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Angola

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 U.S. Congress. Any updates will be reflected in revised postings.

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

CONTENTS

ABBREVIATIONS

ACT	Artemisinin-based Combination Therapy
ADECOS	*Agentes de Desenvolvimento Comunitário e Sanitário*/Community and Health Development Agents
ANC	Antenatal Care
ARU	ADECOS Referral Unit
ASAQ	Artesunate-Amodiaquine
ARMED	*Agência Reguladora de Medicamentos e Tecnologias de Saúde*/Regulatory Agency of Medicines and Health Technologies
CDC	Centers for Disease Control and Prevention
CECOMA	*Central de Compras de Medicamentos e Meios Médicos de Angola*/Central Procurement Agency for Medicines and Medical Supplies
DHS	Demographic and Health Survey
DHIS2	District Health Information Software 2
DNSP	*Direção Nacional de Saúde Pública*/National Directorate of Public Health
DQA	Data Quality Assessment
E8	Elimination 8
eLMIS	Electronic Logistics Management Information System
EUV	End-Use Verification
EPI	Expanded Program on Immunization
FAS	*Fundo de Apoio Social*/Social Support Fund
FBO	Faith-based Organization
FETP	Field Epidemiology Training Program
FY	Fiscal Year
GEPE	*Gabinete de Estudos, Planeamento e Estatística*/Office of Planning and Statistics
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GRA	Government of the Republic of Angola
GTI	Office of Technology and Information
HF	Health Facility
HMIS	Health Management Information System
HNQIS	Health Network Quality Improvement System
HW	Health Worker
ICCT	*Instituto de Combate e* Controlo das Tripanossomíases/Institute to Combat and Control Trypanosomiasis
INIS	*Instituto Nacional de Investigação em Saúde*/National Health Research Institute
IPC	Interpersonal Communication

IPTp	Intermittent Preventive Treatment for Pregnant Women
IRS	Indoor Residual Spraying
ITN	Insecticide-treated Mosquito Net
M&E	Monitoring and Evaluation
MBS	Malaria Behavior Survey
MIP	Malaria in Pregnancy
MIS	Malaria Indicator Survey
MOH	Ministry of Health
MOP	Malaria Operational Plan
NMCP	National Malaria Control Program
NMSP	National Malaria Strategic Plan
OR	Operational Research
PBO	Piperonyl Butoxide
PE	Program Evaluation
PPMRm	Procurement Planning and Monitoring Report for Malaria
PMI	U.S. President's Malaria Initiative
RAS	Rectal Artesunate Suppositories
RDT	Rapid Diagnostic Test
SADC	Southern African Development Community
SBC	Social and Behavior Change
SDP	Service Delivery Point
SIGLOFA	*Sistema Informática de Gestão de Logística Farmacêutica de Angola*/Pharmaceutical Logistics Management Information System
SM&E	Surveillance, Monitoring, and Evaluation
SP	Sulfadoxine-Pyrimethamine
SRH	Sexual and Reproductive Health
TES	Therapeutic Efficacy Study
USAID	United States Agency for International Development
WHO	World Health Organization
ZMSWM	Zero Malaria Starts with Me
ZMCC	Zero Malária Começa Comigo

EXECUTIVE SUMMARY

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

U.S. President's Malaria Initiative

Launched in 2005, U.S. President's Malaria Initiative (PMI) supports implementation of malaria prevention and treatment measures as well as cross-cutting interventions. PMI's 2021–2026 strategy, *End Malaria Faster*, envisions a world free of malaria within our generation with the goal of preventing malaria cases, reducing malaria deaths and illness, and eliminating malaria in PMI partner countries. PMI currently supports 24 countries in sub-Saharan Africa and three programs across the Greater Mekong Subregion in Southeast Asia to control and eliminate malaria. Angola began implementation as a PMI partner country in fiscal year (FY) 2006.

Rationale for PMI's Approach in Angola

According to the World Malaria Report 2021, Angola is one of the six countries that account for over half the global malaria burden in terms of both malaria cases and deaths. (Angola specifically accounts for approximately 3 percent of global malaria cases and deaths). Malaria is transmitted nationwide with 100 percent of the population at risk, and although progress has been made over the years toward achieving key milestones for malaria case management and control, these efforts are hampered by multiple challenges, including insufficient funding, limited qualified human resources, weak government structures, and various logistical constraints.

The general objective of the current 2021–2025 National Malaria Strategic Plan (NMSP), developed with technical and financial support of PMI, is to reduce malaria-related morbidity and mortality by 40 and 50 percent, respectively, by 2025, from 2020 baseline figures. To support these goals, PMI aligns its funding and technical assistance to implement interventions that reflect the majority of the country's strategies in the NMSP 2021–2025. In doing so, PMI prioritizes its implementation in the areas of Angola with the highest malaria burden (33 percent of all malaria cases in 2021 occurred in PMI focus provinces), focusing efforts in 60 municipalities of 6 provinces (Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uíge, and Zaire) aiming to achieve highest reduction of malaria morbidity and mortality.

Overview of Planned Interventions

The proposed FY 2023 PMI funding for Angola is $18 million. PMI will support the following intervention areas with these funds:

1. Vector Monitoring and Control

With FY 2023 funds, PMI plans to procure 800,000 of the approximately 1.9 million piperonyl butoxide (PBO) or dual active ingredient insecticide-treated mosquito nets (ITNs) needed for PMI focus provinces for the calendar year (CY) 2025 mass campaign and support continuous distribution channels in CY 2024 in the same provinces. PMI will provide support for 12 months for the standard durability monitoring activity of PBO and standard nets distributed during the CY 2022 mass campaign. PMI will continue to support entomology activities in Angola including determining species' composition and abundance throughout the year in two provinces (Luanda and Huambo) and vector susceptibility to different insecticides in seven provinces (Cuanza Norte, Luanda, Lunda Norte, Lunda Sul, Malanje, Uíge, and Zaire) during the peak mosquito season (November to April), while working with the NMCP, *Direção Nacional de Saúde Pública*/National Directorate of Public Health (DNSP), *Instituto Nacional de Investigação em Saúde*/National Health Research Institute (INIS), provincial/district authorities, and other entomological partners. PMI will continue to provide technical assistance to the *Instituto de Combate e* Controlo das Tripanossomíases/Institute to Combat and Control Trypanosomiasis (ICCT) to support the establishment of a national insectary. As part of the capacity-strengthening plan, PMI will continue to support the implementation of standardized protocols and best practices (laboratory and insectary), develop a job aid for morphological identification of local *Anopheles* species (including *An. stephensi*), and contribute to NMCP entomological map development to include all vector monitoring activities and data (including vector species and insecticide resistance).

2. Malaria in Pregnancy (MIP)

The proportion of pregnant women attending antenatal care (ANC) who receive intermittent preventive treatment for pregnant women (IPTp) has increased in the last four years but remains low compared with targets set by NMSP goals. In 2021, only 62 percent of expected pregnant women attended any ANC visit, 52 percent received the first dose of IPTp, 37 percent received the second dose, 25 percent, the third dose, and only 14 percent completed at least four doses as per the national guidelines. PMI/Angola will continue to support activities to strengthen MIP services and improve uptake of IPTp, including: strengthening national- and provincial-levels MIP coordination structures in collaboration with the Ministry of Health (MOH) Sexual and Reproductive Health (SRH) Department; supporting the revision of MIP guidelines, standard operating procedures, training manuals, and job aids to address barriers to uptake of IPTp; and expanding the introduction of the revised guidelines to medical training institutions and other relevant institutions. PMI will continue to expand access to ANC provider training on MIP, fund supportive supervision for ANC facility health workers (HWs), promote data quality improvement, and advocate for the realization of clinical meetings in targeted HFs to strengthen MIP implementation and discuss bottlenecks. PMI will also

continue to fund procurement of 100 percent of sulfadoxine-pyrimethamine (SP) needs in PMI focus provinces, support SP distribution, and use findings from the ongoing Malaria Behavior Survey (MBS) to further inform future intervention strategies.

3. Drug-based Prevention

PMI does not support seasonal malaria chemoprevention or other drug-based prevention in Angola.

4. Case Management

PMI procures artemisinin-based combination therapies (ACTs), rapid diagnostic tests (RDTs), definitive treatment and pre-referral treatment for severe malaria, and microscopy supplies for diagnosis. PMI proposes to maintain its commodity commitment to assist in avoiding potential stockouts of essential products so that investments in facility- and community-levels case management are maintained and supported. Activities focus on quality improvement of malaria case management at the health facility (HF) level, including mortality audits and continued focus on training and supportive supervision. Activities will include providing technical assistance for updating guidelines for malaria case management as needed, continuing to support laboratorial diagnostics training (basic and advanced) including training of trainers, and continuing efforts to establish a national malaria slide bank. An emphasis will be placed on analysis and dissemination of routinely collected data to demonstrate impact of interventions including the roll-out of rectal artesunate at the community level, malaria-related mortality after referral, feasibility of digital training and supervision tools used at the community level, evaluating change in quality of care documented in supervisions after training at the community and HF levels, and other measures of change of quality of care.

5. Health Supply Chain and Pharmaceutical Management

The main supply chain functions planned to be supported by PMI in FY 2023 are continued support to strengthen pharmaceutical management related to antimalarial commodities and contributing technical assistance to encourage the government to lead in-country distribution of PMI-funded commodities stocked at the Angolan MOH warehouse. Support will continue to be provided for the registration of medicines and pharmaceutical management strengthening through the *Agência Reguladora de Medicamentos e Tecnologias de Saúde*/Regulatory Agency of Medicines and Health Technologies (ARMED) directly to NMCP. PMI will maintain current support of the national health electronic Logistics Management Information System (eLMIS) called *Sistema Informática de Gestão de Logística Farmacêutica de Angola*/Pharmaceutical Logistics Management Information System (SIGLOFA) in Angola, while engaging with

other stakeholders on its future national roll-out and advocacy for its integration with the District Health Information Software 2 (DHIS2).

6. Social and Behavior Change (SBC)

While PMI supports SBC activities that promote the uptake and maintenance of all key malaria interventions (all adapted to emphasize that it is still critical to protect against malaria during the COVID-19 pandemic), three behaviors will be prioritized with FY 2023 funds: consistent ITN use, maintenance, and proper ITN care by all members of households; prompt care-seeking for fever for children under five years of age; and uptake of four or more doses of IPTp during pregnancy. Major activities include increasing the reach and exposure to PMI-funded activities supporting the national Zero Malaria Starts With Me campaign via multiple channels using mass digital technology, social media, Kassai (Moodle-based e-learning training platforms), and interpersonal communication (IPC) channels; adapting technical assistance to service delivery partners for the deployment of behavioral prototypes across PMI focus facilities; and sustaining peer-to-peer engagement and group problem-solving through provider cluster and professional meetings to promote provider behavior change regarding the use of RDTs and results from death audits. Across all behaviors, SBC interventions will continue to be deployed using enhanced audience segmentation approaches to further prioritize and enhance coverage of sub-populations.

7. Surveillance, Monitoring, and Evaluation (SM&E)

Significant investment has been made in SM&E, with an increasing focus on improving the prompt availability and quality of routine data on electronic platforms. The implementation of the DHIS2 platform allows the NMCP to get granular epidemiological data at all levels for subnational tailored interventions: health unit, municipality and province, as well as data from the community level. DHIS2 also provides data related to monthly consumption and inventory of key malaria products at service delivery points (SDPs), allowing the supply chain teams to monitor the management and supply of these products. Furthermore, to ensure appropriate amounts of commodities are procured for timely delivery to Angola, PMI supports the elaboration of monthly supply plan updates and stock status reports for informed last-mile distribution. With FY 2023 funds, PMI will build on previous successes to further strengthen the data collected through a routine health management information system (HMIS) called DHIS2 and to monitor and evaluate malaria interventions with a focus on high-malaria burden provinces supported by PMI. PMI will continue to support malaria-related data integration and management systems and regular technical working groups to review and discuss SM&E activities at national and district levels. PMI will continue to support NMCP in analyses, reviews, and dissemination of malaria-related data. Data quality assessments (DQAs) are planned to continue efforts to ensure data generated has the

necessary quality to inform accurate decision-making through DHIS2. Emphasis will also be placed on use of data for decision-making by supporting NMCP to respond to increases in cases and deaths and make recommendations for control at the municipal level and for advocacy efforts for timely and adequate government commodity investment.

8. Operational Research (OR) and Program Evaluation (PE)

OR capacity has been prioritized as an interest of the NMCP in Angola. However, limitations on funding motivated PMI/Angola to focus efforts instead on expanded and strengthened analysis and dissemination of routinely collected data with an intention of preparing Angola to have capacity for implementing future OR studies. There are no proposed OR studies using FY 2023 MOP funds, but exploration of forming an OR technical working group with entities such as national universities with medical schools, foreign universities, nongovernmental organizations, or private entities able to conduct research interventions has been identified as a potential step for strengthening capacity to prioritize and investigate OR/PE questions in Angola.

9. Capacity Strengthening

PMI/Angola supports interventions that aim to strengthen the institutional and individual capacity of national-, subnational-, and local-level malaria programs and teams to effectively lead, manage, implement, and oversee their own programs to achieve their own objectives. Until recently, PMI utilized the approach of funding training through the frontline U.S. Centers for Disease Control and Prevention (CDC) Field Epidemiology Training Program (FETP), but shifted to supporting the development of the Epidemiological Surveillance on Public Health Course for the Kassai digital e-learning platform. With FY 2023 funding, PMI will continue its support for capacity-building of the NMCP via conference and workshop attendance, including oral or poster presentations of implementing partners at conferences and the participation of relevant NMCP personnel, where the outcome is beneficial to the country’s program.

I. CONTEXT AND STRATEGY

1. Introduction

Angola began implementation as a U.S. President's Malaria Initiative (PMI) partner country in fiscal year (FY) 2006. This FY 2023 Malaria Operational Plan (MOP) presents a detailed implementation plan for Angola, based on the strategies of PMI and the National Malaria Control Program (NMCP). It was developed in consultation with the NMCP and with the participation of national and international partners. The activities that PMI is proposing build on investments made by partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund). This document provides an overview of the strategies and interventions in Angola, describes progress to date, identifies challenges and relevant contextual factors, and provides a description of activities planned with FY 2023 funding. For more detailed information on the country context, please refer to the country malaria profile, which provides an overview of the country's malaria situation, key indicators, the NMCP strategic plan, and the partner landscape.

2. PMI

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

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

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 Angola

3.1. Malaria Overview for Angola

For more detailed information on malaria indicators, please refer to the country malaria profile.

Malaria is transmitted throughout Angola with 100 percent of the population at risk. It continues to be the primary health burden in Angola and the principal cause of morbidity and mortality. Data from 2021 show that malaria was the leading cause of low birth weight and anemia and was the primary cause of death reported nationwide (42 percent), followed by accidental trauma (8 percent), HIV/AIDS (7 percent), malnutrition in children under five years of age (6 percent), severe acute respiratory infections (6 percent), tuberculosis (5 percent), arterial hypertension (5 percent), and COVID-19 (4 percent). There is significant geographical heterogeneity in malaria transmission in Angola, with hyperendemicity historically observed in the northeast provinces of Cabinda, Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, and Uíge. In the north, the peak malaria transmission season extends from March to May, with a secondary peak in October to November. The central and coastal provinces (Benguela, Bie, Cuanza Sul, Huambo, Luanda, Moxico, and Zaire) are mesoendemic with stable transmission. The four southern provinces bordering Namibia have highly seasonal transmission and are prone to epidemics. These ecological zones and their areas of transition are

distinguished by rainfall and other climatic conditions. The rainfall duration ranges from about three months in Cunene Province to eight or nine months (October to April or May) in northern and eastern Angola. The climatic patterns affect vegetation, and most flora and fauna are differentiated across the ecological zones.

According to the World Malaria Report 2021, Angola is one of the six countries that account for over half of all the global malaria burden in terms of both malaria cases and deaths (Angola specifically accounts for approximately 3 percent of global malaria cases and deaths). In 2021, Angola reported 13,676 deaths (an increase of 12 percent in comparison with 2020). Despite this overall country trend, in PMI focus provinces a decrease in malaria deaths by 10 percent was observed over the same time frame (2,987 deaths were reported in 2021 versus 3,302 in 2020).

