first ANC visit in their sixth or seventh month of pregnancy. In order to achieve optimal IPTp3 coverage, the early initiation of ANC is an important programmatic consideration for the NMCP. The 2016 MIS did not collect information about ANC attendance.
- In 2017, the MOH adopted the 2016 WHO ANC Guidelines including the recommended eight ANC contacts during pregnancy. With the updated ANC guidelines, the MOH recommends an additional ANC contact early in the second trimester (between 13 to 16 weeks) to administer SP as early as possible to pregnant women.
- There is little available evidence of the specific behavioral factors that influence ANC attendance (e.g., self-efficacy, attitudes, response efficacy, perception of health workers, distance to health facility, etc.). However, data from some available sources indicate barriers to ANC attendance are distance to the health facility, costs of services, and quality of ANC services. Data from the MBS will be available in the coming months and will be used to further inform the most appropriate behavior change approach (factors to address, target audience, messages, etc.) for SBC activities that promote early and regular ANC attendance to achieve optimal IPTp coverage.

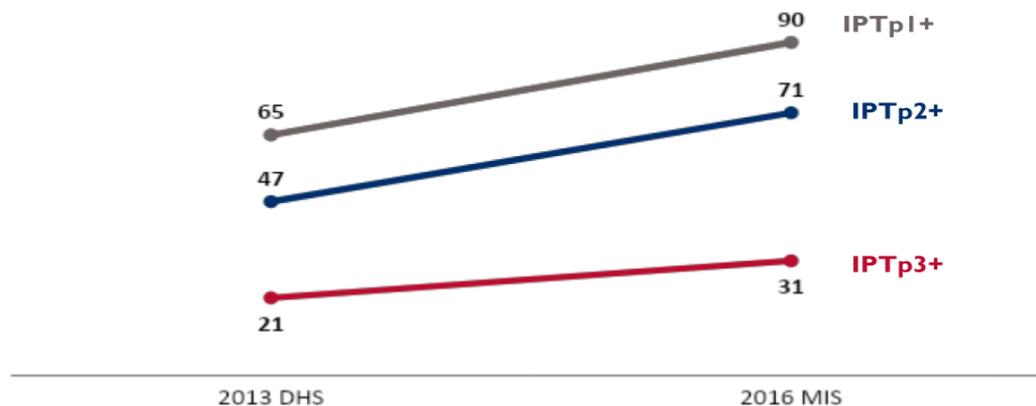
Key Question 2

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

Supporting Data

Figure A25. Trends in IPTp

Percent of women age 15-49 with a live birth in the two years before the survey who received the specified number of doses of SP/Fansidar during their last pregnancy



Note: These indicators have been recalculated according to the newest definition, at the least the specified number of doses of SP/Fansidar from any source.

Conclusion

- According to the MIS 2016, IPTp2 and IPTp3 coverage is 71 percent and 31 percent, respectively. The 2013 DHS reported IPTp2 at 47 percent, which indicates an increase in IPTp2 uptake over the last three years.
- While coverage of the first and second dose of IPTp is generally high, improvements are needed in achieving high coverage of the third dose of IPTp. Most pregnant women initiated ANC after their first trimester, contributing to low IPTp3 uptake.
- As mentioned in Key Question 1, data from the MBS will be available in the coming months and will be used to inform the most appropriate behavior change approach (factors to address, target audience, messages, etc.) for SBC activities that promote optimal IPTp coverage.

Key Question 3

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

Supporting Data

Figure A26. Missed Opportunities for IPTp, Percent of Women Age 15-49

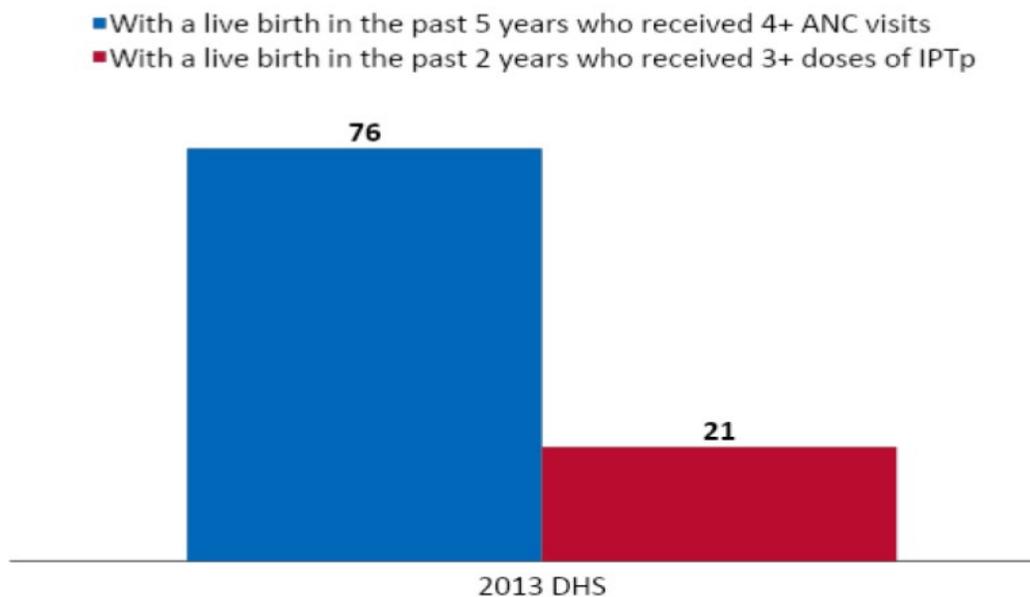


Figure A27. Key Barriers and Facilitators to IPTp Administration at ANC Visits

Facilitator	Type of Factor	Data Source	Evidence
Availability of free health services for pregnant women	Environmental	Sierra Leone Free Health Care Initiative CRS 2017 Barrier Analysis (Koinadugu, Kenema, Pujehun, Western Area Rural)	The Free Health Care Initiative eliminates user fees for under-fives and pregnant women. Additionally, the CRS Barrier Analysis reported that those women who regularly attended ANC and received IPTp3+ were 3.5 times more likely than to report that SP being free made it easier to take the third dose during pregnancy than those women who did not receive IPTp3+.
Increased access to IPTp at the community level	Environmental	NMCP's MIP PowerPoint slide presentation for PMI FY 20 MOP	At the community level, CHWs and Traditional Birth Attendants (TBAs) play a key role in promoting uptake of IPTp. Specifically, TBAs have been trained to administer IPTp-SP at community level, thus increasing access to IPTp.

Barrier	Type of Factor	Data Source	Evidence
Perception that SP does not prevent malaria	Internal	CRS 2017 Barrier Analysis (Koinadugu, Kenema, Pujehun, Western Area Rural)	Women who did not receive IPTp3+ were 2 times more likely to report that it is “somewhat likely” they will get malaria during pregnancy even if they take the third dose.
Intermittent stockout of SP tablets	Environmental	NMCP MIP Presentation for PMI FY2020 MOP, November 4, 2019 Sierra Leone Service Readiness Assessment Report (SARA) Plus Report 2017	Per NMCP’s MIP presentation, a remaining challenge for improved IPTp uptake is the intermittent stockouts of SP tablets at peripheral levels. NMCP recommends capacity building DHMTs, PHU staff to forecast & quantify for SP, and provide adequate and uninterrupted supply of SP tablets to PHUs and communities. According to the SARA report, 67% of health facilities had SP for IPTp (N=1279).

Conclusion

- There is limited quantitative data available on ANC attendance and IPTp; the only data available is from one time point (2013 DHS) and shows that a large gap exists between ANC4 and IPTp3.
- Systems challenges remain in supporting MIP implementation including the need to train all health facility staff and TBAs in the updated ANC and IPTp policy guidelines, occasional SP stock outs at peripheral health facilities due to poor supply chain management practices, the lack of private sector engagement in MIP and IPTp administration, and inadequate monitoring and supervision of IPTp at the community level. PMI will assist with building capacity in supervision and mentoring of the CHW peer supervisors who supervise CHWs including TBAs.
- Moreover, other barriers to improving ANC and IPTp coverage include distance from and accessibility to health facilities, the costs of health services (as noted in Key Question 1), and the perception that SP does not prevent malaria. Thus, PMI will provide technical support to address these identified barriers in an effort to reduce missed opportunities between ANC and IPTp. Efforts will also ensure sufficient quantities of SP treatments are available at the health facility level.

Key Question 4

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

Supporting Data

Data on this intervention strategy is limited. In 2018, HMIS reported a total of 139,474 pregnant women were treated for malaria. Of these cases, 122,597 pregnant women in their second and third trimesters were treated with an ACT, and 16,877 pregnant women in their first trimester were treated with oral quinine.

