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Liberia

Malaria Operational Plan FY 2023

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This FY 2023 Malaria Operational Plan has been approved by the Acting U.S. Global Malaria Coordinator and reflects collaborative discussions with national malaria control programs and other partners. Funding available to support outlined plans relies on the final FY 2023 appropriation from the U.S. Congress. Any updates will be reflected in revised postings.

This document was prepared in the early months of 2022 as the COVID-19 pandemic continued to evolve worldwide, including in PMI-partner countries. The effects of the pandemic on malaria control and elimination work in 2023 are difficult to predict. However, because U.S. Congressional appropriations for PMI are specific to work against malaria and any appropriations for work against COVID-19 are specific for that purpose and planned through separate future U.S. Government planning processes, this FY 2023 MOP will not specifically address the malaria-COVID-19 interface and will reassess any complementary work through timely reprogramming in countries.

CONTENTS

ABBREVIATIONS

ACT	Artemisinin-based Combination Therapy
AI	Active Ingredient
AL	Artemether-Lumefantrine
ANC	Antenatal Care
ASAQ	Artesunate-Amodiaquine
CBIS	Community-based Information System
CDC	Centers for Disease Control and Prevention
CHA	Community Health Assistant
CHSS	Community Health Services Supervisor
CHT	County Health Team
CHV	Community Health Volunteer
CMS	Central Medical Store
CY	Calendar Year
DHIS2	District Health Information Software 2
DHS	Demographic and Health Survey
DPS	Department of Pharmaceutical Services
eLMIS	Electronic Logistics Management Information System
EPI	Expanded Program on Immunization
EUV	End-Use Verification
FETP	Field Epidemiology Training Program
FY	Fiscal Year
G2G	Government-to-Government
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GMP	Good Manufacturing Practice
HMIS	Health Management Information System
HSS	Health Systems Strengthening
iCCM	Integrated Community Case Management
IG2	Interceptor® G2
IPTp	Intermittent Preventive Treatment for Pregnant Women
IRS	Indoor Residual Spraying
ITN	Insecticide-treated Mosquito Net
JISS	Joint Integrated Supportive Supervision
LMA	Logistics Management Advisor
LMHRA	Liberia Medicines and Health Products Regulatory Authority
LSM	Larval Source Management
LTTA	Long-term Technical Assistance
M&E	Monitoring and Evaluation
MBS	Malaria Behavior Survey

MFP	Malaria Focal Person
MIP	Malaria in Pregnancy
MIS	Malaria Indicator Survey
MOH	Ministry of Health
MOP	Malaria Operational Plan
NMCP	National Malaria Control Program
NSP	National Strategic Plan
OR	Operational Research
PCV	Peace Corps Volunteer
PE	Program Evaluation
PMI	U.S. President's Malaria Initiative
RAS	Rectal Artesunate
RDT	Rapid Diagnostic Test
SBC	Social and Behavior Change
SM&E	Surveillance, Monitoring, and Evaluation
SP	Sulfadoxine-Pyrimethamine
TES	Therapeutic Efficacy Study
TPR	Test Positivity Rate
TWG	Technical Working Group
UL-PIRE	University of Liberia-Pacific Institute for Research and Evaluation
USAID	U.S. Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

To review specific country context for Liberia, please refer to the country malaria profile, which provides an overview of the country malaria situation, key indicators, the National Malaria Control Program (NMCP) strategic plan, and the partner landscape.

U.S. President's Malaria Initiative

Launched in 2005, U.S. President's Malaria Initiative (PMI) supports implementation of malaria prevention and treatment measures as well as cross-cutting interventions. PMI's 2021–2026 strategy, *End Malaria Faster*, envisions a world free of malaria within our generation with the goal of preventing malaria cases, reducing malaria deaths and illness, and eliminating malaria in PMI partner countries. PMI currently supports 24 countries in sub-Saharan Africa and three programs across the Greater Mekong Subregion in Southeast Asia to control and eliminate malaria. Liberia began implementation as a PMI focus country in fiscal year (FY) 2008.

Rationale for PMI's Approach in Liberia

PMI will continue to support the NMCP to implement and monitor the 2021–2025 National Strategic Plan (NSP) to reduce malaria incidence per 1,000 population from 380 to 95 (2016 and 2025, respectively) and malaria mortality rate per 100,000 population from 172 to 43 in 2016 and 2025, respectively. PMI efforts will focus on implementing proven malaria control interventions and strengthening commodity delivery to reach populations at risk wherever they live, invest locally, and use innovation to reduce intervention costs and develop national capacity for the long term. In addition, PMI will support the improvement of the Surveillance, Monitoring, and Evaluation (SM&E) system and the ways surveys and program evaluations (PEs) are conducted to guide decision-making.

Overview of Planned Interventions

The proposed FY 2023 PMI funding for Liberia is $13.5 million. PMI will support the following intervention areas with these funds:

1. Vector Monitoring and Control

PMI and the NMCP will continue to support entomological and insecticide resistance monitoring programs to understand malaria vector prevalence, behavior, location, and susceptibility to insecticides, which ultimately inform vector control decisions throughout the country. Liberia will also continue to use a two-pronged approach for deployment of insecticide-treated mosquito nets (ITNs) through continuous routine distribution through institutions (antenatal care [ANC] and institutional delivery) and community-based

distribution through mass distribution campaigns every three years. With FY 2023 funding, PMI will procure 585,000 dual active ingredient (AI) ITNs for continuous routine distribution at ANC and institutional deliveries and will expand the school net distribution to additional counties.

2. Malaria in Pregnancy

Available data show an increasing trend of intermittent preventive treatment for pregnant women (IPTp) coverage, including IPTp1, IPTp2, and IPTp3. The November 2021 End-Use Verification (EUV) survey shows an average stockout of 20 percent for sulfadoxine-pyrimethamine (SP), above the target of 5 percent. PMI, the Ministry of Health (MOH), and other supply chain partners are rethinking the supply chain to address the issues. With FY 2023 funding, PMI will continue to support the full package of malaria in pregnancy (MIP) interventions at facility level that includes: provision of IPTp; ITNs during the first ANC visit and at delivery; testing for malaria for the pregnant women that have fever during ANC visits; appropriate treatment for those confirmed to have malaria. PMI will support the newly introduced community distribution of IPTp in partnership with the Expanded Program on Immunization (EPI) outreach services.

3. Drug-based Prevention

PMI does not support seasonal malaria chemoprevention and/or other drug-based prevention in Liberia.

4. Case Management

PMI supports the national case management strategies outlined in the Liberia National Malaria Strategic Plan (2021–2025) by providing diagnostic tests and technical support to scale up testing for malaria with rapid diagnostic tests (RDTs) and microscopy nationwide, with the goal that all persons with suspected malaria attending public health facilities and community services are tested for malaria, and all patients who test positive are treated for malaria according to national guidelines. With FY 2023 funds, PMI will support the NMCP's efforts to ensure availability of quality-assured diagnostic testing and treatment for malaria at all levels of the healthcare system, including at the community health program, at all times. PMI will also continue to support the training and supportive supervision of health workers at all levels of the health system in order to improve the quality of care for malaria services.

5. Health Supply Chain and Pharmaceutical Management

PMI will continue to support the NMCP and Department of Pharmaceutical Services (DPS) in Liberia with supply chain strengthening activities and ensuring commodity security, including: strengthening the leadership, governance, and ownership of the DPS; supporting malaria commodity quantification; strengthening electronic Logistics

Management Information System (eLMIS) reporting and data quality; and supporting routine distribution of ITNs to health facilities for ANC and institutional delivery and schools. In recognition that Liberia needs a new approach to managing the supply chain, the MOH and the two major donors, USAID, including PMI, and the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), agreed to a two-year intensive investment in mentoring and capacity-building at the central medical store (CMS) from March 2021 through September 2022. PMI and the mission health team are discussing with stakeholders what approach to take following the two-year period. With FY 2023 funding, PMI will also continue supporting regulatory functions of the Liberia Medicines and Health Products Regulatory Authority (LMHRA) and funding post-market surveillance to investigate possible counterfeit and substandard commodities.

6. Social and Behavior Change

PMI supports the NMCP's social and behavior change (SBC) strategy (2021–2025) that fully aligns with and contributes to the attainment of the malaria NSP of 2021–2025. With FY 2023 funding, through partnerships with county and district health teams, local media, local and community-based organizations, advocacy leaders, and health facility and community-based service providers, PMI will support advocacy, community awareness, and mobilization aimed at the three priority behaviors of improving ITN access, care and consistent use, prompt care-seeking for fever, and improving IPTp3 coverage. PMI will also support targeted service providers at health facilities and the community to improve adherence to national malaria prevention and case management guidelines.

7. Surveillance, Monitoring, and Evaluation

To monitor the implementation and progress of the 2021–2025 NSP, in 2022, PMI will continue to support building and strengthening the national routine malaria surveillance through District Health Information Software 2 (DHIS2). In addition, PMI will support the national Malaria Indicator Survey (MIS), IPTp barrier study, Malaria Behavior Survey (MBS), Therapeutic Efficacy Study (TES), and quality of malaria testing at primary health facilities and in the community. The findings of these studies will be used to guide malaria program implementation decisions and activities. With FY 2023 funding, PMI will provide technical assistance and resources to support the NMCP to build staff capacity to conduct routine surveillance and surveys as a core malaria intervention; to collect, transmit, analyze, and produce high-quality data; and to monitor progress overtime.

8. Operational Research and Program Evaluation

PMI has not planned any operational research/PE to be funded with MOP FY 2023 funding. During the last 12 months, Liberia has made progress in supporting the NMCP

to launch some of the PE activities with previous years' MOP funding. These PEs include completed data collection for the IPTp barrier study and the MBS and finalized protocol for the malaria RDT quality assessment. In 2022, PMI will support the NMCP to complete these studies.

9. Capacity Strengthening

PMI will continue to provide direct and indirect support to strengthen the skill set of local clinical, lab, and public health officials. Through direct funding of integrated government health programs with both the government-to-government (G2G) support and technical assistance by PMI implementing partners, PMI will train and supervise staff in 12 counties to improve malaria control in Liberia. PMI will work with county health teams (CHTs) to strengthen local capacity in all counties through case management training. Select NMCP and CHT staff will be selected to participate in the PMI-funded Field Epidemiology Training Program (FETP) frontline to bolster epidemiologic capacity at national and county levels. Community malaria control will be strengthened when Peace Corps Volunteers (PCVs) work with local community officials on malaria prevention and management needs. PMI will support three PCVs for malaria control activities.

I. CONTEXT AND STRATEGY

1. Introduction

Liberia began implementation as a U.S. President's Malaria Initiative (PMI) focus country in fiscal year (FY) 2008. This FY 2023 Malaria Operational Plan (MOP) presents a detailed implementation plan for Liberia, based on the strategies of PMI and the National Malaria Control Program (NMCP). It was developed in consultation with the NMCP and with the participation of national and international partners. The activities that PMI is proposing build on investments made by partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund). This document provides an overview of the strategies and interventions in Liberia, describes progress to date, identifies challenges and relevant contextual factors, and provides a description of activities planned with FY 2023 funding. For more detailed information on the country context, please refer to the Country Malaria Profile, which provides an overview of the country's malaria situation, key indicators, the NMCP strategic plan, and the partner landscape.

2. U.S. President's Malaria Initiative (PMI)

PMI is led by the U.S. Agency for International Development (USAID) and implemented together with the U.S. Centers for Disease Control and Prevention (CDC). Launched in 2005, PMI supports implementation of malaria prevention and treatment measures, insecticide-treated mosquito nets (ITNs), indoor residual spraying (IRS), accurate diagnosis and prompt treatment with artemisinin-based combination therapies (ACTs), intermittent preventive treatment for pregnant women (IPTp), and drug-based prevention—as well as cross-cutting interventions such as surveillance, monitoring, and evaluation (SM&E); social and behavior change (SBC); and capacity strengthening. PMI's 2021–2026 strategy, *End Malaria Faster*, envisions a world free of malaria within our generation with the goal of preventing malaria cases, reducing malaria deaths and illness, and eliminating malaria in PMI partner countries. PMI currently supports 24 countries in sub-Saharan Africa and three programs in the Greater Mekong Subregion in Southeast Asia to control and eliminate malaria. Over the next five years, PMI aims to save lives, reduce health inequities, and improve disease surveillance and global health security.

Under the strategy, and building upon the progress to date in PMI-supported countries, PMI will work with NMCPs and partners to accomplish the following objectives by 2026:

- Reduce malaria mortality by 33 percent from 2015 levels in high-burden PMI partner countries, achieving a greater than 80 percent reduction from 2000.

- Reduce malaria morbidity by 40 percent from 2015 levels in PMI partner countries with high and moderate malaria burden.
- Bring at least 10 PMI partner countries toward national or subnational elimination and assist at least one country in the Greater Mekong Subregion to eliminate malaria.

These objectives will be accomplished by emphasizing five core areas of strategic focus:

1. **Reach the unreached:** Achieve, sustain, and tailor deployment and uptake of high-quality, proven interventions with a focus on hard-to-reach populations.
2. **Strengthen community health systems:** Transform and extend community and frontline health systems to end malaria.
3. **Keep malaria services resilient:** Adapt malaria services to increase resilience against shocks, including the COVID-19 pandemic and emerging biological threats, conflict, and climate change.
4. **Invest locally:** Partner with countries and communities to lead, implement, and fund malaria programs.
5. **Innovate and lead:** Leverage new tools, optimize existing tools, and shape global priorities to end malaria faster.

3. Rationale for PMI's Approach in Liberia

3.1. Malaria Overview for Liberia

For more detailed information on malaria indicators, please refer to the Country Malaria Profile.

Malaria is endemic in all 15 counties of Liberia with continuous transmission throughout the year. The principal malaria parasite is *Plasmodium falciparum* (95 percent) and the principal vectors are *Anopheles gambiae* s.l. (primary vector) and *An. funestus* s.l. (secondary vector). The 2018 Health Facility Survey found that malaria remains the leading cause of morbidity and mortality, accounting for 34 percent of all out-patient consultations and 48 percent of all in-patient cases. Among children under five years of age, confirmed malaria accounted for 34 percent of all reported deaths. In 2021, Liberia conducted its third ITN mass distribution campaign and distributed approximately 2.6 million Interceptor® G2 (IG2) ITNs to 4.5 million Liberians. To address the ITN access gap, PMI in collaboration with the NMCP and the Ministry of Education started school net distribution in late 2021. The distribution started in Montserrado County with the highest number of schools and the lowest net access. A total of 48,382 nets were distributed to 124 schools. The school net distribution will be rolled out to more counties with low net access and high school enrollment rates. Liberia completed its first net durability study in 2021. The coverage of IPTp3 has increased from 25 percent in 2018

to 56 percent in 2021. IPTp4 has remained stable during the last three years (see Figure 3). During the last five years, through PMI's work with and support of the NMCP, Liberia has made substantial improvements in malaria case management activities, including testing suspected malaria cases using either malaria rapid diagnostic test (RDT) or microscopy and treatment of confirmed malaria cases using ACT in the health facilities and the community according to national guidelines. The proportion of children under five years of age with a fever in the last two weeks for whom advice or treatment was sought increased from 78 percent in 2016 to 81 percent in 2019 (Malaria Indicator Survey [MIS] 2016, Demographic and Health Survey [DHS] 2019). In 2021, 95 percent of the 1,616,919 suspected malaria cases seen at health facilities benefited from a malaria diagnostic test (using malaria RDT or microscopy). During the last four consecutive years, Liberia recorded less than a million new malaria cases per year (see Figure 7). The estimated malaria incidence per 1,000 population decreased from 281 in 2016 to 177 in 2021 (annual Health Management Information System [HMIS] data and population estimate, https://www.populationpyramid.net/liberia/2021/), and during the same period, the malaria mortality rate in the general population decreased from 35 to 6 per 100,000 population, respectively, in 2016 and 2021.

3.2. Key Challenges and Contextual Factors

The key challenges Liberia is currently facing in achieving its malaria control objectives include:

- The recurrent high stockout of malaria commodities is common at service delivery points across the country as a result of the weak first- and last-mile distribution. The electronic Logistics Management Information System (eLMIS) functionality and consumption data do not match with routine malaria data collected and reported from health facilities and communities. Many of these challenges are due to limited accountability and a highly demotivated and undercompensated workforce with unclear roles and responsibilities at all levels.
- Currently the support of community health assistants (CHAs) for the integrated community case management (iCCM) program is donor-dependent. There is limited domestic financing for the CHA program outside of limited support for community health services supervisor (CHSS). In addition, two counties (Montserrado and Sinoe) do not have any CHA support at this time.
- ITN access has remained low even after the 2015 and 2018 national ITN mass distribution campaigns. The 2019–2020 DHS shows a high net use:access ratio. ITN access, however, was low just a year after the 2018 ITN mass distribution campaign at 40 percent of the population. The 2018 and 2021 mass distribution campaigns did not prioritize SBC. As a result, many

communities were not mobilized during household registration; those registered did not know when or where to receive nets. For both campaigns, over 200,000 nets remained and were not distributed to the communities due to lack of information on the campaign dates, distribution points, and campaign strategy, thus contributing to the sustained low access to ITNs. The reasons for the low ITN access rate are unclear, but accessing the hard-to-reach communities during the rainy season may have played a substantial role. The 2022 MIS will assess how the 2021 ITN mass distribution campaign has impacted ITN access.