As far as morbidity is concerned, in 2021, there were 9.2 million malaria cases (91 percent confirmed by microscopy or rapid diagnostic test [RDT]) from which 32.5 percent were in children under five years of age and 3.3 percent in pregnant women. Of approximately 14.8 million fever cases tested at service delivery sites, 53.3 percent were positive for malaria. The increase over the years can be partially explained by the increase of 81 percent, since 2006, in the overall number of patients that present for evaluation of fever, both through outpatient clinics and malaria case management at community level through *agentes de desenvolvimento comunitário e sanitário* (ADECOS) or community and health development agents, the community health and development workers platform deployed in 2016 (Angola Health Management Information System [HMIS] 2006–2021). Furthermore, with the shift from paper-based reports to digital platforms like the District Health Information Software 2 (DHIS2) supported by PMI, malaria monthly report completeness rates have increased nationwide from 82 percent in 2017 to 91 percent in 2021, while the timely reports rate improved from 55 percent in 2017 to 73 percent in 2021. In 2021, 33 percent of all patients seeking health care were diagnosed with malaria (5.6 percent with severe malaria).

3.2. Key Challenges and Contextual Factors

Angola’s health care and welfare system is inadequate to fulfill the needs of the population. It has not adapted to the growth of the population and has limitations in resources: A shortage of medical professionals and skilled practitioners, poor infrastructure, insufficient medical services, and limited budget allocation. The insufficient number of skilled nurses and technical staff are not all working in their fields of expertise. The very few physicians are limited in their capacity to do outreach with the population, resulting in challenges related to the delivery of quality services.

The country has made progress toward increasing access to health care services, including availability and affordability of malaria preventive and case management

interventions toward achieving malaria control. In 2021, the Angola Ministry of Health (MOH) reported a coverage of 63 percent of the population with public health services. In support of the development of the 2021–2025 National Malaria Strategic Plan (NMSP), the 2020 Malaria Program Review identified multiple challenges that hamper effective implementation, including limited governance structures, which often result in inadequate funding allocated and released for the health sector at national and subnational levels. The NMCP sits within the MOH but is not formally structured as an independent unit, and therefore does not receive direct and consistent funding from the general state budget. This limits the capacity of NMCP to lead operations and makes the program highly dependent on external partners to fund and implement activities prioritized in the NMSP. Subnational engagement with individual provincial/district governments is required to effectively support the entire country and successfully implement malaria programming. While there is a National Malaria Partners Forum, it is limited in its leadership and engagement.

3.3. PMI's Approach for Angola

PMI organizes its investments around the activities below, in line with the Angola NMSP 2021–2025. Building and strengthening the capacity of Angola's people and institutions, from the central level to communities. To effectively lead and implement evidence-based malaria control and elimination activities is paramount to PMI. The majority of PMI's planned support for FY 2023 across the areas of vector control, service delivery, and critical support systems such as supply chain, contains elements of capacity-building and system-strengthening. PMI/Angola will continue to rely on and engage with local partners, such as national and provincial government departments, and is expanding its local partner base to reach municipal health departments and administrations, community-based organizations and civil society organizations.

Finally, PMI/Angola will continue to rely on private sector partnerships with entities such as Unitel, ExxonMobil Foundation, *Banco de Fomento Angola*, and other partners through the National Malaria Partners Forum. To accelerate sustainable development, PMI has worked over the years to assess the strengths and persistent challenges of Angola's malaria program. The activities proposed in this MOP are tailored to draw on these strengths and address weaknesses; activities will be monitored to evaluate the effectiveness of capacity-building and strengthening efforts. In addition, while PMI understands it will take time for Angola to fully finance its development priorities, PMI will work with other partners (e.g., the Global Fund) to jointly advocate for Angola's funding commitments across the malaria portfolio.

3.4. Key Changes in This MOP

There has been no significant change in strategies, activities, or budget levels compared to the previous MOP.

II. OPERATIONAL PLAN FOR FY 2023

1. Vector Monitoring and Control

1.1. PMI Goal and Strategic Approach

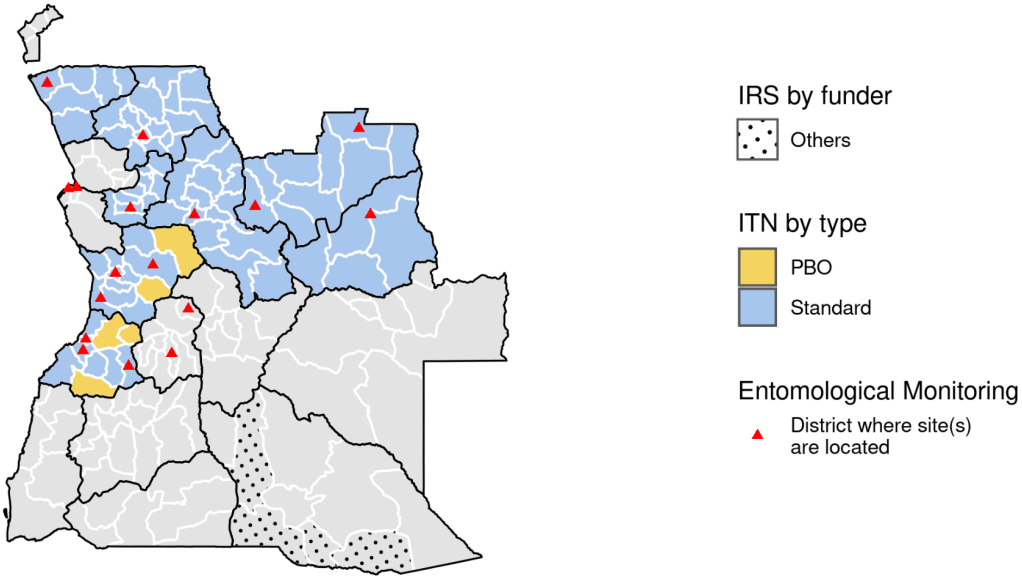
The Angola NMSP 2021–2025 aims to protect at least 80 percent of the population at risk with effective malaria prevention interventions through an integrated vector management strategy. This includes vector surveillance, insecticide resistance management, continuous and mass distribution of ITNs, targeted insecticide spraying (IRS and outdoor fumigation), larviciding, and strengthening entomological capacities. Currently, PMI supports the use of all of these interventions, with the exceptions of IRS, fumigation, or larviciding. PMI supports insecticide susceptibility monitoring in six focus provinces (Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uíge, and Zaire) plus Luanda and Huambo, entomological monitoring in the non-PMI focus provinces of Luanda and Huambo, and contributes to national-level insectary management and maintenance as well as laboratory sample processing. PMI also supports the implementation of entomological surveillance by other partners working in-country through coordination of activities plans, harmonization of data and results reporting, implementation of standard methods, technical assistance, and supplies.

The current NMCP strategy for malaria prevention in Angola includes ITN ownership and use as key population behavior for vector control, thus prioritizing coverage of the entire population through facility-level continuous distribution with basis in antenatal and immunization services as well as community-level periodic distribution through mass campaigns. PMI supports ITN procurement, warehousing, transportation, micro-planning, supervision, registration, and other logistical support for ITN distribution in the six PMI focus provinces of Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uíge, and Zaire. Moreover, PMI supports continuous distribution of ITNs via antenatal care (ANC) and Expanded Program on Immunization (EPI) channels as well as mass campaigns every three years, per the NMSP, in PMI focus provinces.

The Global Fund supports entomological surveillance and mass distribution of ITNs every three years in two provinces (Cuanza Sul and Benguela). The Global Fund has been supporting annual IRS campaigns along the Angola-Namibia border (in Cuando Cubango province) since 2019 and the NMCP expects to continue IRS operations funded by the Global Fund regional grant (2021–2024).

The Government of the Republic of Angola (GRA) is currently undergoing a public tender process for procurement of 10 million ITNs to be distributed in the calendar year (CY) 2022 mass campaign in the ten provinces not covered by PMI or Global Fund. GRA also supports larviciding activities in the provinces of Luanda and Huambo.

Figure 1. Map of Vector Control Activities in Angola, 2022



1.2. Recent Progress (between October 2020 and June 2022)

PMI supported the following vector control activities:

- Supported insecticide resistance monitoring in seven provinces (Huambo, Cuanza Norte, Luanda, Lunda Sul, Malanje, Uíge, and Zaire) during peak mosquito abundance months in partnership with NMCP mosquito brigades. For more information about entomological monitoring, please refer to the 2021 Entomological Report.
- Supported monthly community-based entomology monitoring activities (training of community collectors to conduct vector bionomics monitoring using CDC light traps and larval collections for insecticide resistance testing) in Huambo and Luanda provinces, and conducted a pilot in Lunda Norte, through training of community collectors and municipal brigade staff.
- Provided training and technical assistance and supplies to *Instituto Nacional de Investigação em Saúde*/National Health Research Institute (INIS) and NMCP to support the establishment of an insectary colony and laboratory protocols for molecular determination of mosquito species identification and sporozoite detection through ELISA.
- Provided training and technical assistance to INIS and NMCP on best practices for general laboratory management, including data workflow, supplies inventory, database management, and insectary maintenance.
- Provided coordination and technical assistance to *Instituto de Combate e* Controlo das Tripanossomíases/Institute to Combat and Control Trypanosomiasis (ICCT) to support the establishment of a national insectary.

- Supported the national quantification of ITNs for use in continuous distribution and for mass campaigns.
- Supported the procurement and distribution of 600,000 standard ITNs for continuous distribution in the six PMI focus provinces during FY 2021.
- Supported the procurement, related microplanning and transportation of 3,453,800 standard ITNs for distribution in PMI focus provinces during the CY 2022 mass distribution campaign.
- Supported both continuous and mass campaign distributions (CY 2022 campaign currently ongoing with 1,919,306 ITNs distributed benefiting 3,513,959 people) in six PMI focus provinces (Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uíge, and Zaire) complemented with SBC activities to improve demand for ITNs, increase appropriate use, promote care, and mitigate against misuse. For more information, please refer to the **SBC section** below.
- Supported standard ITN durability monitoring by contributing technical assistance to develop the work plan and implementing pre-distribution data collection coordination among donors to start monitoring the standard and piperonyl butoxide (PBO) nets from the CY 2022 mass distribution campaign.

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 Angola 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/Angola will continue to support entomological monitoring activities as described in the **Recent Progress section** above**.** PMI will maintain support for insecticide resistance monitoring in the seven provinces and will conduct community-based longitudinal vector monitoring shifting to an every-other-month frequency in Huambo and Luanda provinces only. In addition, activities for enhanced surveillance of *Anopheles stephensi* will be included in accordance with the PMI *An. stephensi* action plan guidance for high-risk countries. PMI will continue to collaborate with and provide technical assistance to local research institutions and NMCP to support localization and strengthen capacity to conduct entomological activities—mainly collaboration with the NMCP, INIS, and provincial authorities to conduct entomological monitoring and laboratory testing and with ICCT to support a national insectary.

Summary of Distribution and Bionomics of Malaria Vectors in Angola

As of 2021, primary malaria vector species in Angola are members of *An. funestus* s.l. and *An. gambiae* species complex. Other species recorded include *An. rufipes*, *An. coustani,* and *An. squamosus*. *An. funestus* is the species mostly captured through CDC light traps in the two provinces where longitudinal monitoring took place through community-based surveillance, reaching an abundance peak in September in Luanda and in December in Huambo. Albeit only a small number of captures were from Lunda Norte through a community-based surveillance pilot (due to logistical and capacity limitations), *An. gambiae* s.l. was the most abundant among those. Among the specimens collected through light trapping across all sites, above 90 percent were unfed. Additionally, of the 20 samples from Huambo tested for parasite infection, one *An. funestus* was positive for *P. falciparum*. Laboratory processing of 2021 samples in country (at INIS) was ongoing as of the time of writing this MOP.

A subset of samples collected from Luanda Province for susceptibility testing were morphologically identified and confirmed through DNA sequence analysis as *An. azevedoi*, a species identified in Angola in the 1960s but not further studied. The PMI-supported entomologists, as well as other partners, have confirmed the presence and significant abundance of this species in highly productive breeding sites, not only in Luanda but also in three other provinces. As this species has been mistakenly reported as *An. gambiae* s.l. (or others) in previous susceptibility reports, the PMI team and local entomologists are bringing awareness to others in the field and NMCP for proper morphological identification.

Entomological monitoring conducted by the Global Fund's implementing partner in Cuando Cubango province showed that *An. funestus* was the most prevalent species at most sites, and *An. arabiensis*, in a few sites. *An. rufipes* was highly prevalent in light trap collections from various houses in four municipalities. The three species were found to feed on humans (the human blood index for *An. funestus* was 0.70) and cows. *An. funestus* was found infected with *P. falciparum* on 5.9 percent of the sample analyzed.

Status of Insecticide Resistance in Angola

As of 2021, *An. gambiae* s.l. in all tested sites as well as *An. azevedoi* from Luanda were resistant to all pyrethroids (permethrin, deltamethrin, and alpha-cypermethrin). PBO increased mortality of *An. gambiae* s.l. and *An. azevedoi* to all pyrethroids in all sites, though most absolute mortality levels remained below the World Health Organization (WHO) threshold of 90 percent mortality. All vectors were fully susceptible to chlorfenapyr.

Preliminary results, shared by the Global Fund, which evaluated susceptibility and response to IRS with a limited number of specimens from two localities in Cuando Cubango province, indicate that *An. gambiae* s.l. and *An. rufipes* were fully susceptible to pirimiphos-methyl.

1.3.2. ITNs

PMI/Angola will continue to support ITN activities as described in the **Recent Progress section.** PMI will continue to support quantification, procurement, and distribution of ITNs through continuous distribution in PMI focus provinces via ANC and EPI, as well as provide support for the procurement of ITNs for the CY 2025 mass campaign. In line with current insecticide resistance data to pyrethroids, PMI will shift to procuring new types of nets. PMI will also support SBC to improve use and care of ITNs and to mitigate against misuse. PMI will continue to support standard durability monitoring of standard and PBO ITNs to be distributed in the CY 2022 mass campaign.

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

ITN Distribution in Angola

In Angola, the national strategy is for ITNs to be distributed via mass campaigns every three years and through continuous distribution channels, in non-campaign years, via ANC and EPI clinics and municipal health day events. The previous mass campaign was completed in Benguela, Huila, and nine municipalities in Uíge in 2016, and in 2018 for the remaining areas of PMI focus provinces. PMI contributed to 100 percent of the net needs in PMI focus provinces for the CY 2022 mass campaign. As the financial envelope allows, PMI prioritizes and contributes nets to sustain the continuous distribution channels in PMI focus provinces. Continuous distribution funded by the Global Fund took place in Cunene and Cuando Cubango provinces from September 2020 to September 2021, and starting in January 2022 in Benguela and Cuanza Sul provinces. There has been some, but decreasingly limited, distribution of ITNs via continuous distribution in other, exclusively MOH-supported, provinces since 2018.

The country is beginning to transition from standard pyrethroid-based to new types of nets during its CY 2022 mass distribution campaign in some districts of Benguela and Cuanza Sul provinces (through Global Fund funding). PMI plans for the CY 2025 mass campaign to distribute PBO nets in PMI focus provinces, based on insecticide resistance data.

In mid-2022, implementing partners noted a higher-than-forecasted amount of ITNs being distributed in the PMI focus provinces where the mass campaign was under way. To address a potential gap in the mass campaign occurring in PMI focus provinces, the PMI focus provinces stocks of ITNs that had been held in reserve for use in continuous

distribution in CY 2023 were used. This re-allocation resulted in a gap for ITNs to be used in continuous distribution in PMI focus provinces being projected in CY 2023. Continuous distribution of PBO ITNs in PMI focus provinces will recommence in CY 2024.

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

Table 1. Standard Durability Monitoring

Campaign Date	Site	Type	Brand	Baseline	12-month	24-month	36-month
2022	Cacuso (Malange)	Pyrethroid	Yahe	Planned	Planned	Planned	Planned
2022	Mussende (Cuanza Sul)	PBO	PermaNet 3.0	Planned	Planned	Planned	Planned

1.3.3. IRS

PMI does not support IRS in Angola.

Limited targeted IRS is supported until 2022 by the Global Fund Southern African Development Community (SADC) regional grant in four border municipalities (Calai, Cuangar, Dirico, and Menongue) of Cuando Cubango province in the context of SADC Elimination 8 (E8) interventions targeting elimination of malaria transmission in Namibia. The country was recently authorized to revise the funding application section for Prioritized Above Allocation on the National Global Fund portfolio to include IRS activities targeting Cuando Cubango province.

2. Malaria in Pregnancy (MIP)

2.1. PMI Goal and Strategic Approach

PMI supports the WHO-recommended approach to reduce the burden of malaria infection among pregnant women through the provision of:

- IPTp
- ITN use
- Prompt and effective case management of malaria illness.

