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Malawi

Malaria Operational Plan FY 2024

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This Fiscal Year (FY) 2024 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 2024 appropriation from U.S. Congress. Any updates will be reflected in revised postings.

CONTENTS

ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AI	Active ingredient
ANC	Antenatal care
CHAG	Community Health Action Group
CHW	Community health worker
CMED	Central Monitoring and Evaluation Division
DHIS2	District Health Information System-2
EPI	Expanded Program on Immunization
FY	Fiscal year
G2G	Government-to-government
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HES	Health Education Services Unit
HSA	Health surveillance assistant
HSSP III	Health Sector Strategic Plan 2023–2030
iCCM	Integrated community case management
IMCI	Integrated Management of Childhood Illnesses Unit
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated net
LMIS	Logistics management information system
MBS	Malaria Behavior Survey
MIP	Malaria in pregnancy
MICS	Multiple Indicator Cluster Survey
MIS	Malaria Indicator Survey
MOH	Ministry of Health
MOP	Malaria Operational Plan
MVIP	Malaria vaccine implementation program
NMCP	National Malaria Control Program
NMSP	National Malaria Strategic Plan
NPRL	National Public Reference Lab
OTSS	Outreach training and supportive supervision
PBO	Piperonyl-butoxide
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PMI	U.S. President’s Malaria Initiative

RDT	Rapid diagnostic test
RAS	Rectal artesunate suppository
SBC	Social and behavior change
SM&E	Surveillance, monitoring, and evaluation
SP	Sulfadoxine-pyrimethamine
TWG	Technical working group
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

To review the specific country context for Malawi, please refer to the Malawi Malaria Profile, which provides an overview of the country's malaria situation, key indicators, the National Malaria Strategic Plan 2023–2030 (NMSP), and the partner landscape.

U.S. President's Malaria Initiative

Launched in 2005, the U.S. President's Malaria Initiative (PMI) supports implementation of malaria prevention and treatment measures as well as cross-cutting interventions. PMI's 2021–2026 strategy, *End Malaria Faster*, envisions a world free of malaria within our generation with the goal of preventing malaria cases, reducing malaria deaths and illness, and eliminating malaria in PMI partner countries. PMI currently supports 27 countries in Sub-Saharan Africa and 3 programs across the Greater Mekong Subregion (GMS) in Southeast Asia to control and eliminate malaria. Malawi began implementation as a PMI partner country in fiscal year (FY) 2006.

Rationale for PMI's Approach in Malawi

PMI support for the prevention, diagnosis, and treatment of malaria is in line with the NMSP and complements interventions supported by the Global Fund to Fight AIDS, Tuberculosis and Malaria. In support of the decision by the National Malaria Control Program (NMCP) to prioritize the distribution of dual active ingredient (AI) insecticide-treated nets (ITNs) over indoor residual spraying (IRS), PMI will support a comprehensive IRS exit strategy in all four districts that will be shifting from IRS to ITNs, including a full supply of rapid diagnostic tests (RDTs) and artemisinin-based combination therapies (ACTs), robust entomological and epidemiological surveillance, and social and behavior change (SBC).

Overview of Planned Interventions

The proposed FY 2024 PMI funding for Malawi is $23 million. PMI will support the following intervention areas with these funds.

1. Vector Monitoring and Control

PMI supports entomological monitoring and ITN distribution targeting those most vulnerable to malaria (pregnant mothers and children under five years of age). With FY 2024 funding, PMI will support entomological monitoring at 16 sites in 8 districts across the country, as well as procurement, warehousing, and distribution of ITNs for use at antenatal care clinics (ANC) and labor and delivery wards nationwide.

2. Malaria in Pregnancy

PMI supports ITN provision at the first ANC visit, a minimum of three doses of intermittent preventive treatment for pregnant women (IPTp), and effective case management. With FY 2024 funding, PMI will support malaria in pregnancy (MIP) outreach training and supportive supervision (OTSS) interventions in at least five districts as well as group mentorship at the facility and community level in an additional nine districts to improve quality of care and MIP data quality through data review and strengthening activities. Although PMI will continue to budget for 100 percent of sulfadoxine-pyrimethamine (SP) procurement, it will continue to advocate for additional Malawi government support for the procurement of SP and directly observed therapy supplies. PMI will support the national MIP technical working group (TWG) and support updates to Ministry of Health (MOH) ANC guidance documents and registers.

3. Drug-Based Prevention

N/A

4. Case Management

PMI supports case management activities at the national, facility, and community level. With FY 2024 funding, activities at the national level will include support to review policies, guidelines, and standard operating procedures; TWG and National Malaria Advisory Board meetings; updating preservice and in-service training curricula; quarterly district technical review meetings; training of laboratory technologists/technicians; technical assistance to NMCP and the National Public Reference Lab (NPRL); capacity strengthening for slide bank management at the National Parasitology Reference Laboratory; and initial funding for a planned 2025–2026 therapeutic efficacy study (TES). Facility-level support includes strengthening parasitological testing of suspect malaria cases, adherence to testing results, and prompt and appropriate treatment for confirmed malaria cases. PMI will continue to support improved community case management service delivery activities and prompt and appropriate treatment for confirmed malaria cases, including training of health surveillance assistants (HSAs) and supervision and mentorship at the community level.

5. Health Supply Chain and Pharmaceutical Management

With FY 2024 funding, PMI will support the warehousing and distribution of ITNs, RDTs, ACTs, SP, and rectal artesunate suppositories (RAS) and provide technical assistance to the Malawi government. In line with the Health Sector Strategic Plan 2023–2030 (HSSP III) and the Master Supply Chain Transformation Plan, MOH intends to create a single logistics management unit to manage the integration process for the country's parallel public sector supply chains. PMI will coordinate with the Global Fund and other partners to strengthen the unit and continue to facilitate the integration of parallel supply chains. At the national level, PMI will provide technical assistance directly to NMCP, the Directorate of Health Technical Support Services, and the Drug Theft Investigation Unit within the MOH. At the subnational level, PMI

will provide technical assistance related to commodity management, data collection, and commodity tracking and tracing to districts and health facilities across the entire country.

5. Malaria Vaccine

Malawi participated in the malaria vaccine implementation program (MVIP); select clusters in 11 districts with high malaria burdens were included in the pilot. Following the World Health Organization recommendation of the vaccine, the country rolled out malaria vaccine implementation in all MVIP evaluation clusters, including the comparator clusters of the 11 districts. Furthermore, the country applied to Gavi as a MVIP country to continue implementation of the vaccine. The national Expanded Program on Immunization (EPI) led the introduction of the vaccine; PMI/Malawi will work with NMCP and national immunization colleagues to provide complementary support for planning, SBC, and monitoring of vaccine deployment, as requested; however, no FY 2024 funding is currently planned.

6. Social and Behavior Change

With FY 2024 funding, PMI will support national-level coordination and capacity strengthening through the Malaria SBC TWG. PMI will promote malaria behaviors through national and community-level radio stations. It will strengthen community-based SBC activities through continued implementation of interpersonal communication activities, including community health action groups (CHAGs), care groups, and household visits in the four IRS withdrawal districts and in at least one other yet-to-be-determined district. These visits will encourage the uptake and maintenance of prompt care seeking, correct ITN use and care, and uptake of IPTp3+. PMI will strengthen the SBC monitoring and evaluation system by improving the data capture of the District Health Information System-2 (DHIS2), as well as reporting, analysis, and decision making for community-level care-seeking behaviors. PMI will also design and implement data-driven SBC interventions to address behavioral factors and the specific needs of specific audiences, while leveraging existing implementation channels.