- Despite high antenatal care (ANC) attendance reported survey after survey, IPTp3 uptake remains below the national target. PMI and the NMCP are currently conducting a program evaluation (PE) to better understand the reasons and address this challenge accordingly.
- Performance and adherence to RDT results at primary health facilities resulting in high malaria testing positivity rates which may have resulted in an overestimate of malaria burden in Liberia. PMI is supporting a PE to assess quality of RDT practices.
- Implementation of in-country entomological molecular work was hampered by diminished internet bandwidth/connectivity for remote training, lack of reagents in-country, and slow receipt of supplies caused by international procurement delays.
- The Liberia Ministry of Health (MOH) supply chain system does not include the warehousing and distribution of ITNs for the routine program. The ITNs are warehoused outside the central medical stores (CMSs)and distributed through a parallel system. The first-mile ITN distribution is funded by PMI but last-mile distribution is left to the counties to work with partners to distribute the ITNs, resulting in stockouts of ITNs at service delivery points.

The goal of the Liberia 2021–2025 National Malaria Strategic Plan is to reduce the malaria burden by 75 percent from 2016 levels by the end of 2025; that is a reduction from 45 percent prevalence in 2016 to 11 percent prevalence by 2025. The strategic interventions to reach this goal will focus on the following:

- Improve parasite-based diagnosis at all levels of point-of-care and provide prompt and effective case management of malaria at all levels of service delivery.
- Strengthen integrated vector management and malaria prevention during pregnancy and in infancy.
- Strengthen and improve surveillance systems with quality data and information products to drive decision-making.

- Strengthen supply chain management as well as governance and program management.

The Government of Liberia and international development partners (mainly the Global Fund and PMI) invest extensively in these key malaria control interventions:

- Distribution of ITNs
- IPTp
- Prompt and effective malaria case management
- Cross-cutting interventions
- SM&E
- SBC
- Supply chain systems strengthening

PMI and the World Bank together provide technical support covering all 15 counties of Liberia, including all core interventions except IRS. The Global Fund program is national in its approach and overlaps with PMI- and World Bank–supported counties. In addition, the Global Fund malaria grant covers procurement and distribution of ITNs for a mass distribution campaign. The Global Fund also supports some aspects of malaria case management, especially iCCM, private sector case management, malaria in pregnancy (MIP), SM&E, and supply chain. The World Bank uses performance-based financing to support three counties (Gbarpolu, Rivercess, and Sinoe). PMI supports the remaining 12 counties, including six through a government-to-government (G2G) agreement.

PMI is working with the NMCP to support the following strategic focus areas:

- **Reach the hard-to-reach populations:** Achieve, sustain, and tailor deployment and uptake of high-quality interventions with a focus on people not reached through routine interventions. For example: 1) To fill the ITN access gap, PMI and NMCP reached out to the Ministry of Education to start distribution of ITNs in schools starting with Montserrado County which has the highest number of schools and the least net access according to the 2019 DHS. PMI in collaboration with the NMCP and Ministry of Education is now developing a nationwide school net distribution strategy; 2) Proposed the expansion of community case management to include adolescents up to 13 years of age, (ACT packing by age guided the cutoff of 13 years); and 3) The newly adopted private sector strategy will help strengthen collaboration with the private sector to improve the quality of malaria services provided at private health facilities as well as data reporting.
- **Strengthen community health systems:** PMI is supporting the community health program in two counties and will scale up to two more remote and difficult-to-reach counties. PMI is working with the National Community Health

Program, the NMCP, and MOH to standardize indicators and reporting through the Community-based Information System (CBIS), which is integrated into the District Health Information Software 2 (DHIS2) platform.

- **Invest locally:** PMI is supporting the MOH through a G2G arrangement in 8 of the 15 counties of Liberia.
- **Innovate and lead:** PMI has supported the Liberian government with data on mosquito vectors and insecticide resistance. Such information has been critical to phasing out pyrethroid-treated nets and switching to IG2 nets. In 2021, about 2.6 million dual active ingredient (AI) IG2 nets were distributed during the mass campaign. In August 2021, the routine ITNs were also transitioned to IG2 nets.

3.3. Key Changes in This MOP

Except the following, there will be no additional changes:

- Discontinuation of the long-term technical assistance (LTTA) to the NMCP: Over the past five years, the embedded long-term technical advisor to the NMCP helped build and strengthen malaria SM&E capacity and promoted data review and use. Transition of supported activities to NMCP/MOH and other partners is underway.
- PMI/Liberia is establishing collaboration with the Field Epidemiology Training Program (FETP) to introduce malaria modules in the FETP frontline training. Funding to train three frontline fellows starting in calendar year (CY) 2023 will be provided. Malaria modules will inform all FETP fellows about malaria epidemiology, prevention, and control activities in Liberia.
- A malaria private sector engagement strategy will guide the implementation of malaria activities in the private sector like improving malaria testing and treatment in the private-for-profit health facilities, including supply of malaria case management guidelines, training of health workers, technical assistance for reporting in the MOH HMIS, and access to high-quality ACTs and malaria RDTs through pooled procurement.
- When the results of ongoing PEs become available and the proposed rethinking of the supply chain strategy is finalized, PMI/Liberia will use the findings to update activities and guide implementation plans.

II. OPERATIONAL PLAN FOR FY 2023

1. Vector Monitoring and Control

1.1. PMI Goal and Strategic Approach

The malaria National Strategic Plan (NSP; 2021–2025) for Liberia promotes an integrated vector management strategy that includes universal access to ITNs through continuous and mass distribution campaigns, insecticide-resistance monitoring, entomological surveillance, IRS in targeted districts, and environmental and larval source management (LSM). Currently, PMI supports all of these interventions and activities with the exception of IRS and LSM. Furthermore, as no funding is available through other donors, and conditions are not suitable, the NMCP does not conduct IRS or LSM.

ITN Distribution in Liberia

Liberia's strategy for deployment of ITNs is two-pronged: 1) a continuous routine distribution through institutions such as health facilities, schools, orphanages, and others; and 2) an intermittent community-based distribution through mass distribution campaigns every three years. Health facility distribution includes providing a net to pregnant women at the first ANC visit and at the time of delivery.

In 2021, Liberia introduced a school-based net distribution channel in the heavily populated Montserrado County which had the highest school enrollment but lowest ITN coverage during the mass campaign. The objective was to complement other channels and address the current challenge of low net access.

PMI procures all ITNs for continuous net distribution and funds operational costs for continuous net distribution for all 15 counties. The Global Fund procures all of the ITNs and provides funds for operational costs for mass distribution campaigns that take place every three years. PMI provides technical assistance and funding for logistics management and SBC activities for the mass distribution campaign.

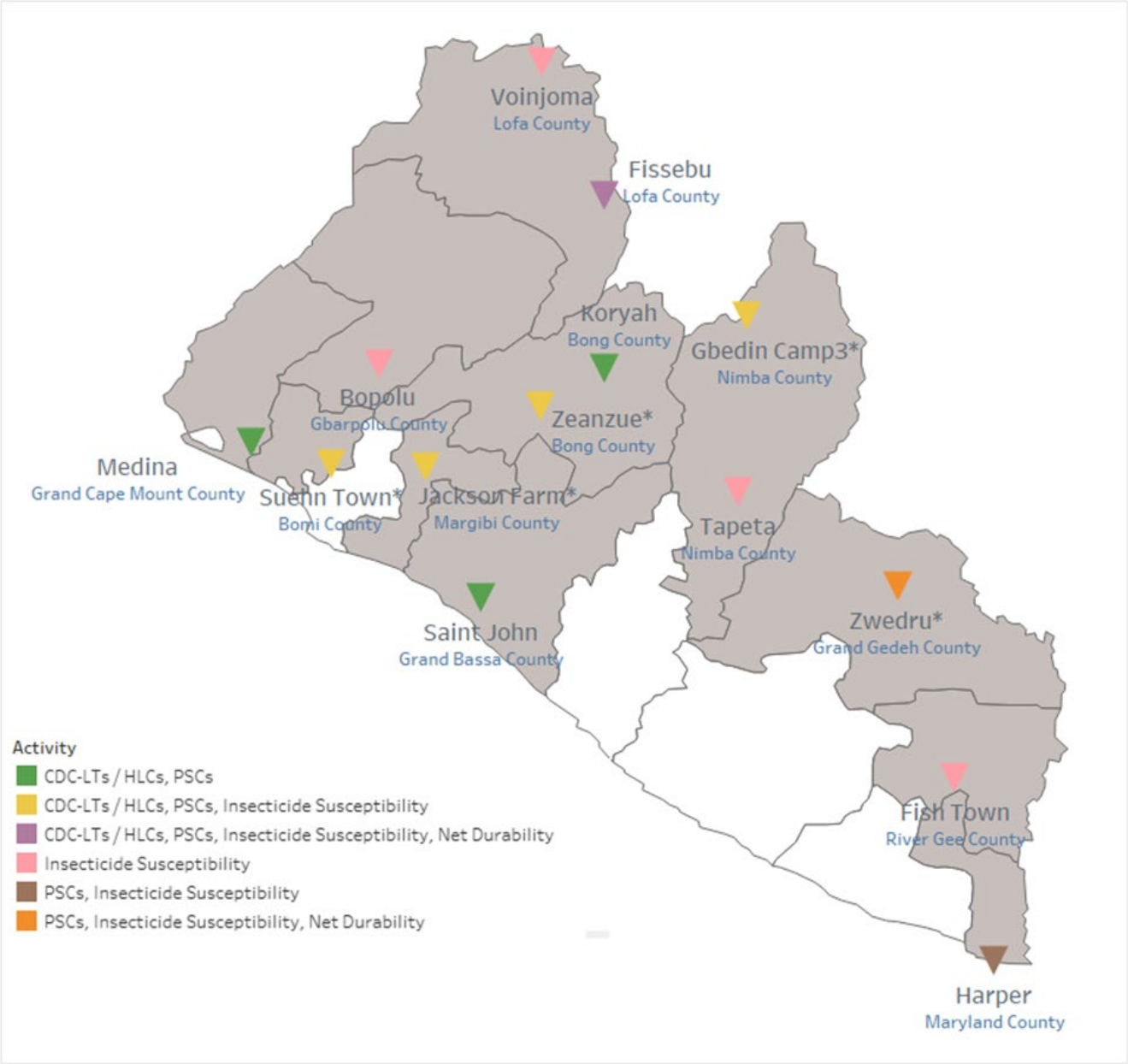
Liberia transitioned from the standard pyrethroid-treated nets to dual AI ITNs in 2021 starting with the mass distribution campaign nationwide. The first consignment of PMI-procured dual AI (IG2) nets arrived in the country in May 2021. This started the phaseout of the standard nets for the continuous channels.

Entomological Monitoring

Key goals of the entomological and insecticide resistance monitoring programs are to understand malaria vector prevalence, composition, biting behavior, infectivity rates, and insecticide-resistance profiles, which ultimately inform vector control decisions throughout the country.

Currently, PMI supports entomological surveillance in 8 sites and insecticide-resistance monitoring in 10 sites.

Figure 1. Map of Vector Control Activities in Liberia



CDC-LT: Centers for Disease Control and Prevention miniature light traps; HLC: human landing catch; PSC: pyrethrum spray catch

1.2. Recent Progress (between October 2020 and September 2021)

- Supported longitudinal entomological monitoring at 8 sentinel sites in 7 counties and insecticide-resistance monitoring in 10 sentinel sites in 10

counties, in collaboration/partnership with the University of Liberia-Pacific Institute for Research and Evaluation (UL-PIRE) and the NMCP.

- Monitored activities included vector bionomics, insecticide resistance, and insecticide residual efficacy. For more information about entomological monitoring, please refer to the 2021 Entomological Report.
- Trained community health volunteers (CHVs) on mosquito collection methods and basic adult and larval morphological identification of *Anopheline* mosquitoes for vector monitoring and larval collections to be used for insecticide-resistance testing. In 2021, all larval collections in Grand Gedeh, River Gee, and Maryland counties were performed by CHVs with supervision provided by a senior CHV from Grand Gedeh. The CHVs in Montserrado County were able to perform larval and adult mosquito collections and identification with minimal supervision.
- Trained a CHV to collect adult and mosquito larvae, which were then sent to Monrovia via domestic flights for species identification and insecticide-resistance testing in order to address challenging road conditions in the Southeast region of Liberia.
- Held a workshop involving the NMCP and other stakeholders to increase synergy for vector control efforts to include entomological monitoring, insecticide resistance, and durability monitoring for ITNs.
- Provided technical assessments and virtual training for molecular analyses of *Anopheline* mosquitoes were provided by the CDC Atlanta Entomology Branch to two technicians from the Liberian Institute of Biomedical Research in an effort to achieve long-term and in-country capability for such necessary activities.
- Supported the procurement and distribution of 258,240 dual AI IG2 ITNs for the continuous distribution channel that includes distribution of ITNs at first ANC visit and at time of delivery, distribution through schools, and distribution through other institutions like orphanages. Of the total 258,240 ITNs distributed through the continuous distribution channel, 209,312 were distributed to pregnant women at the time of the first ANC visit and at the time of delivery, 48,328 ITNs were distributed through schools, and 600 ITNs were distributed to institutions such as orphanages and rotary clubs to distribute to the communities they serve.
- Supported the introduction of a school-based ITN distribution channel, the first in Liberia. A total of 48,328 ITNs were distributed in Montserrado, which has the highest number of schools and a number of communities that reportedly did not receive nets from the 2021 ITN mass distribution campaign. Of the targeted 137 schools, 124 (90.5 percent) received nets. The

beneficiaries included 45,801 students (22,876 male, 22,925 female) and 2,527 teachers.

- Provided short-term technical assistance, logistics, and SBC support for planning and implementation for the June–July 2021 ITN mass distribution campaign that distributed 2,557,419 dual AI IG2 ITNs nationwide to 4,536,603 people, achieving a coverage of 92 percent of the targeted population to receive one net per two people under the leadership of the NMCP, and in partnership with the Global Fund, Plan International, and Alliance for Malaria Prevention.
- Completed a three-year standard durability monitoring of the DuraNet® ITN (alpha-cypermethrin) which were distributed in the 2018 national mass campaign. Please refer to the 36-month durability monitoring report.
- Supported national- and community-level SBC activities to improve ITN access and care during the mass distribution campaign and the school-based ITN distribution in Montserrado County, promoted appropriate use and care for ITNs, and addressed misinformation and rumors that linked the dual AI ITNs to the COVID-19 pandemic. For more information, please refer to the **SBC section** below.

1.3. Plans and Justification for FY 2023 Funding

FY 2023 funding will maintain the same level of support for vector control activities with no change to the longitudinal and insecticide-resistance monitoring sites. The FY 2023 funding tables contain a full list of vector monitoring and control activities that PMI proposes to support in Liberia with FY 2023 funding. Please visit www.pmi.gov/resources/malaria-operational-plans-mops for these FY 2023 funding tables.

1.3.1. Entomological Monitoring

Summary of Distribution and Bionomics of Malaria Vectors in Liberia
In 2021 and in agreement with historical data, the primary vector observed in Liberia was *An. gambiae* s.l. and the secondary vector was *An. funestus* s.l. Peak transmission season was noted to be from March through June which corresponds to the beginning of the rainy season. There was no observable or statistical significance noted for the preferred biting location (indoors or outdoors) of the primary vector as based on human landing catches and CDC miniature light trap (CDC-LT) collections. Generally, peak biting of *An. gambiae* s.l. (both indoors and outdoors) occurred between 2200 and 0100 hours.

Status of Insecticide Resistance in Liberia
Based on 2021 data, *An. gambiae* s.l. in Liberia is highly resistant to pyrethroid insecticides at 1X, 2X, 5X, 10X concentrations of alpha-cypermethrin, deltamethrin, and

permethrin. However, when *An. gambiae* s.l. mosquitoes were pre-exposed to piperonyl butoxide, susceptibility to pyrethroids was fully restored in five out of nine sites where tests were performed. Chlorfenapyr, a slower-acting AI, was tested and provided full mortality within three days post-exposure. Based on these findings, it is expected that the IG2 ITNs (alpha-cypermethrin and chlorfenapyr) distributed in 2021 should have a superior mortality effect on *An. gambiae* s.l. vectors which are resistant to pyrethroids.

