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# U.S. PRESIDENT'S MALARIA INITIATIVE

## Mozambique

## Malaria Operational Plan FY 2023

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This FY 2023 Malaria Operational Plan has been approved by the 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.

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## ABBREVIATIONS

| | |
|---|---|
| ACT | Artemisinin-based Combination Therapy |
| ANC | Antenatal Care |
| BMGF | Bill & Melinda Gates Foundation |
| CBO | Community-based Organization |
| CHW | Community Health Worker |
| CMAM | Central Medical Store |
| CY | Calendar Year |
| DHS | Demographic and Health Survey |
| DQA | Data Quality Assessment |
| FELTP | Field Epidemiology Laboratory Training Program |
| FY | Fiscal Year |
| G2G | Government-to-Government |
| Global Fund | Global Fund to Fight AIDS, Tuberculosis and Malaria |
| iMISS | integrated Malaria Information Storage System |
| IPTp | Intermittent Preventive Treatment for Pregnant Women |
| IRS | Indoor Residual Spraying |
| ITN | Insecticide-treated Mosquito Net |
| LMIS | Logistics Management Information System |
| MCH | Maternal and Child Health |
| MDA | Mass Drug Administration |
| MIP | Malaria in Pregnancy |
| MOH | Ministry of Health |
| MOP | Malaria Operational Plan |
| NMCP | National Malaria Control Program |
| NMSP | National Malaria Strategic Plan |
| OR | Operational Research |
| PBO | Piperonyl Butoxide |
| PCV | Peace Corps Volunteer |
| PE | Program Evaluation |
| PMI | U.S. President's Malaria Initiative |
| QA | Quality Assurance |
| QC | Quality Control |
| RDT | Rapid Diagnostic Test |
| SBC | Social and Behavior Change |
| SIGLUS | *Sistema de Informação de Gestão Logística das Unidades Sanitária* |
| SM&E | Surveillance, Monitoring, and Evaluation |
| SP | Sulfadoxine-pyrimethamine |
| USAID | U.S. Agency for International Development |
| WHO | World Health Organization |

## EXECUTIVE SUMMARY

To review specific country context for Mozambique, 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, the 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. Mozambique began implementation as a PMI partner country in fiscal year (FY) 2007.

### Rationale for PMI's Approach in Mozambique

Malaria is endemic in Mozambique. There were over 10 million cases in 2021, with pregnant women and young children at greatest risk for severe malaria. Despite progress by NMCP, PMI, and other partners, incidence remains high in central and northern Mozambique. Based on epidemiological trends and strategic discussions with the NMCP, PMI Mozambique revised the list of provinces for targeted service delivery support to include Nampula, Zambezia, and Manica starting in FY 2022. A lighter touch level of support to Cabo Delgado and Tete will be maintained via government-to-government agreements. Challenges to achieving malaria control include logistics of delivering commodities and services to hard-to-reach areas, insecticide resistance, and limited adherence to case management practices and care-seeking behaviors. Mozambique has experienced increased natural disasters and violent extremism, which have contributed to increased transmission and limited access to malaria services. PMI leverages investments to build the capacity of Mozambican people and institutions to achieve malaria control.

### Overview of Planned Interventions

The proposed FY 2023 PMI funding for Mozambique is $27.5 million. PMI will support the following intervention areas with these funds:

#### 1. Vector Monitoring and Control

PMI supports the National Malaria Strategic Plan (NMSP) and national integrated vector management strategy through indoor residual spraying (IRS) implementation,

entomological monitoring, and strengthening Ministry of Health (MOH)-led entomology and IRS. The following activities will be implemented with FY 2023 funds:

- Year-round entomological data collection at sentinel sites throughout the country, along with IRS residual efficacy monitoring and annual insecticide resistance testing as part of supported IRS activities.
- Direct implementation of IRS in four districts of Zambezia, which provided malaria protection to 1,408,179 inhabitants in calendar year 2021.

**2. Malaria in Pregnancy**

PMI supports the NMCP with the delivery of intermittent preventive treatment for pregnant women (IPTp) to all eligible pregnant women at all eligible antenatal care (ANC) visits in the target provinces of Nampula, Zambezia, and Manica.

With FY 2023 funds, PMI will continue to prioritize implementation of malaria in pregnancy (MIP) activities through the malaria integrated supervision platform. PMI will also continue to provide technical support at the central level by participating in the MIP technical working group. This group includes both NMCP and maternal and child health representatives.

**3. Drug-based Prevention**

PMI does not support seasonal malaria chemoprevention or other drug-based prevention in Mozambique. PMI will provide technical assistance to the NMCP and engage in stakeholder discussions regarding introduction of new World Health Organization chemoprevention interventions, as appropriate for the context.

**4. Case Management**

PMI support is aligned with the NMCP National Strategy and the case management strategy. PMI provides national-level technical assistance for all malaria interventions, but the geographic focus is limited to the provinces of Zambezia, Nampula, and Manica. The following case management activities will be implemented with FY 2023 funds:

- National level: PMI will continue to support case management activities and provide technical assistance at the central level.
- Commodities: PMI will continue to procure rapid diagnostic tests (RDTs), artemisinin-based combination therapies (ACTs), injectable artesunate, and rectal artesunate. PMI will coordinate its shipments with the Global Fund to Fight AIDS, Tuberculosis and Malaria to ensure a continued supply of malaria commodities to the country.
- Facility level: PMI will continue to support training and supervision of health workers and laboratory technicians.

- Community level: PMI will continue to support integrated community case management, community case management of malaria for older ages, and pre-referral rectal artesunate for severe malaria. In Mozambique, the World Bank supports community health worker (CHW) compensation; with the design of the new community strategy, the Government of Mozambique has created a new cadre of elementary CHWs and has approved the salary for this cadre. It is expected that the existing and future CHWs will be included in this cadre and will be paid directly by the Government of Mozambique. PMI recognizes that support of this new cadre in Mozambique demonstrates progress toward strengthening the overall health system and toward greater ownership of human resources, specifically CHWs.

**5. Health Supply Chain and Pharmaceutical Management**

In alignment with the NMCP, PMI aims to develop more effective public sector medical supplies/commodity forecasting, support for commodities and supply planning, and procurement capacity; improve public sector warehousing and distribution at all levels; improve the use of medicines and develop more effective pharmaceutical services; strengthen the central medical stores' strategic planning and management capacity; strengthen overall regulatory capacity; and reduce stockout rates over the next two years by optimizing PMI's supply chain investments.

With FY 2023 funds, PMI will continue supporting procurement, quality control, storage, and distribution of malaria commodities, and management, oversight, and physical distribution of PMI-procured ACTs, RDTs, sulfadoxine-pyrimethamine, and drugs for severe malaria.

**6. Social and Behavior Change**

PMI support is aligned with the NMCP national strategy and social and behavioral change (SBC) strategy. SBC activities are implemented through a malaria-specific intensive approach that promotes adoption and adherence of malaria prevention behaviors with an emphasis on early care-seeking behavior, adherence to clinical guidelines, and acceptance of IPTp3.

With FY 2023 funds, PMI will implement a combination of evidence-based SBC interventions through community-based organizations and community radio stations, including mass media activities and interpersonal communication activities in Nampula, Zambezia, Manica, and Cabo Delgado (media only).

### 7. Surveillance, Monitoring, and Evaluation

In Mozambique, PMI collaborates with the NMCP and the Bill & Melinda Gates Foundation in providing technical assistance and resources for surveillance, monitoring, and evaluation (SM&E) activities.

With FY 2023 funds PMI will continue to support SM&E refresher training and data quality assurance as part of the integrated supervision visits and support the roll-out of the integrated Malaria Information Storage System. Most of the support will be to the PMI focus provinces of Nampula, Zambezia, and Manica. PMI will also provide technical assistance to the central team to develop and prioritize interventions for elimination areas.

### 8. Operational Research and Program Evaluation

PMI supports the NMCP to identify and execute operational research and evaluations. There are no planned PMI-supported operational research projects.

### 9. Capacity Strengthening

PMI supports the NMCP to strengthen the Government of Mozambique staff program management skills at central, provincial, and district levels to effectively achieve the other NMSP strategic objectives. PMI's strategic approach is to support activities that improve the technical knowledge and skills of GRM government staff to design, plan, implement, and monitor health activities, leading to an overall improved capacity of government entities to implement and manage key malaria reduction activities. Technical support will be provided at the central level and in target provinces to improve the planning and coordination of malaria control activities and partners. The following activities will be implemented with FY 2023 funds:

- PMI will provide capacity building support for provincial- and district-level MOH managers for data assessment, analysis, and use in program decision-making.
- PMI will continue to provide technical and financial support for Field Epidemiology Laboratory Training Program residents in the advanced training program. Currently, two program residents are working on projects utilizing routine Health Management Information System and entomological data.
- PMI will also continue supporting Peace Corps Volunteers on malaria-related interventions at the community level.

# I. CONTEXT AND STRATEGY

## 1. Introduction

Mozambique began implementation as a U.S. President's Malaria Initiative (PMI) partner country in fiscal year (FY) 2007. This FY 2023 Malaria Operational Plan (MOP) presents a detailed implementation plan for Mozambique, 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. PMI is proposing activities that build on partner investments to improve and expand malaria-related services, including investments by the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund). This document provides an overview of the strategies and interventions in Mozambique, describes progress to date, identifies challenges and relevant contextual factors, and provides a description of activities that are 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)

The U.S. President's Malaria Initiative (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. 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 of 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:

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

2. Reduce malaria morbidity by 40 percent from 2015 levels in PMI partner countries with high and moderate malaria burden.
3. 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 COVID-19 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 Mozambique

### 3.1. Malaria Overview for Mozambique

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

Malaria is endemic in Mozambique, and the entire population is at risk of contracting the disease. Pregnant women and children under five years of age have the greatest risk of developing severe malaria. *Plasmodium falciparum* accounts for 90 percent of all malaria infections, while *Plasmodium malariae* accounts for 9 percent and *Plasmodium ovale* for 1 percent. In 2021, malaria accounted for approximately 23 percent of all outpatient consultations, with over 10 million cases diagnosed in public health facilities and communities. From 2015 to 2020, the number of reported malaria cases nationwide increased each year, but in 2021 there was a slight reduction of cases nationwide with important differences throughout the country. Gaza, Manica, Niassa, and Tete reported large decreases in cases, Maputo Cidade, Maputo province, Sofala, and Zambezia reported slight decreases, and Cabo Delgado, Inhambane, and Nampula reported increases in cases. Malaria incidence increased by 45 percent from 2015 to 2021, with 226 cases per 1,000 population in 2015 and 328 cases per 1,000 population in 2021. The number of reported hospital malaria deaths decreased from 2,337 in 2015 to 411 in 2021. Malaria prevalence among children 6 to 59 months of age remained stable from

2011 to 2018 at around 40 percent, but the prevalence of low hemoglobin in the same ages increased from 9 percent in 2011 to 14 percent in 2018. Data from the 2018 Malaria Indicator Survey showed that malaria prevalence varies across the country. Prevalence is higher in the northern and central regions (ranging from 29 percent in Sofala to 57 percent in Cabo Delgado) and lower in the southern region (ranging from 1 percent in Maputo city to 35 percent in Inhambane). Results from the 2022 Demographic Health Survey will be available in 2023.