The MOH has adopted the WHO 2016 guidelines and the updated WHO policy of IPTp3+, which is to give three or more doses of sulfadoxine-pyrimethamine (SP) monthly until the day of delivery, administered as directly observed therapy during ANC visits. The 2016 guidelines support early initiation of IPTp between 13 to 16 weeks to all

pregnant women in areas of moderate-to-high malaria transmission at every scheduled ANC visit, except during the first trimester and women living with HIV treated with co-trimoxazole. The National Diagnosis and Treatment Guidelines was updated in 2022, alongside the Manual for the Prevention and Treatment of Malaria in Pregnancy which was developed with PMI support to be used nationwide. The guidelines specify that IPTp starts at the 13th week of pregnancy and continues at every prenatal visit until the delivery date; the NMSP 2021–2025 includes the 2016 WHO guidelines for monthly SP doses. MIP training and supervision are integrated with malaria case management. Furthermore, as per national policy, pregnant women receive ITNs at the first ANC visit.

With regard to the treatment of uncomplicated MIP, the NMCP's policy is to administer oral quinine (with clindamycin) during the first trimester and ACTs during the last two trimesters of the pregnancy. For severe malaria, the first-line treatment is intravenous artesunate, intramuscular artemether as second-line treatment, or injectable quinine as third-line treatment. Health facilities (HFs) track malaria cases during pregnancy and report on a monthly basis.

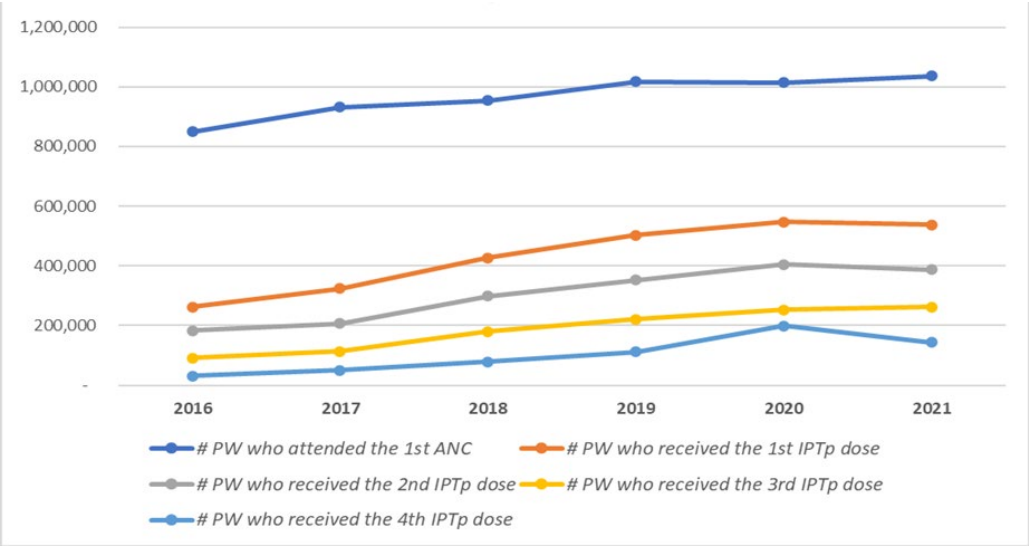
According to the NMSP 2021–2025, the NMCP has the following objectives for MIP:

- By the end of 2025, at least 80 percent of pregnant women sleep under an ITN.
- By the end of 2025, 50 percent of pregnant women with access to prenatal consultations and those eligible for IPTp receive at least four doses of SP.
- By the end of 2025, 100 percent of pregnant women with malaria should receive an early and effective diagnosis and treatment in accordance with national policy guidelines.

Despite PMI covering 100 percent of the projected SP needs for IPTp in PMI focus provinces, the low attendance rate of pregnant women at ANC continues to be a main challenge.

The data from the 2015–2016 Demographic and Health Survey (DHS) indicate that 82 percent of pregnant women attended at least one ANC visit by a skilled provider, a trend relatively consistent since 2006. However, in 2021, out of an estimated 1,669,079 expected pregnant women nationwide, only 62 percent (1,035,999) expected pregnant woman attended any ANC. Of these, 52 percent received the first dose of SP, 37 percent received the second dose, 25 percent the third dose, and only 14 percent completed at least four doses as per the national guidelines. Continued efforts are needed in Angola to increase both the frequency and earlier initiation of ANC visits. Figure 2 below shows the trends over the last six years.

Figure 2. Trends in First ANC Visit and IPTp Doses, 2016–2021



Source: Angola HMIS data

A follow-up qualitative study among pregnant women in 2016 identified key barriers for ANC attendance at HFs and efficient delivery of IPTp, including: long distance (road complexity associated with high cost of challenging transportation); long waiting hours (few ANC specialized clinics available coupled with the high volume found in the not-so-strategically-placed ANC centers); perceived judgment from health providers; and lack of knowledge about the normality of the IPTp drug side effects and how to manage them. Providers interviewed in the same 2016 study identified additional barriers such as workload, insufficient physical examinations for pregnant women due to lack of basic equipment, cost of transportation, and distance. Health workers (HWs) reported challenging systematic factors such as the overlapping of tasks with multiple roles performed by the same health provider (i.e., being overwhelmed) and huge client flow at the HFs. The study highlighted the need for policy development and dissemination, HW training and supervision, and supporting health systems development.

PMI contributes toward the achievement of the NMSP objectives by supporting IPTp administration through ANC training and supervision visits and through SBC activities targeting health providers toward MIP and the community where pregnant women live. PMI also contributes by funding the procurement and distribution of the SP quantities required to support 100 percent of the projected needs for IPTp in PMI focus provinces and a portion of needs in other provinces. PMI also contributes to the procurement and distribution of essential antimalarial commodities (ACTs, RDTs) used to diagnose and treat MIP and intravenous artesunate for severe malaria cases in all the trimesters of the pregnancy, also covering 100 percent of PMI focus areas.

While PMI provides targeted technical assistance to all the 60 districts of the six PMI focus provinces (Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uíge, and Zaire) for training and supervision in MIP and the procurement of SP, it also provides technical assistance at the central level to support overall national-level program implementation. However, there is a low coverage of 28 percent[1] of facilities in PMI focus provinces providing ANC services (*Gabinete de Estudos, Planeamento e Estatística/Office of Planning and Statistics* [GEPE], 2022), with several municipalities only having one ANC facility. Very low availability and access to ANC services is a major barrier to sustainably scaling up IPTp-SP in targeted provinces and Angola at large.

NMCP is initiating discussions internally at *Direção Nacional de Saúde Pública*/National Directorate of Public Health (DNSP), including other departments such as Sexual and Reproductive Health (SRH), on the possibility of expanding the number of HFs providing IPTp-SP using trained senior nurses currently working at peripheral HFs without ANC services. Thus, in an effort to explore other ways to improve both ANC attendance and IPTp uptake, Angola NMCP also expressed interest during the MOP FY 2023 meeting in piloting the implementation of community-based IPTp in the near future.

2.2. Recent Progress (between October 2020 and June 2022)

PMI supported:

- Conducted two regional workshops for harmonization of MIP implementation with provincial malaria supervisors and SRH.
- Revised *Malaria in Pregnancy Manual* and treatment guidelines (2022).
- Trained 2,077 HWs in IPTp-SP working across the 936 HFs among the six PMI focus provinces (not only HWs from the 266 HFs that provide ANC services). The training was done either through Kassai e-learning platforms (self-learning and blended training) and/or classroom training. The overall course evaluation carried out in 2022 suggests higher proficiency scores were obtained through Kassai. Kassai analytics indicated competency gaps primarily related to physical examination of pregnant women, applied learning scenarios, and severe malaria case management in pregnancy. Follow-up training is then tailored to address these competency gaps.
- Followed up formative supervision visits (1,396) to targeted ANC clinics with demonstrated competency gaps in MIP, particularly maternal child health

[1] This average percentage of ANC services coverage is derived from the following rates: Cuanza Norte, 19 percent; Lunda Norte, 44 percent; Lunda Sul, 21 percent; Malanje, 24 percent; Uige, 22 percent; and Zaire, 60 percent.

clinics and municipal hospitals using Health Network Quality Improvement System (HNQIS).
- Distributed treatment protocols and job aids to all HWs and HFs that provide ANC services during training and formative supervision visits.
- Donated approximately 250,000 doses of PMI-funded SP to the *Central de Compras de Medicamentos e Meios Médicos de Angola*/Central Procurement Agency for Medicines and Medical Supplies (CECOMA) for use in other provinces.
- Conducted SBC activities for demand generation of MIP preventive services like ITNs, IPTp-SP, and the effects of MIP to the mother and fetus through interpersonal communication (IPC) targeting women attending ANC services in selected clinics using community activists from *Rede Mulher Angola*.
- Leveraged mass and social media platforms like TV shows, radio spots, billboards, Facebook, and SMS messaging to disseminate information, education, and communication materials on MIP preventive services (for more details, see the **SBC section** below).
- Procured and distributed 2.5 million doses of SP to municipality-level and selected ANC clinics.
- Supported routine ITN distribution via ANC services.

2.3. Plans and Justification for FY2023 Funding

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

The proportion of pregnant women attending ANC who receive IPTp has trended up over the last four years based on Angola's HMIS data, but overall still remains low. Strengthening of MIP services remains a need and priority in Angola. With FY 2023 funding, PMI plans to continue to support MIP activities as described in the **Recent Progress section.** PMI will continue supporting NMCP with expanding access to training, including through the online Kassai platform, and formative supervisions, and analyzing possible ways to increase access to MIP services and supporting national quantification. Barriers and facilitators will be examined in a Malaria Behavior Survey (MBS) planned for October 2022. Data collected will help to inform future intervention strategies.

With MOP FY 2023 funds, PMI plans to procure 980,000 doses of SP to meet 100 percent of the IPTp needs in PMI focus provinces in CY 2024 and a small portion of the IPTp needs for SP in other provinces. No gaps are projected to occur in PMI focus provinces, and if surpluses occur due to lower than projected rates of IPTp uptake, these surpluses, if any, will be reallocated to non-PMI focus provinces.

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

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

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

3. Drug-Based Prevention

PMI/Angola does not support seasonal malaria chemoprevention, mass drug administration, intermittent preventive treatment during infancy, or other drug-based prevention in Angola apart from the IPTp-SP described in the **MIP section** above.

4. Case Management

4.1. PMI Goal and Strategic Approach

The NMCP's goal toward malaria case management is to provide early and effective diagnosis and treatment of 100 percent of malaria cases according to national guidelines. According to the 2021–2025 NMSP:

- By the end of 2025, 100 percent of suspected malaria cases in HFs and communities should be tested before being treated.
- By the end of 2025, 100 percent of confirmed malaria cases both uncomplicated and severe should be treated in accordance with national policy guidelines at all levels of the health pyramid, including the community.

The Angola NMSP 2021–2025 and the national treatment guidelines promote a comprehensive case management strategy, including universal, quality-assured parasitological testing of all cases of suspected uncomplicated malaria, prompt and effective treatment with ACTs of all parasitologically confirmed cases of 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 HWs (in Angola named ADECOS) performance. The NMCP has made microscopy diagnosis one of the pillars of its interventions during the past few years, and significant investments have been made in capacity-building through the strengthening of human resources, as well as equipment and supplies. The NMCP recommends RDT and microscopy quality assurance coverage during twice-yearly supervision visits. Since 2013, NMCP has been developing and institutionalizing an external quality assurance system for malaria

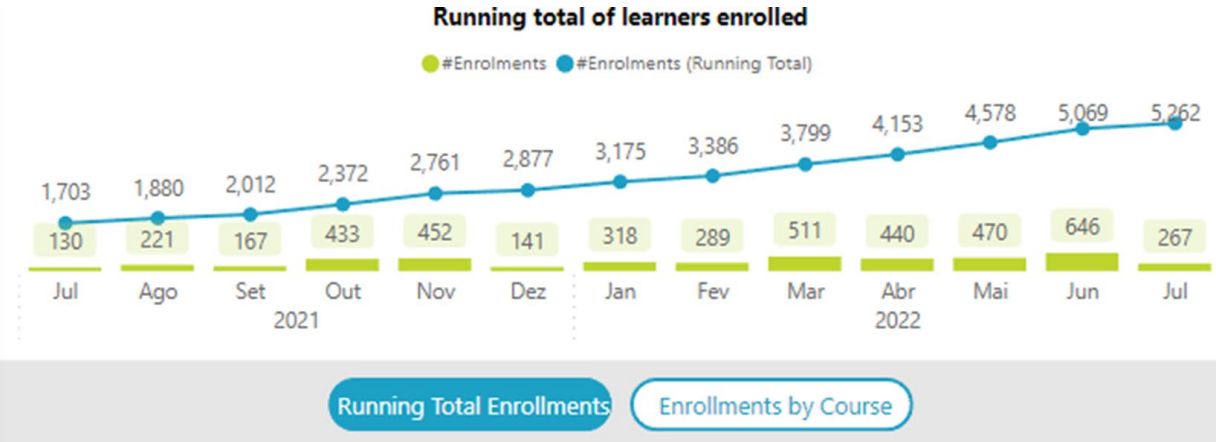
microscopy in Angola at the municipal level, which will provide both a platform for assessment and a way to strengthen microscopy techniques in routine activities.

PMI supports procurement of 100 percent of PMI focus provinces' needs and contributes 10 percent of the procurements to cover gaps in other provinces for malaria RDTs, ACTs, and injectable artesunate; the Global Fund supports procurement of needs of antimalarials and ITNs from Benguela and Cuanza Sul province; the GRA is responsible for procurement of commodities in the remaining 10 provinces. PMI also supports training and supportive supervision activities in all 60 districts of the six PMI focus provinces; the Global Fund supports training on case management in Benguela and Cuanza Sul, and the Global Fund regional grant funded through SADC E8 supports case management training in seven districts in southern Angola along the border with Namibia.

In 2021, in PMI focus provinces, 95 percent of suspected malaria cases were tested by either RDTs or microscopy and 95 percent of confirmed malaria cases were treated with ACTs at HFs and at the community level, compared to 72 percent of confirmed malaria cases treated with ACTs in non-PMI focus provinces (NMCP DHIS2 2021).

In 2020, USAID Angola and PMI launched the Moodle-based Kassai e-learning platform. In July 2021, the Kassai platform was adopted by MOH for national roll-out. The goal of the Kassai platform is to improve the quality of training of health care providers and to make quality training resources, protocols, and job aids available to health care providers and their supervisors. It provides visibility on the training results of the providers, through evaluation checklists, which also include case studies, before, during, and after the course. Inbuilt analytics, using PowerBI, allows for in-depth and detailed analysis of the providers' training journey, such as time spent on each lesson, individual knowledge gaps, links to assessments during supervisory visits using HNQIS tools which were also developed with PMI funding in previous years. Kassai is accessible through any digital tool, and the plan is to make that platform available to health care providers nationwide. During the COVID-19 pandemic, this e-learning training resource became an even more important tool to promote continuous medical education for the improvement of quality of services. As of May 2022, Kassai has more than 5,000 unique users and 13 courses in malaria, SRH, COVID-19, and maternal and child health. Figure 3 below shows the trend of HWs enrolled from July 2021 to 2022.

Figure 3. Trend of Health Workers Nationwide Enrolled in Kassai Platform from July 2021 to July 2022



Source: Kassai platform analytics (2022)

At the community level, PMI supports service delivery aimed to increase access to malaria case management through 364 ADECOS in 14 municipalities: Lunda Sul (Cacolo and Dala); Zaire (Soyo, Tomboco, and Cuimba), Malanje (Cacuso, Cangandala, Kalandula, Mucari, and Quela), and Uíge (Maquela do Zombo, Mucaba, Quitexe, and Sanza Pombo). The ADECOS program's primary objectives are to increase access to effective community-based diagnosis and treatment of uncomplicated malaria in underserved and hard-to-reach communities, ensure zero stockouts of ACTs, RDTs, and other essential commodities, and routinely capture ADECOS data through DHIS2. PMI works in close partnership with the *Fundo de Apoio Social*/Social Support Fund [FAS]) of the Ministry of Territorial Administration, the respective municipal administrations, NMCP, the GEPE, and the Office of Technology and Information (GTI). PMI support consists of provision of malaria commodities, basic tool kit and equipment, bicycles, training, and formative supervision on febrile case management. Formative supervision provides both technical support to ADECOS and ADECOS Referral Units (ARUs) designed to strengthen: 1) quality control of malaria case management; 2) referral systems (ADECOS to HFs) and counter-referrals (HFs back to ADECOS); 3) accountability of ACTs and RDTs commodities; and 4) routine collection of ADECOS malaria data in ARUs. PMI started scaling up its approach at the community level in 2021 to target all age groups for community case management of malaria and will be piloting the introduction of rectal artesunate suppositories (RAS) in five municipalities: three in Zaire and two in Lunda Sul provinces.