7. Surveillance, Monitoring, and Evaluation

With FY 2024 funding, PMI will continue to provide technical assistance to NMCP, the Central Monitoring and Evaluation Division (CMED), and the Digital Health Division to strengthen SM&E activities, including enhancing the governance and coordination systems for health information systems; providing technical support and ensuring that policies are in place to support interoperability and integration of data across platforms; and improving data analysis and use.

8. Operational Research and Program Evaluation

No operational research or program evaluation activities are proposed with FY 2024 funding.

9. Capacity Strengthening

With FY 2024 funds, PMI will continue to support training, supervision, and mentorship to further strengthen capacity at the national, district, and community level. PMI will provide financial support for HSAs to deliver integrated community case management (iCCM) and SBC through routine case management activities and health communication efforts in their communities through the government-to-government (G2G) agreement with Mangochi District Council. In addition, through a governance strengthening project, PMI will help increase the availability of high-performing staff in service delivery facilities to ensure coverage of essential malaria-related services and support implementation of policy and regulatory frameworks to increase compliance among commercial and artisanal fishers with existing laws on ITN misuse. Furthermore, PMI will provide continued support to maintain Malawi Peace Corps volunteers to support malaria activities throughout the country.

10. Staffing and Administration

A minimum of three health professionals oversee PMI in Malawi. The single interagency team led by the United States Agency for International Development (USAID) Mission Director or their designee consists of a resident advisor representing USAID, a resident advisor representing the Centers for Disease Control and Prevention, and three locally hired experts known as foreign service nationals. The PMI interagency team works together to oversee all technical and administrative aspects of PMI, including finalizing details of the project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, reporting of results, and providing guidance and direction to PMI implementing partners.

I. CONTEXT & STRATEGY

1. Introduction

Malawi began implementation as a PMI partner country in fiscal (FY) 2006. This FY 2024 Malaria Operational Plan (MOP) presents a detailed implementation plan for Malawi based on the strategies of PMI and the National Malaria Control Program (NMCP). It was developed in consultation with NMCP and with the participation of national and international partners. The activities that PMI proposes 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 Malawi, describes progress to date, identifies challenges and relevant contextual factors, and provides a description of activities that are planned with FY 2024 funding. For more detailed information on the country's context, refer to the Malawi Malaria Profile, which provides an overview of the country's malaria situation, key indicators, the National Malaria Strategic Plan 2023–2030 (NMSP), and the partner landscape.

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

PMI is led by the United States Agency for International Development (USAID) and implemented with the U.S. Centers for Disease Control and Prevention. Launched in 2005, PMI supports the implementation of malaria prevention and treatment measures such as insecticide-treated nets (ITNs), indoor residual spraying (IRS), accurate diagnosis and prompt treatment with artemisinin-based combination therapy (ACT), 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 in our generation, with the goal of preventing malaria cases, reducing malaria deaths and illness, and eliminating malaria in PMI partner countries. PMI currently supports 27 countries in Sub-Saharan Africa and 3 programs in the Greater Mekong Subregion (GMS) 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 on progress already made in PMI-supported countries, PMI will work with national malaria control programs 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 Malawi

3.1. Malaria Overview for Malawi

Malaria is endemic to Malawi, with the entire population of 19 million people at risk, particularly during the rainy season (November–April). *Plasmodium falciparum* is the principal malaria parasite, and *An. funestus* and *An. gambiae* are the main vector species contributing to transmission.[1] Malawi has made progress in reducing reported malaria-attributable mortality from 23 per 100,000 population in 2016 to 9 per 100,000 population in 2022,[2] and prevalence in children under five years of age from 28 percent in 2012 (Malaria Indicator Survey [MIS] 2012) to 11 percent in 2021 (MIS 2021). Yet malaria incidence continues to fluctuate, decreasing in the first year after each mass ITN distribution campaign and then increasing nearly back to previous levels by the third year.

Sustaining access to nets has been a challenge; the percentage of the population with access to an ITN has ranged from 37 to 63 percent over the past decade, with rates of 57–63 percent measured one year after a campaign (MIS 2017 and Multiple Indicator Cluster Survey [MICS] 2019–2020) and 37 percent measured three years after a campaign (MIS 2012). In 2019, durability monitoring results indicated that only 34 percent of nets were present at 24 months,[3] which may be a contributing factor to the fluctuations in malaria incidence. However, usage rates remain high (approximately 1-to-1) among those with access to nets, with children under five years of age and pregnant women disproportionately using nets within households (MIS 2021). With respect to accessing services, Malawi has also made significant strides in increasing IPTp uptake, with over 56 percent of pregnant women receiving three or more doses in 2022 (compared with 13 percent in 2014).[4] Continued investments by the Malawi government and donors in the community health system have led to small increases in the

[1] PMI VectorLink Annual Entomological Monitoring Report 2022.
[2] NMSP 2023–2030.
[3] Net Durability Study 2019.
[4] NMSP 2023–2030.

number of suspected cases being tested by community health workers, although a great deal of work remains. For more detailed information on malaria indicators, refer to the Malawi malaria profile.

To reach its goal of eliminating malaria as a public health concern in Malawi by 2030, the NMSP's objectives are outlined below.

- **Integrated vector management:** Increase the proportion of population protected by at least one malaria vector control intervention from 37 percent in 2022 to at least 90 percent by 2030.
- **Malaria case management:** Increase and sustain the proportion of suspected cases of malaria that are tested from 98 percent in 2022 to 100 percent, and treat all confirmed cases by 2030.
- **Malaria in pregnancy (MIP):** Increase the uptake of at least three doses of IPTp from the 2022 baseline of 56 percent to 80 percent by 2030.
- **Procurement and supply management:** Sustain an annual average stockout rate of less than 1 percent for all malaria first-line treatment throughout the NMSP.
- **SBC for malaria:**
    - Increase the proportion of caregivers of children under five years of age who take action to seek appropriate malaria treatment within 24 hours of the onset of fever from 46 to 90 percent by 2030.
    - Increase the proportion of the general population who use an ITN consistently from 55 percent (Malaria Behavior Survey [MBS] 2021) to 80 percent by 2030.
    - Increase the proportion of pregnant women who take IPTp3+ during pregnancy from 56 percent (MBS 2021) to 80 percent by 2030.
- **SM&E and operations research:** To ensure evidence-based program implementation, policy direction, and accountability at all levels of health service delivery, improve malaria data quality (the average of completeness, timeliness, and accuracy) from 94 percent in 2022 to 99 percent by 2030.
- **Malaria program management:** Strengthen program management to support the effective implementation of planned activities from 56 percent to over 90 percent by 2030.