### 3.2. Key Challenges and Contextual Factors

Despite the progress made by the NMCP in collaboration with PMI and other partners, malaria incidence remains high in the center and north of the country. Particular challenges in achieving malaria control include logistical challenges (such as poor infrastructure and high cost) associated with delivering malaria commodities and services to hard to reach areas, increasing insecticide resistance, and gaps in understanding the barriers to adherence of case management practices, prompt care-seeking behavior for persons with fevers, and adherence to IPTp.

Mozambique is prone to natural disasters such as drought, cyclones, and floods, which have likely contributed to increases in malaria transmission in recent years, particularly in low-lying coastal areas and along major rivers. In 2019, the country was devastated by back-to-back cyclones, which killed at least 600 people and damaged or destroyed at least 240,000 homes, creating recovery needs estimated at $3.02 billion. In 2022, by April, the country had already been hit by two cyclones and one tropical storm, which affected more than 300,000 people.

Additionally, since late 2017, a violent extremist group now linked to the Islamic State and known as Islamic State-Mozambique has carried out over 580 attacks against the government and civilians in Cabo Delgado. The conflict in Cabo Delgado has made it unsafe for implementing partners to support the area and for residents to seek care.

### 3.3. PMI’s Approach for Mozambique

PMI activities align with the National Malaria Strategic Plan (NMSP) by supporting vector control (IRS and entomological monitoring), case management and drug efficacy monitoring, drug-based prevention, malaria commodity procurement and distribution, and SBC activities. PMI uses an integrated approach for the control of malaria in close collaboration with other key partners such as the World Health Organization (WHO), Global Fund, and Bill & Melinda Gates Foundation (BMGF). PMI is gradually expanding its support to local partners by shifting to a model in which implementing partners provide more technical assistance and the provincial level departments of health lead implementation of activities. Support to the provincial level departments of health leading implementation activities will be through government-to-government (G2G)

agreements. With FY 2023 funding, PMI will support direct G2G agreement in Zambezia, Tete, Nampula, Cabo Delgado, and the *Instituto Nacional de Saúde*. The agreements will support IRS in Zambezia, entomological surveillance in Zambezia and Nampula, case management supervision activities in Cabo Delgado and Nampula, surveillance in Tete and Cabo Delgado, and laboratory capacity to the *Instituto Nacional de Saúde*. PMI staff and PMI implementing partners will provide technical assistance to the G2G agreements and at the central level in the provinces of Zambezia and Nampula, where PMI will be providing support through implementing partners and G2G agreements; this support will be complementary, increasing geographical coverage and technical capacity. PMI also supports Agency priorities in localization, with significant components of the new malaria flagship activity and the new SBC activity prioritizing further strengthening technical, organizational, and management capacity of local organizations. PMI also invests in strengthening the overall health system through focused work to build the leadership of NMCP, capacity building of Ministry of Health (MOH) health care worker cadres, and strengthening the national supply chain system, including the capacity of the Central Medical Store (*Central de Medicamentos e Artigos Médicos*, or CMAM) to outsource drug transport to the private sector and supply chain information systems.

### 3.4. Key Changes in this MOP

There are no significant changes in the strategies or activities proposed for FY 2023.

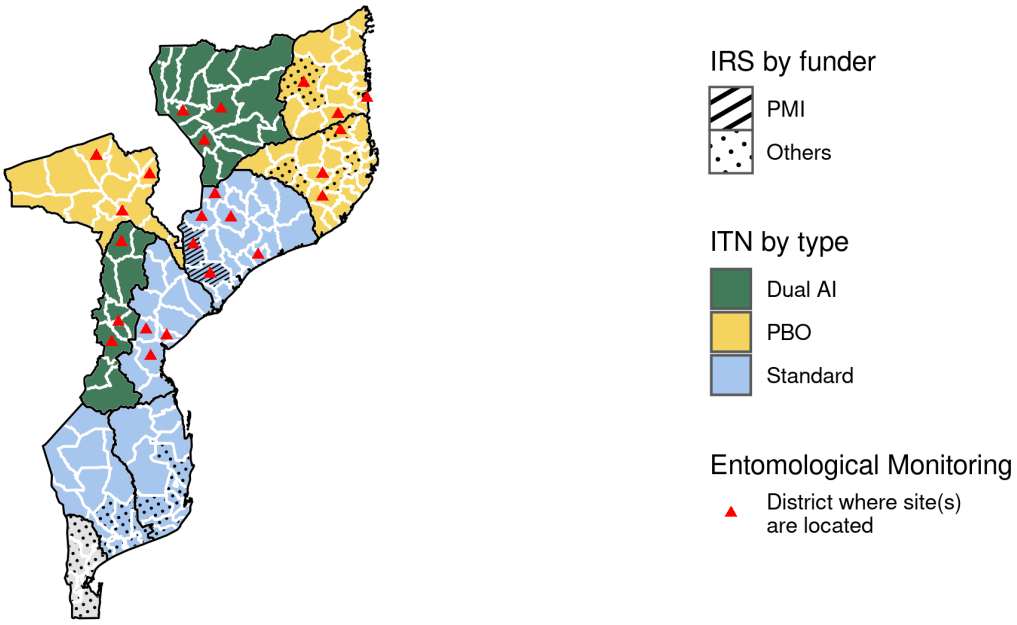
# II. OPERATIONAL PLAN FOR FY 2023

## 1. Vector Monitoring and Control

### 1.1. PMI Goal and Strategic Approach

The NMCP's objective for vector control is to provide at least 85 percent coverage of the population with a minimum of one vector control intervention in every district of the country. To achieve this objective, the NMSP promotes an integrated vector management strategy, including vector surveillance, insecticide resistance management, ITN distribution through national mass campaigns and routine distribution through antenatal care (ANC) services, larval source management, and targeted IRS to areas with pyrethroid insecticide resistance, continued high transmission, and in areas targeted for elimination. PMI supports the use of all of these interventions, with the exception of larval source management, distribution through ANC services, and interventions in areas targeted for elimination. PMI supports entomological monitoring in 34 sentinel sites in seven provinces, of which 19 sentinel sites are managed by the central mechanism (in the provinces of Zambezia and in Nampula) and the remaining 15 sentinel sites are managed by the MOH with financial support through the central mechanism (in Cabo Delgado, Niassa, Tete, Sofala, and Manica). PMI implements IRS in Zambezia and Global Fund procures the insecticide. Global Fund supports procurement and distribution of all ITNs.

**Figure 1. Map of Vector Control Activities in Mozambique for Calendar Year 2022**




The province of Zambezia has two sentinel sites in each of the districts of Zambezia and Nampula, except for Nampula City which has three sentinel sites. There is one

sentinel site per each of the three districts in the provinces of Cabo Delgado, Manica, Niassa, Sofala, and Tete.

### 1.2. Recent Progress (between April 2021 and March 2022)

- Conducted entomological monitoring in 19 sentinel sites that are managed by the central mechanism. Vector bionomics was conducted in four districts in Zambezia and three districts in Nampula, and resistance monitoring was conducted in six districts in Zambezia and three districts in Nampula. IRS quality and residual efficacy was monitored in three districts in Zambezia, where the IRS campaign was funded by PMI, and two IRS districts Nampula, where the IRS campaign was implemented by the MOH. For more information about entomological monitoring, please refer to the 2020–2021 Entomological Report.
- Provided financial support for entomological monitoring conducted by the MOH in 15 sentinel sites in three districts in Cabo Delgado, Niassa, Tete, Sofala, and Manica provinces. Resistance monitoring was conducted in 15 districts and vector bionomics was conducted in 10 districts.
- Supported the planning, implementation, and evaluation of the fifteenth year of IRS in four districts of Zambezia province, covering 319,731 structures and protecting 1,408,179 people between November 8 and December 23, 2021. For more information about the IRS campaign, please refer to the most recent End of Spray Report.
- Trained and engaged community members in four districts of Zambezia province to support IRS mobilization and spray activities. Provided technical and financial support to the MOH-led IRS campaign implemented in Nampula province, including leading a training of trainers and funding central-level supervision.
- Supported the construction of a prefabricated insectary-in-a-box in Zambezia province.
- Supported the distribution of ITNs from regional to subregional level for routine distribution at ANC (PMI did not procure ITNs in the past 12 months because ITN procurement has shifted to Global Fund support).
- Supported ITN durability monitoring by implementing 12-month data collection, monitoring the Royal Guard, OlysetPlus, and Interceptor G2 of nets from the 2020 cohort.
- Supported community-level SBC activities to improve demand for ITNs, increase appropriate use, promote proper ITN care, and mitigate against misuse. For more information, please refer to the Social and Behavior Change section.

### 1.3. Plans and Justification for FY 2023 Funding

The FY 2023 funding tables contain a full list of vector monitoring and control activities that PMI proposes to support in Mozambique 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

PMI will support provincial-level government implementation of entomological monitoring activities and residual efficacy monitoring in five PMI IRS districts in Zambezia and three MOH-led IRS districts in Nampula. PMI will continue to financially support the government's entomological surveillance program for the established sentinel sites in 15 districts in the provinces of Cabo Delgado, Niassa, Tete, Sofala, and Manica. In addition, PMI will increase entomological monitoring capacity by supporting the *Instituto Nacional de Saúde* to conduct laboratory analysis of mosquito samples and in-person technical assistance.

**Summary of Distribution and Bionomics of Malaria Vectors in Mozambique**

As of 2021, the predominant vectors in Mozambique are *Anopheles funestus* s.l. and *Anopheles gambiae* s.l. with *An. funestus* s.l. being more abundant in Zambezia and *An. gambiae* s.l. in Nampula. However, species composition is shifting within Zambezia. The most recent entomological report indicated the emerging dominance of *An. gambiae* s.l. in areas previously dominated by *An. funestus* s.l. Peak transmission season is during the rainy season from October to March. Most biting occurs around midnight and in the early morning hours for both *An. funestus* s.l. and *An. gambiae* s.l. In Nampula, biting continued outdoors for *An. funestus* s.l. and indoors and outdoors for *An. gambiae* s.l. in the hours of 5 a.m. and 6 a.m.