1.3.2. ITNs

PMI will continue to support procurement and distribution of ITNs through continuous distribution. PMI will scale up the school-based ITN distribution to cover additional counties that demonstrate low net access from the 2022 MIS data. Additionally, PMI will provide technical and logistical support to the country's 2024 mass distribution campaign through participation in a national task force and funding local short-term technical assistance for the planning, organizing, and producing of various documents and reports for the campaign.

PMI will support direct distribution of ITNs to health facilities nationwide to overcome current challenges with last-mile distribution of ITNs, and missed opportunities for providing nets to pregnant women during the first ANC visit and at the time of delivery at the health facility.

PMI will work with partners to strengthen the community health program and CHAs to refer pregnant women for IPTp and ITNs at health facilities, where they can receive the nets at the prenatal visits, and support the school-based distribution of ITNs.

PMI will also focus on planning and implementation of the 2022 MIS that will provide updated data on ITN ownership, access, and use.

The 2019–2020 DHS shows a high net use:acces ratio. ITN access, however, was low just a year after the 2018 ITN mass distribution campaign at 40 percent of the population. The 2018 and 2021 mass distribution campaigns did not prioritize SBC. As a result, many communities were not mobilized during household registration; those registered did not know when nor where to receive nets. For both campaigns, over 200,000 nets remained, contributing to the sustained low access to ITNs.

PMI will support SBC to improve use and care of ITNs and to mitigate against misuse. The SBC activities will include: informing the communities of the net distribution channels, distribution points during campaigns, and school net distribution; mobilizing the community to collect the nets during the campaign days and during school net distribution; and informing pregnant women to request a net at first ANC visit and after delivering at a health facility. Post-campaign and post-distribution SBC activities will focus on maintaining net use and care. Based on the results of 2022 MIS, PMI will revise the SBC strategy and interventions to address any ITN access and consistent net

care and use gaps. Please see the **SBC section** below for details on challenges and opportunities to improve intervention uptake or maintenance.

PMI will continue to support streamlined durability monitoring of dual AI nets distributed in the 2021 mass distribution campaign. The 36-month data collection will take place in June 2024.

The Global Fund will procure all of the 2,821,833 dual AI ITNs for the 2024 mass distribution campaign. Based on the stock levels, PMI plans to procure 585,000 dual AI IG2 ITNs for continuous distribution channels (ANC, institutional delivery, schools, and institutions).

Please refer to the **ITN Gap Analysis Table** in the annex for more detail on planned quantities and distribution channels.

Table 1. Streamlined Durability Monitoring

Campaign Date	Site	Brand	Baseline	12-month	24-month	36-month
2021	Bomi	IG2	Nov./2021	Planned	Planned	Planned
2021	Bong	IG2	Nov./2021	Planned	Planned	Planned

1.3.3. IRS

PMI does not support IRS in Liberia.

2. MIP

2.1. PMI Goal and Strategic Approach

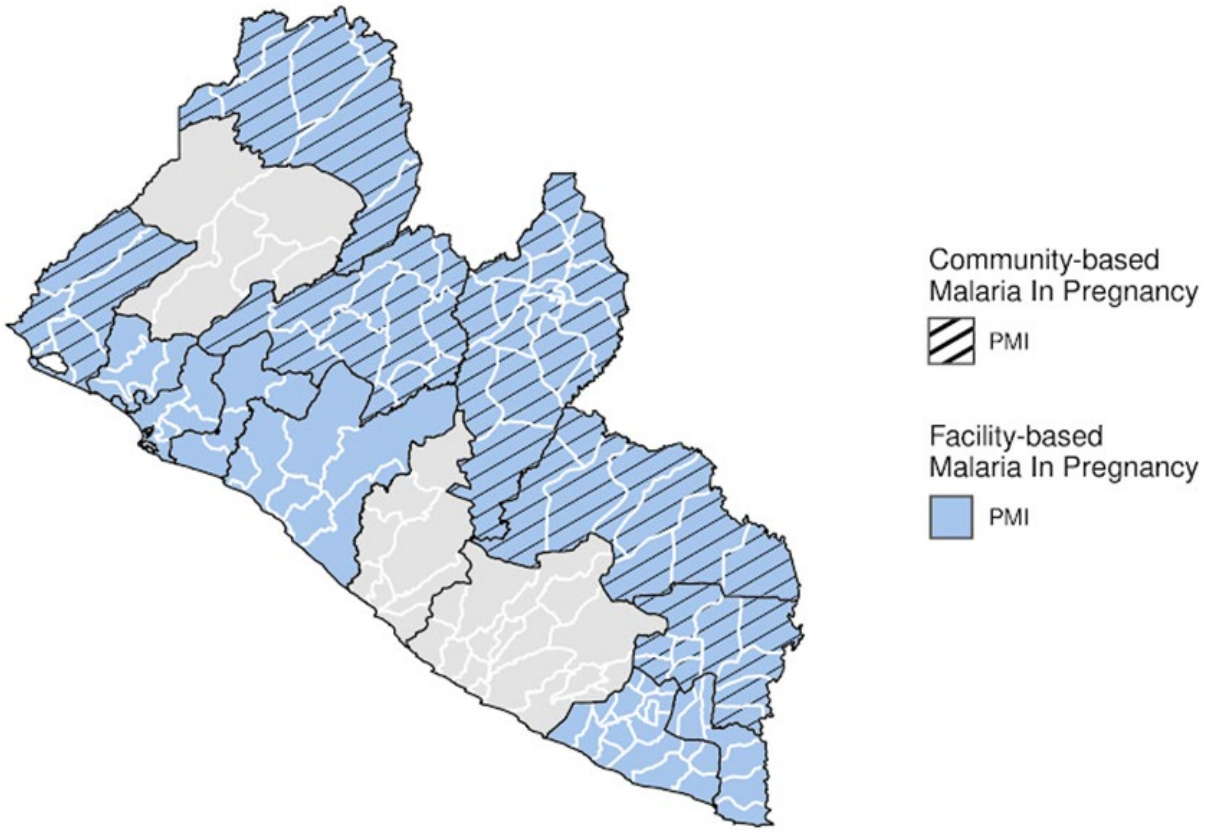
PMI/Liberia's goal is to support the national strategy for MIP, which includes: provision of ITNs at the first ANC visit and at the time of delivery; a minimum of three doses of IPTp with sulfadoxine-pyrimethamine (SP) starting at 13 weeks gestational age; and effective case management of malaria per World Health Organization (WHO) guidelines. These goals are supported by PMI through procurement of both SP for IPTp and ITNs, as well as through training of healthcare workers at all levels of the healthcare system.

PMI provided technical assistance and support for the revision of the ANC and delivery registers to include: 1) more columns for recording up to four doses of IPTp; 2) a column to record ITNs issued in ANC registers; and 3) a column for ITNs issued at delivery in the registry.

Currently, facility-based MIP service delivery is covering 12 counties, with the World Bank covering the remaining three counties of Gbarpolu, Sinoe, and River Cess. In

2021, PMI/Liberia in collaboration with the Expanded Program on Immunization (EPI), introduced delivery of IPTp during community outreach visits in six G2G counties in accordance with the WHO reaching every district strategy (see Figure 2). During outreach visits, IPTp is provided by midwives who conduct immunization outreach services. After visits, IPTp data from outreach services is transferred to the ANC register. This intervention targets difficult-to-reach women, including those who do not return for scheduled ANC visits. Disaggregating IPTp by channel (health facility or in the community) will provide data to assess whether this intervention is a viable option to be expanded to the other counties in Liberia.

Figure 2. Map of Facility- and Community-based Malaria in Pregnancy Service Delivery Activities in Liberia in 2021



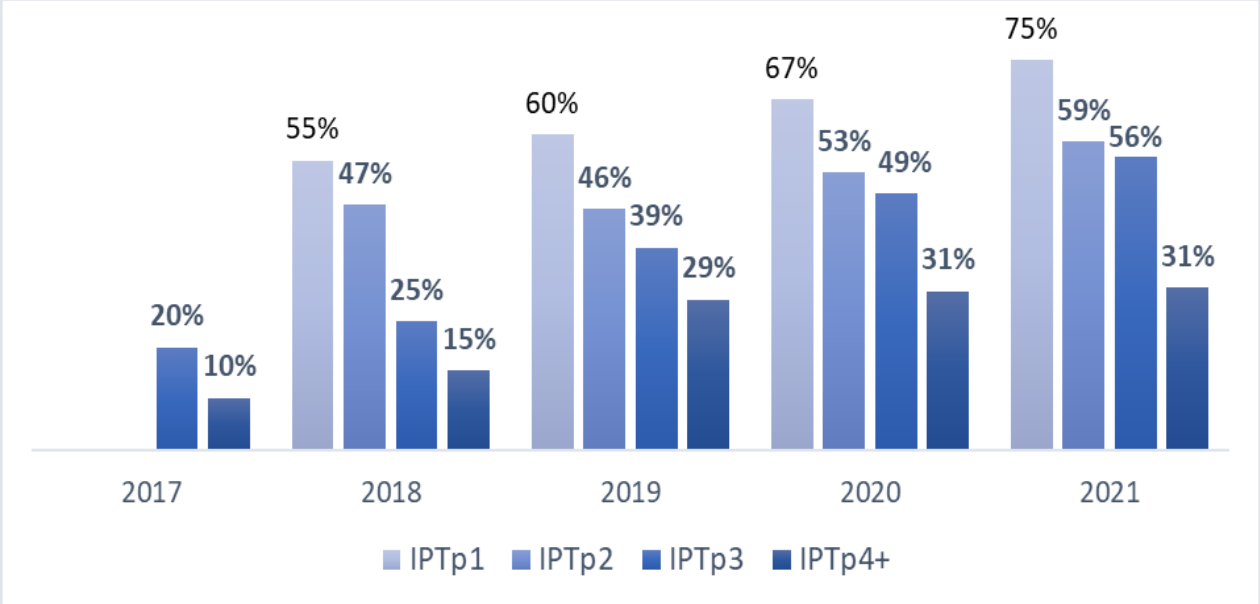
*The three counties without PMI support (in gray) are supported by the World Bank.

2.2. Recent Progress (between January 2021 and December 2021)

- Supported training of 928 health workers and 106 county and district supervisors on the revised MIP technical guidelines including the standard operating procedures and job aids.

- Supported printing and distribution of malaria case management MIP technical guidelines, job aids, and standard operating procedures to public and faith-based facilities in six counties to ensure standards are being adhered to.
- Provided administrative support (communication cards) to NMCP for follow-up with county malaria focal persons (MFPs) on use of job aids and adherence to revised policy at health facilities.
- Supported the scale-up of ITN distribution during ANC and at delivery. The HMIS shows a steady increase in the number of nets given to pregnant women during ANC and at delivery. In CY 2021, of the 136,578 pregnant women who attended the first ANC visit, 115,370 (84 percent) received ITNs, compared to 77 percent (103,146 out of 134,529) of women who received ITNs during the first ANC visit in CY 2020. In CY 2021, of the 96,293 women who delivered at health facilities, 87,040 (90 percent) received ITNs compared to 83 percent (76,645 of 91,88) of women who received nets in 2020 after delivery.
- Provided 109,598 IPTp1, 89,059 IPTp2, 86,574 IPTp3, and 49,015 IPTp4 or more to pregnant women during ANC. The data from HMIS are showing a steady improvement of IPTp coverage (see Figure 3).

Figure 3: Trends of IPTp Coverage in Liberia from 2017 to 2021 (Source: MOH HMIS)



The figure shows an increasing trend of IPTp1, IPTp2, IPTp3, and IPTp4+ coverage. Liberia's interpretation of IPT3+ is four or more IPTp treatments, which is different from PMI's definition of three or more IPTp doses.

- Supported counties to address commodity stockouts by assisting with last-mile distribution and redistributing overstocked SP and ITNs to other health facilities with low stocks.
- Provided guidance to the NMCP and Family Health Division on recording malaria test results and treatment in the new registers.
- Supported the NMCP and the county and district health teams to conduct malaria supportive supervision that included an MIP component.
- In collaboration with the EPI, introduced IPTp outreach for difficult-to-reach populations in six G2G counties. IPTp distribution is done by the midwives who conduct immunization outreach services in the community.

Challenges

- The MOH reproductive division has not yet adopted the 2016 ANC policy that recommends pregnant women have at least eight ANC contacts during each pregnancy at recommended intervals. The 2019–2020 DHS shows that 87 percent of women 15 to 49 years of age who had a birth in the five years before the survey had four or more ANC visits, and 71 percent received ANC during the first trimester. The same survey shows that the proportion of pregnant women who received the first and second dose of IPTp was 90 percent and 70 percent, respectively, but IPTp3 coverage is only 40 percent. The NMCP and partners attribute the low IPTp3 coverage to the late adoption of WHO IPTp policy.
- Another challenge is the stockouts of SP for IPTp as well as malaria RDTs and ACTs for proper management of malaria during pregnancy. The November 2021 End-Use Verification (EUV) Survey shows that 20 percent of health facilities were stocked out of SP for three or more consecutive days in the last three months. For the same period, 16 percent, 31 percent, and 64 percent of health facilities were stocked out of ITNs, malaria RDTs, and adult ACTs, respectively, for three or more consecutive days. The stockouts are attributed to CMSs not supplying commodities as requested, and sometimes the delay was in last-mile distribution resulting from counties delaying to account for the last-mile distribution funds.

2.3. Plans and Justification for FY 2023 Funding

The FY 2023 funding tables contain a full list of MIP activities that PMI proposes to support in Liberia. Please visit www.pmi.gov/resources/malaria-operational-plans-mops for these FY 2023 funding tables.

Liberia will continue to support MIP activities as described previously in the **Recent Progress section** and will include the full package of MIP interventions: IPTp, provision of ITNs to pregnant women during the first ANC visit and at delivery, testing for malaria,

and providing appropriate treatment for the pregnant women with fever during ANC visits. The specific activities for FY 2023 funding are detailed below:

- Support for county trainings in MIP and case management in collaboration with the NMCP.
- Support for community outreach activities as part of the reaching-every-district strategy.
- Administrative support to the NMCP for monthly virtual meetings with county MFPs.
- Support at county- and district-levels' joint integrated supportive supervision (JISS) and post-supervision visits to ensure staff are adhering to national guidelines.
- Support of quarterly supervision to districts and health facilities.
- Use of the results of the ongoing IPTp barrier study to address interventions for addressing missed opportunities for ITNs and IPTp. The study results will be available in June 2022.
- Strengthen of coordination between the family health program and NMCP in technical working group (TWG) meetings.
- Facilitation of meeting and coordination between MIP service delivery partners, the supply/logistics partners, and the MOH to address the stockout issues at service delivery points.
- Strengthen of the community health program and CHAs to refer women for IPTp (and a net at first ANC) at health facilities.
- Advocation and support of the NMCP and the MOH Family Health Division to adopt the 2016 WHO guidelines that promote eight ANC contacts during pregnancy. This will provide an opportunity for Liberia to improve IPTp3 and ITN coverage for pregnant women.
- Support of the implementation of the newly introduced IPTp distribution through EPI outreach and the updated National Community Health Program policy that promotes CHA referral for pregnant women, which will contribute to improvement of the IPTp coverage.
- Exploration of SBC and other interventions for improving IPTp3 coverage and proper management of malaria. Please see the **SBC section** below for details on challenges and opportunities to improve intervention uptake or maintenance.

Currently, only PMI procures SP for the entire country. PMI will procure SP treatments, including a buffer stock of six months. In addition, PMI will procure any supplies required for directly observed therapy of IPTp, personal protective equipment needed for health workers during ANC examinations and malaria diagnostic testing, and infrared thermometers for taking body temperature of pregnant women during ANC.

Please refer to the **SP Gap Analysis Table** in the annex for more detail on planned quantities and distribution channels.

3. Drug-based Prevention

PMI does not support seasonal malaria chemoprevention and/or other drug-based prevention in Liberia.