Conclusion

- Data is currently unavailable for the total number of pregnant women with a fever tested for malaria to calculate the proportion of pregnant women with fever being tested and treated. However, HMIS data does report the number of malaria cases among pregnant women receiving appropriate treatment based on trimester.
- PMI will continue to work closely with the NMCP through both service delivery and SM&E partners to ensure that malaria testing and treatment data on pregnant women are appropriately conducted and captured.

Key Question 5

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

Supporting Data

Figure A28. Gap Analysis of SP Needs for Pregnant Women

Calendar Year	2019	2020	2021
Total Population at Risk	8,025,731	8,282,554	8,547,596
SP Needs			
Total number of pregnant women ¹	353,132	364,432	376,094
Total SP Need (in treatments)	890,599	972,123	1,057,953
Partner Contributions			
SP carried over from previous years ²	1,078,438	818,357	0
SP from Government	0	0	0
SP from Global Fund	630,518	153,766	1,057,953
SP from Other Donors	0	0	0
SP planned with PMI funding	0	0	0
Total SP Available	1,708,956	972,123	1,057,953
Total SP Surplus (Gap)	818,357	0	0

¹ The total number of pregnant women is estimated at 4.4% of the total population.

² The carry-over includes the quantity for IPTp and IPTi. The carry over in 2020 was from the physical count done on 30th September 2019 subtracting the 4th quarter distribution quantity done in October.

Figure A29. Gap Analysis of SP Needs for Children Under 1 Year

Calendar Year	2019	2020	2021
Total Population at Risk	8,025,731	8,282,554	8,547,596
SP Needs			
Total number of children under 1 year ¹	321,029	331,302	341,904
Total SP Need (in treatments)	808,994	858,073	902,626
Partner Contributions			
SP carried over from previous years ²	0	0	0
SP from Government	0	0	0
SP from Global Fund ³	0	0	0
SP from Other Donors	0	0	0
SP planned with PMI funding	0	0	0
Total SP Available	0	0	0
Total SP Surplus (Gap)	-808,994	-858,073	-902,626

¹ 4% of total population are children under 1 year old (based on 2015 Population Census) with 3.2% annual population growth.

² The SP stock for IPTi is pooled with that for IPTp. The carry-over is indicated in the "SP gap analysis for pregnant women" sheet.

³ Global Fund might fill the gap pending discussion with MoHS.

Conclusion

The Global Fund is the primary contributor to SP procurement for pregnant women, and plans to fill the SP need in calendar years 2020 and 2021. PMI currently does not have plans to procure SP.

Key Question 6

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

Supporting Data

N/A

Conclusion

N/A

3. CROSS-CUTTING AND OTHER HEALTH SYSTEMS

3.A. SUPPLY CHAIN

NMCP objective
<ul style="list-style-type: none"> According to the National Malaria Strategic Plan (2016 - 2020), the main objective of the NMCP's supply chain is the availability of quality assured commodities in both public and private sector. The NMCP seeks to strengthen the capacity of health workers both in the public and private health sectors to implement the new Test, Treat and Track (T3) strategy by

improving: procurement and supply of malaria prevention and treatment commodities; proactive engagement of the private sector in malaria control, as well as community participation in diagnosing, treating and reporting malaria cases.

- The MoHS and partners have undertaken the following steps in relation to procurement and supply management:
 - Updated procurement guidelines and SoPs.
 - Updated tools for Logistics Management Information System (LMIS) including a computer software, mSupply.
 - Developed a Procurement and Supply Management Plan.
 - Developed a Risk Mitigation Matrix for commodity distribution to prevent “leakages.”

NMCP approach

- Under the MoHS, the Directorate of Drug and Medical Supplies (DDMS) is responsible for pharmaceutical management activities. The primary drug regulatory body is the Pharmacy Board of Sierra Leone, which oversees quality and pharmacovigilance activities. Building off of previously published documents on procurement practices (ex. 2012 National Medicines Policy and the 2010 Sierra Leone LMIS Standard Operating Procedure Manual), in 2016, a Malaria Procurement and Supply Management Plan was developed in close collaboration with the Pharmacy Board of Sierra Leone and the TB and HIV/AIDS national programs.
- In 2012, an act of parliament was passed for the establishment of the National Pharmaceutical Procurement Unit (NPPU) to be responsible for procurement, storage and distribution of general health commodities. In April 2013, the GoSL, with the support of its development partners, the NPPU was established and began operations to develop an integrated cost-effective system for the procurement and distribution of all health commodities based on globally recognized standards.
- After a series of challenges and concerns regarding transparency and accountability, the NPPU underwent a reform which involved both the macro-level governance, as well as technical pharmaceutical supply management. In August 2017, an act was signed to form the National Medical Supplies Agency (NMSA), a new body to replace the NPPU. This new agency is now operational and has recruited its administrative and operations teams. NMSA has taken over the distribution of Free Healthcare commodities from UNICEF and DDMS and its transitioning the other supply chain functions (procurement and warehouse) from UNICEF and DDMS. The transition for NMSA to take over full operations will begin in January 2020 and will be a gradual process with full engagement by PMI, Global Fund, other health donors and the stakeholder community to ensure a smooth transition. NMSA is currently responsible for conducting all procurement for government-funded Free Health

Care commodities. It's also involved in the distribution of Global Fund commodities including malaria products and this function may be transitioned fully from UNICEF/DDMS to NMSA by July 2020.

- The supply chain system in Sierra Leone is an “informed push” for all commodities. The NMCP continues to push for integration of supply chain activities into the mainstream MoHS platform, led by the Directorate of Drug and Medical Supplies (DDMS). This is the unit responsible for policy formulation, quantification, LMIS, and rational use, and NMSA is responsible for procurement, storage and distribution. The Pharmacy Board of Sierra Leone PBSL continues to be the primary drug regulatory body that has the mandate for quality and pharmacovigilance activities.
- There is no specific supply chain master plan in Sierra Leone, however the MoHS plans to develop a National Supply Chain Strategy in 2020 that will guide supply chain processes. The system of distribution in Sierra Leone is currently mixed with most programs conducting an informed “push system” while malaria program is now using consumption data to inform distribution.
- With the introduction of the DHIS-2 and Sierra Leone Pharmaceutical Dashboard (SLPD) for eLMIS as well as roll out of mSupply for warehouse management, the previously used Channel will be phased-out. mSupply continues to be the warehouse management tool and its roll out to district and hospital medical stores is on-going.

PMI objective, in support of NMCP

- PMI supports the procurement of commodities for Sierra Leone, including ACTs, RDTs, injectable artesunate, and ITNs for routine distribution.
- PMI supports technical assistance for strengthening the supply chain system including improving stock reporting, and quantification and forecasting of commodities. In collaboration with other partners, PMI is providing technical assistance for the integration of LMIS into DHIS2 for accurate quantification of malaria commodities.
- A PMI-supported analysis of supply chain data conducted in 2018 reported that the percentage of health facilities reporting “No Stock-Out” of ACTs and RDTs were 96 percent and 95.3 percent, respectively, which is consistent with the reported HMIS data.
- Ongoing challenges in the supply chain system include the clearing of commodities at the ports resulting in artificial shortages, and inadequate and poor storage facilities. PMI will continue to support NMCP’s effort to ensure the availability of malaria commodities at facility levels with no stockouts.

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

- With FY18 funding, PMI supported the procurement, warehousing and distribution of antimalarial commodities: ACTs, RDTs, LLINs, injectable artesunate, and RAS.
- In the effort to increase collaboration and reduce redundancies in the supply chain system, PMI supported national level coordination meetings with the NMCP, DDMS and NMSA to improve coordination for strengthening health system activities among all key stakeholders.
- PMI supported the establishment of a functioning malaria quantification TWG and National Quantification Committee (NQC). To date, 46 members have been orientated on the functions and responsibilities of the NQC and have shared updates on various programs and TWGs.
 - During the TWG orientation meeting, 14 TWG members were trained on quantification process and tools (PipeLine®) and 12 people were trained on the use of stock validation checklist.
- PMI supported stock validation exercises in all districts and at the central warehouses for malaria commodities, the development of an annual forecast and supply plan; preparation of the malaria commodity stock status report, submission of malaria commodities supply plans on a quarterly basis and the development of annual quantification report.
- Recognizing NMCP's priority on integration of Report Request and Issue Voucher (RRIV) into the DHIS2 platform, PMI conducted an LMIS review and provided technical assistance to train health facility representatives on the proper reporting of logistics data at district-level.
- Thus far integration of DHIS2 and eLMIS has been completed in eight districts and with support from other donors, the DHIS-2 RRIV integration training has been rolled out to the remaining districts. Data entry of LMIS into the DHIS-2 is on-going in all the districts.
- PMI supported a commodities gap analysis with recommendations for improving the LMIS system.

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

- PMI will continue to collaborate with the NMCP, MOHS and other donors and partners to strengthen the supply chain management in Sierra Leone. The established TWG will enable proper coordination among stakeholders and donors to ensure availability of malaria commodities at all levels with zero stockouts and overstocking as the case may be.
- PMI will collaborate with other partners to strengthen the collection and use of malaria commodity consumption data in an effort to address stock management issues.