**Status of Insecticide Resistance in Mozambique**

In 2020, *An. funestus* s.l. was fully susceptible to clothianidin in the Maganja da Costa and Mopeia districts of Zambezia. In 2021, *An. funestus* s.l. was not tested against clothianidin in all intervention and control districts in Zambezia, but was tested against alphacy-permethrin in Maganja da Costa, pirimiphos-methyl in Milange, bendiocarb in Mopeia, and pirimiphos-methyl and alpha-cypermethrin in Morrumbala districts. Although mortality rates were low, it is difficult to interpret the resistance results because the sample size of *An. funestus* s.l. used for testing was small, as it was difficult to collect *An. funestus* s.l. in the field.

In 2022 (January–April), *An. gambiae* were susceptible to pirimiphos-methyl, clothianidin, and chlorfenapyr in Lugela, Maganja da Costa, Milange, Molumbo, Mopeia, and Morrumbala districts of Zambezia. However, resistance to bendiocarb was observed in Mopeia and resistance to permethrin was observed in Milange and Molumbo.

Resistance to pyrethroids was observed in the following testing sites in 2021 and 2022 from Zambezia: Lugela, Milange, Mopeia, Morrumbala, Molumbo, and Maganja da

Costa. Piperonyl butoxide (PBO) restored susceptibility to alpha-cypermethrin in Milange (100 percent), Maganja da Costa (94.7 percent), Lugela (82.7 percent), Molumbo (82.6 percent), and Morrumbala (97.3 percent). In Mopeia and Lugela, susceptibility was fully restored to deltamethrin and partially restored in Maganja da Costa (86.7%). Susceptibility to permethrin was restored to 99 percent in Mopeia, 96 percent in Lugela, and 76 percent in Morrumbala. In Nampula in 2021, *An. gambiae* s.l. was susceptible to bendiocarb in Mogovolas and Erati districts, while resistant in Nampula district. For pirimiphos-methyl, possible resistance was observed in Nampula district (94 percent) and full susceptibility was observed in Mogovolas with 100 percent mortality. In Nampula district, *An. gambiae* s.l. was also resistant to permethrin and DDT, while it was susceptible to clothianidin. Resistance to pyrethroids was also observed in Mogovolas. The pre-exposure to PBO resulted in restoration of partial susceptibility in *An. gambiae* s.l. to permethrin (45.3 percent), alpha-cypermethrin (57.3 percent), and deltamethrin (74.7 percent) in Nampula district. In summary, although resistance to pyrethroids is observed throughout Mozambique, PBO restored susceptibility either partially or fully in testing sites from Zambezia and Milange, justifying the procurement of PBO ITNs. Additionally, susceptibility to chlorfenapyr supports the case for procuring Interceptor G2 ITNs.

### 1.3.2. Insecticide-treated Nets

Global Fund will continue to procure ITNs for distribution through ANC services and universal coverage campaigns. PMI will continue to support SBC activities that address barriers to use and maintenance with an enhanced focus on populations or localities with suboptimal use and care. Please see the Social and Behavior Change section for details on challenges and opportunities to improve intervention uptake or maintenance.

**ITN Distribution in Mozambique**

In Mozambique, ITNs are distributed via national mass campaigns every two and a half to three years, with ITNs rolled out one province at a time over the span of 12 months. The next mass campaign, scheduled to begin in August 2022, will continue into 2023, with Interceptor G2 ITNs to be distributed in Manica and Niassa while the rest of the provinces will receive PBO nets. ITNs are continuously distributed to pregnant women through ANC services. Every pregnant woman is expected to receive an ITN during her first visit. Maputo province and Maputo city are not included in the ITN national mass campaign and receive ITNs only through ANC services. The Global Fund procures all ITNs and there are currently no anticipated gaps.

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

Durability monitoring is supported through the New Nets project with funding by Unitaid and the Global Fund. Data collection is ongoing and is expected to provide data on the durability and impact on burden of different types of ITNs.

**Table 1. Standard Durability Monitoring**

| Campaign Date | Site | Brand | Baseline | 12-month | 24-month | 36-month* |
|---|---|---|---|---|---|---|
| 2020 | Mandimba, Niassa | Royal Guard | August, 2020 | September, 2021 | Planned | TBD |
| 2020 | Changara, Tete | OlysetPlus | August, 2020 | September, 2021 | Planned | TBD |
| 2020 | Guro, Manica | Interceptor G2 | August, 2020 | September, 2021 | Planned | TBD |

* The 36-month collection timepoint is currently dependent on availability of funding.

### 1.3.3. Indoor Residual Spraying

In calendar year (CY) 2024, PMI will support the planning, implementation, and evaluation of the eighteenth year of IRS in four districts in Zambezia through a G2G agreement and a vector control implementing partner. The NMCP will select the insecticide that will be used in 2024 in Zambezia the year prior to the campaign based on the latest insecticide resistance results and scheduled rotation plan. Global Fund will continue to procure the insecticide. The FY 2023 funds will also be used to conduct the biannual routine environmental assessment to monitor IRS activities as recommended by WHO.

**Table 2. PMI-supported IRS Coverage**

| Calendar Year | District | Structures Sprayed (#) | Coverage Rate (%) | Population Protected (#) | Insecticide |
|---|---|---|---|---|---|
| 2021 | Milage, Molumbo, Mopeia, and Morrumbala | 309,547 | 96.8 | 1,408,179 | Pirimiphos-Methyl and Bendiocarb |
| 2022** | Morrumbala and Mopeia | 140,939 | 85.0 | 605,324 | Pirimiphos-Methyl and Bendiocarb |
| 2023** | Molumbo, Mopeia, and Morrumbala | 201,532 | 85.0 | 893,515 | Deltamethrin/Clothianidin |
| 2024** | Milage, Molumbo, Mopeia, and Morrumbala | 309,547 | 85.0 | 1,408,179 | To be determined |

** Prioritization within the MOP envelope led to a decrease of districts during CY 2022.

### IRS Insecticide Residual Efficacy in Mozambique

Wall bioassays were conducted monthly following the 2020 IRS campaign at five sites and showed a residual efficacy of SumiShield 500 WG (clothianidin) of 10–11 months

and Fludora Fusion (deltamethrin/clothianidin) of 9–0 months, depending on the location.

## 2. Malaria in Pregnancy

### 2.1. PMI Goal and Strategic Approach

The objective of the Mozambique NMCP is to improve coverage of IPTp to reach all eligible pregnant women attending ANC services. PMI supports the NMCP with the delivery of IPTp to all eligible pregnant women at all eligible ANC visits in the target provinces of Nampula, Zambezia, and Manica. At the central level, there is a malaria in pregnancy (MIP) working group chaired by the NMCP which includes participants from the maternal child health (MCH) department, through which PMI also provides technical support through the MIP working group.

Mozambique has been implementing the WHO updated guidelines on IPTp since 2014, which recommend administering IPTp as early as possible starting in the second trimester (13 weeks) and at each scheduled ANC visit until the time of delivery, as long as there has been an interval of at least one month since the last sulfadoxine-pyrimethamine (SP) dose. The national guidelines also state that SP is contraindicated in women receiving cotrimoxazole HIV/AIDS preventive treatment.

Malaria in pregnancy is a component of the malaria integrated supervision platform. PMI's supportive supervision and training efforts aim to reach all health workers from at least two health facilities (one referral and one peripheral) in the 57 target districts of the three focus provinces of Nampula, Zambezia, and Manica.

Results from the national household surveys (2007, 2011, 2015, and 2018) show that coverage for at least one ANC visit is high, at 85 percent or more. However, coverage of at least four ANC visits remains low, around 55 percent. In addition, less than 20 percent of women start their ANC during the first trimester of pregnancy. Mozambique has adopted the 2016 WHO ANC guidance, and the national guidelines recommend a minimum of eight ANC visits. The country policy also supports early initiation of IPTp between 13 and 16 weeks. However, the fact that most women start ANC later in their pregnancy, coupled with the fact that most women do not return for follow-up visits, poses serious challenges to the implementation of this policy. To address these challenges, it is important to: 1) understand the barriers for early ANC attendance and devise a set of interventions focusing on health promotion to address them, 2) understand the health system barriers that prevent women from returning for follow-up visits and devise a set of interventions to improve the quality of health care, and 3) understand community barriers that prevent women from returning for follow-up visits and devise a set of health promotion activities to address them.

Since 2007, results from four national household surveys (2007, 2011, 2015, and 2018) have shown a gradual increase in the uptake of IPTp. The proportion of women receiving at least one dose of IPTp increased from 27 percent in 2007 to 84 percent in 2018, while the proportion of women receiving at least three doses of IPTp increased from 11 percent in 2007 to 41 percent in 2018. These data demonstrate the need to ensure that pregnant women return for follow-up ANC visits and that they receive all ANC services, particularly IPTp, though these findings also show that important progress has been made to date. Routine health information system data also show improvements in the uptake of IPTp. In fact, the proportion of pregnant women who received two or more doses of IPTp increased from 49 percent in CY 2018 to 77 percent in CY 2021. Similarly, the proportion of pregnant women who received four or more doses of IPTp increased from 44 percent in 2018 to 56 percent in 2021. In Mozambique, the District Health Information System 2 (DHIS2) does not track coverage of IPTp3, and PMI and other stakeholders continue to advocate for the inclusion of IPTp3 in DHIS2 reports.

There are limited data in Mozambique on the barriers and facilitators to IPTp coverage, especially among providers. Low IPTp uptake has been associated with non-institutional deliveries, first ANC visit after 28 weeks, low awareness of IPTp, and having no or only primary education. To address this data gap, PMI is working with the NMCP and other stakeholders to conduct an analysis of barriers to IPTp coverage.

Since 2019, distribution of ITNs to pregnant women has been carried out solely with Global Fund support. The ITNs are distributed directly from the port to each district. Each receives two shipments per year. The ITNs for districts that do not have warehouse capacity are stored in neighboring districts. This new distribution system led to reduced transportation costs. However, it poses new challenges in terms of stock control, warehouse capacity at the district level, and potential commodity diversion. In fact, the proportion of pregnant women receiving an ITN during ANC slightly declined from 94 percent in 2019 to 90 percent in 2021. PMI is engaged in discussions with the NMCP and other partners to identify opportunities to improve ITN delivery.