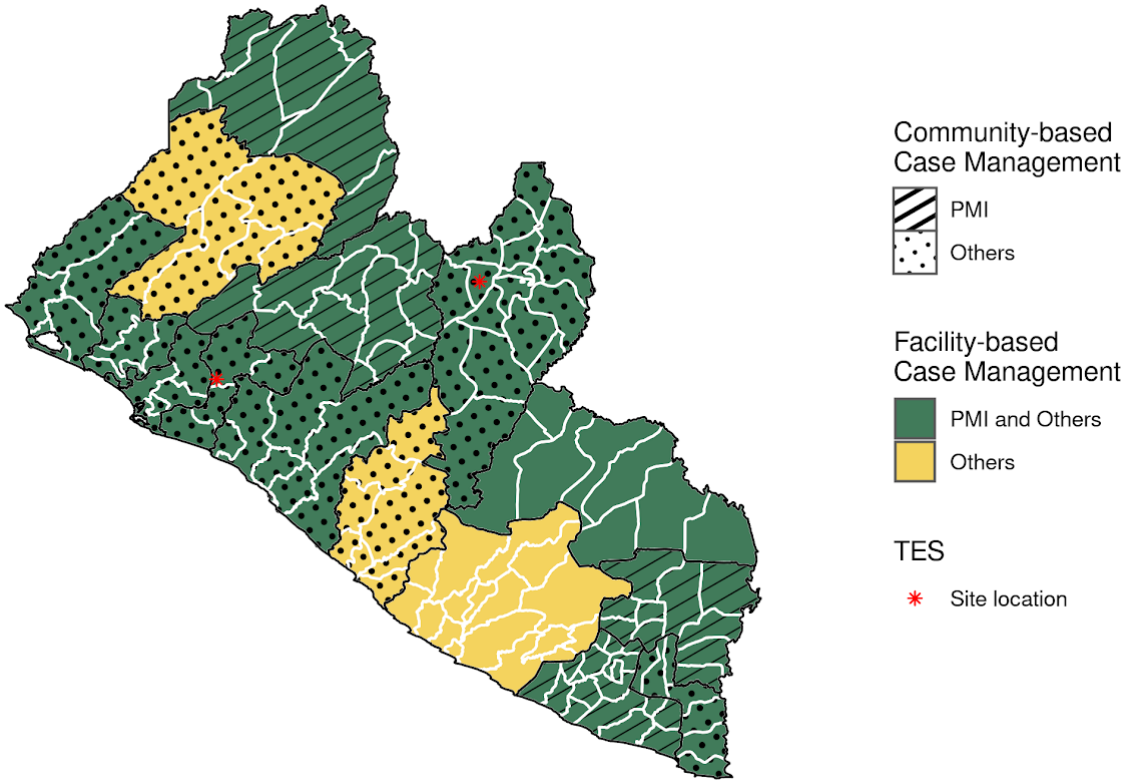
4. Case Management

4.1. PMI Goal and Strategic Approach

PMI supports the national case management strategies outlined in the 2021–2025 Liberia NSP by providing diagnostic tests, treatment, and technical support to scale up malaria testing with RDTs and microscopy nationwide. The NMCP's goals are that all persons with suspected malaria attending public health facilities and community services are tested for malaria, and all patients testing positive are treated for malaria according to national guidelines. PMI's support includes nationwide procurement of RDTs, ACTs, and injectable and rectal artesunate (RAS), accounting for approximately 100 percent of the RDT needs, 93 percent of the ACT needs, 75 percent of the injectable artesunate needs, and 100 percent of RAS needs in areas where this intervention is being piloted. The Global Fund supports procurement of 7 percent of ACTs and 25 percent of severe malaria commodities. The Global Fund and PMI are working towards a PMI (70 percent)/Global Fund (30 percent) split for procuring ACTs. PMI also supports training on malaria case management at all levels of the health system, printing and distributing malaria tools and job aids as well as implementing JISS activities in 12 counties, with the World Bank providing direct support in the remaining three counties of Gbarpolu, Sinoe, and River Cess (see Figure 4).

Liberia has a robust community health worker program with a total of 3,856 CHAs fully trained and providing iCCM, including treatment of malaria, diarrhea, and pneumonia, to children under five years of age in their communities, representing 96 percent of the national target of 4,000 CHAs. CHAs also provide behavior change communications to people of all ages and refer pregnant women to ANC visits to receive IPTp. The National Community Health Program updated their guidelines in 2021 to allow CHAs to treat children up to 13 years old, and is currently in the process of fully revising the CHA training curriculum. In Bong, Lofa, River Gee, and Grand Kru counties, PMI, along with other USAID program areas, support monthly stipends for CHAs and CHSSs. The stipends for CHAs and CHSSs equal $70 and $260 to $320 (depending on location) per month, respectively.

Figure 4. Map of Case Management and Community Health Service Delivery Activities in Liberia



4.2. Recent Progress (between January 2021 and December 2021)

National-level Case Management Activities

- Collaborated with NMCP and other stakeholders to develop the Liberia Malaria Private Sector Strategy (2022–2025), aimed at improving engagement with the private sector for malaria service delivery.
- Coordinated with the National Community Health Program to expand community case management of malaria to children up to 13 years of age.
- Conducted monthly national-level malaria TWG meetings, including case management, MIP, and community health stakeholders.
- NMCP participated in JISS visits to 60 facilities in Bong, Grand Bassa, Nimba, and River Cess counties.
- Hosted the first Collaborating, Learning, and Adaptation Conference in Liberia, focusing on targeting high-volume health facilities for improved malaria outcomes.

Commodities

PMI supported the procurement and distribution of:

- 3.1 million malaria RDTs nationwide, accounting for approximately 100 percent of needs.
- 2.2 million ACT blister packs nationwide.
- 145,620 vials of injectable artesunate nationwide, accounting for approximately 100 percent of needs.
- 12,480 RAS suppositories nationwide.

Facility-level Case Management Activities

- Trained 928 clinicians on malaria case management, MIP, and use of malaria updated tools at 610 health public and faith-based health facilities across the 12 PMI-supported counties. No physicians or laboratory technicians were trained.
- Printed and distributed updated malaria technical guidelines and job aids to 133 private facilities and trained 133 private providers.
- Supported the planning and implementation of a total of 1,136 JISS visits in the 12 PMI-supported counties, including 890 visits to public facilities and 246 visits to private facilities. A total of 541 individual facilities were visited.
- Achieved target of 95 percent of suspected malaria cases being tested at health facilities.
- Conducted quarterly performance review meetings in 12 counties.

Community-level Case Management Activities

- Conducted quarterly on-site training and supportive supervision visits reaching 567 (male 505, female 62) CHAs.
- Trained 55 (male 31, female 24) supervisors in on-site training and supportive supervision for CHAs in Bong and Lofa counties.
- In 2021 with PMI support, identified 12,678 malaria cases in the community and 11,785 (93 percent) received an ACT according to national treatment guidelines.
- Completed recruitment of 20 CHSSs in River Gee and 18 CHSSs in Grand Kru, which will be trained in 2022.
- Contributed to the monthly stipends of 567 CHAs and 82 CHSSs, in line with Liberia's "one county, one program, whole country" strategy.
- Distributed malaria tools and job aids to all CHAs and CHSSs in Bong and Lofa counties.
- Coordinated with community animal health workers to improve community event-based surveillance.
- Completed mapping exercises in Bong and Lofa Counties to document communities that no longer have an active CHA.

Challenges that could affect case management progress**:**

- Frequent malaria commodity stockouts at services delivery points, leaving some patients without free malaria treatment.
- High malaria test positivity rate (TPR) reported from primary health care facilities with some observed challenges (e.g., non-adherence to malaria RDT testing protocol, including incorrect recording of RDT results) which might overestimate the actual malaria burden in Liberia. This issue will be addressed by scaling up training/retraining on malaria RDT use at primary health facilities and community levels.
- The donor-driven nature of the CHA program with its very limited government funding, which also limits scale-up to reach the unreachable in some rural communities.

Please note that recent progress with monitoring antimalarial efficacy and the Therapeutic Efficacy Study (TES) approach is presented in the **Plans and Justification for FY 2023 Funding section** below.

4.3. Plans and Justification for FY 2023 Funding

The FY 2023 funding tables contain a full list of case management activities that PMI proposes to support in Liberia with FY 2023 funding. Please visit www.pmi.gov/resources/malaria-operational-plans-mops for these FY 2023 funding tables.

National-level Case Management Activities
In FY 2023, PMI will continue to support national-level case management activities, including quarterly JISS visits, monthly TWG meetings, and coordination with other relevant MOH offices, as described in the **Recent Progress section**. There are no significant changes to the planned funding allocation for FY 2023 compared to FY 2022. The specific activities for FY 2023 funding at the national level include:

- Continued support for service delivery in 12 of the 15 counties for facility-based case management and also increased support for the NMCP at the central level (e.g., coordination of TWG meetings, site visits, data review, etc.). The remaining three counties will be supported by the World Bank.
- Support for revision and roll-out of CHA training curricula and promotion of recording and reporting on suspected malaria cases and testing data including both negative and positive malaria RDTs.
- Support for national-level implementation activities related to the Malaria Private Sector Strategy.

Commodities
FY 2023 funding for case management commodities will build off existing stock to ensure adequate supplies in-country as well as a minimum of six months of end-of-year

stock for RDTs, ACTs, and severe malaria treatment. There are no major changes to the quantities of case management commodities being procured, and quantities continue to be based on the results of national quantification activities. The implementation of the expanded age group for community case management (5 to 13 years of age) will reduce access barriers, mainly transportation to and from health facilities, resulting in a potential increase above the total historical number of malaria suspect cases tested and treated.

At this time, it is anticipated that in FY 2023 the Global Fund will procure 7 percent of ACTs and 25 percent of injectable artesunate for severe malaria treatments, which is similar to the proportion procured for FY 2022. It is not anticipated that adding ages 5 to 13 years will create an immediate issue for malaria commodity needs for the following reasons: The national quantification exercises are based on national needs using HMIS and CBIS data and testing and treating children up to 13 years of age at community level will reduce the number of children seeking services for uncomplicated malaria at health facilities. Liberia will continuously review the data and identify any increases to guide commodity quantification. To meet the expanded scope of the community health program needs, during the semi-annual quantification review, the NMCP and partners will review the supply plans and stock on hand and make adjustments. To ensure success of the case management at the community level, PMI will re-assess the last-mile commodity distribution, reach other PMI-supported countries with any scale-up experience, and make appropriate changes/modifications.

Please refer to the **ACT, RDT, injectable artesunate, and artesunate suppository Gap Analysis Tables** in the annex for more detail on planned quantities and distribution channels.

Facility-level Case Management Activities
In FY 2023, PMI will continue to support facility-level case management activities, including site visits by county health teams (CHTs), data validation and review meetings, and trainings for health facility staff, as described in the **Recent Progress section**. There are no significant changes to the planned funding allocation for FY 2023 compared to FY 2022. The specific activities for FY 2023 funding at the facility level include:

- Support for training public and private clinicians on malaria case management.
- Printing and distribution of malaria technical guidelines and job aids for public and private facilities.
- Support for the planning and implementation of CHT site visits, including the introduction of quality assessment and quality control for malaria RDTs and microscopy.

- Support to improve data collection, review, and analysis.

Community-level Case Management Activities

The percentage of children under five years of age with fever for whom advice or treatment was sought has remained almost stable with 79 percent in 2009, 77 percent in 2011, 79 percent in 2013, and 81 percent in 2019–2020. The percentage of children with a fever who received any antimalarial drug and given an ACT appears to vary widely between surveys conducted in Liberia from MIS 2009 to DHS 2019–2020. However, if the assumption is made that when respondents indicated their child received amodiaquine the child actually received artesunate-amodiaquine (ASAQ), the trend line is more credible, rising from 45 percent in 2009 to 85 percent in 2013, 2016, and 2019–2020.

The SBC interventions will promote the priority behavior of early care-seeking and proper management of malaria in children. Please see the **SBC section** below for details.

Figure 5. Trends in Care-Seeking for Fever among Children under Five Years of Age

Among children under five years of age with fever in the two weeks before the survey, percentage of whom advice or treatment was sought, and percentage of whom care or treatment was sought the same day or next day.

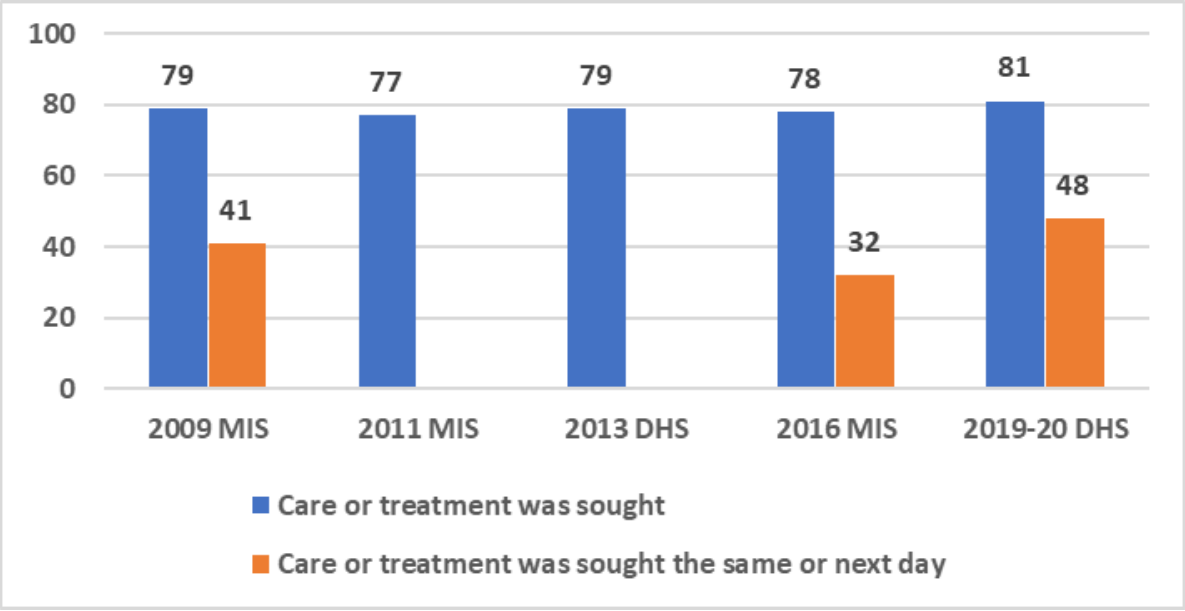
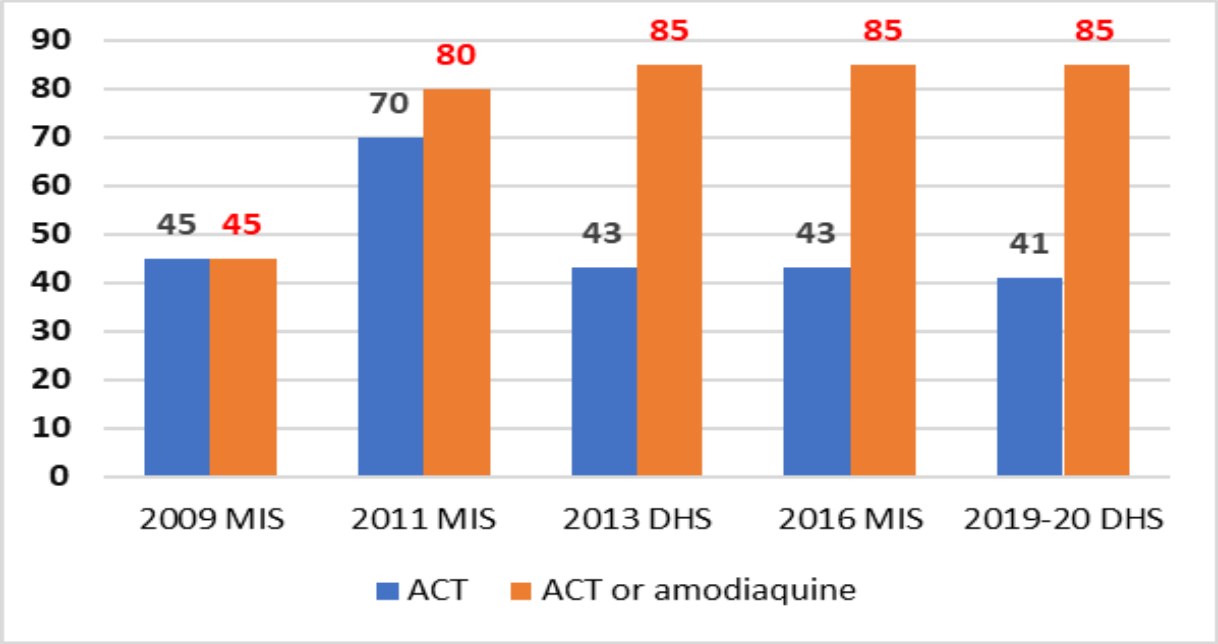


Figure 6. Among Children with Recent Fever Who Took an Antimalarial, Percentage Who Received ACT, and the Percentage Who Received ACT or Reported Receiving Amodiaquine



In 2021, PMI support for community-level interventions was concentrated only in Bong and Lofa counties. This is due in part because USAID was focused largely on start-up activities in the beginning of 2021. However, now that the activity is well under way, PMI will begin to implement activities in River Gee and Grand Kru counties, as well as continue to implement activities in Bong and Lofa counties. There are no significant changes to the planned funding allocation for community-level activities in FY 2023 compared to FY 2022. The specific activities for FY 2023 funding at the community level include:

- Support for coordination to finalize and roll out the revised CHA training curricula, including the expansion of community case management to children up to 13 years of age, and reporting of suspected malaria cases and both positive and negative RDT results.
- Expansion of the community health program in four counties through recruitment and training of CHAs and CHSSs.
- Re-assessment of the last-mile commodity distribution and ability to reach other PMI-supported countries with any scale-up experience, and make appropriate changes/modifications to ensure success of community case management.
- Analysis of secondary data to better understand and improve quality of care, referrals and counter-referrals, and barriers to early ANC attendance.