3.2. Key Challenges and Contextual Factors

Malawi is one of the poorest countries in Sub-Saharan Africa and one of the most disaster-prone countries in the world. While flooding, storms, and droughts are a constant across the landscape, climate change and growing population pressures are increasingly exacerbating the situation. With a total fertility rate of 4.4 contributing to high population growth, Malawi's population is likely to more than double by 2050. The fragile health system is dependent on foreign assistance, already stretched beyond capacity, and characterized by a 45 percent health worker vacancy rate, persistent stockouts of essential medicines and supplies, inadequate and/or dilapidated health infrastructure, the existence of multiple parallel health information systems, and a plethora of parallel supply chains for health products

managed by multiple stakeholders. Weaknesses also exist in the quality, collection, reporting, analysis, and use of timely health data. Tremendous health challenges, combined with constrained economic resources, devaluation of the local currency, and marginalized women and youth, place a significant burden on the health system. All of these factors have a significant impact on Malawi's ability to control malaria. With an average of 6 million cases per year and widespread pyrethroid resistance, the procurement of malaria commodities alone requires over 50 percent of the total financial resources available for malaria. While usage rates are high among those with access to a net, rates of correct ITN care are low, subjecting much of the population to high risk of malaria transmission in the absence of other vector control interventions (2021 MBS). Despite these challenges, the Ministry of Health (MOH) and NMCP have strong partnerships with PMI and the Global Fund, and are working together to overcome these obstacles.

Malawi piloted the RTS,S/AS01 malaria vaccine in 11 districts with high malaria burdens. Following the World Health Organization (WHO) recommendation of the vaccine, the country rolled out vaccine implementation in all study clusters across 11 districts. Vaccine introduction is led by the national Expanded Program on Immunization (EPI), and PMI Malawi will work with NMCP and national immunization colleagues to provide complementary support, if requested.

3.3. PMI's Approach for Malawi

PMI supports all the technical components of the NMSP, except larvicidal management. PMI aims to reduce malaria morbidity and mortality across the entire country through targeted interventions in specific districts and through nationwide support for commodities to prevent, diagnose, and treat malaria. To address the aforementioned challenges, PMI works closely with NMCP and the Global Fund to coordinate support and ensure appropriate coverage of key interventions.

In terms of malaria prevention activities, while the NMSP includes both ITNs and IRS, NMCP prioritized the mass distribution of dual active ingredient (AI) nets and malaria case management commodities over IRS in their Global Fund grant application for 2024–2026. This decision was made due to funding limitations, the cost of IRS, and the preliminary results (six months after baseline) of the ongoing impact evaluation of vector control interventions in Malawi that shows that dual-AI nets are performing as well as IRS. PMI is directly aligning with NMCP by also prioritizing ITNs for continuous distribution, entomological monitoring, prevention of MIP, and malaria case management commodities over IRS in this MOP. Thus, there will be four districts (Balaka, Mangochi, Nkhata Bay, and Nkhotakota) that will be transitioning from IRS to ITNs in 2024.

With respect to case management of malaria, in addition to ensuring that rapid diagnostic tests (RDTs) and ACTs are available nationwide, PMI provides financial support and technical assistance to increase access to and quality of malaria services in select districts. To increase the use of appropriate malaria interventions, including prompt care seeking and correct and consistent net use and care, PMI funds behavior change activities at the national, district, and community levels, as well as individual-level SBC activities at the community level. As part of the IRS exit strategy, PMI will be shifting the districts that receive both case management and SBC support to include Mangochi, Nkhata Bay, and Nkhotakota. Since Balaka is no longer stratified as high or highest risk, it will not be a PMI case management district but will receive SBC support to address the changes in behavior and risk perception associated with the withdrawal of IRS.

Additionally, PMI provides direct technical assistance by U.S. government staff to improve the quality of malaria programming across all technical areas. PMI also responds to requests as a result of unforeseen challenges, such as climate-related disasters.

Primary impact: The MOH launched the Health Sector Strategic Plan 2023–2030 (HSSP III) in January 2023 in an effort to radically shift the way health services are delivered in Malawi toward integrated, holistic, and client-focused health care. With its strong alignment with HSSP III, the USAID Global Health Primary Impact initiative[5] comes at an opportune time for Malawi. Leveraging this opportunity, USAID/Malawi intends to strengthen its approach to holistic primary health care by working internally to improve coordination and efficiencies and by working externally to optimize and reduce gaps in services and systems.

USAID/Malawi has embarked on multiple approaches aligned with the Malawi government's integrated health care priorities, including government-to-government (G2G) agreements, which provide funding directly to the government for human resources and integrated service delivery. Under these agreements, USAID has hired health care workers through the government's systems to provide integrated primary health care; funded trainings, supportive supervision, human resource and performance management systems; and integrated family health outreach clinics and other related activities in two districts to strengthen the capacity of district governments to deliver and manage health services. USAID/Malawi believes that Primary Impact serves as a critical opportunity to build on this G2G model for stronger primary health care platforms. PMI/Malawi plans to co-fund G2G efforts in Mangochi, a district with one of the highest malaria burdens in Malawi, focused on health care delivery at the community level.

[5] Primary Impact is a USAID initiative intended to advance integration of essential health services at the primary care level.

3.4 Key Changes in this MOP

Malawi recently transitioned from a strategy of malaria control to one working toward elimination. A mid-term review of the 2017–2022 NMSP was completed in December 2022; and under the new 2023–2030 strategy—Towards Malaria Elimination in Malawi—the Ministry of Health set the goal of eliminating malaria as a public health concern in Malawi by 2030.

This FY 2024 MOP does not include funds for IRS, which will end after the October 2023 spray campaign. The reprogramed FY 2023 MOP reflects this transition from IRS to new types of nets (dual-AI), including an exit strategy that anticipates potential increases in malaria cases and includes sufficient RDTs and ACTs to test and treat should an increase occur, robust entomological and epidemiological surveillance, and SBC activities. Furthermore, as part of the exit strategy, PMI plans to continue to fund G2G in one district, Mangochi, which is also reflected in FY 2021 and FY 2022 reprogramming. With respect to geographic scope, PMI is planning to focus its case management and SBC support in five and six districts, respectively: Balaka (SBC only), Mangochi, Nkhata Bay, Nkhotakota, and two additional districts that have yet to be determined. Similarly, PMI is planning to maintain its surveillance support to Mangochi, Nkhata Bay, and Nkhotakota and five additional districts in order to continue to improve data quality and increase the capacity at the district and facility level to regularly monitor incidence and identify trends. If there is an upsurge in cases in the IRS withdrawal districts, PMI will have surveillance support in place to help NMCP verify the changes and identify specific communities/facilities that are seeing the most significant increases and provide targeted case management and SBC support to those communities and/or facilities.