Malaria case management among pregnant women is a priority intervention. All pregnant women presenting with fever must receive a malaria diagnostic test. All pregnant women with a positive test must receive prompt treatment with an adequate antimalarial. For uncomplicated malaria, pregnant women are treated with quinine during the first trimester and with artemether-lumefantrine in the second and third trimesters. For severe malaria, women are treated with injectable artesunate during all trimesters. In CY 2021, 23,570 pregnant women were treated with artemether-lumefantrine.

### 2.2. Recent Progress (between April 2021 to March 2022)

- PMI participated in discussions related to the implementation of community IPTp. The country has not yet decided on the way forward, as the MOH is still reviewing evidence and recommendations provided by the TIP TOP project. PMI will continue to engage in these discussions and will support the update of the national malaria policies to include community IPTp.
- PMI supported training and supervision of 581 MCH nurses in IPTp in the four target provinces of Nampula, Zambezia, Cabo Delgado, and Tete.
- In the past two years, the Government of Mozambique has procured enough SP to meet all the country's needs, and this is expected to continue for the near future. However, the country continues to face challenges to ensure continuous availability of SP at service delivery points, as detailed in the Health Supply Chain and Pharmaceutical Management section below.

### 2.3. Plans and Justification for FY2023 Funding

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

Mozambique will continue to support all MIP activities as described in the Recent Progress section.

PMI will continue to prioritize implementation of MIP activities through the malaria integrated supervision platform. PMI will also continue to provide technical support at the central level by participating in the MIP technical working group. This group includes both NMCP and MCH representatives.

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

Please see the Social and Behavior Change section for details on challenges and opportunities to improve intervention uptake or maintenance.

### 3. Drug-based Prevention

PMI does not support seasonal malaria chemoprevention or other drug-based prevention in Mozambique. The NMCP aims to articulate its strategic goals and plans for drug-based prevention activities in the next NMSP currently under development. PMI will provide technical assistance to the NMCP and engage in stakeholder discussions around the introduction and roll-out of the updated WHO-recommended chemoprevention interventions, as appropriate for the Mozambican context. In the

meantime, other donors have been providing limited support to pilots and studies to help inform these conversations, including:

- BMFG: Feasibility, acceptability, and impact of seasonal malaria chemoprevention in Nampula
- Unitaid: Impact of ivermectin mass drug administration (MDA) on malaria infection in Mopeia
- Global Fund: Coverage and impact of dihydroartemisinin-piperaquine MDA in the context of a humanitarian emergency in Cabo Delgado
- European and Developing Countries Clinical Trials Partnership: Assessing MDA in Gaza and focal drug administration in Maputo to advance malaria elimination; and a new study still under development to assess coverage of intermittent preventive treatment during infancy among children attending the Expanded Program on Immunization in the district of Massinga located in Inhambane.

Please see Table 7 under Section 8 (Operational Research and Program Evaluation) for more details on these and other non-PMI funded studies.

## 4. Case Management

### 4.1. PMI Goal and Strategic Approach

According to the 2017–2022 Malaria Strategic Plan, the NMCP objective was to test 100 percent of suspected malaria cases and treat 100 percent of confirmed malaria cases at the health facility and community levels, as per national guidelines, by 2022. The data from the 2021 Health Facility Survey (described below) indicate that this target was not met. The NMCP is currently in the process of devising a new strategic plan, and this target will be reviewed.

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

- Procuring rapid diagnostic tests (RDTs), microscopes, laboratory supplies, and reagents
- Procuring ACTs
- Supporting the implementation of the malaria integrated supervision package
- Scaling up quality assurance (QA)/quality control (QC) systems for malaria diagnostics and treatment

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

- Improve malaria case management at the health facility and community levels through mentoring, supervision, and training

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

PMI support is closely aligned with the NMCP national strategy and the case management strategy. PMI supports all of the technical interventions, but the geographic focus is limited to the provinces of Zambezia, Nampula, and Manica.

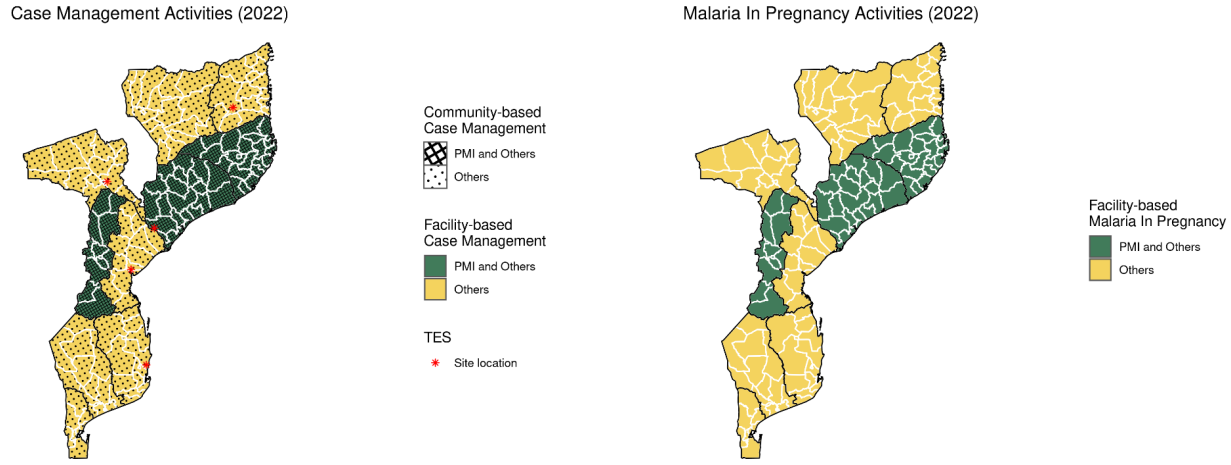
The NMCP's Malaria Strategic Plan promotes a comprehensive case management strategy including universal, quality-assured parasitological testing of all cases of suspected uncomplicated malaria, prompt and effective treatment with ACT of all cases of parasitologically confirmed uncomplicated malaria, and emergent pre-referral and/or definitive management of severe febrile illness and severe malaria. PMI supports all aspects of this approach through support to national-level policy and programmatic activities, commodity procurement, and improvement of facility and community-level health worker performance. PMI supports nationwide procurement of malaria RDTs, ACTs, and injectable and rectal artesunate, accounting for approximately 50 percent of the national need; the other 50 percent is supported by the Global Fund. PMI also supports supportive supervision and on-the-job training activities in four provinces; the Global Fund supports the remaining seven provinces.

PMI supports (through training and supervision) 2,000 community health workers (CHWs) to deliver community-based case management services that include community case management for malaria to all ages and pre-referral rectal artesunate treatment in two provinces, Nampula and Zambézia. PMI also supports procurement and distribution of RDTs, ACTs and rectal artesunate for about 30 percent of all community health workers across the country.

By December 2021, there were a total of 7,329 CHWs across the country. The plan is to train an additional 250 CHWs by the end of 2022, covering the central and northern provinces of Niassa (50), Cabo Delgado (50), Nampula (25) and Zambézia (125). This training will be supported by the United Nations Children's Fund (UNICEF), with contribution from USAID MCH funds. It is important to note that the MOH is reviewing its community health strategy and will likely establish new targets for 2023 and beyond. PMI does not currently provide direct routine payment to CHWs; this is covered by the World Bank. The biggest current challenge faced by the community health system is to ensure a regular supply of commodities and ensure sufficient funding for training and supervision. PMI will work in collaboration with NMCP and the Global Fund to support an assessment of the CHW kitting system and propose possible solutions to improve availability of commodities to CHWs. PMI and the Global Fund will continue to support

on-the-job training and supervision of CHWs, and the World Bank is expected to continue to support CHW salaries.

**Figure 2. Map of Case Management, Community Health and Malaria in Pregnancy Service Delivery Activities in Mozambique**




In Figure 2, "Others" refers to the Global Fund and World Bank (only for community health).

## 4.2. Recent Progress (between April 2021 and March 2022)

### National-Level Case Management Activities

- Developed terms of reference for the National Severe Malaria Cases and Deaths Committee and developed a tool to facilitate the discussion of malaria deaths at district, provincial, and central levels. Supervision teams will use this tool to evaluate how severe malaria cases are managed.
- Collaborated with other relevant stakeholders in the training and implementation of the integrated Malaria Information Storage System (iMISS), as well as in the design of the case management dashboards.
- Strengthened quality assurance of malaria diagnostics in all 24 district level laboratories in Nampula and in all 22 district level laboratories in Zambézia through training and professional development and laboratory supervision.
- Convened and led four national-level technical working group meetings (TWGs), as well as four provincial TWG meetings in each of the target provinces of Nampula and Zambézia, and two provincial TWG meetings in each of the target provinces of Tete and Cabo Delgado.
- Conducted the training of 49 laboratory technicians in basic malaria diagnostic refresher training.
- The country also made significant progress in rolling out its electronic Logistics Management Information System (*Sistema de Informação de Gestão Logística das Unidades Sanitária* [SIGLUS]). As of December 2021, 1,470 of the 1,580 public health facilities nationwide (93 percent) were equipped and trained with

SIGLUS. Although the availability of ACTs has improved, data from SIGLUS show that the country continues to have challenges in ensuring continued availability of ACTs and RDTs at service delivery points, as described in detail in the supply chain section below (see Section 5).

**Commodities**

- Supported the procurement of 24 million malaria RDTs for nationwide distribution, accounting for 74.3 percent of all shipments received between April 2021 and March 2022. The Global Fund supported the remaining amount. PMI also supported the nationwide distribution of 3.7 million malaria RDTs through the CHW Kit.
- Supported the procurement of 11 million ACTs for nationwide distribution, accounting for all the needs for the period between April 2021 and March 2022. PMI also supported the nationwide distribution of 1.8 million ACTs through the CHW Kit.
- Supported the procurement of 516,000 vials of parenteral artesunate, which were distributed through the Government of Mozambique systems.
- Supported the procurement and nationwide distribution of 42,042 rectal artesunate suppositories through the CHW Kits, which represented the total planned amount.

**Facility Level**

- Across the four PMI target provinces of Zambézia, Nampula, Tete and Cabo Delgado, there are 66 districts with approximately 750 health facilities. PMI conducted on-site training and supportive supervision visits in 259 health facilities of the 66 districts. [Data from the Integrated Malaria Program, from April 2021 through March 2022.]
- As assessed during the 2021 Health Facility Survey, in the three provinces of Zambezia, Manica, and Nampula, between 64 percent and 80 percent of all fever cases presenting for care were tested for malaria. The rate for overall correct management of suspected cases, defined as testing and treatment according to test result, was 60 percent in Manica, 65 percent in Zambezia, and 68 percent in Nampula.
- Conducted 251 data quality assessments (DQAs) in the four target provinces of Nampula, Zambézia, Tete, and Cabo Delgado. [Data from the Integrated Malaria Program, from April 2021 through March 2022.]