- Support for CHA and CHSS stipends in the four supported counties, as well as non-monetary incentives (jackets, ID cards, rain gear, etc.).
- Support for CHTs and CHSSs to conduct supportive supervision visits, which include resupply of commodities to CHAs to improve quality of care and reduce stockouts at the community level.

The National Community Health Program has not yet made a determination on how the recommendations made in the WHO RAS Information Note (January 2022) will be incorporated into Liberia's iCCM policy on pre-referral treatment using RAS. At this time, it is anticipated that CHAs trained on this intervention will continue to administer RAS to children under five years of age, and refer them to the nearest health facility. If this policy changes, RAS procurement will be updated accordingly.

4.4. Monitoring Antimalarial Efficacy

The first-line ACT remains effective in Liberia as documented by the 2017–2018 TES of ASAQ and artemether-lumefantrine (AL) in patients with uncomplicated malaria. The polymerase chain reaction-corrected adequate clinical and parasitological response to ASAQ (95.3 percent) and AL (100 percent) were reported. In 2022, PMI will support the NMCP to conduct another TES with ASAQ and AL at two sites.

Table 2. Ongoing and Planned Therapeutic Efficacy Studies

Ongoing Therapeutic Efficacy Studies			
Year	**Site Name**	**Treatment Arm(s)**	**Plan for Laboratory Testing of Samples**
	N/A		
	N/A		
Planned Therapeutic Efficacy Studies (Funded with Previous or Current MOP)			
Year	**Site Name**	**Treatment Arm(s)**	**Plan for Laboratory Testing of Samples**
2022	Saclepea Mahn Health Center	ASAQ/AL	TBD
2022	Sinje Health Center	ASAQ/AL	TBD

Other Planned Case Management Activities

In the FY 2022 MOP review, it was noted that the number of confirmed malaria cases in Liberia has been steadily decreasing since 2016. However, the TPR has remained stable and consistently high at around 60 percent. In order to better understand why malaria cases were decreasing but TPR was not, a secondary analysis of HMIS data was completed. In this analysis, it was determined that the high TPR is being driven largely by the primary health facilities, with clinics having higher TPR than health centers, which have a higher TPR than hospitals. This suggests that there is likely reporting of negative malaria RDTs as positive. The PMI/Liberia team also conducted site visits to review registers and had similar findings. To address this issue, FY 2020 and FY 2021 funding has been allocated to conduct a study on malaria RDT adherence

and testing practices focused on CHAs and clinics. The outcomes of this study will help understand the issues and allow PMI and its partners to address them accordingly. The planned 2022 MIS will include both malaria RDT and microscopy results, which should help gain an understanding if malaria RDT TPR is in line with microscopy TPR. But since MIS will target the general population who are healthier than those going for services at health facilities, the MIS TPR is expected to be lower than the observed one from health facilities. To understand if the reported high TPR from routine surveillance reflects the true malaria burden among symptomatic patients attending health service delivery points, Liberia will consider including malaria biomarkers in the next health facility survey and/or conducting a quick cross-sectional study of malaria prevalence among suspected malaria cases seeking services at service delivery points (including community and health facilities).

Despite the challenges with a high-documented TPR, there is evidence that malaria cases in Liberia are truly decreasing. From 2016 to 2020, there was also a decline in the number of all cause consultations as well as in the number of suspected malaria cases. These two measures declining in tandem with the number of malaria cases reinforces the trend that the true number of malaria cases is, in fact, declining.

Figure 7. Testing of Suspected Malaria Cases and Parasitological Confirmation at Health Facilities in Liberia from 2017 to 2021

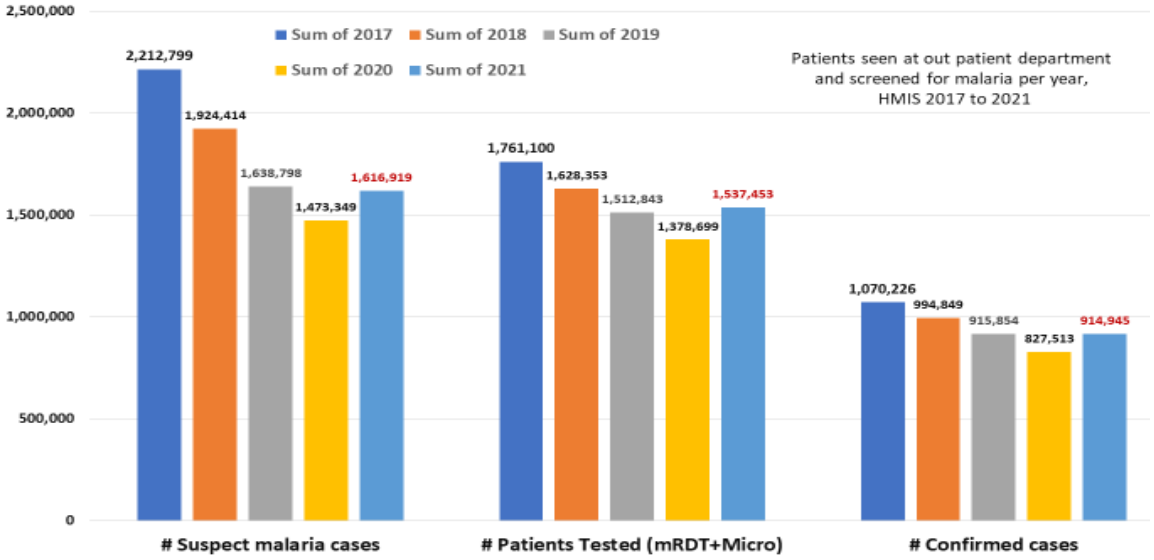


Figure 8. Test Positivity Rate by Health Facility Type

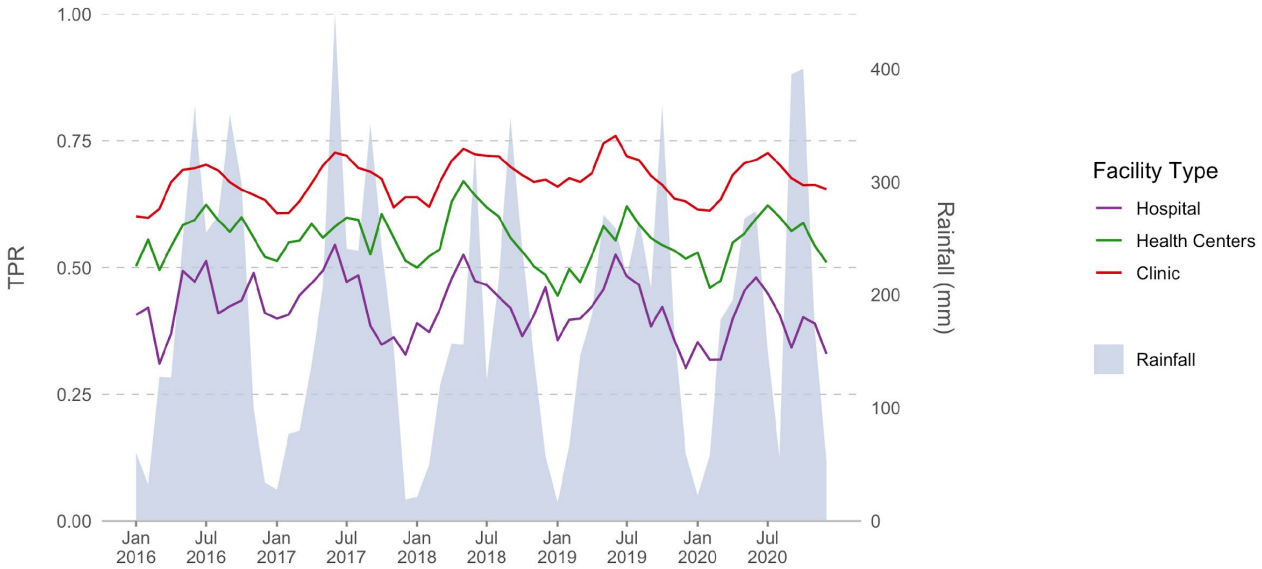
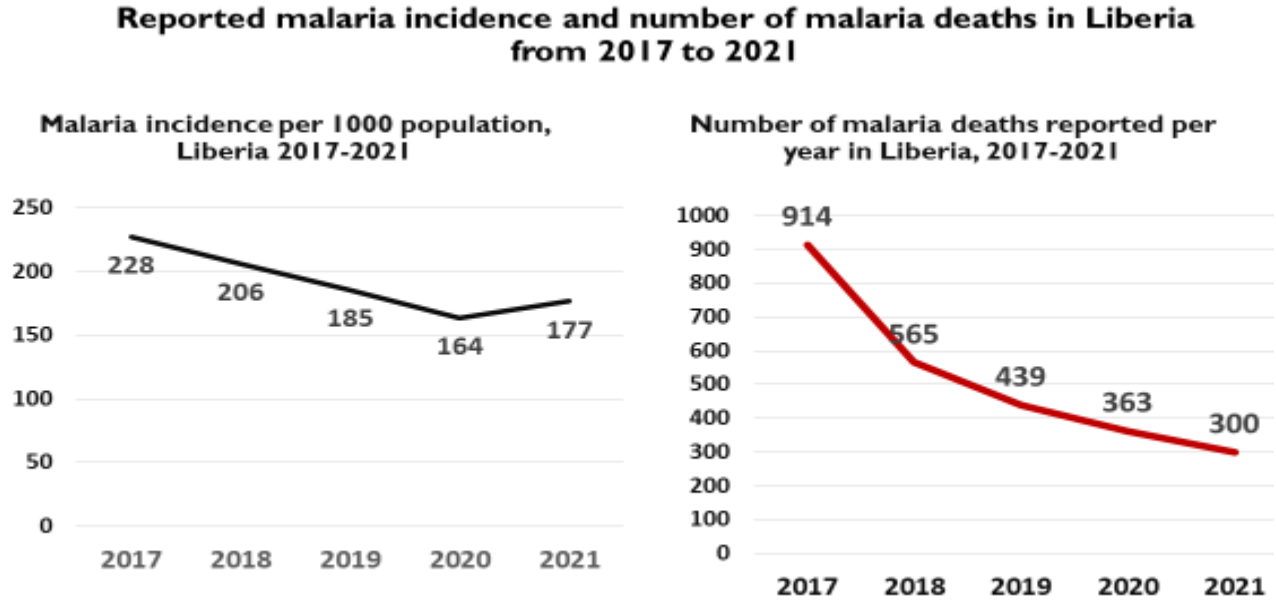


Figure 9. Malaria Incidence per 1,000 Population and Number of Malaria Deaths Reported per Year in Liberia from 2017 to 2021



5. Health Supply Chain and Pharmaceutical Management

5.1. PMI Goal and Strategic Approach

PMI/Liberia provides support to the Department of Pharmaceutical Services (DPS) for the implementation of Liberia's Supply Chain Master Plan (2010–2020), which is undergoing a revision, through commodity procurement and technical assistance, and supports the Liberia Medicines and Health Products Regulatory Authority (LMHRA) Strategic Plan (2021–2025). PMI supports the national quantification technical committee to develop national malaria commodity requirements and funding needs. PMI supports the procurement of malaria commodities and monitoring of the national pipeline to inform joint donor decisions with the Global Fund on the procurement of commodities to meet national malaria product requirements.

PMI supports the CMS in Caldwell, Monrovia, in providing operational support and capacity-building for integrated management of health commodities at the central warehouse. Furthermore, PMI supports ITN distribution nationwide. Through coordination between PMI, other USAID health teams, Global Fund, and the MOH, a new approach was agreed upon to provide intensive technical assistance support at CMS, while continuing to support distribution. It was agreed that starting in March 2021, PMI (and USAID) will provide comprehensive technical assistance in the form of four technical advisors embedded in CMS (management advisor, warehouse operations advisor, financial management specialist, and information technology advisor). The technical advisors will support the current CMS leadership in managing the warehouse,

and the Global Fund will cover the distribution of commodities to the 13 county depots, hospitals, and last-mile distribution in Montserrado and Margibi counties utilizing the World Food Program as their implementing partner. CHTs outside Montserrado and Margibi counties are responsible for last-mile distribution to the health facilities through funding support from the Global Fund (except for ITNs, which are covered by PMI).

PMI has been supporting the revitalization of the eLMIS to guide consumption data collection for decision-making on health product requirements. PMI also supports deployment of eight Logistics Management Advisors (LMAs) that work with the 15 CHTs to strengthen data collection and stock management at the county level.

In accordance with PMI's Stockout Reduction Strategy, which targets stockouts of less than 10 percent across PMI countries by 2023, PMI/Liberia is targeting stockouts of ACTs, RDTs, and SP of less than 22, 11, and 6 percent by 2023. Baseline (2020) stockout rates for ACTs, RDTs, and SP were 40, 21, and 12 percent, respectively.

5.2. Recent Progress (between January 2021 and December 2021)

Central Level

- **LTTA at CMS:** PMI's principal supply chain investment in 2021 was strengthening the operational efficiency of the CMS. The deployment of four LTTA advisors at the CMS was one of the primary supply chain activities in FY 2021. The technical advisors arrived in March 2021 and were in place through September 2022. The focus was to develop the capacity of the CMS team on the appropriate operations of the warehouse while putting in place a sustainable management system that will enable the warehouse to operate efficiently. During 2021, PMI supported the development of a CMS Business and Sustainability Plan, reinforced security measures at CMS, and supported development of a CMS website. In addition, CMS staff were trained on mSupply (CMS's warehouse management system) and standard operating procedures were developed and staff trained in their use. Warehouse temperature and humidity monitoring was instituted and performance metric reporting was established with PMI support.
- **Quantification and Malaria Commodity Stock Status Review:** PMI supported the quantification of malaria commodities with the NMCP and malaria stakeholders. To monitor the availability and use of malaria commodities in the country, PMI continued to work with the NMCP to review malaria commodity stock status and coordinate with the Global Fund to fill any gaps and avoid stockouts. This included working with the NMCP on the transition to AL as the first-line ACT.
- **eLMIS:** Another of PMI's principal supply chain investments aimed at improving malaria commodity data reporting. PMI provided technical

assistance to strengthen the eLMIS for supply chain data visibility, including timely reporting and improving data quality. In conjunction with these interventions, the eLMIS reporting rate remained above 93 percent in FY 2021, while timeliness of reporting ranged from 53 to 73 percent of facilities (see Figure 10). Despite the high reporting rates, data quality remains a challenge. For example, discrepancies between the eLMIS data (consumption of commodities) and HMIS data (malaria services) are still observed. In Figure 11, the malaria RDT consumption is less than the number of patients tested. ACT (ASAQ and AL) consumption is higher than the number of confirmed malaria cases. PMI is working with the NMCP to investigate this further.