- PMI will continue providing support for the distribution of LLINs through the routine channels to facility level and warehousing and distribution costs for PMI’s procurements of ACTs, RDTs, and severe malaria drugs.
- PMI will procure 2.5 million PBO LLINs as well as providing technical and logistic support to the NMCP for the 2020 mass LLIN campaign.
- PMI will support LMIS data analysis training for district and hospital personnel. Subsequently information from data analysis will be used to inform the development of an evidence-based distribution plan.
- PMI will support establishment of forecasting and distribution TWGs in all 16 districts (14 current districts plus the two newly established districts per the government’s re-districting plan).
- PMI will support the review of the existing Logistics Management SOPs and manuals and conduct capacity development training based on the revised SOPs and manuals, as well as conduct regular quality assurance appraisals to monitor SOP implementation.
- PMI will support quarterly supply chain monitoring at PHU levels in the four PMI focus districts with the objective of reducing stockout and/or overstocking, mentoring facility staff, facilitate reverse logistics of antimalarial commodities among other supply chain indicators.
- PMI will measure the level of data quality through data quality assessments (DQA) on a quarterly basis to guide the use of data for decision making at central and district levels.
- PMI will continue to support the integration process of linking DHIS-2 into the SLPD to enhance analysis and monitoring of LMIS indicators.

PMI Goal

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

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

No changes to supply chain activities are proposed. The increase in budget is reflective of updates to costs of maintaining technical assistance staff in-country.

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

Key Question 1

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

Supporting Data

Figure A30. Central Stock Levels for ACTs

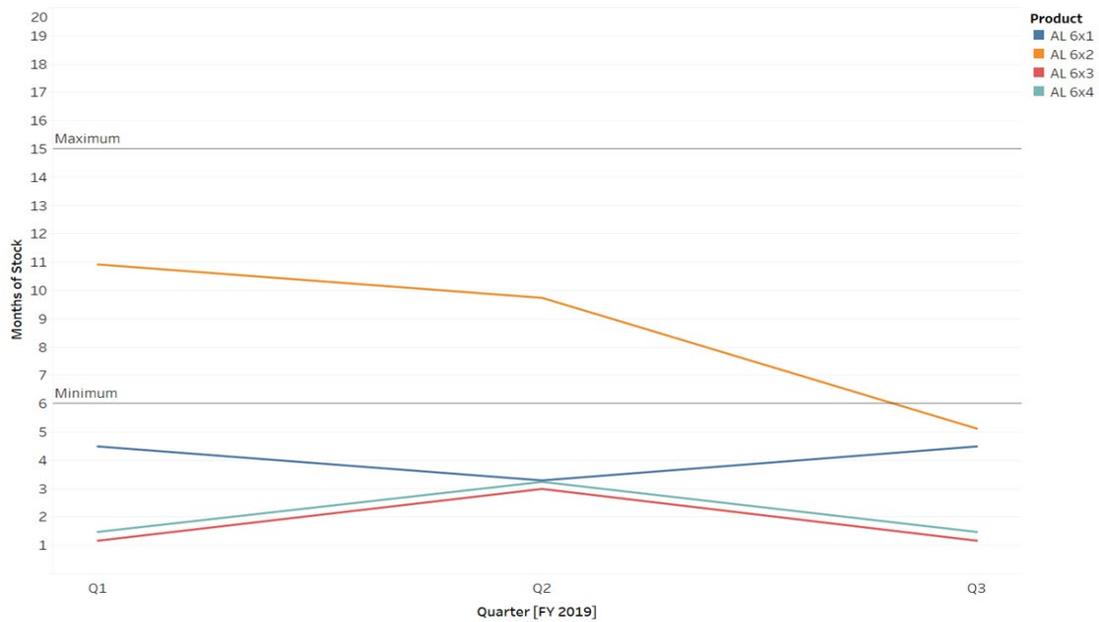
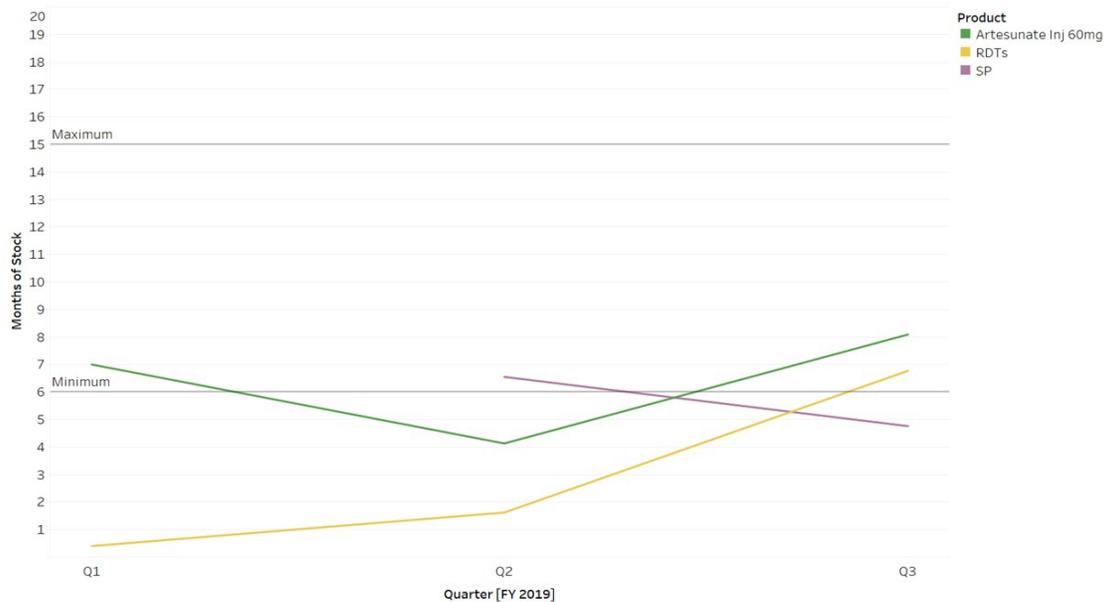


Figure A31. Central Stock Levels for RDTs, SP, and Injectable Artesunate, 60mg



Conclusion

- The data above demonstrate that Sierra Leone has not had major issues with stockouts at central level of ACTs, RDTs, SP, and injectable artesunate the last few quarters of 2019, but that the country has been understocked according to a definition of a minimum desired stock level of 6 months.

- PMI will continue to coordinate to ensure that commodity quantifications plan for desired levels of stock and assess whether appropriate procurements are planned between the country and other donors.

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

No information currently available.

Conclusion

The information reported for this indicator is incomplete at this time. With the integration of eLMIS into the DHIS2 currently being rolled out, PMI and NMCP expect to start having better quality data from next year. National reporting of eLMIS through DHIS2 began in September 2019.

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

- Difference between number of suspected cases treated with ACT and reported malaria cases: There is no available data at this time. PMI is working with NMCP and MoHS to improve the current data situation in Sierra Leone.
- Difference between number of suspected cases tested with RDT and confirmed cases by RDT: There is no available data at this time. PMI is working with NMCP and MoHS to improve the current data situation in Sierra Leone.

Conclusion

While HMIS reporting remains high, LMIS reporting tends to be lower with continued strengthening efforts to improve reporting quality and consistency (see Supply Chain Key Issue #4). Consumption data used and referenced in the most recent national quantification exercise came from the Report Request and Issue Voucher (RRIV) system, as efforts are made to improve the quality of actual consumption reporting.

ACT

- There is no indicator in the HMIS capturing ACT consumption. The number of malaria treated is used as a proxy for this indicator.

- Of the total 2,400,159 reported cases, 2,200,328 received an ACT treatment. The discrepancy between the ACTs consumed and number of reported cases is due to weakness in data collection and reporting system. Not all treated cases are captured in the HMIS.
- In addition, there may be an artificial stock out reported as a result of the weakness in supply and distribution of commodities from warehouse to facility level which may have contributed to the discrepancy.