Global Fund changed its geographic coverage in 2020–2021 to focus on Benguela and Cuanza Sul (provinces not currently supported by PMI), thus decreasing its support for community case management from seven provinces where they previously supported implementation of 1,250 ADECOS in 24 municipalities to two new provinces with 670

ADECOS in 22 municipalities (however, the ADECOS activities under the new and reduced geographic scope were delayed and not carried out in 2021 as planned). In CY 2022, it is expected that community case management activities supported by Global Fund will be fully implemented and will target children under five years of age in 22 municipalities of Benguela and Cuanza Sul and pilot the introduction of RAS at community level in six municipalities: four in Benguela Province (Caimbambo, Catumbela, Chongoroi, and Balombo) and two in Cuanza Sul Province (Mussende and Seles). In southern Angola, SADC E8 projects support implementation of community case management activities by 77 ADECOS covering three border districts of Cuando Cubando province (aiming to scale up to 120 ADECOS in four additional districts in the next months: three in Cunene and one additional district in Cuango Cubango province).

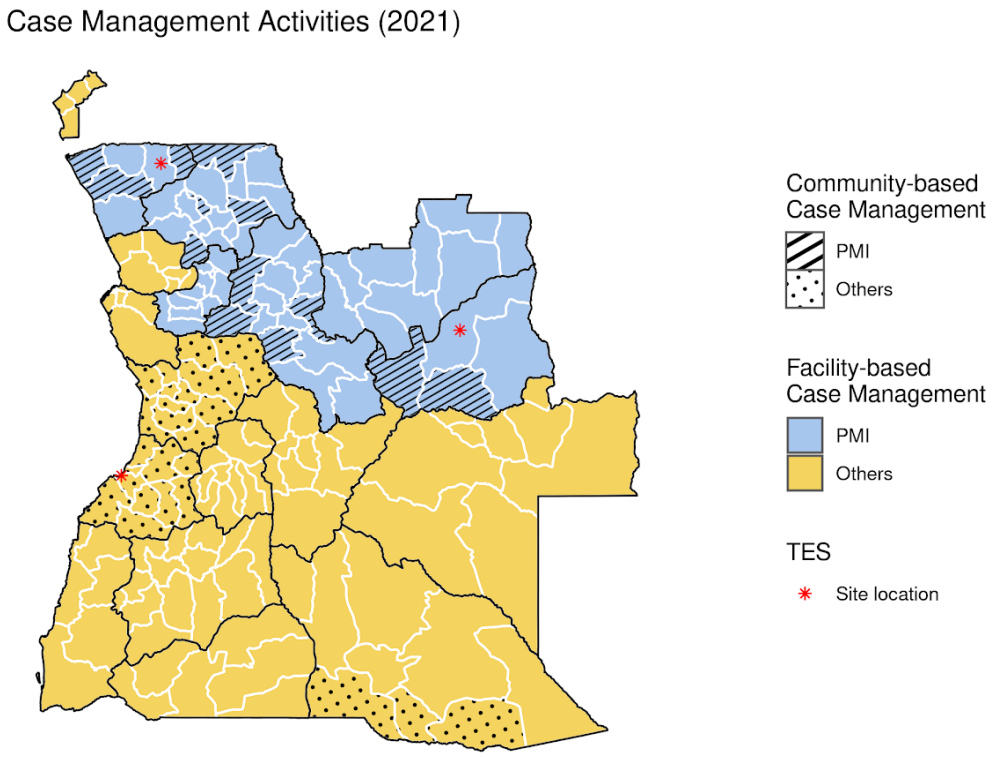
According to national policy, each ADECOS worker is responsible for a micro-area. A micro-area is a delimited geographical space of 50 to 100 households (between 50 to 500 people). ADECOS are linked to an HF, where integrated health teams are responsible for performing routine supervision and where they receive their supply of monthly commodities. Salaries and operational costs should be paid by the local administrations. However, this is not always the case and this is the current major challenge for national scale-up. For this reason, PMI provides performance-based monthly payments premised exclusively on timely delivery of ADECOS monthly reports to ARUs. Along with malaria commodities, PMI supplies bio-waste containers, thermometers, household notebooks, micro-area registration notebooks, health promotion material, such as pamphlets, on malaria prevention (adapted to COVID-19 biosafety prevention recommendations), raincoats, and bicycles.

While the ADECOS program was initially designed to be a platform for integrated community case management inclusive of diarrhea and pneumonia, currently they are not yet allowed to manage other health diseases beyond malaria. However, they remain critical focal points for health promotion activities at community level, including involvement during mass ITN campaign activities, the promotion of malaria health-seeking behavior, and they have played an important role during the COVID-19 pandemic through SBC activities.

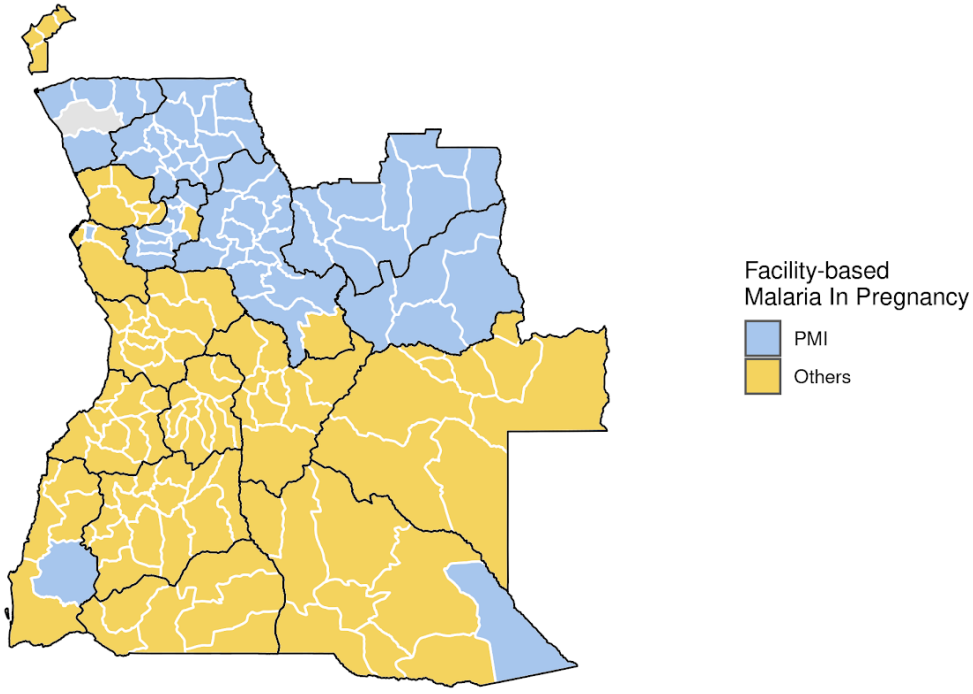
According to the MOH 2021 Annual Health Report, the coverage of the population with access to public health services is 60 percent. Scaling up malaria case management activities at community level is critical. Preliminary data from the first semester of 2022 comparing confirmed malaria cases of children under five years of age tested at community level and at HF by municipality show that 15 percent of all malaria cases in children under five years of age are confirmed at community level (with the current number of 364 ADECOS in 14 municipalities in the six PM focus provinces, covering a forecasted population of 1,179,681, which represents 19 percent of the total population).

Furthermore, while national treatment guidelines are for both the public and private sectors, the private sector often does not follow the established norms and there is not much reinforcement in terms of regulatory authorities to address this issue. Antimalarials of all kinds—including monotherapies and drugs for severe malaria—are available in private outlets. According to a fever management Reach and Recall study conducted by PMI in 2016 in Uíge and Huambo, out of 1,068 respondents, 14 percent went to private sector pharmacies, 4.5 percent visited a private HF, and 24 percent self-medicated after detecting a fever.

Figure 4. Maps of Case Management, Community Health and Malaria in Pregnancy Service Delivery Activities in Angola, 2021



Malaria In Pregnancy Activities (2021)



4.2. Recent Progress (between October 2020 and June 2022)

National-level Case Management Activities

- PMI developed two promotional videos to showcase how the support to HWs and integrated community case management in Angola is oriented:
    - Demonstrated Kassai, which is customized for use in the Angolan health sector to innovate capacity-building of HWs in public facilities from in-classroom training to a digital resource (Kassai YouTube video link).
    - Showcased strategy and benefits to deploy community HWs (ADECOS) for the prevention, diagnosis, and treatment of uncomplicated malaria and recognizing the need to extend health services at community level. (ADECOS YouTube video link).
- PMI supported the revision of National Treatment Guidelines and training manuals.
- PMI continued to improve malaria training contents both with the classroom training materials and on Kassai e-learning training platform, and scaled up access to the training platform nationwide. Currently, Kassai has more than 5,000 unique users and 13 courses in malaria.
- PMI developed Digital Rapid Data Quality Assessment tool built within DHIS2 which allows for a comprehensive and systematic way to conduct data quality

supervisions at the level of HFs for malaria indicators (more information described in **SM&E section** below).

- PMI supported the NMCP's shift from centralized planning to provincial-based planning informed by municipalities' needs in an effort to increase the impact of interventions and optimize locally generated efficiencies and resources. During the reporting period, all the PMI focus provinces started, and are successfully developing, quarterly provincial-based planning for malaria case management training and supervision, led by provincial NMCP-accredited trainers (accreditation is achieved through the completion of a national-level training and pedagogical competency training).
- PMI convened and led two national-level coordination meetings between the NMCP, National Institute of Communicable Diseases of South Africa, and SADC E8, designed to support the NMCP's objective to develop a malaria slide bank to support local capacity-building in malaria microscopy. Slide collection in PMI focus provinces is ongoing.
- PMI collaborated and coordinated with other relevant country government officials, partners, and stakeholders (e.g., Maternal and Child Health department, CECOMA, GEPE, GTI, and FAS within Ministry of Territorial Administration).
- PMI convened and led three national-level coordination meetings and two provincial meetings with participation all municipal health directors.
- PMI conducted a malaria diagnostic laboratory workshop designed to re-evaluate technical and pedagogic knowledge and skills of national and provincial accredited laboratory trainers/supervisors. The workshop evaluated the following technical components: capacity to detect malaria parasites; capacity to differentiate between different species of malaria parasites; capacity to differentiate development stages of various malaria parasite species; capacity to quantify malaria parasite infection in a blood smear; and pedagogical training competencies. A total of six nationally accredited trainers were assessed by a WHO-certified Level 1 trainer, but only one trainer successfully maintained their national accreditation; the remaining five scored between 81 and 90 percent and are currently only allowed to carry out provincial-level trainings.
- PMI convened one national "lessons learned" workshop with malaria case management trainers.
- PMI supported national quantification of malaria commodities.
- PMI expanded the roll-out of the HNQIS:
    - HNQIS is an electronic system to support quality improvement efforts at HFs by standardizing supportive supervision visits and linking to DHIS2 so data and feedback are available countrywide for analysis.

HNQIS ensures that interaction and feedback between supervisors and supervisees are standardized across the 60 target municipalities by creating a uniform process of data collection, course correction and feedback, real-time generation of dashboards for interpretation, and dissemination of results. This standardization facilitates comparison of results across the 60 municipalities in the six PMI focus provinces.

- The tool was adapted at the national level and will be used nationwide.

Commodities

- PMI supported the procurement and distribution of 10,092,150 malaria RDTs. Ninety percent were distributed to the 60 municipal and provincial warehouses of the six PMI focus provinces, and 10 percent were donated to the central warehouse, CECOMA, to contribute to needs of the rest of the country.
- PMI supported the procurement and distribution of laboratory supplies for microscopy diagnosis.
- PMI supported the procurement and distribution of 7,728,200 ACTs. Ninety percent were distributed to the 60 municipal and provincial warehouses of the six PMI focus provinces, and 10 percent were donated to the central warehouse, CECOMA, to contribute to needs of the rest of the country.
- PMI supported the procurement and distribution of 916,997 vials of parenteral artesunate for use in the six PMI focus provinces.
- PMI supported the procurement and distribution of 6,000 vials of artemether for use in PMI focus provinces.
- PMi supported the procurement and distribution of 9,920 RAS for five municipalities of Zaire (three) and Lunda Sul provinces (two) to be used in a pilot project of RAS at community level. This procurement covers approximately 100 percent of the forecasted needs for pre-referral at community level and at the HFs in the same municipalities.

Facility-level Case Management Activities

- PMI trained 3,118 HWs in malaria case management through classroom training and enhanced training of “hybrid” Kassai blended learning training.
- PMI provided 415 HWs with enhanced training in severe malaria.
- PMI conducted 60 classroom trainings, 197 self-learning-oriented trainings, and 46 blended trainings across the six PMI focus provinces.
- PMI trained 842 laboratory technicians in malaria diagnostics (microscopy) and conducted 1,396 formative supervision visits that included on-the-job laboratory diagnostic training.
- PMI conducted 3,438 on-site case management and RDT testing trainings and supportive supervision visits in 60 municipalities.

- PMI produced and disseminated nine monthly formative supervision bulletins to all provincial and municipal departments. The primary objectives of these were: 1) to develop evidence-based action plans to inform targeted supervision and training of service providers; and 2) to nurture an appetite among health managers for evidence to drive malaria decisions at institutional and subnational levels.
- PMI observed a positive trend in key performance tracking indicators based on supervision data from HNQIS in PMI focus provinces. For example:
    - The average score of HWs in HFs with more than four supervision visits, who correctly diagnosed malaria (e.g., conducted and read the test results) and adhered to the diagnostic test result (e.g., if test is positive, prescribe antimalarials; if negative, identify other possible causes of illness and/or refer to appropriate referral unit) increased from 86 percent in quarter two of 2021 (January to March 2021) to 97 percent in quarter two of 2022 (January to March 2022).
    - The average score in malaria counseling[2] of HWs in HFs that received more than four supervision visits increased from 86 percent in quarter two of 2021 (January to March 2021) to 90 percent in quarter two of 2022 (January to March 2022).
    - The average score in administering IPTp in HFs that received more than four supervision visits increased from 74 percent in quarter two of 2021 (January to March 2021) to 83 percent in quarter two of 2022 (January to March 2022).
- PMI strengthened quality assurance of malaria diagnostics in 936 public HFs and 109 laboratories through training, professional development, and laboratory supervision.
- PMI supported the NMCP in design and planning, elaborating protocol and obtaining approval from the ethics committee for the 2022 HF survey.

Community-level Case Management Activities

- PMI is successfully integrating the ADECOS test and treat policy to cover all age groups, in addition to registering high levels of ADECOS data submission to their referral units (still ongoing; not all ADECOS trained on testing and treating all ages yet).

[2] Malaria counseling: HW provides advice on malaria prevention measures (ITN use), explains correctly how to take prescribed medicine, informs how to check for fever and for dangerous signs, and refers to appropriate referral site.

- PMI scaled up its support at community level by increasing the number of ADECOS from 132 to 364 (from 5 to 14 municipalities).
- PMI transitioned from a card-based supermarket food-subsidy-plus-mobile-phone credit for communication to a performance-based incentive. PMI supports disbursement of ADECOS performance-based monthly payments premised exclusively on timely delivery of ADECOS monthly reports to the ARUs.
- PMI supported logistics and antimalarial commodity supplies such as bicycles, smartphones to facilitate transport and data management, personal protective equipment to protect ADECOS from COVID-19 and ensure continuity of malaria services, bio-waste containers, 44 thermometers, 5,350 household notebooks, 128 micro-area notebooks, 2,486 pamphlets with malaria and COVID-19 prevention content, and 82 raincoats.
- PMI facilitated the NMCP to support an advocacy and engagement strategy targeting key political decision-makers at national and subnational levels to continue scale-up of ADECOS. Coverage is still very low compared to actual needs.
- PMI provided training of trainers and subsequent refresher trainings of supervisors and ADECOS. Training contents included:
    - A four-day refresher training workshop for 18 municipal ADECOS supervisors and 25 HWs affiliated with ARUs. The training was done in partnership with the NMCP and FAS.
    - A four-day refresher training workshop for 221 ADECOS in Malanje province (Cacuso, Cangandala, Kalandula, Mucari, and Quela), and Uíge province (Maquela do Zombo, Mucaba, Sanza Pombo, and Quitexe). The training was on malaria case management, COVID-19, and monthly reporting.
    - A two-day training workshop on formative supervision for ADECOS using HNQIS with 78 HWs affiliated to ARUs in Malanje and Uíge.