Figure 10. Malaria Electronic Logistics Management Information System Reporting Rate and Timeliness

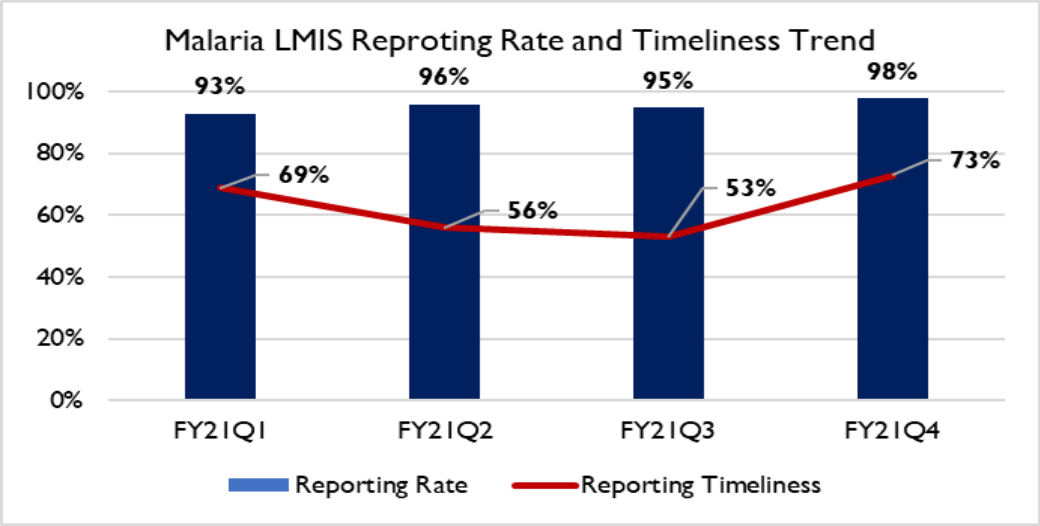
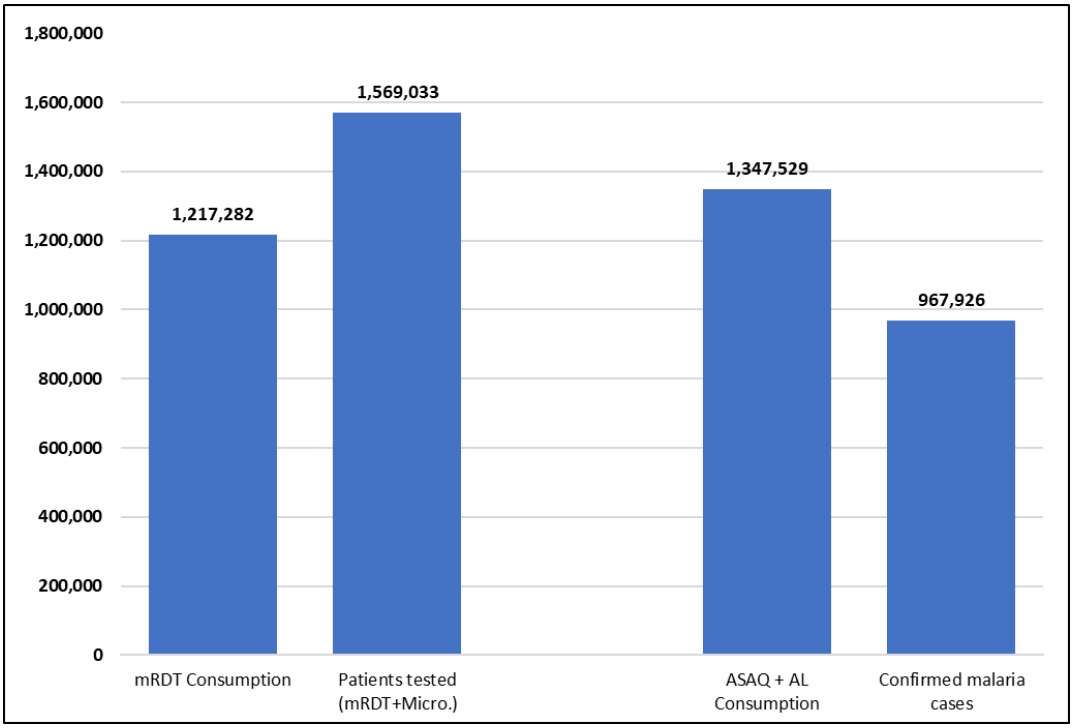


Figure 11. Reported Rapid Diagnostic Test Consumption and Suspected Malaria Cases Tested and ACT Consumption and Confirmed Malaria Cases in 2021



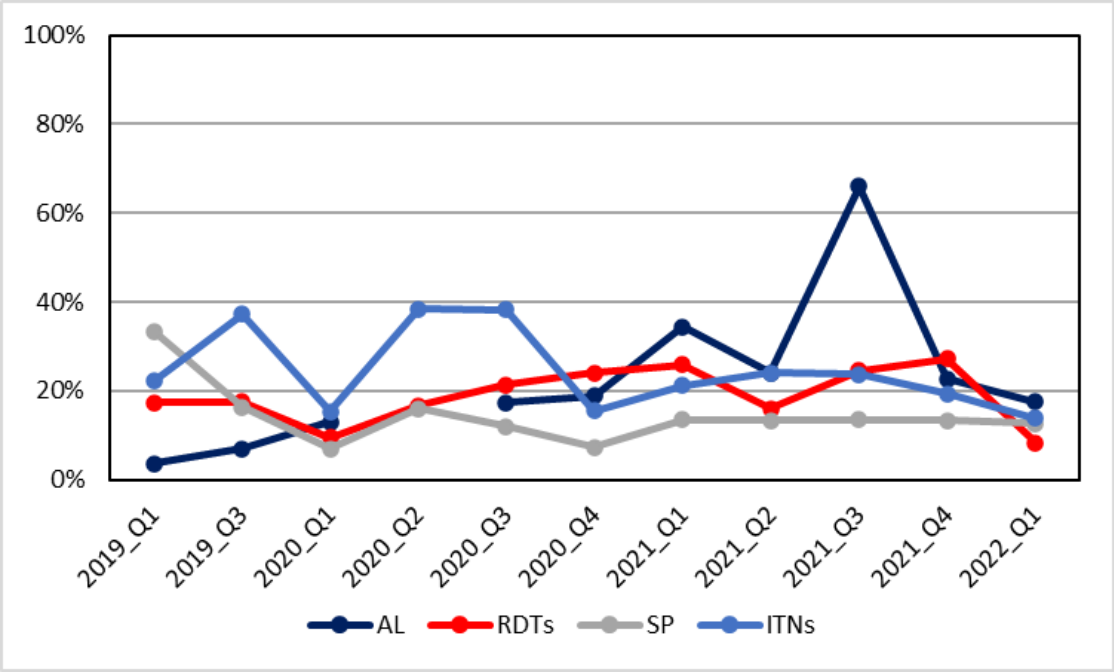
- **ITN Procurement and Distribution:** PMI continued to provide support to the NMCP for the procurement and bi-annual last-mile delivery of continuous ITNs to health facilities across the country and storage at General Services Agency in Monrovia. PMI supported the implementation of the national ITN mass distribution campaign conducted in 2021. The support to the NMCP included coverage of the national technical assistance role and other logistics support functions. PMI supported the NMCP and Ministry of Education to establish and provide logistical support for the school-based distribution channel following the mass campaign, which was launched in December 2021.
- **LMHRA Strategy and Planning:** PMI supported the LMHRA to draft seven regulations and assisted LMHRA to develop a five-year strategic plan (2021–2025). PMI also supported LMHRA to conduct a human resource assessment and to develop a new post-market surveillance protocol. PMI supported the LMHRA quality control lab to purchase equipment and reagents and to develop a sustainable costing model for lab testing, a quality manual, and 36 standard operating procedures. PMI is supporting capacity-building of LMHRA inspectors, as the regulatory authority, on good manufacturing practices (GMPs).

- **Support to Local Manufacturing:** PMI supported Global Pharmaceutical Limited, a local pharmaceutical manufacturer, on the implementation of GMP in preparation to begin manufacturing pharmaceutical products, including active pharmaceutical ingredients for antimalarials in Liberia. A GMP gap assessment was conducted in 2021.

County and Facility Levels

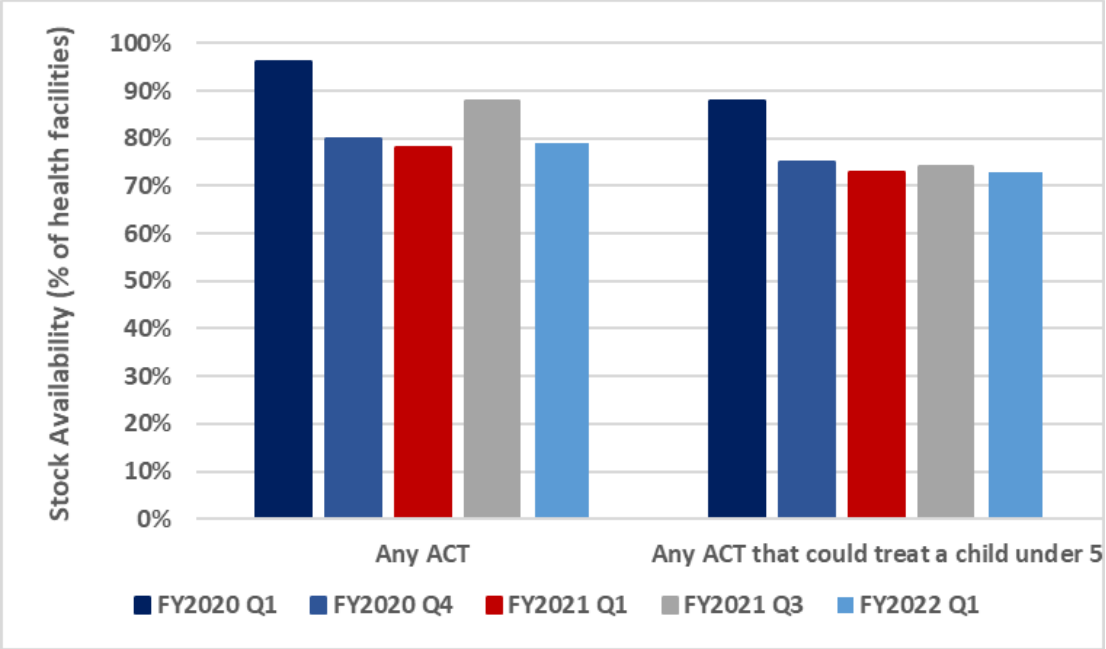
- **Mentorship and Supply Chain Data Management and Visibility:** PMI provided mentorship through the LMAs to the CHTs and health facilities to improve inventory management and reporting. PMI continued to support the LMAs to work with the CHTs and health facilities to support supply chain data visibility through the eLMIS, including mentorship support to improve quality of the LMIS data being collected and used for decision-making. The LMAs supported inventory monitoring at the county depots (review of 138 inventory reports) and coordinated reverse logistics and commodity redistribution. The LMAs visited 770 health facilities in 2021, mentored 1,720 health care workers on supply chain record keeping, and supported 203 hospital storeroom inventory counts.
- **Coordination:** The LMAs facilitated over 80 monthly supply chain TWG meetings at the county level during 2021.
- **Improved County Depot Storage Areas:** PMI supported minor upgrades at eight county depot warehouses (Bong, Bomi, Grand Bassa, Grand Cape Mount, Gbarpolu, Maryland, River Cess, and Sinoe) and two hospital storerooms with shelves and cooling systems to improve storage conditions at the county depots.
- **Malaria Commodities Stockout Reduction Initiative:** PMI built off the investment plan developed as part of the implementation of PMI's stockout reduction initiative to improve commodity availability at service delivery points. As seen in Figure 12, commodity stockouts fluctuated over the past three years, with high stockouts (approaching 40 percent) of ITNs in 2019 and 2020, which reduced to about 20 percent in 2021 and 2022. AL stockouts also fluctuated due to the transition from ASAQ to AL and delays in delivery. PMI is working with the NMCP and the chief medical officer to push out the remainder of the ASAQ before it expires and to adjust the policy to allow health facilities to use any of the AL weight bands in stock to treat patients. Figure 12 only reflects AL, but when factoring in ASAQ, the stockouts are not as severe, given that over 78 percent of facilities had an ACT and over 73 percent had an ACT that could be used to treat a child under five years of age (see Figure 13).

Figure 12. Stockout Rate of AL, Rapid Diagnostic Tests, SP, and Insecticide-treated Mosquito Nets in Health Facilities



Source: eLMIS data as reported in the GHSC-PSM quarterly reports

Figure 13. ACT (Combining AL and ASAQ) Availability at Visited Health Facilities



Source: EUV surveys

- **EUV**) **Survey:** PMI in collaboration with the NMCP conducted two EUVs in 2021. The EUV continues to serve as a spot-check opportunity to monitor availability of malaria commodities at the service delivery points and at the county depots.
- **Post-market Surveillance and Investigation of Diversion of Malaria Commodities:** PMI supported post-market surveillance of malaria commodities in five counties, testing 303 malaria and maternal and child health samples across public and private facilities. PMI supported additional activities to assess diversion of donor-procured commodities.

5.3. Plans and Justification with FY 2023 Funding

PMI plans to maintain the funding level for health supply chain and pharmaceutical management compared to FY 2022. The FY 2023 funding tables contain a full list of health supply chain and pharmaceutical management systems strengthening that PMI proposes to support in Liberia with FY 2023 funding. Please visit www.pmi.gov/resources/malaria-operational-plans-mops for these FY 2023 funding tables.

Despite numerous advances in the supply chain in Liberia, challenges remain in the manifestation of frequent stockouts of commodities, large stockpiles of overstocked/expired commodities, and lack of visibility of commodities in the supply chain system. PMI will continue to support the NMCP and DPS in Liberia with supply chain strengthening activities and ensuring commodity security. PMI will continue to build off the investment plan developed as part of PMI's Stockout Reduction Strategy to reduce and maintain stockouts to less than 10 percent across malaria commodities. With FY 2023 funding, PMI will support implementation of the new Supply Chain Master Plan developed in 2022 with Global Fund support. The current approach of intensive technical assistance with four PMI-supported staff embedded at the CMS will end in September 2022. PMI is working with the broader USAID health team, MOH, and partners to determine what form the support will take after September 2022. There will be a shift from providing external technical assistance to a greater emphasis on building local staff/institution capacity. The below activities will fit into this approach:

- PMI will work with the MOH and DPS to improve the Supply Chain Management Unit's and CMS's leadership, governance and ownership of the supply chain in Liberia as this has been identified as a clear area of need.
- Key additional support areas will include malaria commodity quantification (including the use of the Quantification Analytics Tool), improving eLMIS data quality, and bi-annual EUV surveys. PMI will support GS1 when the DPS is ready to move forward with this.

- PMI will continue to support last-mile distribution of continuous ITNs to health facilities for ANC visits and institutional delivery as well as school distribution. PMI will also support emergency distribution of other non-ITN malaria commodities to complement the first-mile distribution Global Fund is funding through World Food Program and last-mile distribution Global Fund is funding through direct support to the CHTs.
- PMI will continue to support the supply chain coordination forums at the county level to improve commodity data visibility and enhance supply chain decision-making that will improve commodity availability at health facilities. Support will continue to be provided for capacity-building and mentorship to health facilities on accurate utilization of supply chain tools for inventory management at the health facilities.
- PMI will contribute commodities to the CHA commodity kits system being piloted in 2022 with Global Fund co-impact funding. The pilot will take place in 2022 starting in Bomi and Margibi counties. PMI will monitor the outcomes of the pilot and consider funding future work in this area if successful. Additional support to the community level will also be based on outcomes of the community supply chain benchmarking work being conducted by PMI in 2022.
- PMI will continue to support the LMHRA to implement its new strategic plan 2021–2025, including the development of an appropriate staffing structure. PMI will also support LMHRA to review its ACT policy to align the LMHRA Law with the African Union Model Law on medical products regulation. LMHRA lab analysts will also be trained to perform quality control techniques that will enable the lab to perform a comprehensive range of tests required by compendial monographs. PMI will also support the National Metrology Infrastructure.
- PMI will support Global Pharmaceuticals Ltd., a local pharmaceutical manufacturer, in GMP and dossier compilation to enhance production of quality assured medicines of public health importance, including antimalarials.
- PMI will continue to support post-market surveillance of malaria commodities, expanding to the 15 counties; it will further investigate the scope and breadth of the diversion of malaria commodities and will establish interventions to address the diversion of malaria commodities to the medicine stores and open markets, working with the office of the inspector general as needed.

6. SBC

6.1. PMI Goal and Strategic Approach

PMI's goal is to support the NMCP's SBC to reach its strategic plan objectives 2021–2025. PMI strategic approaches include: 1) capacity strengthening; 2) design and implementation; 3) coordination with service delivery; and 4) monitoring and evaluation

(M&E) at all levels of the health care system. PMI supports capacity-strengthening efforts related to the design, implementation, monitoring, and evaluation of SBC activities. Capacity-strengthening activities are directed toward NMCP staff and subnational health staff, implementing SBC activities at national, county, district, and community levels.

PMI's SBC support is achieved through data driven coordinated communication and non-communication interventions deployed across 12 of the 15 Liberian counties. The remaining three counties are supported by the Global Fund and World Bank. PMI support prioritized the three behaviors below:

1. Improving access and maintaining use and care of ITNs.
2. Missed opportunities for IPTp3 in health facilities.
3. Prompt care-seeking for fever for children under five years of age.

Through partnerships with county and district health teams, local media organizations, community-based organizations, community advocacy leaders, and health facility and community-based service providers, PMI supports the NMCP's efforts for advocacy, community awareness, and community mobilization aimed at increasing correct and consistent ITN use and care, prompt care-seeking for fever, increasing malaria testing before treatment above 95 percent, and improving IPTp coverage. PMI support also targets service providers at health facilities and in the community to improve provider adherence to guidelines and protocols. PMI is currently supporting ongoing efforts to review and estimate the cost of a five-year SBC implementation plan aligned with the 2021–2025 SBC strategy and National Malaria Strategic Plan. At the county and district levels, PMI continues to support the implementation of the national SBC Strategy to address local contexts, develop work plans and materials, and support partner coordination efforts.