**Community Level**

- Conducted 259 on-site training and supportive supervision or mentorship visits reaching 463 CHWs. [Data from the Integrated Malaria Program, from April 2021 through March 2022.]
- Trained 524 supervisors in on-site training and supportive supervision for CHWs

- Continued to support the CHW program by providing RDTs and ACTs and by supporting the kitting system through which these commodities are distributed to CHWs.

Please note that recent progress with monitoring antimalarial efficacy and the Therapeutic Efficacy Study 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 Mozambique 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**
PMI Mozambique will continue to support case management activities and provide technical assistance at the central level as described in the Recent Progress section.

**Commodities**
Mozambique will continue to procure RDTs, ACTs, injectable artesunate, and rectal artesunate as described in the Recent Progress section. Please note that PMI and the Global Fund are the two main donors that support procurement of RDTs and ACTs. Given that the current Global Fund grant will end in December 2023, PMI will coordinate shipments with the Global Fund to ensure a continuous supply of malaria commodities to the country.

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**
Mozambique will use the findings of the 2021 Health Facility Survey, described above, to target its support to training and supervision of health workers to improve their performance. Mozambique will also continue to support training and supervision of laboratory technicians as described in the Recent Progress section. Please note that the new PMI focus provinces are Nampula, Zambézia, and Manica.

**Community Level**
Mozambique will continue to support integrated community case management, community case management of malaria for all ages, and pre-referral rectal artesunate for severe malaria as described in the Recent Progress section. With FY 2023 funds, PMI will continue to implement these activities in Nampula and Zambézia, and include Manica as a new focus province. In Mozambique, the World Bank supports CHW

compensation; with the design of the new community strategy, the Government of Mozambique has created a new cadre of elementary workers and has approved the salary for this cadre. It is expected that the existing and future CHWs will be included in this cadre and will be paid directly by the Government of Mozambique.

### Monitoring Antimalarial Efficacy

**Table 3. Ongoing and Planned Therapeutic Efficacy Studies**

| Ongoing Therapeutic Efficacy Studies (TES) | | | |
|---|---|---|---|
| **Year** | **Site name** | **Treatment arm(s)** | **Plan for laboratory testing of samples** |
| 2022 | Moatize | AL, As-Pyr | In-country |
| 2022 | Montepuez | AL, DP | In-country |
| 2022 | Mopeia, Dondo, Massinga | AL, ASAQ | In-country |
| **Planned TESs (funded with previous or current MOP)** | | | |
| **Year** | **Site name** | **Treatment arm(s)** | **Plan for laboratory testing of samples** |
| 2024 | Moatize, Montepuez, Mopeia, Dondo, Massinga | AL<br>Other drugs TBD | In-country |

AL = artemether-lumefantrine; ASAQ = artesunate-amodiaquine; DP = dihydroartemisinin-piperaquine; As-Pyr = artesunate-pyronaridine; TBD = to be determined.

Please see the Social and Behavior Change section for details on challenges and opportunities to improve intervention uptake or maintenance.

## 5. Health Supply Chain and Pharmaceutical Management

### 5.1. PMI Goal and Strategic Approach

The NMCP aims for all malaria case management and prevention commodities to be available at all service delivery points. For an overview of Mozambique's supply chain system, please view the Country Health System section of the Country Profile. In alignment with the NMCP, PMI aims to achieve the following objectives:

- Develop more effective public sector medical supplies/commodity forecasting, support for commodities and supply planning, and procurement capacity.
- Improve public sector warehousing and distribution at all levels.
- Improve the use of medicines and develop more effective pharmaceutical services.
- Strengthen the CMAM's strategic planning and management capacity.
- Strengthen overall regulatory capacity.

PMI also aims to reduce stockout rates over the next two years by optimizing PMI's supply chain investments.

### 5.2. Recent Progress (between April 2021 and March 2022)

During the past year, PMI's principal supply chain investments aimed to improve malaria commodity availability at service delivery points by providing technical assistance on forecasting and supply planning, management information systems, warehousing and distribution, direct warehousing, and the delivery of commodities to health facilities. PMI also supported the MOH, CMAM, and the provincial and regional warehouses to manage this supply chain efficiently and effectively, providing training, supervision, and technical assistance on the quantification and monitoring of malaria commodity stock levels over the year. At the country level, PMI supports country strategies and priorities that fall under the following three program objectives: 1) Global commodity procurement and logistics; 2) Systems strengthening technical assistance; and 3) Collaboration to improve long-term availability of health commodities.

PMI also supported procurement, alongside Global Fund, of CHW malaria commodities and the kitting and distribution of these commodities. In addition, PMI supported training of CHWs supervisors, facilitation of community health committee meetings with CHWs, and SBC to promote appropriate community and facility care-seeking.

PMI supported NMCP and CMAM to establish baseline performance and set targets for a stockout reduction strategy for ACTs and RDTs. Despite an increase in stockouts of ACTs and RDTs in the second quarter (Q2) of 2022, attributed primarily to floods and delays renewing the agreement with the transport vendor, data from service delivery points have shown a decrease in stockouts of all formulations of ACTs, from 19 percent in Q1, 2021 to 12.1 percent in Q1, 2022. The decrease in stockouts of ACTs is attributed to timely availability of funds, which improved availability of all formulations of ACTs and distribution of ACTs to health facilities. The level of the RDT stockouts remains stable, at 5.6 percent in Q1, 2021 and 6.1 percent in Q1 of 2022. Stockouts of RDTs remained low because they are distributed monthly from the central level to the provincial level, and then from the provincial level to health facilities. This process helps assure the availability of RDTs across the supply chain.

There is limited stock level data for service delivery points because the data are not captured at the dispensing points; rather, stock levels are captured at the health facility storeroom. As of December 2021, 1,470 of 1,580 health facilities (93 percent) were actively reporting logistics information to SIGLUS. PMI continued to provide support to the Medicines Technical Working Group, chaired by CMAM and composed of various U.S. government implementing partners, MOH officials, and other donors. The group covers several technical areas, including malaria. It meets quarterly to review forecasting and quantification of malaria commodities, and monthly to monitor the shipments of commodities and to track commodity consumption data to support the management and oversight of health commodities via regular supply plan updates.

Other recent activities supported by PMI include district and provincial quarterly meetings across the country to review and improve supply chain and logistics data and performance, training and supervision on logistics standard operating procedures, and technical assistance for improving data quality to the district and facility staff. The majority of the quarterly meeting and training activities were carried out by provincial partner coordinators who worked closely with the MOH provincial warehouse to strengthen logistics management of health commodities in the province. Such activities were also targeted in response to specific provincial needs and training strategies and focused on inventory control, warehousing and storage, distribution, and supply chain monitoring and evaluation.

### 5.3. Plans and Justification with FY 2023 Funding

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

PMI will continue supporting procurement, quality control, storage, management and oversight, and distribution of PMI-procured malaria commodities, such as ACTs, RDTs, SP, and drugs for severe malaria.

PMI provides warehousing and distribution support for procured malaria commodities (i.e. ACTS, RDTs, SP, and drugs for severe malaria) from the ports of entrance to provincial and intermediate warehouses to last-mile service delivery points. Additionally, PMI will continue to support CHWs by providing RDTs and ACTs through the kit system.

PMI support will leverage broader, cross-health element USAID investments in the last-mile distribution of malaria commodities in Nampula and Zambezia. Moreover, PMI support will leverage health sector-wide USAID investments in warehousing and distribution in Mozambique.

PMI will continue providing support for Logistics Management Information System (LMIS) supervision, training, e-supervision, and on-site supervision. During the supervision, DQAs of commodity stock will be conducted at the health facility and regional levels to improve data completeness, consistency, accuracy, and timeliness. Data will be included in the iMISS system, which supports data visibility across all levels of decision-making. Additionally, PMI will strengthen the skills of key personnel in supply chain and commodities planning and management at the national and provincial levels. Provincial- and district-level support will improve warehouse management, supervision of the LMIS, and transportation of medicines.

Technical support will be provided to improve forecasting and supply planning, focusing on:

- Annual quantification exercises, quarterly supply plan updates, and continuous order/status monitoring
- Support the 2023 Global Fund subvention, which will cover 2024–2027 subvention planning and its implementation
- Expansion of LMIS, data visibility, and data-driven decision-making across the supply chain
- Supporting CMAM on stock status monitoring and commodities visibility at central and provincial levels and improvement of reporting rates to inform decision-making
- Supporting the end-to-end visibility for malaria commodities (ACTs and malaria RDTs) and other commodities included within the integrated SIGLUS
- Planning malaria community kits assembly and distribution with CMAM and NMCP
- Continue supporting the discussion of a stockout reduction initiative approach with the malaria supply chain technical working group and relevant stakeholders

## 6. Social and Behavior Change

### 6.1. PMI Goal and Strategic Approach

NMCP aims to ensure that 70 percent or more of people seek appropriate and timely health care and that at least 85 percent of the population uses an appropriate malaria protection method. To achieve these goals, Mozambique has a national SBC strategy that includes strategic communication interventions for advocacy, malaria prevention, and appropriate case management. A national SBC technical working group meets on a monthly basis to coordinate partner activities, review SBC materials, plan commemorative activities, and support NMCP strategic planning. The provinces of Zambezia, Nampula, and Sofala have formalized SBC technical working groups.

PMI support is closely aligned with the NMCP national strategy and the SBC strategy. PMI supports implementation of all the SBC technical interventions through community-based organizations (CBOs), faith-based organizations, and community radio stations. This is done through a malaria-specific, tailored approach that is implemented by a malaria service delivery partner. The approach is integrated and aims to address diverse health topics, including malaria, through religious leaders. The PMI geographic focus for SBC interventions is the provinces of Nampula and Cabo Delgado (malaria-specific, intensive, and integrated approach through religious leaders), Zambezia and Tete (malaria-specific, intensive approach), and Sofala (integrated approach through religious leaders). PMI also supports community-level projects that focus on education

on malaria prevention, treatment, and transmission through Peace Corps volunteers (PCVs). All PMI SBC support, including central- and provincial-level planning and community-level implementation, is aligned with complementary SBC support from the Global Fund.