Key results to highlight include the following:

- At the municipalities with ADECOS, on average 15 percent of all cases confirmed among children under five years of age reported were tested and treated at community level (with 99.8 percent of positive confirmed cases receiving an ACT).
- Of the 50,746 suspected malaria cases tested, 36,678 (72.3 percent) were confirmed with malaria. This RDT positivity rate is indicative of the high malaria burden prevalent in underserved and hard-to-reach communities and further underscores the importance ADECOS plays in early detection and

prompt treatment of uncomplicated malaria, preventing progression to severe malaria and death.

- A total of 36,458 (99.8 percent) of the 36,678 confirmed malaria cases were treated with ACTs (artesunate-amodiaquine [ASAQ]).
- Of the 50,746 febrile cases tested, 11,738 cases (23.2 percent) were referred to HFs, as they tested negative for malaria.
- Results suggest a high adherence to NMCP treatment protocols and guidelines on management of uncomplicated malaria.
- Information generated from the digital systems currently in use for training, supervision, and data quality assessment (DQA; see SM&E section below) are demonstrating that performance on training and supervisions received are most likely having an impact on mortality and morbidity rates. For example, reports showed that from January 2022 to June 2022, mortality was relatively consistent month to month with a small number of "outliers" that drove higher mortality numbers. While the majority of mortality occurs at hospital levels, overall mortality at health posts is driven by a few health posts that can be targeted for interventions in the coming year. Analysis of the associated Kassai training performance data indicates poor pre-test scores and suboptimal course post-test scores, suggesting service providers in hospitals need continuous medical education to attain and sustain optimal levels of malaria case management performance. Recent data also collected from Kassai platform analytics suggested an increased download trend at health posts in areas where post-training performance was higher and supervisions occurred more often. Furthermore, a previous DQA led by NMCP and supported by PMI demonstrated that in some referral hospitals several deaths were wrongly attributed to malaria as a result of poor record keeping and data management. DQAs need to go hand in hand with malaria-related mortality audits. Evidence from Kassai, HNQIS, and DHIS2 can be continuously triangulated to identify common denominators related to gaps in provider competencies and drivers of suboptimal quality of care, and can inform selection of health providers for training.

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

4.3. Plans and Justification for FY 2023 Funding

The FY 2023 funding tables contain a full list of case management activities that PMI proposes to support in Angola 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

Angola will continue to support activities as described in the **Recent Progress section**. For training and supervision, the overall aim is to create a provider-centered, evidence-based, efficient, and effective training program that addresses existing challenges related to severe malaria case management and promotes development of holistic and comprehensive quality of care improvement planning at HF level, for sustainability. PMI will continue to support activities using comprehensive implementation of target activities such as:

- Based on evidence, optimize targeting of in-patient clinicians, nurses, and HFs with competency gaps; leveraging DHIS2, Kassai analytics, and HNQIS.
- Reduce in-patient malaria mortality through improved severe malaria case management training targeting hot spots that drive mortality in provincial and municipal hospitals.
- In partnership with MOH, NMCP, and provincial health training schools, explore opportunities of leveraging Kassai as a stepping stone to revitalize a continued medical education program.
- Improve uncomplicated malaria case management targeting health centers, health posts, and ADECOS.
- Link malaria case management trainings to holistic and comprehensive hospital quality of care improvement planning and continued medical education programs for in-patient clinicians and nurses in hot spots.
- Amplify the Kassai/continued medical education concept in strategic meetings with NMCP, PMI, and other key stakeholders. PMI will continue to support NMCP to expand enrollment of HWs onto Kassai in non-PMI-supported provinces. Focus can be on GF-supported provinces of Benguela, Cuanza Sur, Cuando Cubango, Cunene, and Namibe (under SADC E8).
- Continue to advocate for the adoption of a multisectoral approach to mobilization, supporting the NMCP to lead efforts to reach out and engage the National Malaria Partners Forum, FAS, GPS, and municipal administration in 14 municipalities of Lunda Sul, Zaire, Malanje, and Uíge to prioritize and invest in ADECOS welfare, sign contracts, pay salaries, and reactivate municipal ADECOS coordination committees. Additionally, support engagement at the highest levels of government involving key stakeholders like USAID, Global Fund, World Bank, WHO, the United Nations Children's Fund, and the European Union.
- Leverage operational research (OR) findings for measurement and learning and overall program direction such as the malaria case management HF survey (2022), MBS (2022), DHS (2023), TES, and others.

Commodities
The following commodities and associated quantities are planned to be supplied to Angola to meet both the projected consumption-related needs in CY 2024 in PMI focus provinces and the needs required to maintain the equivalent of 12 months' worth of consumption throughout the PMI focus province supply chain through the year. Neither GRA nor the Global Fund is expected to contribute toward these needs. PMI also plans to contribute to the needs for the remainder of the country by procuring additional quantities of commodities equivalent to 10 percent of what is to be supplied to PMI focus provinces. All of these quantities will be allocated to, warehoused, and distributed by CECOMA with PMI providing technical assistance to augment, when necessary, the transportation required to move these commodities to the municipal level:

- ACTs: 3.5 million treatments
- RDTs: 7.5 million tests
- Artesunate Injection: 420,000 vials
- RAS: 3,000 suppositories
- Microscopy Supplies: Various microscopy equipment, reagents, and other consumables

There are no expected commodity gaps projected for PMI focus provinces.

Please refer to the **ACT, RDT, Injectable Artesunate, and Artesunate Suppository Gap Tables** in the annex for more detail on planned quantities and distribution channels.

Facility-level Case Management Activities
PMI/Angola will continue to support all activities as described in the **Recent Progress section**. Efforts will be made to identify the key hospitals, centers, and health posts with poor performance and higher morbidity and mortality rates. Guided by data collected from integrated supervision visits, DQAs, and malaria-related audits, technical meetings (including HF directors and local authorities) will be conducted in facilities to increase quality of malaria case management, particularly of severe malaria at secondary and tertiary HFs. PMI will expand its support to case management–strengthening activities that use evidence from Kassai, HNQIS, and DHIS2 to identify common denominators related to gaps in provider competencies and drivers of suboptimal quality of care and that inform selection of health providers for training. Data from the 2022 HF survey on the public facilities will include the private and military sectors, which will support the design and implementation of national strategies to engage private sector players to improve malaria services.

Community-level Case Management Activities

PMI/Angola will continue to support all activities as described in the **Recent Progress section**. Additionally, PMI will work with local authorities to find ways of continuing to scale up deployment of ADECOS in PMI focus provinces where PMI investment can catalyze the deployment of ADECOS, and local authorities can increasingly support the program in the longer term.

Monitoring Antimalarial Efficacy

Table 2. Ongoing and Planned Therapeutic Efficacy Studies

Ongoing Therapeutic Efficacy Studies			
Year	**Site Name**	**Treatment Arm(s)**	**Plan for Laboratory Testing of Samples**
NA	NA	NA	NA
Planned Therapeutic Efficacy Studies (Funded with Previous or Current MOP)			
Year	**Site Name**	**Treatment Arm(s)**	**Plan for Laboratory Testing of Samples**
2023	Benguela, Lunda Sul, Zaire	TBD	TBD

Please see the **SBC section** below 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

PMI/Angola health supply chain and pharmaceutical management objectives align supply chain key strategies reflected across the six objectives of the Angola NMSP 2021–2025. The Angola NMSP 2021–2025 goal is to improve NMCP management capacity and good governance required to achieve the programmatic objectives of the health system. Strengthening NMCP capacity for procurement and management of malaria commodities is one of the intermediate objectives with the aim to ensure that all malaria case management and prevention commodities are available at all service delivery points (SDPs) critical for achieving other intermediate objectives and overall NMSP goal.

The Angola MOH developed the National Supply Chain Strategy in 2016 and is meant to serve as the principal guiding document for better planning and the effective alignment of financial, technological, and human resources to improve the overall performance of health commodity supply chains, including that of malaria, in Angola.

Even though the NMCP relies on other GRA entities and donors to manage the physical warehousing and distribution of commodities used in malaria programming in Angola, it

has aligned its interventions with the current existing draft of National Supply Chain Strategy and leading and participating in activities such as:

- Elaboration of the national commodity procurement and distribution plans.
- Strengthening of the joint planning and coordination of all actors throughout the supply chain.
- Improvement of the use of antimalarial consumption data to accurately determine future commodity needs for each SDP, municipality, province, and the central levels.
- Generation of timely and accurate data to be used for supply chain decision-making.
- Improvement of storage conditions for pharmaceutical products.
- In conjunction with the *Direcção Nacional de Medicamentos e Equipamentos*, development of drug registration, approval, rational use, and quality control systems, as well as a surveillance drug network to monitor adverse effects.

The GRA has committed to funding the largest portion of the needs for the procurement and distribution of malaria program commodities and the procurement and supply management reporting tools for the 10 provinces that receive partial support from PMI or the Global Fund. However, these commitments are often not fully executed which often results in commodity gaps in non-PMI focus provinces.

At the national level, PMI supports achievement of the NMCP's own objectives of the national health commodity supply chain through routine and ongoing support. The following are examples of this support:

- Monthly review of malaria commodity supply plans across funders via coordinate procurement planning.
- Quarterly convening of procurement funders for the creation of the Procurement Planning and Monitoring Report for malaria (PPMRm).
- Provision of technical assistance for the creation of annual malaria quantifications, quarterly updating of supply planning, and informing plans for routine resupply of commodities from the central to provincial levels.
- Technical assistance for inventory storage and management designed to improve the storage and management conditions for pharmaceutical products (e.g., temperature monitoring, configuration of existing racking layouts to increase storage capacity and improve process flows, implementing of warehouse management software, and planning for integration of logistic software platforms).
- Development and implementation of improvements to the national eLMIS called *Sistema Informática de Gestão de Logística Farmacêutica de*

Angola/Pharmaceutical Logistics Management Information System [SIGLOFA]) at the central level and in PMI focus provinces.;
- Creation of an enabling environment for effective and accountable communication within the technical working group to secure adequate resources through procurement and supply chain management.

At the provincial level, due to capacity limitations of the national supply chain, PMI, like Global Fund, supports its focus provinces with central-level commodity warehousing and subnational transportation activities (either from the central to provincial levels, central to municipal levels, or provincial to municipal levels) to supplement, using outsourced private sector logistics providers. To support this activity, PMI has expanded supply chain technical assistance to the provincial level in six PMI focus provinces via embedded staff to support improved malaria commodity availability (and related data) at the SDP level. For PMI to effectively follow through on commitments to supply 100 percent of the needs of select commodities in PMI focus provinces, it needs to be well informed through the provision of reliable and actionable data of what quantity is required and when it is required to be supplied.

Furthermore, after a decade of systems-strengthening support and the experience of already managing a greater volume of USAID-funded commodities including those of malaria, the national medical warehouse is expected to safely and securely assume responsibility for the storage of all PMI-funded commodities and contribute toward distribution to the provincial level.

In sum, while also continuing to support central-level warehousing and in-country transport it will be critical to ensure continual availability of quality products needed for malaria control at HFs and the community level. This is a priority identified through the application of the PMI Stockout Reduction Initiative and will be a focus of PMI supply chain intervention in coming years.

5.2. Recent Progress (between October 2020 and June 2022)

PMI's principal supply chain investments aimed at improving malaria commodity availability at service delivery sites during the reporting period were the following:

Forecasting, Supply Planning, and Procurement

- Provided support to the NMCP in the development of the quantification for antimalarial commodities and updated the forecast for the next four years (from 2022 to 2025) in alignment with the NMSP.
- Elaborated and executed against supply plans specific to PMI focus provinces allowing for better planning with a higher emphasis, using accurate

consumption data as key source (along with retrospective information, seasonality, and others).
- Developed requisition orders based on supply planning and provided supplementary assistance for subsequent order placement and delivery.
- Produced and shared monthly stock reports of malaria commodities. Reports included the stock status of 18 provinces, CECOMA, and Global Fund and PMI implementing partner warehouses in order to support the NMCP and malaria commodities risk management to mitigate stock disruptions. This PMI support contributed to improvements in facility-level logistics data from approximately 1,000 HFs in PMI focus provinces being available at the central level approximately 80 percent of the time.
- Completed monthly PPMRm for Global Fund, PMI, and GRA-funded commodity contributions.
- Supported data collection for DQA.

Warehousing and Distribution

- Conducted a management capacity assessment of CECOMA to inform PMI and other stakeholders' planning.
- Coordinated in-country receipt, storage, and distribution of all PMI-funded shipments from the ports of entrance to municipality and some SDPs.
- Under coordination of the NMCP, carried out 13 supervisions, on-the-job training for 56 technicians and assessments to provincial warehouses and municipal warehouses, and supported HFs; a total of 294 personnel were trained on data collection, record keeping, and data reporting.

Data Management

- Continued support to the SIGLOFA deployment.
- Completed an End-Use Verification (EUV) survey in ten provinces, which included six PMI focus provinces (Cuanza Norte, Lunda Norte, Lunda Sul, Malange, Uíge, and Zaire) and four non-PMI focus provinces (Cunene, Huambo, Huila, and Namibe) comprising 154 HFs, 44 municipal depots, and 10 provincial warehouses. The MOH staff (health inspectorate and NMCP) participated in this survey.
- Assisted GTI leadership by providing technical experience with liaising with other donors and partners aiming to improve the public health supply chain across the country.

Medicines Quality and Regulation

- Provided technical assistance to the national pharmaceutical regulatory agency MINSA/*Agência Reguladora de Medicamentos e Tecnologias de Saúde*/Regulatory Agency of Medicines and Health Technologies (ARMED), formerly National Department of Medicines and Equipment on health

programs aimed to strengthen the national regulatory authority around registration and importation for regulatory, registration and standards outcomes.
- Ongoing support was given to ARMED on activities aiming to standardize the importer database and drug registry.
- Supported ARMED developing and launching the first National Essential Medicines List to inform procurement of critical medicines but also support the standardization effort which will contribute significantly in the fight against counterfeit medicines and facilitate in-country capacity-building efforts toward end-to-end track and trace.

In conjunction with these interventions, the availability of ASAQ (the principal ACT formulation expected) in PMI focus provinces tracked during EUV was between 2 percent and 12 percent which reflects an improvement from 2020 rates (between 35 percent and 70 percent) due to the pivot of PMI increasing its commitment of supplying 100 percent of the ACT needs in PMI focus provinces through the provision of ASAQ. In 2021, the SDP stockout percentages found during EUV (August 2021) for RDTs and SP in PMI focus provinces were 0 percent.

Challenges That Could Affect Progress

The availability of malaria commodities in PMI focus provinces has improved from previous years and been well maintained over the past year. However, even with PMI assistance at the central level, the ability to extend these rates of availability to other non-focus provinces will be difficult because of the following challenges:

- Limited involvement of GEPE (MOH Procurement Department) with the malaria quantification increases the effort needed to advocate at other levels of government for the GRA-funded procurement needs of antimalarial products.
- Delays in information-sharing and the inadequate coordination between the procuring entity (GEPE), donors, and GRA. Closely tied to this is also the limited visibility into GRA planning, resource allocation, and expenditure tracking of antimalarial commodity procurements between MOH and partners.
- Poor capacity of GRA to lead and coordinate supply chain actors and activities in a transparent and accountable manner.
- Extended (and sometimes unpredictable) procurement lead times as a spillover of COVID-19 and global logistics challenges and in-country logistics.
- Absence of a defined budget for commodities procurement and in-country supply chain activities.
- Delays in conducting real-time inventory at the end of each month at CECOMA and delays in the submission of monthly provincial malaria reports constrained stakeholders in their respective planning due to the unavailability

of timely logistics data. Additionally, even when logistics data are available, there is generally, due to staffing constraints at the central level, more focus on completeness and accuracy than on deeper analysis of these data for use in decision-making.

- Lack of follow-through with action points from analyzed stock data from the monthly stock status report at central level to accelerate decision-making.
- Limited sites with implementation of eLMIS (SIGLOFA) in-country.
- Poor accuracy of data and limited utilization of data for decision-making due to insufficient capacity, including inadequate use of quantification exercise outputs to inform supply planning requirements by MOH and partners.
- Inadequate capacity for supply chain data management processes and data quality improvement.
- Inadequate domestic funding for commodities procurement and in-country logistics and unclear commodity procurement prioritization process within the government systems.
- The stock card updating rates at SDPs found during EUV were generally low (0 to 49 percent). Those for ASAQ and RDT were between 41 percent and 49 percent. It was found that for 54 percent of the SDPs and 7 percent of the warehouse visits, the unavailability of stock cards was one of the main stock management challenges. This issue affects the availability and quality of inventory data and, consequently, negatively impacted the quality of logistics data reported at these levels.