PMI support for SBC targets several audiences that include policy makers, county administrators, facility- and community-based service providers, community leaders, and the community as a whole. PMI supports several communication channels, namely, mass and social media, community dialog, and interpersonal communication.

6.2. Recent Progress (between January 2021 and December 2021)

Liberia SBC activities actively resumed in 2021 after being delayed in 2020 due to COVID-19 lockdown and restrictions. SBC activities supported and implemented in 2021 are detailed below:

- Supported the dissemination and implementation of the SBC strategy at the national and subnational levels.

- Provided technical support to the NMCP to draft the SBC activities for the 2021 Global Fund COVID-19 Response Mechanism application that mobilized an additional $650,000 toward SBC activities for Liberia.
- In collaboration/partnership with the UL-PIRE, conducted the first Liberia Malaria Behavior Survey (MBS) in six counties (Lofa, Bong, Nimba, Montserrado, Grand Bassa, and Margibi) and Greater Monrovia. The final report will be disseminated in August 2022. The MBS study will provide baseline information for the behavioral and communication objectives as well as information to support the update of the SBC strategy and programing.
- Developed the capacity of CHAs and CHVs to serve as change agents for positive behaviors at the community level.
- Supported the communication plan for SBC activities for the 2021 ITN mass distribution campaign that included addressing rumors that related COVID-19 to the new dual AI ITNs. PMI supported the airing of SBC messages on various channels, including mass and social media as well as in community meetings compliant with COVID-19 safety measures. The CHAs and CHVs contributed to mobilizing communities to receive the nets and provided messages on caring for the net and use.
- Supported the SBC activities for the first Liberia school-based ITN distribution program in Montserrado and Bong Counties, covering 127 schools in 26 school districts (Montserrado County) and 95 schools in 9 school districts (Bong County).
- Supported the NMCP and CHTs in planning, implementation, coordination, and monitoring of SBC activities. This included support for the central and county SBC TWGs.
- Supported SBC activities using various channels like mass media, social media, community dialog, advocacy meetings, and interpersonal communication. All SBC-related meetings and community mobilization activities observed COVID-19 safety measures.
- Supported two global awareness days: World Malaria Day on April 25 with the theme of “Zero Malaria.”
- Supported SBC routine activities in the counties that included:
    - Interpersonal communication and group health education sessions for clients at health facilities, targeting ANC, malaria testing and treatment, and IPTp.
    - Interpersonal communication targeting health workers to test before treatment, complying with malaria test results, rational use of ACTs, and addressing missed opportunities for IPTp and ITNs.

    - House-to-house and outreach visits by CHAs and CHVs using SBC materials (print) to engage with communities and provide health education and risk communication.
    - Town hall meetings with communities and monthly advocacy and sensitization meetings by CHTs targeting local leaders and change agents (youth, women, teachers, religious leaders, and traditional healers).
    - Extended airing of SBC messages on numerous radio stations and mass and social media.

In addition, Liberia continues to face the following challenges that require greater SBC investments to improve the uptake and/or maintenance of priority behaviors:

- **ITNs:** DHS 2019–2020 shows high net access:use ratio but ITN access is low at 40 percent. Net access is still below the national target of 80 percent. Using SBC approaches for demand creation to improve access, consistent use, and proper care of the net through available channels will contribute to achieving national targets.
- **MIP:** The 2019–2020 DHS shows a high ANC coverage of at least one ANC visit of 89 percent, a high ANC visit during the first semester of 71 percent and ANC4 attendance of 87 percent. However, the 2019–2020 DHS shows a low IPTp3 coverage of 40 percent, and the HMIS shows IPTp3 coverage of 56 percent. The policy, structural, and environmental factors contributing to the high IPTp1-IPTp3 and ANC4-IPTp3 gap of 45 percent need urgent attention. PMI in collaboration with the University of Liberia School of Public Health is assessing the barriers to IPTp3 uptake, the finding will help to develop appropriate SBC approaches to bridge the gap between ANC4 visits and IPTp3 uptake through targeting clients and providers.

Although the HMIS is showing an upward trend of pregnant women who receive an ITN during the first ANC visit and at delivery, some women still do not get the nets as per NMCP guidelines. The HMIS shows that 84 percent of pregnant women received ITNs during the first ANC visit and 90 percent of the women that deliver at health facilities receive an ITN.

- **Case Management:** DHS 2019–2020 shows 81 percent of children who had a fever within two weeks before the survey sought advice or treatment but only 48 percent of these were taken for advice or treatment the same or next day. PMI is supporting the use of targeted SBC approaches for service providers and clients to promote early fever care-seeking to reduce severe cases and to reduce the probability for self-medication and risk of taking ACT without obtaining test results.

- **Service Delivery:** The high IPTp1-IPTp3 gap as well as the 47 percent ANC4-IPTp3 gap point to barriers that could include health workers attitudes and practices that require continued PMI investment. The ongoing IPTp barrier study and MBS will identify issues associated with both clients and providers behavior toward care-seeking and provision of care. PMI will use these results to support SBC activities directed to improving service provider behaviors including addressing service providers bias, improving interpersonal communication and counseling skills, improving empathy toward clients, and improving adherence to national malaria guidelines.

6.3. Plans and Justification with FY 2023 Funding

The FY 2023 funding tables contain a full list of SBC activities that PMI proposes to support in Liberia with FY 2023 funding. Please visit www.pmi.gov/resources/malaria-operational-plans-mops for these FY 2023 funding tables. Liberia is implementing an integrated SBC portfolio with funding from various USAID funding streams that include PMI, MCH, population, and Global Health Security Agenda funds; as well as other funding from especially the Global Fund and World Bank for the three World Bank–supported counties.

Priorities
With FY 2023 funding, PMI will support the following priorities.

While PMI supports SBC activities that promote the uptake and maintenance of all key malaria interventions, the following three behaviors will be prioritized with FY 2023 funds:

1. Improving access and maintaining use and care of ITNs.
2. Missed opportunities for IPTp3 in health facilities.
3. Prompt care-seeking for fever for children under five years of age.

PMI supports the NMCP with the planning, design, and implementation of SBC interventions that promote the uptake and maintenance of all key malaria activities as indicated below.

Table 3. Priority Behaviors to Address

Behavior	Target Population	Geographic Focus	Programming to Address Behavior
Improving access to and maintaining use and care of ITNs	Community, community leaders, pregnant women, teachers, students, caretakers of children, health workers at ANC and delivery sites	National and all 15 counties	• PMI will support SBC activities to improve demand, access, and consistent use of ITNs distributed through the various channels such as mass distribution campaigns and the alternate routine distribution channels such as school net distribution. • The SBC activities will include informing the communities of the net distribution channels, distribution points during campaigns and school net distribution, mobilizing the community to collect the nets during the campaign days and during school net distribution, and informing pregnant women to request a net at first ANC and after delivering at a health facility. • Post-campaign and post-distribution SBC activities will focus on maintaining net use and care. Based on the results of 2022 MIS, PMI will revise the SBC strategy and interventions to address any ITN access and consistent net care and use gaps.
Missed opportunities for IPTp3+ in health facilities	Pregnant women, spouses, in-laws, service providers	12 counties (Bomi, Bong, Grand Bassa, Grand Cape Mount, Grand Gedeh, Grand Kru, Lofa, Margibi, Maryland, Montserrado, Nimba, and River Gee)	• PMI will advocate and support the NMCP and the MOH Family Health Division to adopt the 2016 WHO guidelines that promote eight ANC contacts during pregnancy. • Develop an SBC plan for the newly introduced IPTp outreach program • Strengthen the IPTp referral for the CHAs • Introduce SMS-based IPTp3 reminders for health workers

Prompt care-seeking for fever for children under five years of age	Community, community leaders, caretakers of children, community health workers, health workers, and other service providers	15 counties	• SBC activities will include promoting early care-seeking behaviors, testing before treatment, and community and health worker adherence to both negative and positive malaria test results by:
			  • Supporting the CHAs and CHVs to conduct health education and communicate the risks associated with late health seeking.
			  • Supporting community dialogs using community change agents and individual testimonials
			  • Creating awareness on the dangers of self-medication and the presence of counterfeit and substandard medicines in the market.

Additional Support Activities

- Currently, Liberia is implementing several studies and surveys that will provide information on the specific behaviors. They include the MBS, the IPTp barrier study, and the 2022 MIS. These studies will provide information on the behavior and communication behaviors and will form a basis for revision of the 2021–2025 SBC strategy. The annual Knowledge, Attitude and Practices studies will also provide information on the outputs/outcomes of the SBC interventions and will be used to identify gaps for SBC investment.
- FY 2023 funding will be used to bolster the country's capacity for SBC design, implementation, monitoring, and evaluation at central, county, and community levels. There is a need for continued SBC capacity strengthening with increased level of effort with the NMCP and CHTs for the planning, design, implementation, and evaluation of SBC activities PMI will continue to:
    - Coordinate SBC activities at the national and county levels through targeted support to improve the effectiveness of the SBC TWG.
    - Strengthen capacity of malaria key players, stakeholders, and PMI implementing partners for effective SBC design, implementation, and evaluation.
    - Develop the capacity of NMCP to use data for SBC programming and streamline SBC indicators for the 2021–2025 NSP.
    - Support county-specific SBC focal persons to increase coordination and ensure the impact of SBC investments; strengthen capacity of key players and stakeholders for effective SBC design, implementation, and evaluation; and implement capacity-building for NMCP staff on the use of data from operational studies to inform SBC program priorities and strategies.
    - Review the National Malaria SBC Strategy to include results from the MBS, MIS, and other operational research (OR) and develop and operationalize SBC materials to support priority behaviors like: ITN access and use, improvement of IPTp3+ coverage, correct testing before treatment among providers, and early care-seeking for fever. PMI will support the dissemination and implementation of the National Malaria SBC Strategy at all levels.
    - Support the development and costing of a five-year operational plan for NMCP first National Malaria SBC Strategy (2021–2025) after its review.
    - Support the NMCP and the health promotion division to use the results from the MBS, MIS, and other performance evaluations to revise malaria SBC messages and materials (audio, social media, and interpersonal communication).

- Support SBC for ITNs distributed through various channels, including mass campaign nets and nets distributed through health facilities and schools. This includes finalizing the SBC plan for the school-based ITN distribution program.
- Improve service providers' behaviors to include addressing service provider's bias before, during, and after care-seeking for malaria prevention and treatment services. Improve interpersonal communication and counseling skills to improve empathy toward patients.
- Support NMCP to ensure availability and proper use of malaria SBC tools (malaria counseling tools, job aids, talking points for health talks, etc.) in all supported facilities.

7. SM&E

7.1. PMI Goal and Strategic Approach

PMI's objective is to support the NMCP to build staff capacity to conduct surveillance as a core malaria intervention using high quality data from routine health information systems and surveys and to support SM&E activities which align with the NMCP's NSP 2021–2025. PMI and the NMCP have prioritized interventions such as routine surveillance data collection, printing of registers and reporting forms, supporting of quarterly data review meetings to increase data use at each level of the health care system, and producing quarterly bulletins.

7.2. Recent Progress (between January and December 2021)

PMI supported the following activities at the central level:

- An LTTA advisor seconded at the NMCP to support malaria SM&E capacity development. The LTTA advisor developed a transition plan with some activities like production of the quarterly report transitioning to the NMCP and training, mentoring, malaria data review, and information dissemination transitioning to another implementing partner. Going forward the PMI team and M&E officers for PMI-funded implementing partners will continue to provide targeted technical assistance to the NMCP to strengthen its SM&E capacity.
- Implementation of entomological surveillance to describe malaria vector population and insecticide resistance monitoring at supported sentinel sites.
- In collaboration with the central MOH, implementation of routine monitoring of ITNs, IPTp coverage, TPR, new malaria cases, malaria death, etc. These data are used to guide malaria control activities.
- Training/orientation of 34 M&E officers and supervisors at the central level.

- Ongoing planning of the MIS 2022, data collection scheduled for the second half of 2022, use of routine surveillance data to guide malaria commodities quantification in 2021, and the implementation of two EUV surveys.

PMI supported the following activities at the county and district levels:

- Held a total of 48 quarterly malaria data quality review meetings in 12 districts.
- Conducted EUV surveys in 15 counties covering 13 county depots.
- Provided 16 laptops to MFPs and M&E staff to facilitate data recording, aggregation, and transmission through DHIS2.
- Conducted refresher training for 207 county MFPs and SM&E officers.

PMI supported the following activities at the health facility level:

- Printed and distributed 19,704 HMIS forms to 821 health facilities, distributed the reusable health facility key indicator wall chart (dashboard) to 101 health facilities as well as 365 technical guidelines to 365 health facilities. In addition, provided copies of the updated malaria technical guidelines and job aids to 133 private health facilities.
- Conducted data quality review at 104 health facilities.
- Conducted EUV surveys at 173 health facilities.
- Conducted quarterly JISS visits at 541 health facilities in 12 out of 15 counties.
- Oriented/trained supported health facility staff on how to use data collection tools and forms to improve patient data recording and monthly data aggregation before transmission through the DHIS2.

Key Country Challenges

- **End of the LTTA Support to the NMCP:** After five years, the NMCP will be without an LTTA advisor; a transition plan has been developed to continue supporting the NMCP.
- **Global Fund Support:** Pending a Global Fund audit report and the signature of its new grant, it is not clear how the new Global Fund grant will support the M&E activities in the year to come.
- **M&E Officers/Data Clerks Limited Computer/Internet Access:** There is very limited computer access and/or electricity and internet at most of the health facility, district, and even county levels. As a result, monthly data reports rely heavily on paper forms and are transmitted from health facilities to districts and/or counties for data entry into DHIS2, increasing the risk of data entry error during the process.

- **Limited Focus:** PMI SM&E support for tools and forms development and distribution target all the 15 counties of Liberia, while staff training, quarterly data review and direct support only focus on 12 counties.

7.3. Plans and Justification with FY 2023 Funding

The FY 2023 funding tables contain a full list of SM&E activities that PMI proposes to support in Liberia with FY 2023 funding. Please visit www.pmi.gov/resources/malaria-operational-plans-mops for these FY 2023 funding tables.

Liberia will continue to support SM&E activities as described in the **Recent Progress section** with the following changes:

- Discontinuation of the LTTA to the NMCP: PMI ended its LTTA support to the NMCP in March 2022. Over the past five years, the embedded LTTA advisor to the NMCP helped build and strengthen malaria SM&E capacity and promoted data review and use. Plans to transition supported activities to NMCP and other partners are under way.
- PMI/Liberia is establishing collaboration with the FETP to introduce a malaria curriculum module. In addition, PMI will provide funding to train three frontline fellows starting in CY 2023. This will be an additional opportunity to develop the NMCP surveillance capacity. The collaboration will be an opportunity to increase FETP fellows' awareness on malaria epidemiology, burden, and control activities in Liberia before their graduation.

Planned Activities
With FY 2023 funding, PMI will continue to support the following:

- Ongoing routine surveillance activities and special surveys (e.g., routine data collection and transmission through DHIS2 from counties to the national HMIS, IG2 net streamline durability monitoring at 36 months, EUVs across the country, etc.).
- With the MOH, PMI will support data quality assurance and supportive supervision to improve DHIS2 data reporting. This activity will be addressed jointly with the Global Fund.
- Promotion of data review meetings at county, district, and health facility levels to promote quality data collection, recording, aggregation, presentation, and data use.
- Training/retraining and mentoring of M&E officers, data clerks, and MFPs, mainly at health facilities and districts in the 12 supported counties.
- Follow up on findings from MIS 2022.

Table 4. Available Malaria Surveillance Sources

Source	Data Collection Activity	2020	2021	2022	2023	2024	2025
Household Surveys	Demographic and Health Survey	X					P*
Household Surveys	Malaria Indicator Survey			P			
Household Surveys	Multiple Indicator Cluster Survey						
Household Surveys	Expanded Program on Immunization Survey						
Health Facility Surveys	Service Provision Assessment						
Health Facility Surveys	Service Availability Readiness Assessment survey						
Health Facility Surveys	Other Health Facility Survey		*X		*P		
Malaria Surveillance and Routine System Support	Therapeutic Efficacy Studies			P		P	
Malaria Surveillance and Routine System Support	Support to Parallel Malaria Surveillance System						
Malaria Surveillance and Routine System Support	Support to Health Management Information System	X	X	X	P	P	P
Malaria Surveillance and Routine System Support	Support to Integrated Disease Surveillance and Response						
Malaria Surveillance and Routine System Support	Electronic Logistics Management Information System	X	X	X	P	P	P
Malaria Surveillance and Routine System Support	Malaria Rapid Reporting System						
Other	End-Use Verification Survey	X	X	P	P	P	P
Other	School-based Malaria Survey						
Other	Knowledge, Attitudes and Practices Survey; Malaria Behavior Survey (MBS)			X			
Other	Malaria Impact Evaluation		X		P		
Other	Entomologic Monitoring Surveys	X	X	P	P	P	P

*Asterisk denotes non-PMI funded activities; X denotes completed activities; P denotes planned activities.