RDT

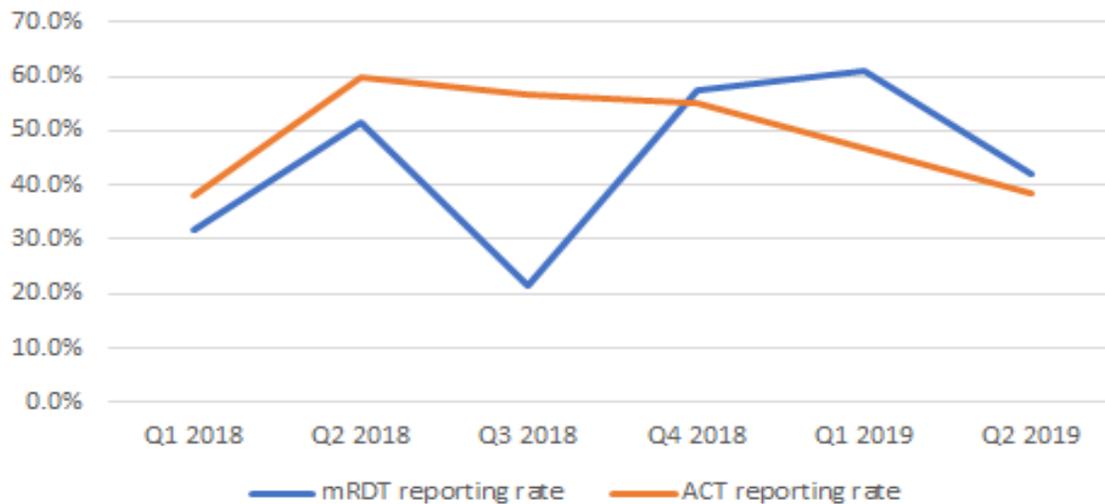
- There is no indicator in the HMIS tracking RDT consumption, hence this number is under reported using number of cases confirmed with an RDT as a proxy.
- According to 2018 HMIS 99.6 percent (3,996,065 of 4,011,921) of all suspected malaria cases received a parasitological testing by RDT or microscopy. Of this number 3,813,469 was tested by RDT (95.4 percent) and three percent received microscopy testing. The remaining suspected cases that did not receive a parasitological testing, were clinically diagnosed.
- Recognizing the existing weaknesses in the system, PMI will continue to support the MoHS to strengthen the system and improve data quality.

Key Question 4

What are the trends in LMIS reporting rates?

Supporting Data

Figure A32. Quarterly Reporting Rate for ACT and mRDT*



*At facility-level.

Conclusion

LMIS reporting rates on stock availability across all malaria commodities have stayed consistently low in the LMIS, below 70 percent from January 2018 through June 2019, with some month-to-month variation. It is observed that the RDT reporting rate is much lower than ACT and dropped to 20 percent in Q2 2018. The inconsistencies seen in the reporting rate and variance between commodities are due to a number of reasons including high staff attrition; lack of verification at district level; stock out of reporting tools and unpaid salaries of district information officers (DIOs) who input data into the LMIS.

- PMI will continue to work with the NMCP and supply chain partners to understand why there are such differences in reporting depending on commodity type, and to improve overall data quality.
- The integration of LMIS into the DHIS2 platform is a high priority of MoHS. PMI and other partners will continue to provide technical assistance to the NMCP and broader MoHS entities to improve the reporting rates and overall quality of the LMIS information collected. With the integration of the LMIS into the DHIS2, data quality will improve in coming years. In addition, the establishment of supply chain TWGs at district level will allow for further discussion of supply chain challenges and issues.

Key Question 5

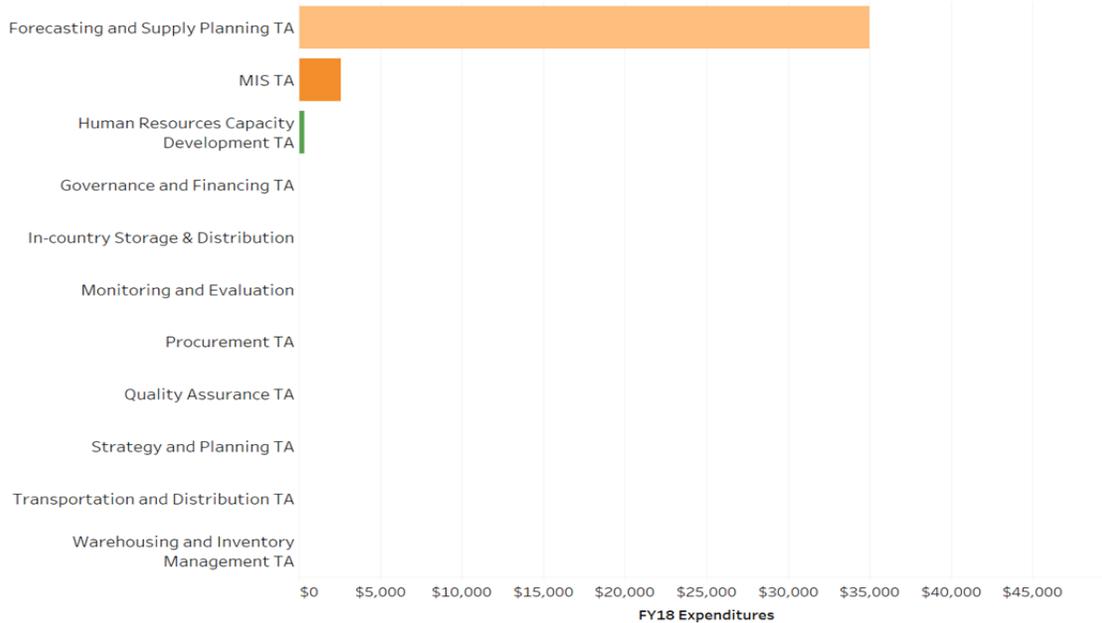
What are the main supply chain functions supported by PMI? For areas that are not as strong is there additional investment that PMI should make? In areas performing well, is it dependent on PMI/donor funding and so should be maintained?

Supporting Data

The main supply chain functions that PMI is supporting are:

- Forecasting and supply planning (FASP): Technical and financial support to the functioning of the Malaria Quantification Technical Working Group through quarterly meetings, training in FASP processes and tools as well as technical support to revise the annual forecast and develop the supply plan. Supported the functioning of the National Quantification Committee.
- LMIS: Support through analysis of data collected from health facilities, conducting the pilot training of LMIS into DHIS2, and analysis and recommendation for improvement of LMIS data sites in DHIS2.
- Coordination: Supporting the coordination of supply chain units of the MoHS (DDMS and NMSA) with the NMCP.
- Supply Chain Monitoring: Limited support for monitoring and supervision especially at service delivery points.

Figure A33. PMI-Supported Supply Chain Assistance



Conclusion

- PMI primarily supports technical assistance in forecasting and supply planning, as well as some smaller investment in logistics management information systems (LMIS) and human resources capacity development. PMI aims to complement the investment of other donors like Global Fund where necessary.
- Given PMI contributions to commodities, strengthening forecasting and supply planning remains a high priority at this time. Sierra Leone is a new focus country, and as the program matures PMI will continue to expand its support and provide adequate technical assistance to the MoHS in the area of procurement and supply management.

Key Question 6

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

Supporting Data

N/A

Conclusion

N/A

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

NMCP objective
The Sierra Leone NMCP’s SM&E strategic objective is to strengthen surveillance, monitoring, evaluation and operational research for effective program management. The NMCP aims for at least

95 percent of health facilities reporting routinely on malaria program performance by 2020. To achieve this objective, the NMCP supports the following key strategies:

- Improve on malaria data collection and reporting through HMIS (public and community);
- Improve on data demand and use at all levels;
- Conduct regular malaria surveys/evaluations;
- Strengthen routine epidemiological, parasitological and entomological capacity for malaria surveillance; and
- Develop and implement an Operational Research Agenda to generate evidence for decision-making.

NMCP approach

The NMCP's SM&E activities fit within the national SM&E strategy under the Directorate of Policy, Planning and Information (DPPI), MoHS. There has been a national focus on strengthening the overall SM&E system by providing resources to DPPI, training staff on DHIS2 software and engaging the University of Oslo in providing on-going technical support. Currently, DPPI is conducting an HMIS assessment with assistance from the University of Oslo with the primary objective to improve data quality. In addition, SM&E officers have been trained on data quality at the district level. Specifically, the NMCP SM&E team conducts routine, quarterly data quality assessments and conducts quarterly supportive supervision visits to the districts and targeted health facilities identified by analyzing the HMIS data.

PMI objective, in support of NMCP

PMI support to the NMCP's SM&E strategy will complement Global Fund support and will help provide key malaria data (e.g., diagnostics, treatment, prevention) for monitoring malaria program implementation. PMI will focus on improving malaria data quality and timeliness by strengthening the capacity and infrastructure at the district and chiefdom levels, including appropriate use of data for decision making, and supportive supervisions from districts to health facilities. At the national level, PMI will support the NMCP SM&E team in conducting supportive supervision to the peripheral level. Initially, district level support will be concentrated on the PMI focus districts.

Specific objectives include:

- Strengthen collection, analysis and use of routine health data;
- Improve country-level capacity to manage health information systems, resources and staff;
- Improve methods, tools and approaches to address health information challenges and gaps;
- Increase capacity for rigorous evaluation.