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

PMI/Angola FY2023 funds will continue to be used to fund activities to support GRA capacity to be self-reliant in timely procuring malaria commodities to meet service delivery and ITN needs. PMI will continue to support quantification workshops using informed and rational approaches (with demographic and consumption data) to forecasting the quantities expected to be consumed in each province.

PMI will also continue to provide technical assistance to the elaboration of supply plans so that along with determining the quantities required to meet these consumption needs, as well as the needs, allocation across funders and timing of shipments to keep the system supplied according to plan are also included and updated on a regular basis.

Warehousing and Distribution
No temporary commodity warehousing support is planned with PMI MOP FY 2023 funding. It is expected that by CY 2024, CECOMA will already safely and securely assume responsibility for the warehousing of 100 percent of PMI-funded commodities. PMI funding will contribute to support the logistics of the distribution led by the Angola central medical warehouse (CECOMA) using the CECOMA fleet, from national level to the provincial. Savings from previously allocated parallel warehousing (approximately 35 percent) will be used to support distribution to the district level and occasionally to the SDP.

Information Management Systems
Support to health Logistics Management Information Systems, particularly at the province warehouses and national/central levels, is proposed to be continued but with a lower intensity than initial years, where the emphasis was put on initial adoption and roll-out. When there is a well-defined, fully-costed, and a funded implementation plan, PMI will review further support to the expansion of the e-LMIS to the municipal and facility levels. While the future-state of the e-LMIS is elaborated, PMI will continue to support the manual collection and collating of facility-level supply chain data available through the existing paper-based Logistics Management Information System. PMI will advocate for feasible integration of the eLMIS and DHIS2 systems for improved data quality for decision-making and forecasting needs.

With MOP FY 2023 funds, PMI will support two EUV surveys in 10 provinces (six PMI focus provinces and four non-PMI focus provinces to HFs), municipal warehouses, and 10 provincial warehouses.

Regulatory and Policy Institutions
PMI/Angola will continue to support the strengthening of institutions involved in regulatory and policy aspects related to supply chain such as the ARMED, GTI, and GEPE as activities are being implemented to support Angola on the journey to self-reliance.

6. SBC

6.1. PMI Goal and Strategic Approach

In alignment with the country's national malaria control communication strategy, PMI utilizes targeted SBC interventions that support the adoption and maintenance of selected key malaria prevention and treatment-seeking behaviors, thereby improving the overall quality of malaria control efforts that will contribute to reductions in malaria morbidity and mortality.

PMI/Angola's SBC strategy focuses on improving behavior change promotion and communication skills at provincial and municipal levels of the six hyperendemic PMI focused provinces; this includes reproduction and distribution of resources with key messages for behavioral change. PMI also ensures coordination with Global Fund and other stakeholders conducting activities linked in the National Malaria Partners Forum.

Following the approval of the NMSP 2021–2025, PMI, in coordination with other partners, is currently supporting the update of the Communication Plan for Malaria Social and Behavior Change 2017–2020 Strategy which outlines NMCP's priorities and goals related to SBC for malaria. Findings from the MBS to be conducted at the conclusion of the 2022 national ITNs mass campaign distribution will provide key data for updating the Communication Plan for Malaria Social and Behavior Change. At the peak of the COVID-19 pandemic in 2020, NMCP with PMI support endorsed the *Zero Malária Começa Comigo* (ZMCC)/Zero Malaria Starts with Me (ZMSWM) advocacy campaign as a core component of the larger, more comprehensive National Malaria SBC Strategy. The integrated implementation of ZMCC with evidence-based implementation of SBC includes a 360-degree communication strategy that targets three key behaviors of malaria prevention and care-seeking at the community, municipal, regional, and national levels. The theory-driven implementation is branded and integrates multiple communication channels and approaches, from IPC to digital and mass media, while contextualizing the need for malaria prevention and care-seeking behaviors complementary to ongoing cross-cutting SBC activities.

6.2. Recent Progress (between October 2020 and June 2022)

- **ZMCC General Campaign:** The ZMCC multi-channel and multi-behavior SBC campaign continued to be implemented throughout the reporting period, addressing the main determinants of behavior identified—knowledge, perceived susceptibility, and perceived severity—through a combination of innovative and evidence-based approaches. PMI continues to work closely with the NMCP for content creation and webpage management to offer users a wide range of useful and interesting information for better care of family and self. The average number of ZMCC webpage interactions per post between October 2021 and June 2022 was 1,411 (highest: 2,479 in April 2022; lowest: 902 in December 2021).
- **Mass Media:** The ZMCC TV spot continues to be aired by *Televisão Pública de Angola*, at no cost, as a public service announcement. This mass media piece uses a storytelling approach, highlighting benefits of positive behavior adoption. The three key messages addressing the main determinants of behavior integrated into the TV spot with references to the COVID-19 context were perceived by viewers to be clear. The importance of observing individual and community protective measures, such as wearing face masks and

handwashing, were also highlighted in the approach. The third set of a new mass media campaign piece—TV and radio—is currently under development for release in FY 2023.

- **Digital:** More than 80,000 people are followers of ZMCC on Facebook and Instagram. From January 1, 2021 to April 30, 2022, the ZMCC page on both platforms achieved an exponential growth of 51.9 percent and have reached close to 3 million and 4 million Angolan users with malaria prevention and care-seeking messages, respectively. The ads appeared on screens over 20 million times—impressions continuing to attract a gender-balanced audience (approximately 60 percent men and 40 percent women) and a fanbase distributed among different age groups (the largest being those aged 25 to 34 years, followed by 18 to 24 years, then 35 to 44 years). Besides being an extraordinary resource in terms of reach, both social media platforms have a dual advantage of increasing visibility of NMCP and PMI collaboration and conducting malaria activities from several key stakeholders and political figures who follow the page and engage on posted content. In addition, a third-party, digital bi-monthly newsletter targeting health professionals has been used to disseminate information related to updates and dynamics of the Kassai platform. The newsletter is distributed among more than 4,500 health care providers in Angola, including doctors, nurses, and pharmacists, among others. During the reporting period, three articles were developed and published.
- **IPC:** Support to IPC activity interventions through community and religious leaders are slowly recommencing after over a year of pause due to COVID-19-imposed restrictions. This specific approach was restarted under the ZMCC campaign and sharpened to increase alignment with determinants of behavior and an empathetic approach with the audience in line with the mood and feeling of the overall campaign, with local leaders being trained on work plan development and techniques to increase engagement from municipal and provincial health promotion focal points responsible for supervision and reporting. Over 100 SBC community activities were reported by community leaders during the reporting period, with an estimated reach of almost 11,000 people in the focus provinces.

It is noticeable that due to the long pause on IPC activities there was a drop in leaders actively running community-level interventions on malaria prevention. Proactively, PMI's implementing partner is discussing possibilities on supporting the NMCP to establish a partnership with the Council of Christian Churches and other faith-based organizations (FBOs) to bring together religious leaders from diverse churches to ensure active mobilization of church leaders and to leverage FBOs' roles in health promotion and malaria prevention.

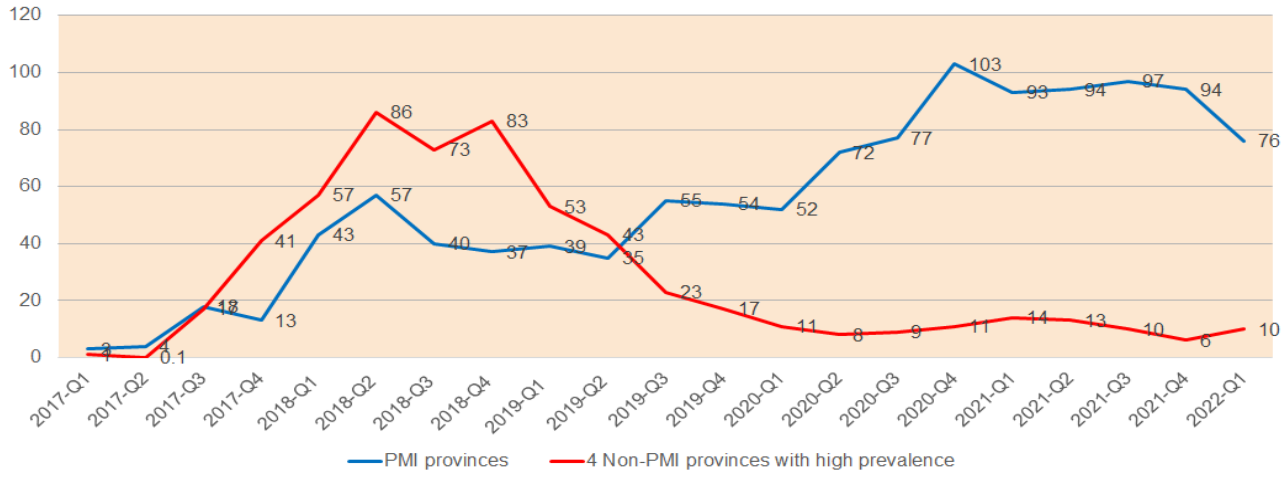
The key objective is to, in a continuous manner, mobilize and promote engagement for community-level interventions on malaria prevention from faith leaders. There is no expectation of receiving financial incentives and all the work from FBOs toward malaria IPC will be carried out on a voluntary basis.

- **Community Mobilization:** The NMCP leadership continues to be committed to exploring and leveraging the potential to improve and increase community mobilization for correct prevention and care-seeking behaviors. Mindful of the fact that CY 2022 is a mass campaign year, a new type of post (which focused on regular live news from the field covering the ITN distribution and updating the followers about the operational process including challenges and achievements) was introduced and proved to be engaging. Hence, ITN distribution and MIP-related posts continue to generate the most engagement (e.g., comments, reaction messages, and sharing). This empathetic approach drives content creation and community activity management, striving to address main determinants of behavior and aiming to lead to behavior change.

Despite the recent progress, there remained challenges outlined by technical area below and for which continued SBC investment is needed to address the determinants of uptake and/or maintenance of prevention, care-seeking, and treatment behaviors.

- **ITNs:** The NMSP 2021–2025 strategic objective is to ensure 80 percent of pregnant women have access to an effective vector control method by the end of 2025. ITNs are the primary vector control intervention in Angola. High coverage in vulnerable groups like pregnant women and young children is achieved through continuous distribution in ANC and EPI outlets. The ZMCC campaign is also the flagship for raising awareness, engagement, and adherence to the CY 2022 ITN mass distribution campaign.

Figure 5. Comparing Access to ITNs in ANC Clinics* between the Six PMI Focus Provinces and Four Non-Focus Provinces, 2017–2022



*Percentage of pregnant women attending ANC who received an ITN during their first ANC visit.
***Source**:* NMCP DHIS2 2020. Period refers to a calendar year (CY). Non-PMI-focus provinces include Moxico, Cuando Cubango, Bie, and Benguela.

Figure 5 compares access to ITNs in ANC clinics in the six PMI focus provinces and four non-PMI focus provinces with high malaria transmission. GRA is responsible for procuring and distributing ITNs for continuous distribution, but maintaining supply has been intermittent, thus decreasing access. Despite the sustained higher level of access and sufficient supply of ITNs in PMI focus provinces compared to non-PMI focus provinces in the last year, significant decline in net access was registered in this reporting period despite sufficient supply of ITNs throughout the six PMI focus provinces. Analysis of DHIS2 data indicates this decline may be due to the following reasons: 1) non-registration of ITN data into ANC registers by nurses; 2) refusal by some ANC HWs to give ITNs to eligible pregnant women; 3) reported stockouts of ITNs in some ANC clinics despite adequate stock levels at municipal warehouses; and 4) orientation from local MOH to stop continuous distribution for prioritization of ITN distribution through mass campaign.

Data analysis points to constraints related to both ITN availability and HWs' skills and behavior as cause for low use of ITNs; namely: 1) limitations inherent to the delivery of ITNs from municipal deposits to SDPs; 2) poor quality of dispensing registries; and last 3) rationing of scarce supplies by some ANC nurses who refuse to give ITNs to some eligible pregnant women. To address the last two constraints, directed on-the-job training during formative supervision with tailored SBC messages and data quality of ITN assumptions/dispensing/consumptions is being conducted to high-volume ANC clinic nurses.

Complementary to the continuous distribution of ITNs, the NMCP, with PMI direct support, scheduled the implementation of a massive ITN distribution campaign for the second half of CY 2022. Attentive to the COVID-19 containment context, flexible and innovative SBC messages and approaches for safe distribution of ITNs were needed to protect HWs, activists, and beneficiary communities. A new set of SBC communication materials were developed and disseminated for the 2022 ITN mass campaign. Materials included:

- 3,000 activist credentials—a guiding document for the activist in the field.
- 1,330,000 voucher brochures—new registration tool to collect data from family members containing instructions on how to correctly use the mosquito net; to be used in areas with poor connectivity access and limited power electricity.
- 1,500 ZMCC T-shirts—to continue giving visibility to the ZMSWM campaign.
- 3,600 ZMCC pink and blue face masks—to provide protection against COVID-19 during field work.

- **MIP:** Despite the ambitious goal set by the NMSP, PMI focus provinces registered low uptake of four doses of IPTp-SP over the last four years with a 28 percent decline between 2020 and 2021. Only 28 percent of facilities in Angola offer ANC services in the focus provinces,[3] with several municipalities having only one ANC facility. Very low availability and access to ANC services is a major barrier to sustainably scaling up IPTp-SP in targeted provinces and Angola at large.

In 2019, a communication campaign was implemented through diverse research activities to collect evidence that would support the building of an informed strategy that sought to improve the uptake of MIP preventive services. The methodology included qualitative information collected from pregnant women and providers regarding IPTp non-adherence and interviews with ANC providers in two of the six PMI focus provinces. From the perspective of pregnant women, there is a need to reinforce the importance (highlighting the severity of MIP) and to reinforce awareness of preventive treatment side effects. As such, the communication campaign remains relevant. From the HW perspective, there is a need to improve IPTp management and also increase provider-client relationships; this was stressed due to the intense workflow of providers which

[3] This average percentage of ANC services coverage is derived from the following rates: Uíge, 22 percent; Cuanza Norte, 19 percent; Lunda Sul, 21 percent; Malanje, 24 percent; Lunda Norte, 44 percent; and Zaire, 60 percent.

reduces their capacity to make the women feel welcome during ANC consultation appointments.

These challenges could be mitigated by engaging the DNSP and SRH Department with relevant recommendations (e.g., propose to DNSP that all health centers—not just the specialized maternal and child health centers—as well as community-based health posts offer ANC services) that would increase the number of facilities administering IPTp for availability and improve access for better coverage. Two suggested approaches currently under discussion include: 1) the integration of SRH into the NMSP; and 2) the implementation of a community (urban and peri-urban) social and mass media campaign with selected health providers as "champions" giving testimony promoting quality of care for group ANC (instead of focusing on activists) and eligible clients promoting IPTp adherence.

- **Case Management:** The NMSP 2021–2025 target is for 100 percent of confirmed cases of uncomplicated malaria to be treated with an effective ACT at HF or community level by the end of 2025. PMI's technical assistance is designed to support NMCP to achieve this strategic target by recognizing that human behavior is a key determinant in malaria prevention, control, and elimination. Malaria SBC becomes an important and integral part for malaria control in Angola and a malaria SBC strategy is always developed to facilitate uptake of the strategies articulated in the NMCP. The current COVID-19 pandemic context makes the malaria SBC approach even more critical to raise facility and community awareness on similarities and differences between COVID-19 and malaria.

Main determinants of behavior for prompt care-seeking are associated with knowledge and social norms, lack of perceived severity, and lack of perceived action efficacy; fever tends to be looked at as something normal and that will happen despite preventive measures. It is important that SBC investments and interventions to encourage early care-seeking and prevention behaviors, to reduce severe malaria and deaths, are addressed to keep emphasizing the message that not all fever is malaria and that there is a need for prompt diagnosis and treatment—this way, both self-medication is discouraged and the banalization of fever symptoms is demystified, insisting on the severity and increased risk, especially for children under five years of age. The optimization of community HWs (ADECOS) conducting IPC interventions integrated in mobile outreach activities in areas with no TV/radio coverage or weak perception of religious presence is another intervention currently under improvement.

- **Service Delivery:** To improve provider behavior practices at the HF and community levels, PMI is supporting the NMCP applying the positive deviance role model approach—an IPC method that involves selecting and training

community members (traditional and religious leaders) who practice uncommon, but positive, behaviors to drive behavior change within their community. Additionally, ADECOS in the municipalities supported by PMI contributed 15 percent of the total uncomplicated malaria cases in children under five years of age via early notification.