8. OR and PE

8.1. PMI Goal and Strategic Approach

The NMCP Surveillance, Monitoring, Evaluation, and Operational Research unit is composed of subunits—SM&E and OR), and is responsible for planning and conducting OR studies in collaboration with other NMCP focal points and partners. An overarching strategic objective for the NMCP is to contribute to the knowledge of malaria epidemiology in Liberia. The current NSP places further emphasis on the strengthening and improvement of the national surveillance system data quality to drive decision-making and using OR to bridge any implementation gaps.

The NMCP, MOH, PMI, and other partners have an inventory of OR/PE activities, which is updated annually and used to set an annual research agenda. Emerging research areas include studies on barriers to uptake of MIP services and factors influencing the periodic regional changes observed in malaria prevalence. Additional studies may be identified on emerging issues as the need arises.

PMI will continue to provide technical assistance to identify priority OR/PE topics.

8.2. Recent Progress (between January 2021 and March 2022)

Since January 2021 to now, PMI and the NMCP have been supporting the following PE activities:

- Assessment of barriers to the uptake of the IPTp services in ANC settings in Liberia (MOP FY 2019 funding); PMI worked with an implementing partner and the School of Public Health of Liberia to conduct this study. The data collection is completed and data cleaning is under way. A final report will be available around mid-2022.
- MBS (MOP FY 2019 funding); PMI worked with another implementing partner and a public university to conduct this study. The data collection is completed and cleaning is under way. The final report will be available some time after mid-2022.
- Quality of malaria RDTs performed at primary health facilities and in the community (MOP FY 2020 and FY 2021 funding). Study timeline is dependent upon revision and approval of the concept note currently under development.

Table 5. PMI-funded Operational Research/Program Evaluation Studies in Liberia

PMI/Liberia currently has no ongoing OR. PE activities currently under way are shown in the table below.

Recently Completed OR/PE Studies	Status of Dissemination	Start Date	End Date
N/A			
N/A			
Ongoing or Planned OR/PE Studies**	**Status**	**Start Date**	**End Date**
Assessment of barriers to the uptake of the IPTp services in ANC settings in Liberia, MOP FY 2019 funding	Data collection completed Mar. 2022 Data cleaning in progress	Nov. 2021	2022
MBS with FY 2019 funding	Data collection completed	Nov. 2021	2022
Malaria RDT, with FY 2020 and FY 2021 funding	Updating/revising of a previously submitted concept note is under way.	TBD	TBD

Table 6. Non-PMI-funded Operational Research/Program Evaluation Studies Planned/Ongoing in Liberia

Ongoing or Planned OR/PE Studies	Status	Start Date	End Date
NIH *Plasmodium falciparum* Transmission Blocking Project	Data collection in progress	2020	2024

8.3. Plans and Justification with FY 2023 Funding

No OR activities are proposed with FY 2023 funding.

9. Capacity Strengthening

9.1. PMI Goal and Strategic Approach

Objective 4 in the Liberia National Malaria Strategic Plan 2021–2025 is to strengthen and maintain NMCP capacity for program management, coordination, and partnership for effective management of the malaria control program at all levels. A high priority of the NMCP is to increase the quality and performance of its staff, particularly in terms of their managerial and supervisory capacity.

PMI's objectives align with those of the MOH and the NMCP. PMI supports the decentralization of services by providing support and technical assistance at the central level as well as to the 15 counties through support to the CHTs. PMI supports a broad array of health systems strengthening (HSS) activities that cut across intervention areas, such as strengthening in-service training of health workers, supply chain management, health information systems, regulation of health services and

pharmaceuticals, and capacity-building of the NMCP and other relevant MOH departments as well as that of CHTs and supervisors to monitor and improve the quality of malaria interventions in the health system. PMI supports strengthening NMCP relationships with various MOH units and agencies such as the National Public Health Institute of Liberia and LMHRA.

Currently, PMI and the World Bank together support all 15 counties in Liberia to include all core interventions except IRS. The World Bank uses performance-based financing to support CHTs in Gbarpolu, River Cess, and Sinoe counties. In the remaining 12 counties, PMI uses implementing partners and G2G support for HSS activities, malaria case management, and MIP activities.

PMI support for capacity-building and HSS are integrated with other non-malaria health services including maternal, neonatal, child, and adolescent health, nutrition, and family planning. The PMI team worked with the NMCP and partners to map partner and donor activities by county to improve coordination and avoid duplication of efforts.

9.2. Recent Progress (between January 2021and December 2021)

In the last 12 months, PMI support for HSS and capacity-building activities were tailored for each county based on the results of the 2019 CHT capacity assessment. As discussed in other sections, PMI supported training and mentoring on the use of eLMIS and the improvements in DHIS2 that resulted in updating and modifying the HMIS reporting tools and registers to address PMI and NMCP reporting needs. Additionally, PMI supported the printing of the new registers to better capture malaria data in DHIS2.

As part of capacity-building for HSS, PMI and other mission funds supported the NMCP and CHTs with health financing capacity development that has resulted in improved management and accounting for public funds, especially the funds used for the G2G malaria service delivery and last-mile distribution of commodities. Over the last 12 months, PMI supported Liberian health officials by providing guidelines and job aids to public and private hospitals, strengthened health worker skills in malaria case management at these facilities through training, as well as printed monthly reporting forms. PMI reported a rebound in the percentage of women receiving ITNs at ANC and institutional delivery compared to 2020 and a continued increase in IPTp3 over the last three years.

The COVID-19 pandemic forced the Peace Corps to halt the Stomp Malaria Program and the Peace Corps Volunteers (PCVs) departed Liberia under authorized departure. Liberia has responded and contained the COVID-19 pandemic and because of the decreasing morbidity and mortality from COVID-19, a limited number of Peace Corps response volunteers are expected to return in January 2023, with additional health and education volunteers anticipated to arrive in June/July 2023.

In 2021, the NMCP's offices moved and are now co-located with the MOH. PMI supported the furnishing of the new office and provided information technology equipment and supplies for optimal office operation. This interim space on a shared floor with the MOH EPI will allow PMI resident advisors to spend up to 50 percent of their office time at the NMCP and further develop their capacities for effective collaboration and management with the NMCP.

9.3. Plans and Justification with FY 2023 Funding

The FY 2023 funding tables contain a full list of capacity strengthening activities that PMI proposes to support in Liberia with FY 2023 funding. Please visit www.pmi.gov/resources/malaria-operational-plans-mops for these FY 2023 funding tables.

PMI will continue to support capacity-strengthening activities as described in the **Recent Progress section.** In addition, PMI will support the Stomp Malaria Program when PCVs return to Liberia in 2023. The support will target educating school-age children and teenagers on malaria prevention, mobilizing students and teachers for the school-based ITN distribution, and educating communities to use the nets properly and to search early for health care when they fall sick. PMI will support three malaria Peace Corps response volunteers and provide support for malaria education activities carried out by other volunteers.

PMI will continue to provide targeted technical assistance and capacity development to the NMCP and CHTs. FY 2023 funds will be used to support the coordination meetings, site visits to all 15 counties, and annual NMCP program review meetings. PMI will also support NMCP staff technical capacity-building including attendance at international meetings, conferences, and training courses. Additionally, PMI will support the NMCP and the Health Care Federation of Liberia to develop their capacity for coordination of the private sector under the new malaria private sector engagement strategy.

PMI will support the FETP frontline project to develop the capacities of the NMCP and CHTs in malaria SM&E. The FETP frontline is a training program for local health officials to strengthen epidemiologic capacity for health programs. PMI plans to support three Liberian health officials in FETP frontline training. The selected NMCP and CHT officials will participate in a three-month training course with both in-class training and practical field opportunities.

10. Staffing and Administration

A minimum of three health professionals oversee PMI in Liberia. The single interagency team led by the USAID mission director or their designee consists of a resident advisor representing USAID, a resident advisor representing CDC, and one locally hired expert

known as a foreign service national. The PMI interagency team works together to oversee all technical and administrative aspects of PMI, including finalizing details of the project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, reporting of results, and providing guidance and direction to PMI implementing partners.

ANNEX: GAP ANALYSIS TABLES

Table A-1. ITN Gap Analysis Table

Calendar Year	2022	2023	2024
Total country population	4,650,676	4,748,341	4,848,056
Total population at risk for malaria	4,650,676	4,748,341	4,848,056
PMI-targeted at-risk population	4,650,676	4,748,341	4,848,056
Population targeted for ITNs	4,650,676	4,748,341	4,848,056
Continuous Distribution Needs			
Channel 1: ANC	232,534	237,417	242,403
Channel 1: ANC Type of ITN	Dual AI	Dual AI	Dual AI
Channel 2: EPI	232,534	237,417	242,403
Channel 2: EPI Type of ITN	Dual AI	Dual AI	Dual AI
Channel 3: School	100,000	100,000	0
Channel 3: School Type of ITN	Dual AI	Dual AI	
Channel 4: Institutions	0	0	0
Channel 4: Institutions Type of ITN	Dual AI	Dual AI	Dual AI
Channel 5:			
Channel 5: Type of ITN			
Estimated Total Need for Continuous Channels	565,068	574,834	484,806
Mass Campaign Distribution Needs			
Mass distribution campaigns	0	0	2,821,833
Mass distribution ITN type			Dual AI
Estimated Total Need for Campaigns	0	0	2,821,833
Total ITN Need: Continuous and Campaign	**565,068**	**574,834**	**3,306,639**
Partner Contributions			
ITNs carried over from previous year	11,032	0	166
ITNs from Government	0	0	0
Type of ITNs from Government			
ITNs from Global Fund	0	0	2,821,833
Type of ITNs from Global Fund			Dual AI
ITNs from other donors	0	0	0
Type of ITNs from other donors			
ITNs planned with PMI funding	139,500	575,000	485,000
Type of ITNs with PMI funding	Dual AI	Dual AI	Dual AI
Total ITNs Contribution Per Calendar Year	**150,532**	**575,000**	**3,306,999**
Total ITN Surplus (Gap)	**(414,536)**	**166**	**360**

Table A-2. RDT Gap Analysis Table

Calendar Year	2022	2023	2024
Total country population	4,650,676	4,748,341	4,848,056
Population at risk for malaria	4,650,676	4,748,341	4,848,056
PMI-targeted at-risk population	4,650,676	4,748,341	4,848,056
RDT Needs			
Total number of projected suspected malaria cases	1,901,730	1,861,794	1,822,696
Percent of suspected malaria cases tested with an RDT	100%	100%	100%
RDT Needs (tests)	**1,901,730**	**1,861,794**	**1,822,696**
Needs Estimated based on HMIS Data			
Partner Contributions (tests)			
RDTs from Government	0	0	0
RDTs from Global Fund	0	0	0
RDTs from other donors	0	0	0
RDTs planned with PMI funding	2,250,000	2,100,000	1,900,000
Total RDT Contributions per Calendar Year	**2,250,000**	**2,100,000**	**1,900,000**
Stock Balance (tests)			
Beginning Balance	390,150	738,420	976,626
- Product Need	1,901,730	1,861,794	1,822,696
+ Total Contributions (received/expected)	2,250,000	2,100,000	1,900,000
Ending Balance	**738,420**	**976,626**	**1,053,931**
Desired End of Year Stock (months of stock)	6	6	6
Desired End of Year Stock (quantities)	950,865	930,897	911,348
Total Surplus (Gap)	**(212,445)**	**45,730**	**142,583**

Table A-3. ACT Gap Analysis Table

Calendar Year	2022	2023	2024
Total country population	4,650,676	4,748,341	4,848,056
Population at risk for malaria	4,650,676	4,748,341	4,848,056
PMI-targeted at-risk population	4,650,676	4,748,341	4,848,056
ACT Needs			
Total projected number of malaria cases	1,160,055	1,135,694	1,111,845
Total ACT Needs (treatments)	**1,160,055**	**1,135,694**	**1,111,845**
Needs Estimated based on HMIS Data			
Partner Contributions (treatments)			
ACTs from Government	0	0	0
ACTs from Global Fund	55,470	474,990	667,470
ACTs from other donors	0	0	0
ACTs planned with PMI funding	923,610	600,000	800,000
Total ACTs Contributions per Calendar Year	**979,080**	**1,074,990**	**1,467,470**
Stock Balance (treatments)			
Beginning Balance	939,750	758,775	698,071
- Product Need	1,160,055	1,135,694	1,111,845
+ Total Contributions (received/expected)	979,080	1,074,990	1,467,470
Ending Balance	**758,775**	**698,071**	**1,053,696**
Desired End of Year Stock (months of stock)	6	6	6
Desired End of Year Stock (quantities)	580,028	567,847	555,922
Total Surplus (Gap)	**178,747**	**130,224**	**497,774**

Table A-4. Inj. Artesunate Gap Analysis Table

Calendar Year	2022	2023	2024
Injectable Artesunate Needs			
Projected number of severe cases	81,204	56,785	55,592
Projected number of severe cases among children	56,843	39,749	38,915
Average number of vials required for severe cases among children	3	3	3
Projected number of severe cases among adults	24,361	17,035	16,678
Average number of vials required for severe cases among adults	9	9	9
Total Injectable Artesunate Needs (vials)	**389,779**	**272,567**	**266,843**
Needs Estimated based on HMIS Data			
Partner Contributions (vials)			
Injectable artesunate from Government	0	0	0
Injectable artesunate from Global Fund	50,000	165,450	152,452
Injectable artesunate from other donors	0	0	0
Injectable artesunate planned with PMI funding	201,947	150,000	150,000
Total Injectable Artesunate Contributions per Calendar Year	**251,947**	**315,450**	**302,452**
Stock Balance (vials)			
Beginning Balance	7,087	0	42,883
- Product Need	389,779	272,567	266,843
+ Total Contributions (received/expected)	251,947	315,450	302,452
Ending Balance	**(130,745)**	**42,883**	**78,493**
Desired End of Year Stock (months of stock)	6	6	6
Desired End of Year Stock (quantities)	194,889	136,283	133,421
Total Surplus (Gap)	**(325,634)**	**(93,400)**	**(54,929)**

Table A-5. RAS Gap Analysis Table

Calendar Year	2022	2023	2024
Artesunate Suppository Needs			
Number of severe cases expected to require pre-referral dose (or expected to require pre-referral dose based on number of providers for the service)	28,421	28,392	41,694
Total Artesunate Suppository Needs (suppositories)	5,000	5,000	5,000
Needs Estimated based on # of providers offering pre-referral services			
Partner Contributions (suppositories)			
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	0	5,000	5,000
Total Artesunate Suppositories Available	**0**	**5,000**	**5,000**
Stock Balance (suppositories)			
Beginning Balance	12,480	7,480	7,480
- Product Need	5,000	5,000	5,000
+ Total Contributions (received/expected)	0	5,000	5,000
Ending Balance	**7,480**	**7,480**	**7,480**
Desired End of Year Stock (months of stock)	6	6	6
Desired End of Year Stock (quantities)	2,500	2,500	2,500
Total Surplus (Gap)	**4,980**	**4,980**	**4,980**

Table A-6. SP Gap Analysis Table

Calendar Year	2022	2023	2024
Total Country Population	4,650,676	4,748,341	4,848,056
Total Population at Risk for Malaria	4,650,676	4,748,341	4,848,056
PMI Targeted at Risk Population	4,650,676	4,748,341	4,848,056
SP Needs			
Total Number of Pregnant Women	232,534	237,417	242,403
Percent of pregnant women expected to receive IPTp1	100%	100%	100%
Percent of pregnant women expected to receive IPTp2	80%	90%	90%
Percent of pregnant women expected to receive IPTp3	66%	75%	75%
Percent of pregnant women expected to receive IPTp4	4%	4%	4%
Total SP Needs (doses)	**581,335**	**638,652**	**652,064**
Needs Estimated based on HMIS Data			
Partner Contributions (doses)			
SP from Government	0	0	0
SP from Global Fund	0	0	0
SP from other donors	0	0	0
SP planned with PMI funding	653,333	700,000	600,000
Total SP Contributions per Calendar Year	**653,333**	**700,000**	**600,000**
Stock Balance (doses)			
Beginning balance	242,700	314,698	376,047
- Product Need	581,335	638,652	652,064
+ Total Contributions (Received/expected)	653,333	700,000	600,000
Ending Balance	**314,698**	**376,047**	**323,983**
Desired End of Year Stock (months of stock)	6	6	6
Desired End of Year Stock (quantities)	290,667	319,326	326,032
Total Surplus (Gap)	**24,031**	**56,721**	**(2,049)**