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

- PMI conducted systematic SM&E capacity assessments of the NMCP and the Bo, Koinadugu, Port-Loko and Pujehun District Health Management Teams (DHMTs) using the Monitoring and Evaluation Capacity Assessment Toolkit (MECAT) survey. A capacity building plan was developed using information from these assessments. Information was shared with NMCP, DPPI, MOHS, Roll Back Malaria (RBM) partners and other HMIS/M&E partners with the goal of the findings to strengthen the country's SM&E strategy and action plans.
- PMI supported the training of two NMCP staff on malaria control specific SM&E at an international workshop/training.
- Provided technical assistance to NMCP in publishing the initial Quarterly Malaria Surveillance Bulletin in 2019.
- PMI supported the revision and development of Malaria Routine Data Quality Audit (RDQA) toolkits. The new Malaria RDQA toolkits will improve the RDQA process.
- PMI assisted MoHS in the national integration of LMIS and DHIS2 integration by developing a practical manual for district data clerks and pharmacists in using DHIS2 for data entry, navigation and data use. In addition, PMI helped teach at the national level LMIS DHIS2 workshop attended by representatives from all districts.
- PMI supported the completion of the Sierra Leone DHS 2019 by Stats SL.
- PMI is supporting the review of the National Malaria M&E Plan as part of the overall Malaria Programme Review. The findings from the M&E Plan review will inform the next National Malaria Strategy.
- These activities will be continuing in FY20 with an emphasis on extending SM&E activities and capabilities to the district and facility level.

There have been no major challenges or bottlenecks that slowed or prevented implementation by PMI in 2019. The National M&E Plan review, quarterly bulletin and technical assistance to improve surveillance, analysis and data use are ongoing.

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

- Support NMCP and PMI implementing partners in improving data collection and use with greater focus on district and facility level use including training of national and sub-national health staff
- Continuation of Malaria Surveillance Quarterly Bulletin

- Development of Data Analysis and Use Protocol and training guide to refine data use for strategic decision making
- Co-analysis and dissemination of Malaria Behavior Survey results with NMCP
- Conduct monthly malaria data review meetings with NMCP as an additional means to strengthen malaria data decision-making.

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?

PMI will support the continuation of current SM&E activities that are strengthening data collection and use with an increase in funding to have a greater impact in coming years. PMI will support the collection, reporting, and use of routine malaria data at the district and chiefdom levels through capacity building of malaria focal persons, SM&E teams and community health officers and ensuring that sufficient infrastructure capacity exist to collect, analyze and report quality malaria data using DHIS2. District level efforts will also strengthen data from the supply chain to ensure that commodity consumption is reported in order to minimize stock-outs. The activity will provide technical assistance at district level for improved supportive supervision activities.

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

Key Question 1

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

Supporting Data

Figure A34. Data Sources to Inform Intervention Coverage

Data Source	Data Collection Activities	Year								
		2015	2016	2017	2018	2019	2020	2021	2022	2023
Household Surveys	Demographic Health Survey (DHS)					X				
	Malaria Indicator Survey (MIS)		X*					(X)		

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

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

Conclusion

- Partly due to external circumstances that have included a contracted history of civil unrest and the nationwide Ebola epidemic in 2014-2016, there is a relative lack of recent household survey data available to the MoHS for strategic decision making. Led by the

GoSL with technical assistance partially funded by PMI, a DHS was successfully conducted in 2019. Analysis is ongoing, and the data and report will be available in 2020.

- Malaria prevalence data is only available from the MIS conducted in 2013 and 2016 and is currently limiting targeting of malaria interventions. The planned MIS in 2021 will also be beneficial in assisting the NMCP in targeting planned malaria interventions and should help demonstrate the impact of increased financial and technical support provided by PMI to supplement the existing malaria partner contributions. PMI and GF are assisting NMCP and DPPI to make improvements to DHIS2 data quality so that HMIS can supplement household survey data for decision making.
- In 2019, PMI implemented the Malaria Behavior Survey and qualitative healthcare provider assessment in two districts. These surveys will assist the NMCP, PMI and other stakeholders to better enhance and target activities that address key behavioral factors and inform implementation of new interventions like IRS more effectively in the future. Although data from national surveys has been limited, the Government of Sierra Leone is an enthusiastic adopter of DHIS2 and has made its use for HMIS, reportable diseases (IDSR) and LMIS. The MoHS reports high rates of timeliness and completeness from all government clinics.
- PMI will continue to assist Sierra Leone in data collection and use initiatives that includes integration of LMIS and private facility data into DHIS2.

Key Question 2

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

Supporting Data

Figure A35. HMIS-Supported Activities in Sierra Leone

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
Central Level					
Register, tools (e.g. checklists, indicator glossary), job aids (design, indicators, definition of data elements, data dictionary, system support)				X	
Data quality assessments (separate from supervision – funding for travel to lower levels)				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		
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	X	X	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	X	X	X	
Policy guidelines and coordination (updating policies, guidelines, supporting sub-committee meetings, supporting participation in sub-committee meetings)	X	X	X	X	
External relations/Communications/Outreach (support travel to international meetings and publications)	X	X	X		
Support to annual operational plans for national malaria program	X	X	X	X	
Desk review to catch “logic errors system” (provide TA to catch logic errors)	X	X	X	X	
Admin 1 Level (District). PMI supports activities in 4 districts while Global Fund supports activities in all 16 districts. (The regional administrative level (Admin 1) in Sierra Leone is district level)					
Registers (warehousing, printing, distribution)				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 Admin 2 (Chiefdom level health staff) staff to conduct training at lower levels, capacity building (i.e. on the job training for Admin 2 level staff)		X	X		
Human Resources (secondment of person for malaria SM&E, office/team for SM&E)				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 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)					
Adaptation of checklists and job-aides		X	X		
Participation in national meetings (support for travel costs)		X	X	X	
Support to Annual Operational Plans for Admin 1 (DHMTs) Malaria Program		X	X		
Admin 2 Level (Chiefdoms)					
Data entry, summary, and transmission (training, re-training, computers, internet, tools)				X	
Supervision (training, traveling, supervision tools/checklists, create/design system for organized/methodical supervision)				X	
Data validation (data validation activities before monthly data submission - organize health facilities)		X	X		
Monthly/Quarterly data quality review meetings (venue, meeting support)		X	X		
Data Use (analysis, interpretation, visualization (i.e., dashboards), dissemination/feedback to facilities, decision-making)		X	X		
Human Resources (secondment of person for malaria SM&E, office/team for SM&E)					X
Annual planning with Admin 1 (support travel)					
Facility Level					
Data collection/entry, summary, and transmission (training, re-training, computers, internet, tools)					

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		
Supervision of CHWs (training, traveling, administering supervision tools/checklists of community health workers)				X	X
Data use (analysis, interpretation, visualization (dashboards), dissemination/feedback to CHWs, decision-making)				X	
Monthly/Quarterly data quality review meetings(support for travel)					
Community Level					
Data collection/entry and transmission (training, re-training, tools)				X	X
Data use (analysis, interpretation, decision-making)					X
Monthly/quarterly data quality review meetings (support for travel)					

Conclusion

- In line with the MoHS's goal to improve health SM&E and data use for decision making, Global Fund has invested heavily on improving the HMIS infrastructure and capacity especially centrally. PMI in close coordination with NMCP, Global Fund and other stakeholders, has begun to supplement and complement these investments to improve the capabilities and output of the NMCP SM&E team and to assist with improvements peripherally with districts and facilities.
- Over the past year, PMI has sponsored NMCP staff to attend international SM&E training symposiums, but has conducted in-country SM&E trainings with national and district level staff. After completion of the MECAT assessment, PMI has incorporated its findings into the ongoing training curriculum. Refresher training will continue for national staff, but the focus will shift to expanding SM&E capacity initially focusing on the districts where PMI investment has been targeted (Bo, Koinadugu, Port Loko and Pujehun) with expansion to other districts as activities become refined.
- To improve data use, a planned PMI initiative is the development of a Malaria Measurement Taskforce led by the NMCP to serve as a hub to improve data use for all malaria interventions like case management and MiP. PMI will continue to work with NMCP to publish quarterly malaria bulletins and conduct regular meetings for systematic data review.

- PMI is developing an improved DQA tool to assist NMCP with supportive supervision but as importantly, it will be a means for DHMT staff to improve data use at the facility level. Another new PMI initiative has been the organization and support of chiefdom level in-charges meetings so that health clinics can improve capabilities and share information including better SM&E.

Key Question 3

What are the outcomes of HMIS strengthening efforts?