As for HWs, NMCP is using theories, models, and conceptual frameworks that focus on socio-ecological approaches to address multilayered human behavior through SBC, community engagement, and advocacy. The use of digital platforms complemented the use of IPC, including health talks at service delivery and community dialogues anchored in local values. Messages and communication focused mainly on improving uptake and acceptance of ACTs antimalarials particularly for pregnant women.

- **Capacity Building:** Recognizing the need for continued SBC capacity strengthening at both the national and subnational levels for the planning, design, implementation, and evaluation of SBC activities, the SADC E8 initiative, with PMI technical assistance, is supporting the NMCP in the hiring of an international consultant who among other things is expected to: 1) improve community engagement with government institutions for accountability in the provision of health services to strengthen social accountability structures and actions; and 2) develop participatory monitoring and evaluation (M&E) approaches and tools to address the complexity of measuring the success of SBC programs aligned with the NMSP 2021–2025 and the (soon to be updated) National Strategic Communication Plan for Behavioral and Social Change on Malaria.
- **Data Collection:** On top of that, PMI in collaboration with the NMCP, is funding an MBS scheduled to be conducted in the first quarter of FY 2023. The MBS will inform malaria barriers and feed the SBC malaria strategies and programming by providing data on the demographic, psychosocial, and contextual factors associated with: use and care of ITNs, uptake of IPTp, and prompt care-seeking for fever in children under five years of age.

The MBS also comes in response to the need to update the Strategic Communication Plan for Behavioral and Social Change on Malaria 2017–2020 and the perceived need for improved formative data to inform SBC activities and further understand the specific factors (e.g., knowledge, attitudes, self-efficacy, risk perception) that influence malaria-related behaviors in Angola.

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

During FY 2023, PMI will continue to concentrate its SBC technical assistance in the six focus hyperendemic provinces of Cuanza Norte, Lunda Norte, Lunda Sul, Malanje, Uíge, and Zaire. This includes reproduction and distribution of resources with messages for behavioral change, as well as post-mass ITN campaign communication skills training for provincial and municipal levels. PMI will also ensure coordination with Global Fund and other stakeholders conducting activities linked in the National Malaria Partners Forum (e.g., ExxonMobil Foundation, Unitel's national corporate social responsibility program "STOP Malária," and Council of Christian Churches).

PMI's support to NMCP's ZMCC campaign while contextualizing the need for malaria prevention and care-seeking behaviors in the midst of the COVID-19 pandemic will remain, reinforcing the cross-cutting coordinated interventions in terms of the malaria prevention (ITN use/IPTp uptake), diagnosis (prompt care-seeking with onset of fever) and treatment (ACTs' acceptance and self-medication) components as those are key identified challenges.

Priorities

While PMI supports SBC activities that promote the uptake and maintenance of all key malaria interventions, the following three behaviors will be prioritized with FY 2023 funds (see Table 3).

Table 3. 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	Mothers/caregivers of children under five years of age; health care providers	All six PMI focus provinces	• Continue training and mentorship of community leaderships and ADECOS to implement IPC activities and give presentations encouraging care-seeking for fever among the community • Conduct community and household-level IPC • Message: "At the first signs of a child's fever, go to the nearest health facility as soon as possible to be seen by a health professional. Timely medical care is very important in cases of malaria, as well as other diseases." • Main determinants: knowledge, perceived severity, perceived action efficacy, social norms
Malaria prevention (ANC attendance, use of an ITN, and use of IPTp)	Pregnant women; male partners; traditional community leaders (*sobas*)	All six PMI focus provinces	• Introduction and integration of IPC in on-the-job training and supportive supervision module at HFs • Conduct health talks during ANC to encourage consistent uptake of IPTp • Promote traditional leader engagement in MIP activities to enforce early ANC attendance and uptake of IPTp • Utilize ADECOS to deliver health promotion messages to increase early ANC access, increase IPTp delivery and demand, and decrease missed opportunities for pregnant women

Behavior	Target Population	Geographic Focus	Programming to Address Behavior
			• Message: “Even during the COVID-19 pandemic, pregnant women (childbearing age) and their partners should prevent MIP by going to HFs for antenatal appointments to do at least four doses of preventive treatment.” • Main determinants: knowledge, negative consequences (side effects), access—psychological, perceived susceptibility
Correct and consistent ITN use	General population	All six PMI focus provinces	• Promote effective engagement and empowerment of traditional leaders especially during mass ITN distribution campaigns • Conduct individual, household, and community IPC through ADECOS to encourage nightly net use and proper net care • Message: “During the COVID-19 pandemic, it remains important to protect ourselves against malaria. Always sleep under a treated mosquito net. Everyone in the family must sleep under a treated mosquito net every night.” • Main determinants: (access), knowledge, perceived susceptibility, perceived action efficacy

Additional Support Activities

In FY 2023, PMI will facilitate the dissemination of the MBS results, which comes in response to the need to update the Strategic Communication Plan for Behavioral and Social Change on Malaria 2017–2020 and the perceived need for improved formative data to inform SBC activities. Findings will contribute in strengthening the capacity of key players and stakeholders for effective SBC design of key strategies and improve the overall quality of malaria control efforts aimed at reductions in malaria incidence. PMI, in alignment with the country’s national malaria control communication strategy, will support the reproduction of evidence-based SBC materials that address determinants for the correct and consistent uptake and adoption of proven malaria interventions, implementation, and evaluation of communication strategy approaches.

7. SM&E

7.1. PMI Goal and Strategic Approach

In Angola, PMI supports the NMSP 2021–2025 objective to improve the NMCP’s decision-making capacity and performance through critical use of data to achieve malaria control goals by 2025. SM&E is defined as one of the core interventions and, for this reason, the objective of the NMCP is based on the following key strategies:

- Strengthening malaria surveillance by mapping malaria risk areas per municipality and developing a malaria surveillance framework to guide decision-making at all levels.
- Strengthening HMIS data collection, quality, and use at facility and community levels.
- Strengthening epidemic prediction, detection, and response system through the malaria early warning system, epidemiological corridor, and surveillance of sentinel sites. In certain regions, these products can be used to determine the timing and severity of any malaria outbreak based on four elements (vulnerability, seasonal weather forecasts, environmental monitoring, and observed malaria morbidity).
- Monitoring the implementation of the NMSP 2021–2025.
- Auditing malaria deaths in all the national, provincial, and municipal hospitals.
- Developing a malaria research agenda from national survey data and previous OR results.
- Promoting a broad integrated vision that ensures timely data collection, analysis, visualization, and reporting of malaria-related information, as well as the development of a culture of data-driven decision-making.
- Introducing data validation processes and implementation of routine DQAs at facility/district/national levels including clinical practice.
- Preparing standardized guides for implementation of periodic audits by the NMCP technical team, clinical partners, and key stakeholders.

In line with its global strategy, the PMI investments to support NMCP for SM&E are focused on the following key activities:

- Strengthening of SM&E capacity and building a culture of data-driven decision-making.
- Strengthening of routine data collection and reporting (including both timeliness and completeness). PMI provides training, supervision, data quality checks, and reporting tools to HFs at the municipal and provincial levels. PMI also supports strengthening monthly malaria surveillance data reporting through electronic DHIS2 in the six PMI focus provinces, as well as at the central level. Currently, only data from the public sector is inserted into DHIS2 platform, but the MOH is interested in including the HFs from the private sector once all the requirements are met.
- Facilitating of the establishment and institutionalization of data use processes through technical assistance with a focus on reducing the time within the “information to decision cycle” between PMI and the NMCP.
- Collecting of critical health indicators by supporting population-based surveys (e.g., MIS 2006–2007, MIS 2011, DHS 2015–2016, and DHS 2022). PMI also

aims to strengthen the institutional capacity of the NMCP in SM&E through the development and update of SM&E tools (e.g., Monitoring and Evaluation Plan 2022–2025), training in SM&E, and data quality analysis.

7.2. Recent Progress (between October 2020 to June 2022)

PMI supported the following activities at the central level:

- The PMI/Angola team provided its technical support to the NMCP to develop the National Monitoring and Evaluation Plan 2022–2025 aligned with the NMSP 2021–2025.
- PMI collaborated with implementing partners and other donors to support the MOH and NMCP's transition from paper-based to digital health information systems, in developing and improving DHIS2 software as the national platform for HMIS and strengthening the capacity of data insertion at municipal level and of data use for decision-making through DHIS2. Before the launch of DHIS2 in 2017, the average malaria annual reporting rate (completeness) was close to 80 percent but after the transition from paper-based reporting to DHIS2, the national reporting rate improved progressively reaching 84 percent in 2020 and 91 percent in 2021. The timeliness of these reports also progressively improved from 55 percent in 2017 up to 73 percent in 2021. In PMI provinces, DHIS2 roll-out completeness rates increased from 82 percent to 95 percent from 2019 to 2021, and timeliness, from 70 percent to 73 percent.
- PMI also provided support to the NMCP and facilitated the harmonization of the collection and reporting of ADECOS community malaria data by using HFs and DHIS2 as the primary sources for ADECOS data. Malaria data from community and HF levels are now being reported in a disaggregated manner through DHIS2 using a designated section of the HF malaria form.
- PMI supported the production of monthly stock status reports in the six PMI provinces, and their subsequent analysis.
- PMI convened 42 quarterly DHIS2 data analyses meetings with municipal and provincial representatives (seven meetings per province).
- In early CY 2021, PMI supported the NMCP to conduct a malaria death review in three of the six PMI focus provinces. The review consisted of an analysis of 730 records of in-patients who died using HF patient registers in 18 selected HFs. The findings of this review prompted the NMCP to improve training content of HWs on the management of severe malaria cases.
- The USAID PMI/Angola data specialist physically sits at the NMCP office at least three times a week to work alongside the NMCP's SM&E point of contact and provide technical support to strengthen the NMCP's SM&E capacity.

- PMI continued implementation of supervisions from district to HFs using HNQIS. HNQIS enables supervision data to be captured through malaria and family planning supportive supervision checklists developed in coordination with national and provincial health authorities and approved by the MOH. The electronic version of the malaria and family planning supportive supervision checklist is now rolling out using the HNQIS application on smartphones and tablets. HNQIS allows MOH supervisors to immediately know the results of the supervision (e.g., strengths and weaknesses of providers), provides standard feedback to health providers through the use of electronic aids, and manages and prioritizes subsequent visits based on previous health performance and number of clients in the HF.
- PMI also developed and introduced, in collaboration with NMCP and GTI, a digital tool that enables the MOH to conduct rapid DQAs. The digital tool has three main components: The **first** is called “Data Verification” and focuses on whether data collected in the HFs meet certain criteria—availability, completeness, timeliness, integrity, confidentiality, precision, and accuracy; the **second** is called “Data Management System” and focuses on whether the HFs have systems in place to properly collect, manage, and secure information (e.g., if the HFs use updated collection forms, keep information secure and confidential, and if there are standard operating procedures in place to collect and revise data before submissions, etc.); and the **third** component, called “Action Plan,” allows supervisors to write up the key problems identified during the visit to the HF, the recommended solution(s), the responsible staff to respond, and the due date for recommendations to be addressed. This tool serves to standardize and automate the process of DQAs, making results immediately visible in DHIS2 to all levels of the MOH (municipal, provincial, and central levels). Each municipality team has at least five to six HFs to visit per month for DQAs and it is anticipated that during one quarter, supervisors of the 60 municipalities will be able to cover all 936 HFs in the PMI focus provinces. The digital tool is allowing the ability to provide a more representative picture of data quality and management issues in the HFs.

The tool started to be implemented in the six PMI focus provinces in November 2021 and can easily be expanded to non-PMI focus provinces or to other health areas once the NMCP trains the staff and makes the required equipment available. PMI and NMCP conducted a total of 1,219 DQAs during the reporting period. Table 4 below shows data results from DQAs conducted in the six PMI focus provinces from the last semester, January 2022 to June 2022.

Table 4. Results from Digital Rapid Data Quality Assessment Improvement Visits in Six PMI Focus Provinces, from January to June 2022

Province	Number of HFs Visited	Number of Visits	Availability (%)	Complete (%)	On Time (%)	Integrity (%)	Confidentiality (%)	Precision (%)	Accuracy (%)	Average (%)
Cuanza Norte	70	206	96.4	100.0	98.3	95.1	75.9	80.5	92	92.4
Lunda Norte	50	184	97.4	92	87.9	85.1	70.8	77.8	95.1	85.5
Lunda Sul	44	121	91.3	84.1	96.6	82.2	89.1	90	98.2	86.7
Malanje	48	97	86.8	89.9	93.6	88.9	75.8	79.9	96.5	85.4
Uíge	100	206	89.5	94.3	99.9	91.2	72.6	79.3	90.1	82.4
Zaire	77	241	99.2	99.7	99.6	99.8	99.9	99.7	97.9	96.9
Total	389	1,055	93.4	95.9	96.0	90.4	80.7	84.5	95.0	88.2

Source: DHI2, downloaded on July 25, 2022.

Key challenges under the reporting period for SM&E activities included:

- COVID-19 emergency travel restrictions continued to limit the movement of the technical teams to conduct field visits related to SM&E activities.
- Data from the private and military sector health units, in general, is not yet included in the epidemiological surveillance system and in the DHIS2 platform.
- There is irregular reproduction and a limited number of management, recording, and data collection tools (e.g., record books, etc.).
- The delay of the 2020 DHS and its postponement to the end of 2022/2023 have not allowed the NMCP and other stakeholders to measure population-level outcomes and impact of malaria interventions implemented in the last five years, nor inform the Malaria Program Review or provide an accurate baseline of malaria interventions that will be implemented during the current NMSP 2021–2025.

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

PMI will continue to support all the activities as described in the **Recent Progress section** with emphasis on:

- Providing technical support to the NMCP in order to implement a strong malaria SM&E strategic plan especially at community, HF, and municipality

levels as per the current M&E and NMSP 2021–2025, including several site visits to catch up over time lost due to COVID-19 travel restrictions.

- Supporting the NMCP in data validation processes and in the implementation of routine DQAs at facility/municipal/national levels and conducting DHIS2 data analysis meetings.
- Strengthening data quality through routine supervisions and DQAs decision-making through quarterly DHIS2 data analysis meetings held at the provincial level.
- Consolidating the capacity of municipal malaria supervisors and statisticians in the use of tools to conduct on-site data verification supervision; train HFs and municipal staff (including director level positions) in the interpretation of results and decision-making processes; continue incorporating results during the quarterly data analyses meetings with statisticians, malaria supervisors, and directors of municipal health directorates; and develop new dashboards as needed by MOH staff, donor, and partners.
- Advocating for increased engagement with the private and military sectors for the consistent use and reporting on malaria monthly reports through DHIS2 to increase participation in DHIS2 for a more holistic description of malaria in Angola.
- With NMCP and partners, developing the Epidemiological Surveillance on Public Health Course on the Kassai platform, which can be a useful training tool for newly hired staff in HFs who otherwise do not have access to training on data registry, analyses, and interpretation, etc.
- Exploring the potential to expand MIP tracking in DHIS2, which would require changes to data collection at HFs to be able to track adherence to IPTp at the individual level and increase the number of private HFs reporting into the DHIS2.
- Supporting the production of monthly stock status reports in the six PMI focus provinces, and their subsequent analysis.
- Proposing that the findings of the PMI-funded Digital Square Survey carried out in 2021 are used to develop a roadmap toward the use of digital tools at community level within the National Community Health Strategy currently under development.
- Implementing on a rolling basis of HNQIS throughout PMI-supported provincial HFs to ensure routine supportive supervision to improve data management quality; possibly expanding into private sector HFs to improve data quality.
- Advocating for local administrations for increasing reproduction of patient register books and other tools for data reporting.

- Advocating with Unitel to provide free internet to use the *Central de Atendimento de Sistemas de Saúde*/Health Systems Call Center (CASS) platform (a free electronic platform administered by GTI to improve the DHIS2 support system developed with PMI support) to encourage its use among provincial staff needing DHIS2 technical support.