### 6.2. Recent Progress (between April 2021 and March 2022)

Between April 2021 and March 2022, CBOs and radio stations in Cabo Delgado and Tete closed with the end of the malaria-specific, intensive approach partner. However, during that period the following activities were implemented:

- Community mobilizers performed 37,743 lectures in health facilities, 26,370 community dialogues, 47,341 community lectures, and 260,389 household visits in Nampula, Zambezia, Tete, and Cabo Delgado. Up to 4,954,618 persons were reached through these activities (a person could have participated in more than one activity).
- 38 radio stations and 13 CBOs in Nampula, Zambezia, Cabo Delgado, and Tete disseminated messages on the prevention of MIP through adherence to IPTp, proper use of ITNs, and by seeking health care promptly.
- The faith-based organization project that uses an integrated approach through religious leaders reached 131,531 people through sermons and trained 480 religious leaders in Cabo Delgado, Nampula, Zambezia, and Sofala. In those same provinces, 18 community radio stations were involved in the dissemination of malaria messages, and there were 133 radio debates. In Nampula and Sofala, the organization trained 20 journalists in malaria issues.
- Peace Corps trained 11 youth health-friendly services providers and 11 physical education teachers in malaria symptoms, prevention, and treatment using the Grassroot Soccer methodology. Participants will use this methodology to deliver important malaria messages to youth and train other educators in their area.
- 50 copies of the Malaria Education Album and Community Educator Guide were distributed to PCVs serving in the education and health sectors.
- 11 malaria education packs were assembled for PCVs to conduct malaria communication. Packs include a portable projector, tripod, tablet, speakers, HDMI cables, USB flash drives, markers, laminated flip charts, a bednet, and sewing needles.

Despite the recent progress, some challenges remained, outlined by technical area below. Continued SBC investment is needed to address the determinants of uptake and/or maintenance of prevention, care-seeking and treatment behaviors in these areas.

**Insecticide-treated Mosquito Nets**

Though ITN use is increasing among Mozambicans, there are still gaps in appropriate use and care. Prevalence of positive net care attitudes is low according to a monitoring and durability study conducted in Inhambane, Tete, and Nampula provinces (Abilio et al., 2020). There is a need to understand barriers to ITN use and proper care to inform development of specific SBC interventions. Additionally, considering the influx of ITNs during the 2022 national campaign, SBC interventions focusing on repurposing of old ITNs are needed.

**Malaria in Pregnancy**

The NMCP policy is for pregnant women to take three doses of IPTp. However, gaps remain in understanding barriers for early ANC attendance, health system barriers that prevent women from returning for follow-up visits, and community barriers that prevent women from returning for follow-up visits. Additionally, evaluating the impact of interventions aiming to increase IPTp3 coverage is challenging because IPTp3 is not reported to SISMA, and only IPTp2 and IPTp4 coverage is available.

**Service Delivery**

There are still critical gaps in quality of care provision as documented in the 2018 and 2021 health facility survey. Critical gaps include failure to test febrile patients, and provision of antimalarial treatment with negative test results. There are gaps in understanding internal and external barriers providers face in adhering to clinical barriers.

### 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 Mozambique with FY 2023 funding. Please visit www.pmi.gov/resources/malaria-operational-plans-mops for these FY 2023 funding tables.

Implementation of SBC interventions through a malaria-specific SBC implementing partner will continue in the next 12 months. Activities will aim to increase MOH and local stakeholder technical capacity on SBC, increase use and generation of data for the design and implementation of SBC interventions, and improve management and supervision of SBC interventions. PMI's FY 2023 funding will support activities guided by baseline evaluation results from the previous year. CBOs will implement these activities via community dialogues, community radio spots, health facility and community-based health talks, influential leader training, and door-to-door visits using the standardized malaria SBC package in targeted communities in Zambezia, Nampula, Manica, and Cabo Delgado (media only). These interventions target influential community members to improve malaria prevention and care-seeking behavior. They also target supervision of SBC at health facilities, addresses availability of print job aids

to improve the quality of the provision of malaria care counseling by health care providers at health facilities. PMI will also provide SBC technical assistance at the central level and continue to actively participate in the SBC technical working group.

## Priorities

**Table 4. Priority Behaviors to Address**

| Behavior | Target Population | Geographic Focus | Programming to Address Behavior |
|---|---|---|---|
| Prompt care-seeking for fever for children under five years of age | Caregivers of children under five years of age | Nampula, Zambezia, Manica, Cabo Delgado | • Conduct community and household-level interpersonal communication to encourage prompt care-seeking.<br>• Provide technical assistance to media stations for production and airing of radio shows and spots to promote prompt care-seeking. |
| Adherence to case management guidelines | Health facility providers | Nampula, Zambezia, and Manica | • Evaluate and validate case management tools to identify barriers to using the tools and improve as necessary.<br>• Sustain peer-to-peer engagement to promote provider behavior change regarding the use of RDTs for testing and treatment decisions. |
| Increased uptake of IPTp3 | Pregnant women and their partners/influential family member | Nampula, Zambezia, and Manica | • Conduct formative research to increase understanding of the social and structural barriers for women to attain three doses of IPT and develop SBC interventions based on those results through programmatic research. |

## Additional Support Activities

There is a need to collect data on the specific behavioral factors for prompt care-seeking behavior, early attendance to ANC visits, and acceptance of three or more IPTp doses and adherence to clinical guidelines. In addition, continued SBC capacity building is needed at all levels of the MOH and among local partners. To address SBC knowledge gaps and bolster the MOH's and local partners' capacity for the planning, design, implementation, and evaluation of SBC activities, PMI will continue to support the following activities through the malaria-specific SBC implementing partner:

- Full-scale implementation of its evidence-based, tailored, innovative package of malaria SBC interventions through CBOs in the provinces of Nampula, Zambezia, and Manica. This is expected to include interventions that target prompt care-seeking behavior, appropriate ITN use and care, IRS acceptability, care-seeking for fevers, and ANC.
- Support SBC technical working groups at the national level and at PMI SBC target provinces (Zambezia, Nampula, and Manica).

- Improve malaria SBC design, implementation, and monitoring capacity of the MOH and implementation partners at the central, provincial, and district levels.
- Build NMCP capacity to use of malaria epidemiologic data and behavioral science to inform SBC strategies.

## 7. Surveillance, Monitoring, and Evaluation

### 7.1. PMI Goal and Strategic Approach

The objective of the NMCP is to strengthen the surveillance system so that all health facilities and districts are reporting complete, timely, and quality data.

In Mozambique, PMI collaborates with the NMCP, Global Fund, and BMGF in providing technical assistance and resources for SM&E activities. In support of the NMCP strategy and needs in Mozambique, PMI and the NMCP prioritize the following interventions:

- Improve malaria SM&E capacity at all levels
- Implement the DQA system
- Implement a comprehensive integrated malaria information storage system at all levels
- Establish a system and strategy for outbreak responses in epidemic-prone areas
- Establish a system to ensure implementation and operational research are conducted and the results inform program activities in real time
- Expand an iMISS that congregates epidemiological, logistic, entomologic, and other programmatic data in one place to use for monitoring of activities and programmatic decisions.

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

- Support the strengthening of malaria SM&E capacity focusing on the three PMI target provinces, Nampula, Zambezia and Manica, along with Cabo Delgado and Tete, through G2G agreements
- Support DQAs in the three target provinces
- Support the roll-out and use of the iMISS platform

### 7.2. Recent Progress (between April 2021 and March 2022)

PMI supported the following activities at the central and provincial levels:

- Supported the implementation of iMISS at the central level and in the former four target provinces (Cabo Delgado, Nampula, Zambezia, and Tete). In CY 2022, iMISS was rolled out to all provinces across the country. The main

focus now is to improve visualization of data to facilitate data use for decision-making.
- Continued to support two data managers, both seconded to the NMCP. One of these data managers is an integral member of the NMCP SM&E working group and provides technical support to the NMCP for data access, data use, and production of annual reports, using iMISS and other data platforms. The second is responsible for supporting the roll-out of the iMISS platform.
- Conducted 63 provincial-level data review meetings across the four PMI-target provinces.

PMI supported the following activities at the district and health facility level:

- Conducted SM&E refresher training as part of the integrated supervision visits for 565 district technical staff across three of the four previous target provinces of Nampula, Zambezia, and Tete.
- Supported strengthening the quality of routine data through the implementation of the DQA tool during the malaria integrated supervision visits. PMI supported implementation of DQAs in 251 health facilities across its four targeted provinces. In 69 of these health facilities (27 percent), data quality did not meet the standards, as defined as having a deviation greater than 20 percent.

Mozambique has been demonstrating significant progress in recent years regarding the timely and completeness of data reporting. The only exception to this is the Cabo Delgado province, where both indicators were below 80 percent in 2020, mostly because of the violent conflict that has disrupted public health service across the province. Despite the positive trend on the DQA results, compared to the previous year, data accuracy is still an issue in Mozambique. Currently, as part of the integrated supervision, the standard package of DQAs includes four rounds in all health facilities of the country per year. However, due to logistical challenges, on average only two to three rounds are performed per year. Linked to this, BMGF is supporting an ongoing assessment to identify the ideal number of DQAs to be performed to observe greater impacts at the district and health facility level. Results from this assessment will contribute to better decision-making regarding the DQAs.

### 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 Mozambique with FY 2023 funding. Please visit www.pmi.gov/resources/malaria-operational-plans-mops for these FY 2023 funding tables.

In FY 2023, PMI will continue to support SM&E refresher training and conducting DQAs as part of the integrated supervision visits and support the roll-out of iMISS as described in the Recent Progress section. These activities aim to improve quality data collection, analysis, and use for improved malaria prevention and control efforts. Most of this support will be focused on the provinces of Nampula, Zambezia and Manica. However, PMI will also provide support to Cabo Delgado and Tete through G2G agreements. Although the focus of PMI Mozambique's activities is on high burden areas, PMI will provide technical assistance to the central team on developing and prioritizing interventions for elimination areas.