Supporting Data [Sierra Leone]

Figure A36. HMIS Strengthening Efforts

		2017	2018
Timeliness	% of reports received on time	82.1	69.1
Completeness	“Confirmed malaria cases for children under 5 years of age” was reported in % of facility-months	96.5	97.9
Accuracy	Populate with most recent DQA data	Not systematically collected at this time	Not systematically collected at this time

Conclusion

- **Timeliness and Completeness:** MoHS has fully adopted DHIS2 platform for all HMIS use at government clinics with an initial focus on timeliness and completeness and the tracking of monthly reporting metrics. Over the previous few years, reporting rates have consistently improved and the MoHS reports timeliness and completeness consistently over 90 percent during this past year (2019). As shown in the table, timeliness scores did not reach the expected standard during a two month period in 2018 when a government contracting issue led to DHIS2 temporarily not functioning. Measures by the GoSL have been taken to prevent this occurrence in the future.
- **HMIS reporting rates** are currently only tracked from government health clinics as shown in the table, and a temporary, parallel data reporting systems by NMCP for government and private hospitals indicate that timeliness and completeness rates are much lower at these facilities. As hospitals are integrated into DHIS2, effort will be taken to improve their data collection and reporting systems. NMCP’s parallel reporting database for hospitals was not used to calculate these metrics because the denominator of this temporary system is not stable.
- **Accuracy:** The NMCP adapted WHO’s standard DQA tool to make assessments of facilities during quarterly supportive supervision sessions since 2011 in the districts. The current DQA tool is not used in a systematic and consistent way to identify and track data

accuracy. PMI has developed an improved Routine Data Quality Assessment (RDQA) tool by adapting the same openly available WHO and is validating and testing it with NMCP and DHMT staff. This new RDQA tool will be a means to assess, record and track data quality centrally and peripherally.

Key Question 4

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

Supporting Data

A previously approved activity on housing modification from the FY 2019 MOP has been reviewed and determined to fit more appropriately as Program Evaluation (PE) rather than Operational Research (OR). This determination to change the activity to PE was made given the country-specific nature of the activity as it pertains to the distinctive housing styles in Sierra Leone.

Conclusion

There are no new funds being requested for this activity as either OR or PE, but since it is now categorized as PE, we are noting it under the inventory of SM&E activities. (For information, please refer to Section 3D: Program Evaluation and Operational Research.)

3.C. SOCIAL AND BEHAVIORAL CHANGE (SBC)

NMCP Objective
Social and behavior change (SBC) falls under one of the core objectives in Sierra Leone’s 2016-2020 national strategy. This objective is to provide knowledge to the population such that at least 80 percent practice correct malaria prevention and treatment measures by 2018 and onwards.
NMCP Approach
In 2017, through support through the Global Fund, the NMCP developed a Malaria Elimination Behavior Change Communication Strategy 2017-2022. The goal of the strategy is to serve as a guide for the design and implementation of malaria SBCC interventions at national, district, chiefdom and other malaria donors, partners and stakeholders.
While Sierra Leone has done an immense work over the past several years promoting positive behaviors as they relate to malaria control, the NMCP wishes to shift from a vast Information, Education, and Communication approach to one that encompasses comprehensive behavior change activities to deliberately create enabling environments where new behaviors can be established and sustained using the health belief model and theory of change. Based on this desire to shift to a comprehensive approach, the NMCP has identified the following behavioral objectives:
<ul style="list-style-type: none"> • Objective 1A: All suspected malaria cases should have access to confirmatory diagnosis

- Objective 1B: All malaria cases to achieve effective treatment
- Objective 2A: Provide access to 100 percent of the population at risk with preventive measures
- Objective 2B: To protect at least 80 percent of pregnant women and children with IPTp3 by 2020
- Objective 3: To provide knowledge to the population such that at least 80 percent practice malaria prevention and treatment measures by 2018
- Objective 4: By 2020, at least 95 percent of health facilities report routinely on malaria program performance
- Objective 5: By 2020, maintain and strengthen capacity for program management, coordination and partnership to achieve malaria program performance at all levels

Critical to achieving the goals of the strategic plan is the willingness and capacity of partners to dedicate resources towards the development and implementation of succinct, accurate, and effective behavior change activities through a variety of channels. The NMCP chairs a national malaria SBCC task force comprised of many stakeholders and public and private sector partners implementing SBCC activities. As a part of the iCCM platform, SBCC messaging is also an important component of CHW training.

PMI Objective in Support of NMCP

- The NMCP and PMI are aligned in their goals to provide quality SBC activities that target behaviors such that at least 80 percent of the target population practice malaria prevention and treatment behaviors. PMI contributes to Sierra Leone's communication strategy with support for national coordination and capacity building and district-level focus in Bo, Pujehun, Koinadugu and Port Loko for direct implementation of SBC activities for improved health worker behaviors supportive of effective malaria service delivery.
- One important activity conducted in 2016 was a partner mapping exercise supported by the NMCP and CRS/Global Fund. The goal of this exercise was to identify how many partners are actually working in the field for malaria, where they are concentrated, and what types of malaria interventions they are focusing on. A total of 28 partners were identified as conducting malaria activities in Sierra Leone, with each district having between 8 and 17 total partners present. The results of this exercise suggested that 22 of the 28 partners implement malaria SBC-related activities, raising concern that with the roll-out of multiple methodologies and messages, there is a lack of cohesiveness in key communication and mobilization efforts.
- In addition to a lack of cohesiveness in key communication and mobilization efforts, the exercise showed that SBC-related interventions reached only 45 percent of the total population. Given these findings, there is an urgent need for better coordination of partners

and innovative strategies to improve uptake of priority malaria behaviors. Thus, PMI has prioritized capacity building and coordination of SBC partners at the national and district levels.

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

Recent supported activities are as follows:

- Supported the 2019 World Malaria Day activities through advocacy and sensitization at the national level.
- Launched the NMCP Communication Strategy in coordination with the NMCP and Global Fund
- Collaborated with service delivery partners to develop malaria job aids targeting health providers
- Supported capacity building of NMCP SBC by funding participation at the Roll Back Malaria Meeting
- Implemented the Malaria Behavior Survey and qualitative provider assessment in Bo and Port Loko districts
- Participated in 2020 LLIN mass campaign planning meetings to provide technical assistance for communication strategies to be used; including review and development of materials.

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

- Support the 2020 World Malaria Day activities through advocacy and sensitization at the national and district level
- Conduct a co-analysis of MBS results with NMCP, PMI, and districts and disseminate the results to a wide range of stakeholders.
- Help translate MBS results for programmatic decision making, including informing revisions to the national SBC strategy and a subsequent messaging guide and/or operationalization guide based on (or even ahead of) the revised strategy
- Translate MBS results to inform decisions around the communication strategies for the 2020 mass distribution campaign
- Support quarterly SBC technical working group meetings through partner coordination
- Build capacity directly and indirectly at the national and district level through workshops and direct technical assistance for the design and implementation of SBC activities
- Additional activities to be determined following full analysis of MBS and qualitative provider assessment results

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 FY20 funds, PMI support for malaria SBC activities will remain at the same intensity with the same general focus of ongoing support for capacity building, coordination support and direct implementation support to address provider behavior change in coordination with the service delivery partner. However, with the completion of the Malaria Behavior Survey, activities may shift based on insights gained from data collection. In addition, PMI will support more targeted SBC for the 2020 mass ITN distribution and 2021 IRS campaign (with additional sensitization efforts to facilitate household acceptance of IRS in a post-Ebola environment). 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 A37 Prioritized Behaviors with FY2020 Funds

Behavior	Target Population	Geographic Focus	Justification
Consistent ITN use and ITN care	Pregnant women and children under 5	National	Although most recent data do not suggest major behavioral issues related to non-use of existing ITNs, encouraging consistent ITN use and care of ITNs is a priority behavior for across Sierra Leone. Through PMI and Global Fund support for the 2020 mass distribution campaign, we can expect access to increase further, but the timing of the distribution puts PBO ITNs in households while standard ITNs will still be in rotation through routine distribution channels. With the arrival of new PBO ITNs, it is important to establish a culture and practice of consistent ITN use and appropriate ITN care. The MBS will provide important insights to guide activity design.

Behavior	Target Population	Geographic Focus	Justification
Prompt care-seeking within the same or next day of fever onset	Caregivers of children under 5	Bo, Bombali, Pujehun, Port Loko	The 2016 MIS showed 71% of children sought care for fever and only 50% sought care the same or next day. Preliminary results from the MBS show that 95% of those surveyed had positive attitudes towards care seeking and that 80% believe malaria treatment works. Alternatively, negative encounters with health facility staff has been identified as a barrier. The MBS will provide additional important insights to guide appropriate activity design.
Uptake of IPTp3+	Pregnant women	Bo, Bombali, Pujehun, Port Loko	Recent data show that 31% of pregnant women received IPTp3+ and there are some missed opportunities between ANC and IPTp. Identified barriers include distance from and accessibility to health facilities, the costs of health services (as noted in Key Question 1 in the MIP section), and the perception that SP does not prevent malaria.

Conclusion

The priority behaviors described above are the behaviors that are considered of high priority for the success of malaria efforts. These priority behaviors were selected after review of the available data from household surveys, HMIS, and preliminary MBS data. As shown under the ITN section (1.B), the use: access ratio for Sierra Leone has consistently been above 80 percent; however, access to ITNs has been a challenge. Given Sierra Leone will be the first country to distribute PBOs nationwide through the 2020 mass campaign, there is a need to prioritize consistent ITN use and care.