Table 5. Available Malaria Surveillance Sources

Source	Data Collection Activity	2020	2021	2022	2023	2024	2025
Household Surveys	DHS				P		
Household Surveys	Malaria Indicator Survey (MIS)						
Household Surveys	Multiple Indicator Cluster Survey						
Household Surveys	EPI survey						
Health Facility (HF) Surveys	Service Provision Assessment						
HF Surveys	Service Availability Readiness Assessment survey						
HF Surveys	Other HF Survey			P			
Malaria Surveillance and Routine System Support	TESs		X		P		P
Malaria Surveillance and Routine System Support	Support to Parallel Malaria Surveillance System						
Malaria Surveillance and Routine System Support	HMIS	X	X	X	P	P	P
Malaria Surveillance and Routine System Support	Support to Integrated Disease Surveillance and Response						
Malaria Surveillance and Routine System Support	eLMIS						
Malaria Surveillance and Routine System Support	Malaria Rapid Reporting System						
Other	EUV	X	X	X	P	P	P
Other	School-based Malaria Survey						
Other	Knowledge, Attitudes and Practices Survey; MBS				P		
Other	Malaria Impact Evaluation						
Other	Entomologic Monitoring Surveys			X	P	P	P

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

8. OR and Program Evaluation (PE)

8.1. PMI Goal and Strategic Approach

Angola's NMSP 2021–2025 encourages working with partners in-country and abroad to develop increased OR capacity and plans for the development of an agenda for OR/PE in collaboration with the different sectors of the MOH, partners, and other stakeholders.

Priority will be given to research and the elaboration of a malaria research plan. The OR agenda will include the development of TESs, entomological studies, HF surveys, and SBC studies (including knowledge, attitudes, and practices).

To increase OR capacity of the NMCP, one priority is to establish partnerships with entities such as national universities with medical schools, foreign universities, non-governmental organizations, or private entities able to conduct research interventions through the form of an OR technical working group. Suggested areas for research include increasing understanding of the determinants of malaria disease burden control process, not only from the point of view of the provision of services, but also of the service demand, to improve the response mechanisms of the program and make the activities more efficient and effective.

PMI continues to support the NMCP providing technical assistance in designing study protocols, performing fieldwork, analyzing data, reporting, and publishing results in scientific journals and conferences. PMI also supports the discussion of results to identify action points with implications for public health. Working closely with the local national team to strengthen technical capacities in research and interpretation of decision-focused results is a key focus of PMI.

8.2. Recent Progress (between October 2020 and June 2022)

No OR/PE has been budgeted or implemented since FY 2019.

The last PMI-supported OR/PE study was completed in CY 2019: a cross-sectional survey to better understand care-seeking behavior for malaria treatment of key populations working in Angola—specifically, a survey of the malaria risk, prevention, and care-seeking practices among Asian migrant workers. The results and recommendations were published in FY 2020.[4]

8.3. Plans and Justification with FY 2023 Funding

No OR/PE activities are proposed with FY 2023 funding. Please visit www.pmi.gov/resources/malaria-operational-plans-mops for these FY 2023 funding tables.

[4] Martins, J.F., Marques, C., NietoAndrade, B., Kelley, J., Patel, D., Nace, D., Herman, C., Barratt, J., Ponce de León, G., Talundzic, E., Rogier, E., Halsey, E.S., & Plucinski, M.M. “Malaria Risk and Prevention in Asian Migrants to Angola.” *The American Journal of Tropical Medicine and Hygience* 103, no. 5 (Nov. 2020): 1918–1926, doi: 10.4269/ajtmh.20-0706. PMID: 32815500; PMCID: PMC7646810.

9. Capacity Strengthening

9.1. PMI Goal and Strategic Approach

The NMCP continues to work with donors and stakeholders to identify opportunities and approaches to strengthen other health system needs.

PMI supports interventions that aim to strengthen the institutional and individual capacity of national-, subnational-, and local-level malaria programs and teams to effectively lead, manage, implement, and oversee their own programs to achieve their own objectives. It provides this support through a multipronged approach consisting of a mix of long- and short-term interventions aimed at building the capacity of individual malaria program personnel and teams, strengthening reporting systems, and strengthening the institutional capacity of the NMCP and other MOH institutions such as GTI, CECOMA, provincial warehouses, and ARMED. To build staffing capacity, PMI historically embedded technical staff within the NMCP and other government departments. This investment was always intended to be temporary to transfer technical skills. For example, PMI currently supports two embedded staff at CECOMA for supply chain strengthening with the goal that technical assistance can help strengthen the government's national distribution system to the point where it could assume the management of the warehousing and transportation of both government- and donor-supplied malaria commodities. Another embedded staff member (one) is at GTI to support with SIGLOFA management at the MOH server.

Training, coaching, mentoring, supportive supervision, and on-the-job capacity strengthening are some of the interventions utilized to strengthen individuals' and teams' capacities to deliver malaria services and manage programs at all levels.

Capacity-strengthening activities for NMCPs and other local government entities to strengthen malaria diagnosis and treatment practices (which include training and on-site supervision) have been described in the relevant intervention sections of the MOP. This section covers other PMI capacity-strengthening support to malaria control programs and other local government entities not covered.

PMI funds short-term training of permanent government staff in the technical aspects of malaria, management and leadership, and pedagogical skills for trainers. In addition, it funds oral or poster presentations by NMCP at conferences where the outcome is beneficial to the country's program.

Until recently, PMI utilized the approach of funding training through the frontline CDC Field Epidemiology Training Program (FETP) to support the MOH's efforts to initiate and strengthen local epidemiologic data collection, management, analysis, and dissemination capacity with the aim to support MOHs to build sustainable capacity for

local detection and response to health threats, including sudden increases in malaria transmission.

9.2. Recent Progress (between October 2020 and June 2022)

During the reporting period, PMI:

- Supported the embedding of two staff at CECOMA that provided technical assistance for supply chain strengthening.
- Supported training of eight municipality- and provincial-level surveillance officials in specific skills like biostatistics, field epidemiology, basic research methods, etc. through first-line FETP in collaboration with the National School of Public Health. Selected participants were officials currently working in PMI focus provinces who will continue to be seconded in their offices after the training with the aim that the knowledge and skills obtained will strengthen the individual and organizational capacity, and support the institutionalization of the skills obtained.
- Supported the elaboration of an abstract submitted by NMCP/CDC/PMI to the American Society of Tropical Medicine and Hygiene Conference 2021 that was approved as a poster entitled: “Is e-Learning Effective at Improving Knowledge of Malaria among Health Workers Compared to Traditional Training? Results from a Pragmatic Assessment in Angola, 2020–2021.” The poster number 491, presented on November 19, 2021 in poster session B.
- Supported NMCP in the development of the NMSP 2021–2025.
- Provides technical assistance to NMCP on the development of the 2021–2025 M&E plan.
- Conducted one graduation ceremony for the first cohort of public health logisticians from the School of Public Health.
- Supported the National Malaria Partners Forum aiming to encourage engagement of private sector and other in-country technical partners to leverage resources for malaria prevention and control activities.
- PMI/Angola FY 2022 funds expanded previously supported health systems strengthening activities by developing a “malariologist” course for training existing and new hires as well as other public health professionals at the NMCP. The curriculum was developed with the NMCP and local universities, utilizing existing materials from FETP and other resources to strengthen malaria expertise and skills, including scientific writing and giving presentations at the central level.

Key challenges were identified:

- NMCP and partners think that the National Malaria Partners Forum could be a platform that would allow the sharing of new research related to malaria

prevention and control, allow activities implemented to be presented and discussed and best practice shared, and allow better coordination among the NMCP and partners. However, currently the National Malaria Partners Forum lacks a clear annual strategy and workplan.

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

With FY 2023 funds, PMI/Angola will continue to support capacity and health systems–strengthening activities as described in the **Recent Progress section,** except that it will pause funding for FETP-frontline. It was determined that this would be a duplication of activities after the NMCP's request for PMI support for the development of the Epidemiological Surveillance on Public Health Course for the Kassai platform. Through this platform, PMI/Angola will be able to reach a greater number of health officers and complete training on the supervision and data quality platforms described above. PMI will fund oral or poster presentations of implementing partners at conferences and the participation of relevant NMCP personnel, where the outcome is beneficial to the country's program.

10. Staffing and Administration

A minimum of three health professionals oversee PMI in Angola. The single interagency team led by the USAID mission director or their designee consists of a resident advisor representing USAID, a resident advisor representing CDC, and two 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, M&E 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	2025
Total country population	33,086,278	34,094,077	35,121,734	36,170,961
Total population at risk for malaria	33,086,278	34,094,077	35,121,734	36,170,961
PMI-targeted at-risk population	6,249,998	6,440,371	6,634,496	6,832,695
Population targeted for ITNs	6,249,998	6,440,371	6,634,496	6,832,695
Continuous Distribution Needs				
Channel 1: ANC		274,617	282,895	
Channel 1: ANC Type of ITN		PBO	PBO	
Channel 2: EPI		213,241	219,668	
Channel 2: EPI Type of ITN		PBO	PBO	
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	0	487,858	502,563	0
Mass Campaign Distribution Needs				
Mass distribution campaigns	3,472,221	530,750		3,795,941
Mass distribution ITN type	Single Pyrethroid	PBO		PBO
Estimated Total Need for Campaigns	3,472,221	530,750	0	3,795,941
Total ITN Need: Continuous and Campaign	**3,472,221**	**1,018,608**	**502,563**	**3,795,941**
Partner Contributions				
ITNs carried over from previous year	432,835	0	0	0
ITNs from Government				
Type of ITNs from Government				
ITNs from Global Fund				
Type of ITNs from Global Fund				
ITNs from other donors				
Type of ITNs from other donors				
ITNs planned with PMI funding	3,453,800	734,050	502,563	1,897,971
Type of ITNs with PMI funding	Single Pyrethroid	PBO	PBO	PBO
Total ITNs Contribution Per Calendar Year	**3,886,635**	**734,050**	**502,563**	**1,897,971**
Total ITN Surplus (Gap)	**0**	**(284,558)**	**(0)**	**(1,897,970)**

Table A-2. RDT Gap Analysis Table

Calendar Year	2022	2023	2024
Total country population	33,086,278	34,094,077	35,121,734
Population at risk for malaria	33,086,278	34,094,077	35,121,734
PMI-targeted at-risk population	6,249,998	6,440,371	6,634,496
RDT Needs (PMI-focus provinces)			
Number of projected suspected malaria cases	5,760,167	6,283,239	6,718,422
Percent of suspected malaria cases tested with an RDT	75%	85%	90%
RDT Needs (tests)	**4,320,126**	**5,340,753**	**6,046,580**
Select Data Source			
Partner Contributions (tests)			
RDTs from Government	0	0	0
RDTs from Global Fund	0	0	0
RDTs from other donors	0	0	0
RDTs planned with PMI funding	8,425,056	6,896,500	7,502,700
Total RDT Contributions per Calendar Year	**8,425,056**	**6,896,500**	**7,502,700**
RDTs planned with PMI funding for non-PMI provinces	842,506	689,650	750,270
Stock Balance (tests)			
Beginning Balance	1,212,213	4,474,638	5,340,735
- Product Need	5,162,631	6,030,403	6,796,850
+ Total Contributions (received/expected)	8,425,056	6,896,500	7,502,700
Ending Balance	**4,474,638**	**5,340,735**	**6,046,585**
Desired End of Year Stock (months of stock)	12	12	12
Desired End of Year Stock (quantities)	4,320,126	5,340,753	6,046,580
Total Surplus (Gap)	**154,512**	**(18)**	**5**

Table A-3. ACT Gap Analysis Table

Calendar Year	2022	2023	2024
Total country population	33,086,278	34,094,077	35,121,734
Population at risk for malaria	33,086,278	34,094,077	35,121,734
PMI-targeted at-risk population	6,249,998	6,440,371	6,634,496
ACT Needs (PMI-focus provinces)			
Projected number of malaria cases	2,741,839	3,066,220	3,092,490
Total ACT Needs (treatments)	**2,741,839**	**3,066,220**	**3,092,490**
Select Data Source			
Partner Contributions (treatments)			
ACTs from Government			
ACTs from Global Fund			
ACTs from other donors			
ACTs planned with PMI funding	3,334,100	3,364,000	3,465,500
Total ACTs Contributions per Calendar Year	**3,334,100**	**3,364,000**	**3,465,500**
ACTs planned with PMI funding for non-PMI-focus provinces	825,535	336,400	346,550
Stock Balance (treatments)			
Beginning Balance	3,337,983	3,104,709	3,066,088
- Product Need	3,567,374	3,402,620	3,439,040
+ Total Contributions (received/expected)	3,334,100	3,364,000	3,465,500
Ending Balance	**3,104,709**	**3,066,088**	**3,092,548**
Desired End of Year Stock (months of stock)	12	12	12
Desired End of Year Stock (quantities)	2,741,839	3,066,220	3,092,490
Total Surplus (Gap)	**362,870**	**(132)**	**58**

Table A-4. Inj. Artesunate Gap Analysis Table

Calendar Year	2022	2023	2024
Injectable Artesunate Needs (PMI-focus provinces)			
Projected number of severe cases	137,092	122,649	92,774
Projected number of severe cases among children	100,077	89,534	67,725
Average number of vials required for severe cases among children	6	6	6
Projected number of severe cases among adults	37,015	33,115	25,049
Average number of vials required for severe cases among adults	6	6	6
PMI Total Injectable Artesunate Needs (vials)	**822,551**	**735,894**	**556,646**
Select Data Source			
Partner Contributions (vials)			
Injectable artesunate from Government			
Injectable artesunate from Global Fund			
Injectable artesunate from other donors			
Injectable artesunate planned with PMI funding	916,997	534,921	419,333
Total Injectable Artesunate Contributions per Calendar Year	**916,997**	**534,921**	**419,333**
Injectable artesunate planned with PMI funding for non-PMI-focus provinces	91,700	53,492	41,933
Stock Balance (vials)			
Beginning Balance	987,612	990,358	735,893
- Product Need	914,251	789,386	598,580
+ Total Contributions (received/expected)	916,997	534,921	419,333
Ending Balance	**990,358**	**735,893**	**556,647**
Desired End of Year Stock (months of stock)	12	12	12
Desired End of Year Stock (quantities)	822,551	735,894	556,646
Total Surplus (Gap)	**167,807**	**(0)**	**0**

Table A-5. RAS Gap Analysis Table

Calendar Year	2022	2023	2024
Artesunate Suppository Needs (PMI focus provinces)			
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)	4,113	3,679	2,783
Total Artesunate Suppository Needs (suppositories)	**4,113**	**3,679**	**2,783**
Select Data Source			
Partner Contributions (suppositories)			
Artesunate suppositories from Government			
Artesunate suppositories from Global Fund			
Artesunate suppositories from other donors			
Artesunate suppositories planned with PMI funding	9,920		3,179
Total Artesunate Suppositories Available	**9,920**	**0**	**3,179**
Artesunate suppositories planned with PMI funding for non-PMI provinces	0	0	0
Stock Balance (suppositories)			
Beginning Balance	260	6,067	2,388
- Product Need	4,113	3,679	2,783
+ Total Contributions (received/expected)	9,920	0	3,179
Ending Balance	**6,067**	**2,388**	**2,784**
Desired End of Year Stock (months of stock)	12	12	12
Desired End of Year Stock (quantities)	4,113	3,679	2,783
Total Surplus (Gap)	**1,954**	**(1,292)**	**0**

Table A-6. SP Gap Analysis Table

Calendar Year	2022	2023	2024
Total Country Population	33,086,278	34,094,077	35,121,734
Total Population at Risk for Malaria	33,086,278	34,094,077	35,121,734
PMI Targeted at Risk Population	6,249,998	6,440,371	6,634,496
SP Needs			
Number of Pregnant Women (PMI-focus provinces)	266,500	334,899	344,994
Percent of pregnant women expected to receive IPTp1	60%	65%	70%
Percent of pregnant women expected to receive IPTp2	55%	60%	65%
Percent of pregnant women expected to receive IPTp3	40%	45%	50%
Percent of pregnant women expected to receive IPTp4	35%	40%	45%
Total SP Needs (doses)	**506,350**	**703,289**	**793,486**
Select Data Source			
Partner Contributions (doses)			
SP from Government	0	0	0
SP from Global Fund	0	0	0
SP from other donors	0	0	0
SP planned with PMI funding	710,000	853,000	981,500
Total SP Contributions per Calendar Year	**710,000**	**853,000**	**981,500**
SP planned with PMI funding for non-PMI-focus provinces	955,397	85,300	98,150
Stock Balance (doses)			
Beginning balance	1,390,747	639,000	703,411
- Product Need	1,461,747	788,589	891,636
+ Total Contributions (Received/expected)	710,000	853,000	981,500
Ending Balance	**639,000**	**703,411**	**793,276**
Desired End of Year Stock (months of stock)	12	12	12
Desired End of Year Stock (quantities)	506,350	703,289	793,486
Total Surplus (Gap)	**132,650**	**123**	**(210)**