**Table 5. Available Malaria Surveillance Sources**

| Source | Data Collection Activity | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|
| Household Surveys | Demographic Health Survey | | | *[1] | | | |
| Household Surveys | Malaria Indicator Survey | | | | | | |
| Household Surveys | Multiple Indicator Cluster Survey | | | | | | |
| Household Surveys | Expanded Program for Immunization survey | | | | | | |
| Health Facility Surveys | Service Provision Assessment | | | | | | |
| Health Facility Surveys | Service Availability Readiness Assessment survey | | | | | | |
| Health Facility Surveys | Other Health Facility Survey | | * | | | | |
| Malaria Surveillance and Routine System Support | Therapeutic Efficacy Studies | | | X | | P | |
| Malaria Surveillance and Routine System Support | Support to Parallel Malaria Surveillance System | | | | | | |
| Malaria Surveillance and Routine System Support | Support to the Health Management Information System | X | X | X | P | P | P |
| Malaria Surveillance and Routine System Support | Support to Integrated Disease Surveillance and Response | X | X | X | P | P | P |
| 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 | EUV | | | | | | |
| Other | School-based Malaria Survey | | | | | | |

| Source | Data Collection Activity | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|---|---|
| Other | Knowledge, Attitudes and Practices Survey, Malaria Behavior Survey | | | | | | |
| Other | Malaria Impact Evaluation | | | | | | |
| Other | Entomologic Monitoring Surveys | X | X | X | P | P | P |

* Non-PMI funded activities
X denotes completed activities and P denotes planned activities.
[1]Demographic Health Survey was expected to be conducted in 2021 and the survey is currently ongoing.

## 8. Operational Research and Program Evaluation

### 8.1. PMI Goal and Strategic Approach

NMCP's objective is to ensure relevant evaluations and operational research (OR) are conducted and that results are rapidly used to inform programmatic decision-making. To achieve this, individuals or entities interested in conducting research related to malaria propose their ideas to the NMCP, who liaises with other national institutions as appropriate. Studies are deemed to be relevant based on local needs, and the National Health Bioethics Committee must review the research agenda prior to implementation. PMI supports the NMCP to define and execute technically sound OR and evaluations to inform programming.

### 8.2. Recent Progress (between April 2021 and March 2022)

The NMCP is interested in appropriate stratification and targeting of interventions, including proven and novel vector control, SBC, surveillance, vaccination, and case management interventions, as part of the national High Burden to High Impact strategy. Specific gaps relate to determining the impact and barriers to uptake of existing interventions to inform adaptations and appropriate targeting and scale. There is a desire for more data on novel interventions and modeling to inform the geographic selection and combination of interventions for optimal effect. There are strong local research institutions to support the NMCP's OR and program evaluation (PE) studies, but not enough researchers and funding to meet programmatic information needs. The limited number of researchers and funding is a barrier to receiving timely data for programmatic decision-making.

**Table 6. PMI-funded Operational Research/Program Evaluation Studies in Mozambique**

There are no recently completed OR/PE studies in Mozambique. Using PMI Core funding, PMI is planning to conduct a partial IRS study in Mopeia in October of 2023.

The objective of the study is to determine if spraying half of the upper walls would be as effective as spraying an entire wall.

| Recently Completed OR/PE Studies | Status of Dissemination | Start date | End date |
|---|---|---|---|
| No PMI-supported OR/PE has been recently completed | | | |
| **Ongoing or Planned OR/PE Studies** | **Status** | **Start date** | **End date** |
| A PMI Core-funded study of partial indoor residual spray | Planning | October 2023 | Planning underway |

**Table 7. Non-PMI funded Operational Research/Program Evaluation Studies Planned/Ongoing in Mozambique**

| Source of Funding | Implementing institution | Research Question/Topic | Current status/ timeline |
|---|---|---|---|
| BMGF | CHAI | **(Case Management)** What is the quality of malaria case management provided in Mozambique health facilities and communities? | Completed |
| BMGF | PATH, Tropical Health | **(MIP)** Are women attending their first ANC visit a pragmatic sentinel population for monitoring malaria burden and malaria intervention coverage at the health facility level in western Mozambique? | Implementation ongoing |
| Unitaid, Global Fund | PATH, Tropical Health | **(Vector Control)** What is the impact of next-generation ITNs on malaria burden? | Implementation ongoing |
| Unitaid | Jhpiego, CISM | **(MIP)** What is the impact of community-based distribution of IPTp on coverage of three doses? | Completed |
| Unitaid | ISGlobal, CISM | **(Drug-based Prevention)** What is the impact of ivermectin MDA on malaria infection in humans, on mosquito populations, and on the environment, as well as on its safety and acceptability by communities? | Implementation ongoing |
| European & Developing Countries Clinical Trials Partnership | CISM | **(Drug-based Prevention)** What is the coverage of three or more doses of intermittent preventive treatment during infancy in children under two years of age attending the Expanded Program on Immunization at public health facilities in one district of Mozambique? | Planning underway |
| Global Fund | NMCP, World Vision | **(Drug-based Prevention)** What is the coverage of and impact of the massive administration of treatment against malaria using dihydroartemisinin-piperaquine in the context of emergency in the province of Cabo Delgado? | Completed |
| BMGF | Malaria Consortium, CISM | **(Drug-based Prevention)** What is the feasibility, acceptability, and impact of seasonal malaria chemoprevention in Mozambique? | Implementation ongoing/ Round I completed in 2021 |

| Source of Funding | Implementing institution | Research Question/Topic | Current status/ timeline |
|---|---|---|---|
| BMGF | CISM | **(Surveillance, Monitoring & Evaluation)** What is the effectiveness of the implementation of reactive surveillance in two low-burden districts? | Implementation ongoing |
| BASF | Tropical Health | **(Vector Control)** Does bursting strength affect ITN durability? | Planning (ethical clearance)<br><br>Baseline 2022 |
| European & Developing Countries Clinical Trials Partnership | NMCP, CISM, ISGlobal | **(Drug-based Prevention)** Malaria mass and focal drug administration to advance malaria elimination in Mozambique: accelerating programmatic implementation and policy translation | Ongoing |
| BMGF | CHAI | **(Vector Control)** IRS evaluation to determine quality of spray coverage, community acceptability, and operational efficiency | Ongoing |
| BMGF | CHAI, UCSF | **(Surveillance, Monitoring, & Evaluation)** Sub-national analysis of transmission trends to determine causes of lack of progress in the center and north of the country | Ongoing |
| BMGF | CHAI | **(Case Management)** Evaluation of the community health case management landscape to determine areas of potential support | Ongoing |
| BMGF | UCSF | **(Vector Control)** Development of an entomological adaptive sampling framework | Planning |

BMGF = Bill & Melinda Gates Foundation; CHAI = Clinton Health Access Initiative; CISM= *Centro de Investigação em Saúde de Manhiça*; UCSF = University of California San Diego.

### 8.3. Plans and Justification with FY 2023 Funding

No OR/PE activities are proposed with FY 2023 funding.

## 9. Capacity Strengthening

### 9.1. PMI Goal and Strategic Approach

PMI supports the NMCP to strengthen program management skills at central, provincial, and district levels to effectively achieve the other NMSP strategic objectives. PMI's strategic approach is to support activities that improve the technical knowledge and skills of Government of Mozambique staff to design, plan, implement, and monitor health activities, leading to an overall improved capacity of government entities to implement and manage key malaria reduction activities. This will result in improving quality health services and strengthening health systems.

Five main strategies were defined to achieve this objective:

1. Establish the NMCP organigram and ensure program staff at all levels have the required capabilities to perform their roles.
2. Ensure the effectiveness of program management.
3. Establish appropriate internal mechanisms for effective communication and coordination between and within the NMCP, partners, the private sector, and the Malaria Technical Advisory Committee.
4. Establish effective and accountable partners to secure adequate resources and their appropriate use.
5. Ensure effective coordination and communication on procurement and supply chain management.

### 9.2. Recent Progress (between April 2021 and March 2022)

In the last 12 months, PMI supported NMCP capacity-building and system strengthening on vector control, and critical support systems such as supply chain and technical skills through the training of health workers. PMI also supported the laboratory and procurement of laboratory consumables used for quality control activities.

PMI supported the National Reference Laboratory to conduct diagnostic proficiency panel testing for RDTs and microscopy. Additional support was provided to entomological laboratory and field activities in 7 out of 11 provinces to produce results to guide decision-making regarding the vector control strategy.

PMI provided technical assistance for the new NMCP strategic plan, currently under development, and the malaria emergency response plan to strengthen system preparedness and resilience. Technical assistance was provided to the NMCP to strengthen the provincial and district technical teams' management capacity to provide oversight and supervision of malaria interventions and implementation of the digital platform for data collection and analysis during the integrated supervision visits.

PMI supported Health Management Information System data reporting, analysis, and use for decision-making at the provincial, district, and health facility levels. PMI also pursued Grants Under Contract to civil society organizations and CBOs to improve individual health-seeking behaviors through SBC.

PMI provided technical and financial support for two Field Epidemiology Laboratory Training Program (FELTP) residents.

Due to the evacuation of PCVs during the COVID-19 pandemic, volunteer activities were halted. However, PMI continued to support the Peace Corps to procure educational materials for future volunteers and for training of trainers of educators on the Grassroot Soccer methodology.

### 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 Mozambique with FY 2023 funding. Please visit Malaria Operational Plans (MOPs) - PMI for these FY 2023 funding tables.

Technical support will be provided at the central level and in target provinces to improve planning and coordination of malaria control activities and partners. The support will focus on capacity building for provincial- and district-level MOH managers for data assessment, analysis, and use in program decision-making.

PMI will continue to provide technical and financial support for FELTP residents in the advanced training program. Currently, two FELTP residents are working on projects utilizing routine Health Management Information System and entomological data.

PMI will also continue providing support to PCVs on malaria-related interventions at the community level.

Please see FY 2023 PMI budget tables for a detailed list of proposed activities with FY 2023 funding.