- Prompt care-seeking will also be prioritized as there is great concern that only 50 percent of children sought care either same or next day of fever onset. Finally, gaps between ANC and IPTp remain such that targeted SBC can promote early ANC and uptake of IPTp3+. While there are still data gaps on the determinants of key behaviors, the behaviors themselves are the ones we feel can and should be improved if a coordinated strategy is clear and specific activities are based on formative data collected.
- With the MBS results and additional insights to be generated through analysis of qualitative data collection targeting health providers, we anticipate movement for these priority behaviors.

Key Question 2

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

Supporting Data

Figure A38. Summary of Determinants and Gaps for FY2020 Prioritized Behaviors

Behavior	Key Facilitators	Key Barriers	Knowledge Gaps
Consistent ITN use and ITN care	<ul style="list-style-type: none"> Knowledge of ITNs as a malaria prevention strategy Positive attitude towards ITNs Perceived ability to use an ITN correctly 	<ul style="list-style-type: none"> Perception that ITNs do not prevent malaria (response efficacy) ITNs irritate skin 	More data are needed on determinants associated with use and nonuse, as well as usage patterns associated with age.
Prompt care-seeking within the same or next day of fever onset	<ul style="list-style-type: none"> Correct knowledge of malaria Positive attitude towards care-seeking Positive perception that malaria treatment works 	Harsh encounters with health workers	More data are needed on determinants of prompt care-seeking and the factors that lead to seeking care from one type of provider to another (e.g., CHW, health facility).
Uptake of IPTp3+	<ul style="list-style-type: none"> Availability of free health services for pregnant women (although there are fees for a portion of ANC care) Increased access to IPTp at the community level through Traditional Birth Attendants 	<ul style="list-style-type: none"> Distance and accessibility to services Quality of ANC services Perception that SP does not prevent malaria 	More data are needed on the determinants associated with early ANC attendance and IPTp uptake (specifically, IPTp3+) and the extent to which different types of health providers facilitate the behavior.

Conclusion

- Much of the data summarized in this section on key facilitators, barriers, and behavioral determinants are from other stand-alone studies that may not be geographically representative of the PMI-supported districts, and may be outdated. In addition, most of them do not tie behaviors to specific determinants.
- The Malaria Behavior Survey, implemented in Bo and Port Loko, will provide valuable insights on the drivers associated with these priority behaviors. These data will be complemented by additional qualitative data that was collected during the same period as the MBS to better understand the determinants of health worker behaviors in the service delivery sphere.

- Another important data source that should be leveraged to inform SBC activities are supervision reports and documents derived from case management activities conducted with CHWs, TBAs and facility-based providers.

Key Question 3

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

Supporting Data

There is a need to support the NMCP's SBCC technical unit to ensure it is providing leadership and playing a coordinating role for implementing partners and donors developing SBC activities throughout the country. In addition to national-level coordination, district-level coordination groups would strengthen SBC implementation to ensure that activities are coordinated and in harmony with the NMCP's objectives and priorities. In particular, the program inventory noted a deficiency in the category of high quality formative assessments being used to inform intervention design (e.g., for care-seeking, malaria in pregnancy, and provider behaviors). The MBS and other qualitative data collection supported by PMI will improve the availability of such data; of utmost importance is ensuring those opportunities are seized to improve the national and regional programs' ability to contribute to data collection, analysis, interpretation, and resulting activity design. Additionally, the inventory noted that while an SBC Technical Working Group exists on paper, it has not been operationalized. NMCP staff also noted capacity gaps related to limited data sharing amongst partners and unclear exit strategies for SBC partners to ensure sustainability of activities.

Conclusion

- PMI will continue to support the NMCP to coordinate technical partners through routine meetings of the national SBC technical working group to ensure. It will also support similar groups at the district level (spearheaded by the District Health Management Team with a clear agenda on malaria prevention and control activities), and identify capacity building opportunities targeted to SBC focal points.
- PMI will also support NMCP SBC focal point participation in global meetings and trainings, including the RBM SBC Working Group, to ensure they have opportunities to engage in global exchange of ideas, best practices, and lessons learned for malaria SBC. There will also be a strong emphasis on capacity building to analyze and interpret the MBS qualitative provider assessment results once they are available.

Key Question 4

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

Supporting Data

N/A

Conclusion

N/A

3.D. PROGRAM EVALUATION AND OPERATIONAL RESEARCH

NMCP objective
Under the NMSP-2016-2020, NMCP plans to strengthen its capacity for implementing an evidence-based malaria control program. This includes plans to establish strong collaborative research initiatives with national and international research and academic institutions.
NMCP approach
<ul style="list-style-type: none">• In June 2018, the NMCP, in collaboration with several academic institutions and other partners, defined their first malaria operational research agenda for the period 2018-2023. The Malaria Research Agenda's (MRA) main purpose is to create a framework that can:<ul style="list-style-type: none">○ document current evidence;○ identify the research needs;○ prioritize future research; and○ use research to influence policy.• The NMCP intends to work with its RBM partners to mobilize the required funding for the research agenda, and has initiated an MRA Technical Working Group.
PMI objective, in support of NMCP
PMI aims to support the NMCP in its objectives to identify appropriate research questions to enhance malaria program implementation and policy decision-making.
PMI-supported recent progress (past ~12-18 months)
There are no current/recently completed studies supported by PMI.
PMI-supported planned activities (next ~12-18 months, supported by currently available funds)
MOP-funded: PMI, with the NMCP, is supporting an evaluation to understand the impact of housing modifications on the reduction of malaria transmission. The housing structure (large, rectangular, open eaves, several families living in a single structure) together with the challenges facing ITN use (despite ITN access) in Sierra Leone provide the ideal setting to test the use of screens (on ceilings, eaves, windows, and/or doors) to prevent mosquito entry in homes.

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.

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?

A previously approved activity on housing modification from the FY 2019 MOP has been reviewed and determined to fit more appropriately as PE rather than OR. This determination to change the activity to PE was made given the country-specific nature of the activity as it pertains to the distinctive housing styles in Sierra Leone. There are no new funds being requested for this activity as either OR or PE.

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

Key Question 1

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

Supporting Data

Figure A39. PE/OR Currently Conducted in Country with United States Government (USG), GF, Multilaterals or Other Major Donors.

Source of Funding	Implementing institution	Research Question/Topic	Current status/ timeline
CDC Sierra Leone / ICAP/WHO/UNICEF	MOHS/NMCP/ ICAP/WHO/UNICEF	Formative Evaluation of the intermittent Preventive Treatment for infants (IPTi) pilot project in Kambia district	Completed; An external evaluation of the IPTi pilot in Kambia district and final results will be available in early 2020.

Conclusion

- The overall goal of the 2018 Malaria Research Agenda (MRA) is to guide researchers, policy makers, program implementers, academic institutions, health development partners and other stakeholders involved in malaria research in Sierra Leone contributing towards the vision of the NMCP.
- Research Priority areas for National Malaria Control Program include: Policy, Epidemiology, Monitoring and Evaluation, Diagnostics and Treatment, Prevention, and Vector control. Specific research themes have been outlined in the MRA, and PMI and

partners will continue to take part in the MRA TWG to help the NMCP develop and prioritize more specific research questions.

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

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

Supporting Data

N/A

Conclusion

N/A

3.E. OTHER HEALTH SYSTEMS STRENGTHENING

NMCP objective
<ul style="list-style-type: none"> • To improve ownership and management of malaria activities, the NMCP’s strategic plan prioritizes capacity building as a cross cutting intervention by strengthening the national and districts’ capacity to deliver malaria control services at all levels. • The NMCP aims to conduct capacity needs assessments to identify staffing gaps and to address infrastructure gaps (office space and equipment). • The NMCP prioritizes strengthening core MoHS-wide management systems that are essential for effective delivery and management of malaria services, such as strengthening procurement and supply chain management of malaria commodities, improving malaria data collection and reporting through HMIS, and strengthening coordination and partnerships in malaria.
NMCP approach
<ul style="list-style-type: none"> • The Sierra Leone health system has significant challenges, including a shortage of qualified staff at all levels of the system. The 2014/2015 Ebola Virus Disease (EVD) outbreak further stressed the system. The MoHS has prioritized human resources for health, health financing,

the health management information system, and logistics management as the priorities for health systems strengthening. Based on lessons learned from the Ebola outbreak, the government and partners initiated measures and systems in the health sector to be better able to respond to both routine and emergency needs of the population. Following the Sierra Leone Health Sector Recovery Plan 2015-2016, emphasis was placed on mobilization of resources to build a strong and resilient health system that would be able to provide quality and timely health care to the population. The establishment of a Health System Unit under the Minister of Health and Sanitation, restructuring and strengthening of the national laboratory directorate, the medicine and commodity supply chain directorate, and the free health care policies are all evidence of this response.