II. OPERATIONAL PLAN FOR FY 2024

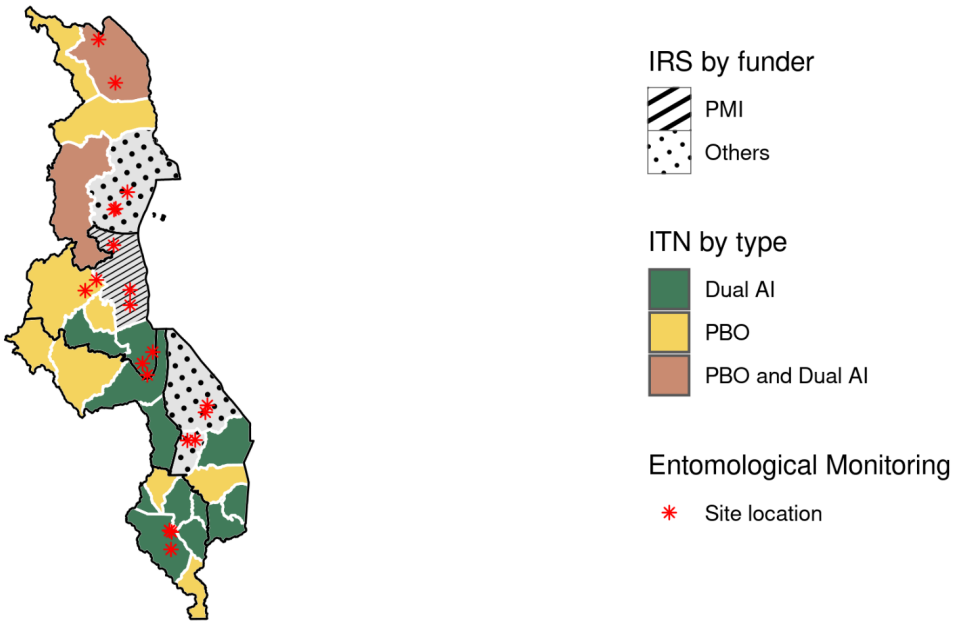
1. Vector Monitoring and Control

1.1. PMI Goal and Strategic Approach

The NMSP promotes an integrated vector management strategy, including vector surveillance, insecticide-resistance management; universal access to quality, long-lasting ITNs through continuous and mass distribution; implementation of quality IRS in select suitable epidemiological areas; and larval source management. PMI funds ITN procurement and distribution and entomological monitoring.

The Global Fund currently supports mass campaigns, while PMI funds continuous distribution of ITNs via antenatal care (ANC) visits and labor and delivery channels nationwide. Until 2024, PMI implemented IRS in one district and provided technical assistance to IRS funded by the Global Fund in three districts. However, IRS will be discontinued in Malawi in 2024. PMI finances entomological monitoring at 13 sites in six districts. Until 2024, the Global Fund is financing four additional sites in the two districts where it funded IRS (Balaka and Mangochi); PMI plans to maintain those sites as part of the IRS exit strategy.

Figure 1. Map of Vector Control Activities in Malawi, 2023



Note: ITNs are not distributed via mass campaign in the districts that receive IRS; piperonyl-butoxide (PBO) ITNs are distributed nationwide, including in these districts, via routine channels.

1.2. Recent Progress (October 2021–September 2022)

- PMI conducted entomological monitoring at 13 sentinel sites in 6 districts, in collaboration and partnership with a local institution, the Malaria Alert Center. Activities included vector bionomics and insecticide-resistance monitoring. For more information about entomological monitoring, refer to the 2022 Entomological Report.
- PMI collected data on human-vector behavior at five sites, including human landing catches, to assess mosquito biting behavior, and conducted surveys in sampled houses to determine when mosquitoes and humans intersect in space (indoors or outdoors), and at what time of night.
- PMI financed the procurement and nationwide distribution of piperonyl-butoxide (PBO) ITNs to pregnant women and newborns through continuous distribution channels (ANC and labor and delivery).
- In collaboration with the Global Fund and NMCP, PMI provided technical assistance as a member of a national task force to implement the 2021–2023 national ITN mass distribution campaign, distributing PBO and two types of dual-AI ITNs.
- PMI conducted ITN durability monitoring by implementing 12-month, post-distribution data collection, monitoring dual-AI and PBO ITNs from the 2021 campaign cohort.
- PMI provided financial and technical assistance for the development of the baseline report and monitoring plan and the six-month interim impact report for an evaluation of the 2021 and 2022 IRS campaign and the ITN mass campaign. The report and plan have three objectives: (1) compare the impact of IRS and new ITNs; (2) compare the impact of Interceptor G2 and Royal Guard ITNs and PBO ITNs; and (3) assess noninferiority between Interceptor G2 and Royal Guard ITNs.
- PMI provided financial and technical support for national and district SBC activities to improve demand for ITNs, increase appropriate ITN use, promote ITN care, and mitigate against ITN misuse (e.g., activities to assess the extent to which ITNs are being used for fishing). For more information, refer to the SBC section.
- PMI financed the implementation of the fifth year of IRS[6] in one district, covering 119,400 structures and protecting 476,625 people between October 10 and November 18, 2022. For more information about IRS, refer to the 2022 End of Spray Report.
- PMI provided technical assistance to NMCP, World Vision International, the Global Fund Principal Recipient, and District Health Offices with the planning, training, supervision, and closing out of IRS operations in three districts (Balaka, Mangochi, and Nkhata Bay).

[6] Note: The government of Malawi first conducted IRS in Northern Nkhotakota in 2007, and has been spraying in various districts since then (2009: Nkhotakota; 2010: Nkhotakota and Salima; 2011: Nkhotakota; 2012: Salima, Nsanje, Chikwawa, Karonga, Nkhata Bay, and Mangochi. However, high levels of pyrethroid and carbamate resistance necessitated a shift to more expensive, short-acting organophosphate insecticides, and PMI suspended direct support for IRS in Malawi in 2012. It was re-initiated in 2018.

- PMI trained and engaged 1,402 community health action group (CHAG) members and 1,253 other health volunteers to support IRS mobilization and spray activities in Nkhotakota.
- PMI conducted spray quality assessments and insecticide residual efficacy monitoring at eight sites in two IRS districts (six in Nkhotakota and two in Nkhata Bay).

1.3. Plans and Justification for FY 2024 Funding

The FY 2024 funding tables contain a full list of vector monitoring and control activities that PMI proposes to support in Malawi with FY 2024 funding.

1.3.1. Entomological Monitoring

PMI will fund entomological monitoring at 16 sites, two in each of eight districts. Selected districts will include one that received PBO ITNs in the 2021 mass campaign, two that received dual-AI ITNs, one that received a mix of net types, and four that previously received IRS. Activities include insecticide resistance and vector bionomics monitoring. Data on human-vector behavioral interactions will be collected at 6 of the 16 sites. Beginning in 2023, *An. gambiae s.l.* that fail to amplify in molecular species identification assays will be subjected to *An. stephensi*-specific identification assays. In addition, a surveillance plan for *An. stephensi* will be developed targeting dry ports, border towns, areas along international highways, and urban areas where introduction is predicted to be most likely. PMI is also continuing to provide technical assistance to strengthen the capacity of local research institutions.

Summary of Distribution and Bionomics of Malaria Vectors in Malawi

As of 2022, *An. funestus s.l.* is the primary vector in most of Malawi, while *An. gambiae s.l.* is a secondary vector. *An. funestus* is the predominant mosquito species at over half of the sites, while *An. gambiae s.l.* predominates in the rest. While nearly 100 percent of *An. funestus* collected were identified as *An. funestus s.s.*, *An. leesoni* was detected for the first time in 2022 in Salima District. *An. gambiae s.l.* is composed almost entirely of *An. arabiensis*, although *An. gambiae s.s.* is present at very low frequencies at a few sites. *An. coustani* has increasingly been collected at several sites in Malawi, particularly by human landing catches, but none have been found to be infected with *Plasmodium falciparum*, and it is unclear if this mosquito species contributes to malaria transmission.

The number of *An. funestus* collected tends to increase beginning early in the rainy season, which usually starts around November–December. *An. funestus populations* reach a peak in May–June, although this species tends to be found in permanent and semipermanent aquatic habitats, and populations may therefore persist throughout the year. The seasonality of *An. gambiae s.l.* is less obvious at most sites, with low numbers found throughout the year, except for Karonga District, where large numbers of *An. gambiae s.l.* are collected in August or September, likely corresponding to rice irrigation cycles.