## 10. Staffing and Administration

Five health professionals oversee PMI in Mozambique. The single interagency team led by the USAID Mission Director consists of a Resident Advisor representing USAID, a Resident Advisor representing the U.S. Centers for Disease Control and Prevention, and three locally hired experts known as Foreign Service Nationals. 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 | 31,616,078 | 32,419,747 | 33,244,414 |
| Total population at risk for malaria | 31,616,078 | 32,419,747 | 33,244,414 |
| PMI-targeted at-risk population | 31,616,078 | 32,419,747 | 33,244,414 |
| Population targeted for ITNs | 31,616,078 | 32,419,747 | 33,244,414 |
| **Continuous Distribution Needs** | | | |
| Channel 1: ANC | 1,861,299 | 1,908,612 | 1,957,162 |
| Channel 1: ANC Type of ITN | Dual AI and PBO | Dual AI and PBO | Dual AI and PBO |
| Channel 2: EPI | | | |
| Channel 2: EPI Type of ITN | | | |
| Channel 3: School | | | |
| Channel 3: School Type of ITN | | | |
| Channel 4: Community | | | |
| Channel 4: Community Type of ITN | | | |
| Channel 5: | | | |
| Channel 5: Type of ITN | | | |
| Estimated Total Need for Continuous Channels | 1,861,299 | 1,908,612 | 1,957,162 |
| **Mass Campaign Distribution Needs** | | | |
| Mass distribution campaigns | 5,198,450 | 10,958,700 | |
| Mass distribution ITN type | Dual AI and PBO | Dual AI and PBO | Dual AI and PBO |
| Estimated Total Need for Campaigns | 5,198,450 | 10,958,700 | 0 |
| **Total ITN Need: Continuous and Campaign** | **7,059,749** | **12,867,312** | **1,957,162** |
| **Partner Contributions** | | | |
| ITNs carried over from previous year | 0 | 1,563,776 | 1,433,348 |
| ITNs from Government | 0 | 0 | 0 |
| Type of ITNs from Government | | | |
| ITNs from Global Fund | 8,623,525 | 12,736,884 | 0 |
| Type of ITNs from Global Fund | Dual AI and PBO | Dual AI and PBO | |
| ITNs from other donors | 0 | 0 | 0 |
| Type of ITNs from other donors | | | |
| ITNs planned with PMI funding | 0 | 0 | 0 |
| Type of ITNs with PMI funding | | | |
| **Total ITNs Contribution Per Calendar Year** | **8,623,525** | **14,300,660** | **1,433,348** |
| **Total ITN Surplus (Gap)** | **1,563,776** | **1,433,348** | **(523,814)** |

**Table A-2. RDT Gap Analysis Table**

| Calendar Year | 2022 | 2023 | 2024 |
|---|---|---|---|
| Total country population | 31,616,078 | 32,419,747 | 33,244,414 |
| Population at risk for malaria | 31,616,078 | 32,419,747 | 33,244,414 |
| PMI-targeted at-risk population | 31,616,078 | 32,419,747 | 33,244,414 |
| **RDT Needs** | | | |
| **Total number of projected suspected malaria cases**[1] | **70,866,774** | **67,491,171** | **66,488,828** |
| Percent of suspected malaria cases tested with an RDT | 40% | 45% | 50% |
| **RDT Needs (tests)** | **28,432,547** | **30,462,908** | **33,531,566** |
| Needs Estimated based on a Combination of HMIS and Consumption Data | | | |
| **Partner Contributions (tests)** | | | |
| RDTs from Government | 0 | 0 | 0 |
| RDTs from Global Fund | 24,060,525 | 14,009,125 | 14,000,000 |
| RDTs from other donors | 0 | 0 | 0 |
| RDTs planned with PMI funding | **12,627,569** | **13,264,556** | **19,000,000** |
| **Total RDT Contributions per Calendar Year** | **36,688,094** | **27,273,681** | **33,000,000** |
| **Stock Balance (tests)** | | | |
| Beginning Balance | **16,963,075** | **25,218,622** | **22,029,395** |
| - Product Need | 28,432,547 | 30,462,908 | 33,531,566 |
| + Total Contributions (received/expected) | 36,688,094 | 27,273,681 | 33,000,000 |
| **Ending Balance** | **25,218,622** | **22,029,395** | **21,497,829** |
| Desired End of Year Stock (months of stock) | **7** | **7** | **7** |
| Desired End of Year Stock (quantities) | 16,585,652 | 19,560,080 | 21,214,140 |
| **otal Surplus (Gap)** | **8,632,970** | **2,469,315** | **283,689** |

[1] The population data was obtained from the National Institute of Statistics (March 22 projections); fever data was obtained from the 2018 and 2021 Mozambique Health Facility Surveys, the data for the number of people with fevers that seek care and the percent of people that use the public sector health care system were obtained from the 2018 Malaria Indicator Survey; and the data to determine the percent of people tested for malaria comes from the Health Management Information System (2021).

**Table A-3. ACT Gap Analysis Table**

| Calendar Year | 2022 | 2023 | 2024 |
|---|---|---|---|
| Total country population | 31,616,078 | 32,419,747 | 33,244,414 |
| Population at risk for malaria | 31,616,078 | 32,419,747 | 33,244,414 |
| PMI-targeted at-risk population | 31,616,078 | 32,419,747 | 33,244,414 |
| **ACT Needs** | | | |
| Total projected number of malaria cases | 11,373,019 | 11,575,905 | 12,071,364 |
| **Total ACT Needs (treatments)** | **16,726,895** | **16,790,149** | **16,734,018** |
| Needs Estimated based on a Combination of HMIS and Consumption Data | | | |
| **Partner Contributions (treatments)** | | | |
| ACTs from Government | 0 | 0 | 0 |
| ACTs from Global Fund | 4,630,500 | 8,995,680 | 6,900,000 |
| ACTs from other donors | 0 | 0 | 0 |
| ACTs planned with PMI funding | 7,065,540.00 | 6,530,029.00 | 9,000,000.00 |
| **Total ACTs Contributions per Calendar Year** | **11,696,040** | **15,525,709** | **15,900,000** |
| **Stock Balance (treatments)** | | | |
| Beginning Balance | 21,364,818 | 16,333,963 | 15,069,522 |
| - Product Need | 16,726,895 | 16,790,149 | 16,734,018 |
| + Total Contributions (received/expected) | 11,696,040 | 15,525,709 | 15,900,000 |
| **Ending Balance** | **16,333,963** | **15,069,522** | **14,235,504** |
| Desired End of Year Stock (months of stock) | **10** | **10** | **10** |
| Desired End of Year Stock (quantities) | 13,939,080 | 13,945,015 | 13,859,959 |
| **Total Surplus (Gap)** | **2,394,883** | **1,124,507** | **375,545** |

**Table A-4. Inj. Artesunate Gap Analysis Table**

| Calendar Year | 2022 | 2023 | 2024 |
|---|---|---|---|
| **Injectable Artesunate Needs** | | | |
| **Projected number of severe cases**[1] | **179,790** | **182,997** | **190,830** |
| Projected number of severe cases among children | 77,190 | 78,567 | 81,930 |
| Average number of vials required for severe cases among children | 5.8 | 6.3 | 6.3 |
| Projected number of severe cases among adults | 102,600 | 104,430 | 108,900 |
| Average number of vials required for severe cases among adults | 7.5 | 7.5 | 7.5 |
| **Total Injectable Artesunate Needs (vials)** | **1,220,751** | **1,274,834** | **1,329,398** |
| Needs Estimated based on a Combination of HMIS and Consumption Data | | | |
| **Partner Contributions (vials)** | | | |
| Injectable artesunate from Government | 275,000 | | 250,000 |
| Injectable artesunate from Global Fund | 486,831 | 653,150 | 570,000 |
| Injectable artesunate from other donors | 0 | 0 | 0 |
| Injectable artesunate planned with PMI funding | **350,000** | | **431,000** |
| **Total Injectable Artesunate Contributions per Calendar Year** | **1,111,831** | **653,150** | **1,251,000** |
| **Stock Balance (vials)** | | | |
| Beginning Balance | 1,696,140 | 1,587,220 | 965,536 |
| - Product Need | 1,220,751 | 1,274,834 | 1,329,398 |
| **+ Total Contributions (received/expected)** | **1,111,831** | **653,150** | **1,251,000** |
| Ending Balance | 1,587,220 | 965,536 | 887,137 |
| Desired End of Year Stock (months of stock) | **8** | **8** | **8** |
| Desired End of Year Stock (quantities) | 813,834 | 849,890 | 886,266 |
| **Total Surplus (Gap)** | **773,386** | **115,646** | **871** |

[1] The projected number of severe cases was calculated using the Health Management Information System (2021) baseline data for severe malaria.

**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) | 180,853 | 211,200 | 211,200 |
| **Total Artesunate Suppository Needs (suppositories)** | **180,853** | **211,200** | **211,200** |
| 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 | 193,046 | 211,200 | 211,200 |
| Artesunate suppositories from other donors | 0 | 0 | 0 |
| Artesunate suppositories planned with PMI funding | **39,072** | 0 | 0 |
| **Total Artesunate Suppositories Available** | **232,118** | **211,200** | **211,200** |
| **Stock Balance (suppositories)** | | | |
| Beginning Balance | 191,000 | 242,265 | 242,265 |
| - Product Need | 180,853 | 211,200 | 211,200 |
| + Total Contributions (received/expected) | 232,118 | 211,200 | 211,200 |
| **Ending Balance** | **242,265** | **242,265** | **242,265** |
| Desired End of Year Stock (months of stock) | **6** | **6** | **6** |
| Desired End of Year Stock (quantities) | 90,427 | 105,600 | 105,600 |
| **Total Surplus (Gap)** | **151,838** | **136,665** | **136,665** |

**Table A-6. SP Gap Analysis Table**

| Calendar Year | 2022 | 2023 | 2024 |
|---|---|---|---|
| Total Country Population | 31,616,078 | 32,419,747 | 33,244,414 |
| Total Population at Risk for Malaria | 31,616,078 | 32,419,747 | 33,244,414 |
| PMI Targeted at Risk Population | 31,616,078 | 32,419,747 | 33,244,414 |
| **SP Needs** | | | |
| **Total Number of Pregnant Women** | **1,861,299** | **1,908,612** | **1,957,162** |
| Percent of pregnant women expected to receive IPTp1 | 79% | 79% | 79% |
| Percent of pregnant women expected to receive IPTp2 | 79% | 81% | 83% |
| Percent of pregnant women expected to receive IPTp3 | 55% | 57% | 58% |
| Percent of pregnant women expected to receive IPTp4 | 58% | 59% | 61% |
| **Total SP Needs (doses)** | **5,055,178** | **5,274,393** | **5,503,208** |
| Needs Estimated based on a Combination of HMIS and Consumption Data | | | |
| **Partner Contributions (doses)** | | | |
| SP from Government | **5,803,676** | **5,457,072** | **5,693,888** |
| SP from Global Fund | 0 | 0 | 0 |
| SP from other donors | 0 | 0 | 0 |
| SP planned with PMI funding | 0 | 0 | 0 |
| **Total SP Contributions per Calendar Year** | **5,803,676** | **5,457,072** | **5,693,888** |
| **Stock Balance (doses)** | | | |
| Beginning balance | 3,464,150 | 4,212,648 | 4,395,327 |
| - Product Need | 5,055,178 | 5,274,393 | 5,503,208 |
| + Total Contributions (Received/expected) | 5,803,676 | 5,457,072 | 5,693,888 |
| **Ending Balance** | **4,212,648** | **4,395,327** | **4,586,007** |
| Desired End of Year Stock (months of stock) | **10** | **10** | **10** |
| Desired End of Year Stock (quantities) | 4,212,648 | 4,395,327 | 4,586,007 |
| **Total Surplus (Gap)** | **0** | **0** | **0** |