- At district level, the NMCP supports holding monthly coordination meetings with partners implementing malaria control activities and DHMTs where feedback is provided and key issues relating to malaria control are discussed. The NMCP also supports annual district integrated health sector planning to include key malaria interventions in their work plans, and conduct regular integrated supportive supervision.
- The NMCP has targeted donor investment towards building the capacity of technicians across various areas, including support for training in entomology and monitoring and evaluation, but more resources are needed for these activities to improve both the quantity and quality of technicians at national and district levels. The NMCP also intends to address programmatic issues and challenges with informed evidenced-based solutions. To this end, the NMCP plans on strengthening research capacity in-country and partnering with research/academia and other national and international research institutions, and developed an operational research agenda and strategy in 2018, which PMI will help to refine.

PMI objective, in support of NMCP Infrastructure

PMI is aligned with and supports the NMCP objectives for capacity building and cross-cutting needs. From 2015-2019, USAID supported a long-term technical advisor embedded in the NMCP to assist with building capacity in management, leadership and governance. The advisor developed a capacity building and training plan for key staff on SM&E and other technical areas to help build overall leadership and capacity at the national level. The advisor also assisted with the coordination and development of Global Fund grants and concept notes including analysis of commodity gaps. With the start-up of PMI activities in Sierra Leone, the long-term technical advisor position was phased out and PMI staff and implementing partners have stepped in to support NMCP in capacity building needs. PMI also coordinates closely with other USG partners in these Health systems strengthening (HSS) and capacity building efforts. For example:

- CDC initiated a short-term training, Frontline Course, on basic epidemiology through the Field Epidemiology Training Program (FETP). The three-month course is comprised of three workshops with two fieldwork periods. Seven cohorts (154 participants) of Sierra Leone health professionals have been trained so far, and one additional cohort will be trained in FY

2020, covering all 16 districts. The first two cohorts of 26 FETP-Intermediate (9-12 months in duration) epidemiologists completed the program in 2018 and 2019. A third FETP-Intermediate cohort of 14 epidemiologists has begun coursework in September 2019, contributing toward the WHO ratio goal for countries of 1 field epidemiologist/200,000 population. Currently, the FETP-Intermediate trained epidemiologists are conducting field work and completing their epidemiology practicum projects in collaboration with MoHS Programs to include NMCP. CDC is also strengthening laboratory capacity at the national reference laboratory in Freetown, including training laboratory technicians and providing equipment and supplies.

- The U.S. Peace Corps has established its presence in Sierra Leone post-EVD outbreak with 61 health and education volunteers currently based in 16 districts. The volunteers provide key malaria messages in their communities.
- The U.S. Department of Health and Human Services through HRSA (Health Resources and Services Administration) is administering two PEPFAR-funded projects focused on health workforce needs, consistent with Government priorities, allocated in the wake of the Ebola outbreak. The Government of Sierra Leone asked that the focus be on midwifery to help the Country confront its high maternal mortality rate. Interventions included installation of skills labs at the schools of midwifery, with high fidelity mannequins and simulation based learning; preceptor training across the Country, curriculum review and development, continuous professional development, and other high impact activities. By the middle of the third of five years of implementation, activities with midwifery were largely completed, and the formation of a PEPFAR West Africa Regional Program led to a shift in Sierra Leone to supporting differentiated HIV testing modalities across 20 high burden hospitals, as well as linking new cases to care.

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

PMI supports several cross-cutting HSS activities focused within the core technical intervention areas described in the MOP above (i.e. training of health workers, strengthening district health management teams in conducting supportive supervision and mentoring, supporting pharmaceutical management systems, community-level communications, etc.) that complement the existing work of other U.S. Government entities and other donors/partners. In addition, PMI supported the following specific activities:

- PMI supported Peace Corps education and health volunteers to work in malaria prevention and control and to assist the NMCP in identifying programmatic gaps in community malaria interventions. With FY 2017 funds, PMI supported small project grants developed by health and education volunteers for malaria-related programming with a focus on early case detection and health seeking behaviors for malaria care, reinforcing prevention measures such as sleeping under an ITN, and promoting IPTp for pregnant women.

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

- PMI will continue to support the small project grants for malaria-related activities developed by volunteers. In addition, PMI will work closely with Peace Corps to determine whether there are third-year volunteers available in 2020 to carry out dedicated malaria projects that might need support.

PMI Goal

PMI supports the NMCP objectives for capacity building and cross-cutting needs, as relevant.

Key Question 1

How does PMI support Peace Corps programs in Sierra Leone?

Supporting Data

As of December 2019, there are 61 health and education Peace Corps volunteers currently based in 16 districts.

Conclusion

PMI supports Peace Corps Volunteers in community-based malaria programming activities through the provision of small project grants. Additionally, if available, third-year volunteers will be identified to assist with carrying out dedicated malaria projects working closely with PMI implementing partners.

Key Question 2

What are the in-country 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

Figure B1. Category: Vector Control

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

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

Figure B3. Category: Drug-Based Prevention

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

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

Figure B4. Category: Supply Chain

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

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

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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
		supplies. No visibility by central level on facilities and none by facility level on central level.	reporting rates, mostly paper-based	maintaining data quality throughout the data supply chain.	Interoperability with other information systems (e.g., warehouse management, medical records, laboratory management, enterprise resource planning systems, and health information management systems)	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.
	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</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</p>	<p>The MOH leads strategic functions such as, policy formulation, quality assurance and overseeing the funds required for policy implementation.</p> <p>Ability to ensure product quality, automated drug registration process, clear/transparent importation process, robust post-market surveillance system and, track and trace regulations developed and/or in the process of implementation.</p> <p>Approved (and up to date) supply chain strategic plan (contains clear roles and responsibilities, stakeholder mapping, costs). Includes risk mitigation plan.</p>

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
				<p>product licensing, registration, manufacturing, post-marketing surveillance.</p> <p>Approved (and up to date) supply chain strategic plan. Partially implemented</p>	<p>date) supply chain strategic plan (contains clear roles and responsibilities, stakeholder mapping, costs).</p>	

Figure B5. Category: Support Systems

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

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

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

Figure B6. Category: Strategic Information

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
Data, Surveillance, Monitoring & Evaluation	Overall HMIS reporting rate (CY 2018)	<60%	60-69%	70-79%	80-89%	90%+
	Element specific reporting rate: “Confirmed malaria cases among children under 5” (CY 2018)	<60%	60-69%	70-79%	80-89%	90%+

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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	Data collection	Data collection is not done at the most peripheral level (CHWs) and is irregular and inaccurate at rural and more central health facilities. System is entirely paper based, but registers may be absent	Data collection is well managed at HF level, but incomplete at community level (CHWs); most collection is paper based and aggregation is paper based; registers generally available; timeliness and completeness remain challenges	Data collection is well managed at HF level and at community level (CHWs); most collection is paper based, aggregation is electronic; registers available; timeliness and completeness >80%, feedback to collectors limited	Data collection at all levels); collection is electronic and sometimes paper based, aggregation is electronic; registers include all program-critical data; timeliness and completeness >80%, feedback to collectors is standardized	Data collection occurs at all levels, is transmitted in real time with timely feedback to those collecting and those using the data; data checks exist at point of collection; electronic transmission is the norm, including to data collectors
	Data use	Activities (analysis, interpretation, visualization) to ensure data use are rarely implemented	Limited data use activities are implemented (bulletin has been developed but analysis and interpretation for decision- making needs to be strengthened)	Country conducts regular data use activities (review meetings, bulletin at least quarterly, at least at the central level).	Country conducts regular data use activities at all levels (review meetings, bulletins, dashboard at least quarterly).	Country has developed their own high- quality dashboard to facilitate data use, and data-informed decision making is evident at all levels, on a frequent basis.
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

Activity	Metrics/ Criteria	Relative Continuum, for discussion purposes				
		1	2	3	4	5
	Country mechanisms for OR/PE review	No in-country process for research review, determination or IRB processes	Limited in-country processes for research review, determination and IRB oversight	Processes in place for research and IRB review with federal-wide assurance approval; no previous PMI in-country OR experience	Processes in place for research and IRB review with federal-wide assurance approval; previous PMI in-country OR experience	Full complement of research review, approval, oversight processes including data safety and monitoring boards and systems for results sharing
	In-country partnerships for OR	No in-country partners (academic, NGO, or other) with OR experience	1-2 in-country partners with OR experience, but no malaria specific experience	3+ in-country partners with OR experience; 1+ with some malaria expertise; no current PMI-linked OR work	3+ in-country partners with OR experience; 1+ with malaria expertise; current or recent work with PMI OR	Multiple in-country partners with specific malaria experience in PMI OR, including completed past work and reporting on malaria OR
	Conceptualization of problems needing scientific evaluation	No experience	Some but limited experience in identifying programmatic problems and prioritization	Experience with identifying program problems and prioritizing PE and OR	Experience with identifying problems needing PE or OR and developing study approaches with partners	Extensive experience with problem identification, prioritization, proposal development and conducting PE or OR