Based on human landing catch data, *An. funestus* bites predominantly indoors, while *An. gambiae s.l.* (*An. arabiensis* in most sites) bites predominantly outdoors. The biting activity of both species occurs from dusk to dawn across all sites, with the greatest proportion occurring when people are asleep, although some early morning biting is observed in both species. *An. funestus* is strongly anthropophilic, with nearly 90 percent of blood meals identified as being from humans. Interestingly, the percent of *An. gambiae s.l.* that had fed on humans increased from 30 percent in 2021 to nearly 60 percent in 2022, which was unexpected given the predominance of the more zoophilic *An. arabiensis.* Both species are frequently sampled resting indoors; however, the relative numbers resting indoors versus outdoors is unknown, as outdoor resting sites have not been sampled. Sporozoite infection rates in *An. funestus* are approximately threefold higher than that of *An. gambiae s.l.*, likely reflecting the stronger anthropophilic tendencies of *An. funestus*.

Status of Insecticide Resistance in Malawi

Anopheles funestus and *An. gambiae s.l.* are highly resistant to pyrethroid insecticides (deltamethrin, permethrin, and alpha-cypermethrin); however, pre-exposure to PBO restored susceptibility for both species. *Anopheles funestus* and *An. gambiae s.l.* are susceptible to pirimiphos-methyl, chlorfenapyr, and clothianidin at all sites.

1.3.2. Insecticide-Treated Nets

Malawi will continue to support ITN activities as described in the recent progress section. PMI will continue to finance procurement and distribution of dual-AI ITNs for continuous distribution via ANC visits and labor and delivery channels.

PMI also funds SBC to improve ITN use and care and to mitigate against misuse.

See the SBC section for details on challenges and opportunities to improve intervention uptake and maintenance.

ITN Distribution in Malawi

In Malawi, ITNs are currently distributed via mass distribution campaign; the national policy calls for campaigns every two years. Continuous distribution channels are currently targeted to pregnant women at ANC visits and to mothers through labor and delivery channels; NMCP would also like to initiate school-based distribution to help sustain coverage between campaigns. Furthermore, given how cyclones are hitting southern Malawi more regularly due to climate change, the country would like to establish a stockpile of ITNs that could be deployed rapidly to protect displaced and vulnerable people. The country transitioned away from standard nets during its 2021 mass distribution campaign. During the 2021–2023 campaign, the country distributed PBO and two types of dual-AI nets. PBO nets are currently distributed nationwide via continuous distribution; however, a switch has been made to dual-AI nets, which will arrive in the country for distribution beginning in 2024.

PMI reprogramed existing funds to minimize gaps projected for the existing continuous distribution channels. A mass campaign is planned for 2024; however, the timing depends on Global Fund grant finalization, fund availability, and lead time for ITNs. PMI and NMCP will carefully monitor issuing and coverage data over the coming year.

Refer to the ITN gap table in the annex for more details on planned quantities and distribution channels.

Table 1. Streamlined Durability Monitoring (2021 Mass Campaign Cohort)

Campaign Date	Site	Brand	Predistribution	12 months	24 months	36 months
Nov 2021	Chikwawa	Interceptor G2 (chlorfenapyr + alphacypermethrin)	Nov 2021	Dec 2022	Planned	Planned
Jan 2022	Kasungu	PermaNet 3.0 (PBO+deltamethrin)	Nov 2021	Dec 2022	Planned	Planned
Nov 2021	Salima	Royal Guard (alphacypermethrin + pyriproxyfen)	Nov 2021	Dec 2022	Planned	Planned

1.3.3. Indoor Residual Spraying

PMI no longer funds IRS in Malawi; November 2023 was the last spray campaign in the four districts (one funded by PMI and three funded by the Global Fund). Starting with FY 2023 funds and continuing with FY 2024 funds, PMI is supporting an IRS exit strategy to mitigate the risk of an upsurge in cases, including full coverage with effective ITNs, RDTs, and ACTs; surveillance; and SBC.

Table 2. PMI-Funded IRS Coverage

Calendar Year	District[1]	Structures Sprayed (#)	Coverage Rate (%)	Population Protected (#)	Insecticide
2021	Nkhotakota	120,097	92.8%	481,075	Fludora Fusion (Clothianidin + deltamethrin), SumiShield 50WG (Clothianidin)
2022	Nkhotakota	119,400	91.7%	476,625	Actellic 300 CS (Pirimiphos-methyl), Fludora Fusion (Clothianidin + deltamethrin), and SumiShield 50WG (Clothianidin)
2023*	Nkhotakota	110,647 (based on 85% of structures found in 2022)	85% (target)	TBD	Actellic 300 CS (Pirimiphos-methyl), Fludora Fusion (Clothianidin + deltamethrin),and SumiShield 50WG (Clothianidin)

[1] Planned.

IRS Insecticide Residual Efficacy in Malawi

Wall bioassays were conducted monthly following the 2022 IRS campaign. At the time of this writing, the assessment was at T3 in Nkhotakota, T2 in Nkhata Bay and T1 in Balaka and Mangochi districts. In Nkhotakota District, the residual efficacy of Actellic 300CS and SumiShield 50WG showed 100 percent mortality at all sites three months after spray. In Nkhata Bay District, the residual efficacy of Fludora Fusion showed 100 percent mosquito mortality two months after spray. However, <80 percent mosquito mortality was observed at sites sprayed with Actellic 300CS two months after spray. In Mangochi and Balaka Districts, the residual efficacy of Actellic 300CS and SumiShield 50WG showed 100 percent mortality at all sites one month after spray.

2. Malaria in Pregnancy

2.1. PMI Goal and Strategic Approach

To combat the problem of malaria during pregnancy, PMI supports all aspects of NMCP's national MIP strategy, including ITN provision at the first ANC visit, a minimum of three doses of IPTp starting at 13 weeks gestational age, and effective case management of uncomplicated and severe malaria per WHO guidelines.

Artemether-lumefantrine is recommended for all three trimesters of pregnancy in Malawi. NMCP's goal is to increase uptake of at least three doses of IPTp from 56 percent in 2022 to 80 percent by 2030. Previously, there had been continuous improvement, with IPTp3+ coverage increasing from 13 percent in 2014 to 41 percent in 2017, then to 56 percent in 2021 (MIS 2014, 2017, 2021). The MBS 2021 report found correct knowledge to be the main known barrier to IPTp uptake. Based on the findings, PMI Malawi is working with partners to increase knowledge on the benefits of IPTp through trusted community messengers/gate keepers, mass and mid-media approaches, male involvement, and strengthening ANC provider communication skills to build an enabling environment.

PMI funds the delivery of a comprehensive package of integrated interventions through ANC to increase uptake and ensure improved pregnancy outcomes and maternal survival, including IPTp administered through ANC, provision of ITNs to pregnant women at first ANC and at delivery, and case management of malaria-infected pregnant women, as follows:

- **Health facility-based IPTp:** The MOH promotes MIP prevention through directly observed therapy for IPTp that is facilitated by PMI/Malawi's nationwide procurement and distribution of sulfadoxine-pyrimethamine (SP) at all facilities.
- **Community-based IPTp:** Currently, IPTp delivery is limited to one channel (ANC clinics). In 2020, NMCP completed a pilot study on feasibility, acceptability, and effectiveness of the use of health surveillance assistants (HSAs) for community IPTp distribution. The study found an overall improvement in IPTp 1+ of 13.5 percentage points (95 percent confidence interval: 4.7–22.3 percent). IPTp3+ did not statistically significantly increase (6.9 percentage point increase; 95 percent confidence interval:

-5.9–19.6 percent). HSAs made fewer than the desired number of follow-up visits, highlighting the need to better understand HSA workload prior to rolling out this strategy on a broader scale. Results of this study have been disseminated to guide training for HSAs on community IPTp. Based on these findings, the MOH did not pursue community-based IPTp.

- **Provision of quality IPTp care:** NMCP improves MIP quality of care through PMI-funded training of ANC health service providers. The MOH also conducts quarterly integrated supervision visits to ANC providers, focusing on MIP and safe motherhood, to improve their knowledge, skills, and attitudes in the provision of care to pregnant women. The MOH also conducts regular meetings of the MIP subcommittee of the working group committee and other related coordinating mechanisms, such as the case management technical working group (TWG). Furthermore, the MOH conducts outreach training and supportive supervision (OTSS) plus, an approach of supportive supervision at the facility level that uses standard automated checklists centered on continuous improvement of the skills and competencies of health providers in MIP and malaria diagnosis and treatment.

See the ITN section for further details on how PMI supports routine ITN distribution through ANC channels.

2.2. Recent Progress (October 2021–September 2022)

- PMI procured 2.5 million and delivered 2.4 million doses of SP in FY 2022; per available supply chain data, stockout rates of SP averaged approximately 4 percent in 2022 and 5 percent between January and March of 2023.
- Provided IPTp and integrated malaria into maternal and neonatal health services, including incorporating messaging into routine ANC activities.
- Provided technical and financial support for the appropriate case management of malaria in pregnant women, including working with NMCP to review and revise the MIP guidelines for health workers and to review and revise job aids and wall charts for MIP.
- Financed and provided technical support for the OTSS+ MIP module implementation in three districts (Kasungu, Mchinji, and Nkhata Bay) at the facility level to ensure appropriate ANC activities and SP and ITN distribution.
- Provided financial and technical support for a national MIP TWG meeting jointly held with the national case management TWG.
- Provided financial and technical support for the orientation of 52 District Health Management Team members on MIP activities.
- Provided financial and technical support for the orientation of 206 ANC providers in three districts (Kasungu, Mchinji, and Nkhata Bay) at the facility level on MIP guidelines, to ensure appropriate ANC activities and SP and ITN distribution.

- Provided financial and technical support to NMCP for the orientation and sensitization of 239 community leaders on available MIP services within their respective geographic authorities.
- Supported the continuous distribution of PBO ITNs through ANC visits and through labor and delivery channels.

2.3. Plans and Justification for FY 2024 Funding

The FY 2024 funding tables contain a full list of MIP activities that PMI proposes to support in Malawi with FY 2024 funding.

PMI will continue to support MIP activities as described in the recent progress section. PMI will continue a split approach to increase geographic coverage, funding OTSS MIP interventions in at least five districts while supporting group mentorship at facility and community levels in an additional nine districts. Support in all districts will improve overall MIP data quality through data review and strengthening activities. In terms of MIP prevention activities, continued quantification of ITN distribution and uptake in calendar year 2023 will determine whether expansion of ITN distribution at the first ANC visit and through labor and delivery or other channels is warranted. Although PMI will continue to fund 100 percent of the SP needs, PMI will continue to advocate for additional Malawi government support for the procurement of SP and directly observed therapy supplies. This is in line with the recently launched Zero Malaria Starts with Me campaign, through which the Malawi government, through the head of state, encouraged the Ministry of Health to continue advocating for locally available resources in the fight against malaria from government ministries and departments and the private sector. To catalyze these processes, PMI intends to start waning support on commodities such as directly-observed therapy (DOT) supplies, which are locally available, have minimal cost, and can be financed through the MOH. The national MIP TWG will continue to be funded, along with changes to MOH ANC guiding documents and registers (e.g., labor and delivery) to better document ITN distribution.

Refer to the SP gap table in the annex for more details on planned quantities and distribution channels.

See the SBC section for details on challenges and opportunities to improve intervention uptake or maintenance.

3. Drug-Based Prevention

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

4. Case Management

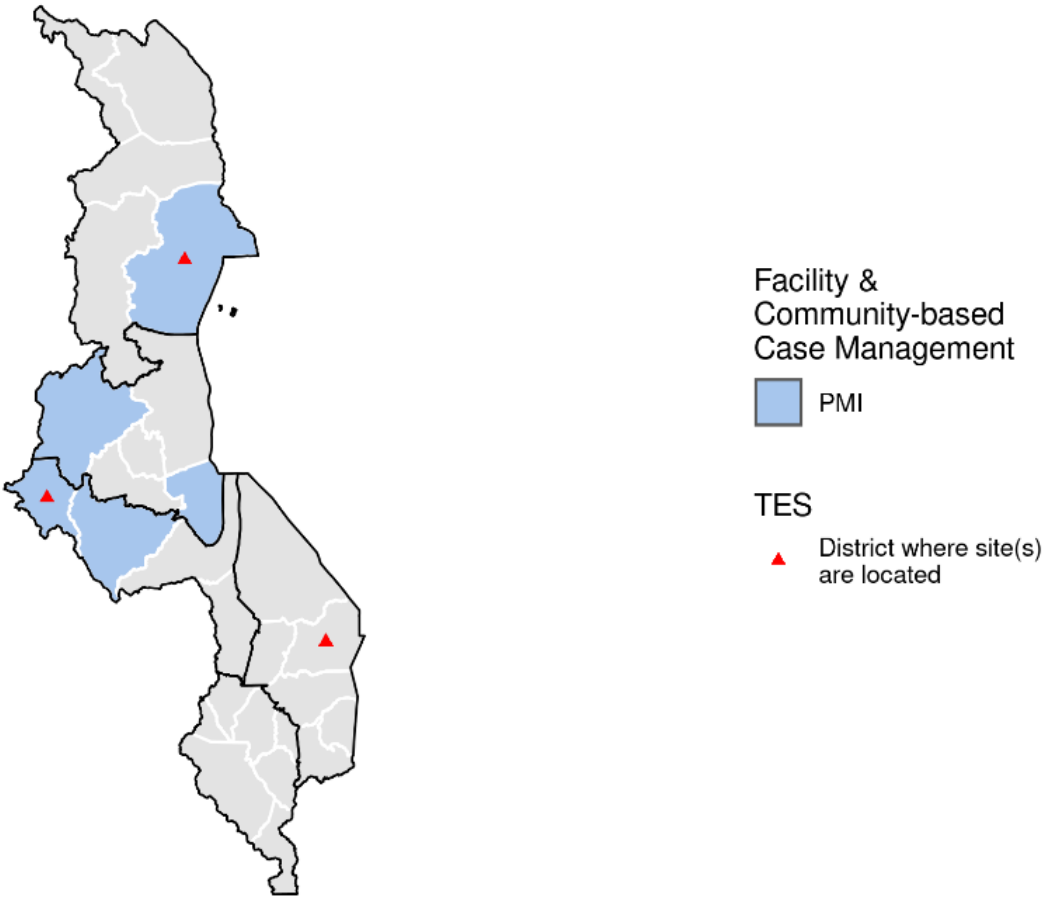
4.1. PMI Goal and Strategic Approach

The NMSP promotes a comprehensive case management strategy that includes quality-assured parasitological testing of all cases of suspected uncomplicated malaria, prompt and effective treatment with ACT of all cases of parasitological-confirmed uncomplicated malaria, and prereferral and/or definitive management of severe febrile illness and severe malaria. NMCP also aims to ensure the consistent availability of high-quality diagnostic and treatment commodities through proper quantification, procurement, and distribution; quality improvement and assurance for malaria diagnostics; supervision of health workers on malaria case management at all levels of the health system; and support for and expansion of community case management in hard-to-reach areas (communities that are more than five kilometers from a health facility). NMCP's approach to quality improvement includes the provision of case management guidelines and job aids, OTSS+, and lessons learned workshops. OTSS activities are the core of the quality improvement approach and utilize on-site training and long-term, ongoing support to strengthen diagnostic and treatment services. During scheduled visits, supervisors identify areas for improvement and provide immediate feedback to laboratory and clinical staff. District malaria coordinators are provided with a list of recommendations to work with facility staff to ensure that all areas of improvement are addressed before the next OTSS+ visit. NMCP recommends that facilities receive quarterly visits at enrollment and then two visits per year after minimum compliance standards are met.

PMI supports all aspects of NMCP's approach through the provision of technical and financial assistance for national policy and programmatic activities, commodity procurement, and improvement of facility- and community-level health worker performance. PMI funds the procurement and distribution of approximately half of the RDTs and ACTs for the management of uncomplicated malaria, with the remainder funded by the Global Fund. PMI procures rectal artesunate suppositories (RAS) for prereferral management of severe malaria, while the Global Fund procures injectable artesunate; both donors share distribution support of both commodities. PMI funds the strengthening of diagnostic and case management activities in support of NMCP through the OTSS+ program in five districts (Mchinji, Nkhata Bay, Kasungu, Lilongwe, and Salima), which complements the quarterly Global Fund-supported integrated supportive supervision visits that NMCP initiates in all districts. The PMI-funded complementary OTSS+ visits are designed to coincide with NMCP-led supervision visits. PMI also finances national-level coordination meetings, including the case management TWG and the National Malaria Advisory Board, and the updating of critical case management policy, guidelines, and job aids and tools. In terms of laboratory strengthening, PMI supports malaria microscopy, both internal and external competency assessments, and diagnostic refresher training.

The community health worker (CHW) program, which has been in existence since the 1970s, provides basic health services in rural and urban communities by formal CHWs, with participation from the local community. The primary health worker cadre in the CHW program comprises disease control and surveillance assistants, formerly and popularly known as HSAs, who have historically provided health promotion and prevention services but who now also provide diagnostic and treatment services. Other CHW cadres include community health nurses, community midwife assistants, and assistant environmental health officers. The Malawi government intended to reach a target of one HSA per 1,000 population by the end of 2022. However, this target was not met. Currently, the ratio is approximately one HSA per 1,825 population (approximately 10,773 HSAs). HSAs who work in hard-to-reach areas, defined as communities more than 5 kilometers from a health facility, are targeted for training and supervision to provide integrated community case management (iCCM) for children under the age of five through village health clinics. Malaria community case management is supported in communities even when nonmalaria commodities are out of stock. Approximately 50 percent of HSAs are trained in iCCM, which includes the malaria community case management module, whereas the remainder have not undergone iCCM training and cannot perform related duties, including malaria community case management. HSAs receive a stipend of approximately $200 per month. PMI supports HSAs through commodity procurement, in-service group training, and supervision. PMI commodity support includes the procurement and distribution of RDTs and artemether-lumefantrine for the prompt diagnosis and effective treatment of uncomplicated malaria cases and RAS as prereferral treatment for suspected severe forms of malaria. The Malawi government, other development partners, and—more recently—the Global Fund finance commodities for pneumonia and diarrhea. PMI/Malawi also provides financial and technical assistance for the supervision of HSAs in the use of RDTs, adherence to RDT results, appropriate use of ACTs, and prereferral use of RAS. The greatest current challenge faced by the community health system is ensuring that all community case management HSAs reside in hard-to-reach communities. Some HSAs relocate from their catchment areas and reside closer to trading areas, rendering iCCM services unavailable during off-working hours. PMI intends to prioritize potential future support toward supervising and training HSAs serving in those areas using the G2G agreement mechanism currently in place between USAID/Malawi and the Malawi Ministry of Finance. By using the G2G mechanism, local councils will be mandated to use their local council regulations to ensure that all HSAs in G2G-supported districts reside in their catchment areas as part of their milestone achievement to initiate payment for deliverables.

Figure 2. Map of Case Management, Community Health, and Malaria in Pregnancy Service Delivery Activities in Malawi, 2023



4.2. Recent Progress (October 2021–September 2022)

National-Level Case Management Activities

- PMI provided financial and technical support to review policies, guidelines, and standard operating procedures for malaria diagnosis, case management, and MIP to ensure NMCP's alignment with WHO guidelines and global best practices, including reviewing and updating of job aids and wallcharts.
- PMI funded and coordinated two meetings of the case management and MIP TWG and two meetings of the National Malaria Advisory Board.
- PMI provided financial and technical assistance to NMCP to review and update preservice and in-service training curricula, including training manuals for health workers on case management, a facilitator's guide for health workers on case management, a malaria microscopy OTSS+ laboratory training manual, and a malaria microscopy facilitator's manual.

- PMI funded and provided technical assistance for quarterly district technical review meetings in three districts (Mchinji, Nkhata Bay, and Kasungu), and trained and mentored 119 health workers from facilities in the three districts on register documentation, report generation, and the District Health Information System-2 (DHIS2).
- PMI conducted basic malaria diagnostic refresher training for 21 laboratory technologists/technicians and advanced training for 59 laboratory technologists/technicians and funded 12 laboratory technologists/technicians to take external competency assessment of malaria microscopists courses, with 10 of the 12 participants being certified as WHO level-1 microscopists.
- PMI financed and provided technical assistance to NMCP and the National Public Reference Lab (NPRL) to conduct a review meeting for malaria microscopy proficiency testing and blinded malaria blood film slide re-reading in intra- and inter-facilities.
- PMI strengthened slide bank management skills at the National Parasitology Reference Laboratory, including supporting NMCP and NPRL to conduct a training on use of the National Archive of Malaria's slide database and providing financial and technical assistance for the development of NPRL accreditation roadmaps.
- PMI provided technical and financial support for the 2023 Therapeutic Efficacy Study (TES), including for the development of the protocol approved by the National Health Sciences Research Committee, procurement of TES materials, development of TES standard operating procedures, and identification and training of TES staff. The TES is being conducted in three districts: Machinga, Mchinji, and Nkhata Bay.
- PMI collaborated and coordinated with other relevant country government officials, partners, and stakeholders, including NMCP, NPRL, and the Integrated Management of Childhood Illnesses (IMCI) Unit, to improve the quality and delivery of malaria case management at the community and facility level.
- PMI convened and led three national-level coordination meetings (two joint case management and MIP TWG meetings and one malaria advisory board meeting).

Commodities

- PMI coordinated procurement and delivery schedules with NMCP and the Global Fund to reduce distribution costs while ensuring that appropriate central and service delivery point stock levels of RDTs and antimalarials were maintained.
- PMI financed the procurement of 11 million and distribution of 7.8 million malaria RDTs for nationwide consumption, accounting for approximately 65 percent of need.
- PMI financed the procurement and distribution of blood/biohazard safety or clinic supplies and other ancillary equipment/supplies.
- PMI financed the procurement of 4 million and distribution of 4.2 million ACTs (artemether-lumefantrine) for nationwide consumption, accounting for approximately 50 percent of national need.
- PMI financed the procurement of 25,000 and distribution of 4,404 RAS for nationwide consumption, accounting for almost 100 percent of need.

Facility Level

- PMI trained 20 supervisors in OTSS+.
- PMI conducted initial OTSS+ visits at 81 health facilities, resulting in 425 health workers being coached, supervised, and mentored in diagnostics and case management.
- PMI conducted follow-up OTSS+ visits at 32 health facilities in three districts, targeting low-performing facilities and reaching 389 health workers.
- PMI financed and provided technical assistance for proficiency testing at laboratories that conduct malaria microscopy, reaching 50 percent of eligible microscopy sites in two districts (Lilongwe and Salima).
- PMI financed and provided technical assistance for the group mentorship of 576 health workers on case management, MIP, and facility data.

Community Level

- PMI provided technical and financial assistance to NMCP and the IMCI unit to conduct two OTSS+ mentorship visits, reaching 411 community health workers in five districts.
- PMI funded iCCM refresher training, reaching community case management HSAs in five districts.
- PMI provided technical and financial assistance to NMCP and the IMCI unit to conduct RDT training for health facilities, targeting 241 HSAs (a subset of HSAs who perform RDT).

Recent progress with monitoring antimalarial efficacy and the TES approach are presented in the plans and justification for FY 2024 funding section below.

4.3. Plans and Justification for FY 2024 Funding

The FY 2024 funding tables contain a full list of case management activities that PMI proposes to support in Malawi with FY 2024 funding.

National-Level Case Management Activities

PMI's support for case management activities has been informed by discussions with NMCP; various stakeholders, including the Global Fund; and its funded partners. PMI will continue to support case management activities at the national level as described in the recent progress section.

Commodities

PMI will continue to procure ACTs, RDTs, and RAS as described in the recent progress section, including commodities that HSAs use in the community.

Refer to the ACT, RDT, injectable artesunate, and RAS gap tables in the annex for more details on planned quantities and distribution channels.

Facility Level

PMI will continue to support the activities as described in the recent progress section, including support to improve malaria case management service delivery at health facilities, with activities including strengthening recognition and parasitological testing of suspect malaria cases, adherence to testing results, and prompt and appropriate treatment for confirmed malaria cases.

Community Level

PMI will continue to support improved community case management service delivery activities as described in the recent progress section, as well as prompt and appropriate treatment for confirmed malaria cases. This may include training of HSAs in malaria community case management and/or iCCM in response to specific requests, in addition to community-level supervision and mentorship.

Monitoring Antimalarial Efficacy

Table 3. Ongoing and Planned Therapeutic Efficacy Studies (TES)

Year	Site Name	Treatment Arm(s)	Plan for Laboratory Testing of Samples
Ongoing			
2023	Nkhata Bay, Mchinji, Machinga	Artemether-lumefantrine, dihydroartemisinin-piperaquine	PARMA-affiliated lab in Kilifi, Kenya, or Mozambique
Planned (funded with previous or current MOP)			
2025	Nkhata Bay, Mchinji, Machinga	TBD (dihydroartemisinin-piperaquine or artesunate-pyronaridine)	PARMA-affiliated lab in Kilifi, Kenya, or Mozambique

Per the agreement between PMI, the Global Fund, and NMCP, PMI is the sole donor providing TES funding. TES 2023 enrollment for the artemether-lumefantrine arm is expected to be completed by August 2023, and lab testing will occur in late 2023–early 2024 at a yet-to-be-determined PARMA-affiliated lab. Final agreement the selection of the drug (dihydroartemisinin-piperaquine or AS-PY) for the second arm is pending, with implementation not planned to start until early 2024 (during a higher-transmission season). Start-up funding for a planned TES in 2025/26 is included in this MOP.

See the SBC section for details on challenges and opportunities to improve intervention uptake or maintenance.

5. Health Supply Chain and Pharmaceutical Management

5.1. PMI Goal and Strategic Approach

NMCP has identified efficient supply chain management systems as fundamental to the fight against malaria. One of NMCP's key objectives outlined in the NMSP is to sustain the annual average stockout rate of less than 1 percent for all first-line malaria treatment throughout the NMSP implementation period (2023–2030).

To support this objective and build an efficient and effective supply chain system, PMI supports all of Malawi's supply chain priorities across the nation, including commodity quantification, procurement, warehousing, and distribution of ITNs, SP, ACTs, RDTs, and RAS, as well as supply chain technical assistance. PMI operates a parallel supply chain for its commodities, and it will continue to store and distribute its commodities through a parallel supply chain managed by the private sector until the Malawi government operated Central Medical Stores is able to manage an integrated national supply chain system. PMI will continue to coordinate with the Global Fund as well as other U.S. government agencies to support the implementation of the Malawi Master Supply Chain Transformation Plan 2023–2030, which is aimed at integrating parallel supply chains in alignment with the Malawi government's HSSP III.

5.2. Recent Progress (October 2021–September 2022)

As one of the major malaria donors in Malawi, PMI's main supply chain investments aim to improve malaria commodity availability at service delivery points through improved forecasting and supply planning, logistics information systems, direct warehousing, last-mile delivery of commodities and supply chain technical assistance at central and subnational levels. Some PMI's recent progress includes:

- Maintaining low stockouts of "all artemether-lumefantrine" under 1 percent from October 2021 to September 2022, including under 0.3 percent in all but two months during this period.
- Introducing a new commodity quantification tool, the Quantification Analytics Tool, in February 2022, to improve the accuracy and supply planning. The roll out included training to key NMCP and other MOH supply chain staff.
- Providing technical and financial support to NMCP to convene key malaria stakeholders to conduct the annual national forecasting and quantification meeting for malaria commodities in March 2022, and a forecast review meeting in September 2022, which included key malaria stakeholders.

- Leveraging resources from the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), the Global Fund, and other U.S. government programs to support MOH through physical assets management to complete maintenance needs assessments in 447 prefabricated pharmacy units in February 2022, and developing a unit-specific, costed maintenance plan. MOH and other development partners use the plan to mobilize resources to conduct maintenance to the prefab units, which are critical to the storage of malaria, HIV/tuberculosis, and COVID-19 commodities at public health facilities.
- Continuing the integration of direct last-mile distribution of malaria commodities with the Global Fund based on an agreement initiated in FY 2021.
- Providing technical and financial support to NMCP's quarterly Drug Management Task Force meetings to review data, address supply chain bottlenecks, and ensure the availability of commodities at health facilities.
- Coordinating with the Global Fund, United Nations Children's Fund (UNICEF), and other U.S. government programs to support MOH's development and launch of the supply chain systems architecture in September 2022. The architecture provides a holistic roadmap to adopting supply chain information systems and technologies to support implementation of MOH's initiative of end-to-end visibility for supply chain data for all health elements, including malaria.
- Coordinating resources with PEPFAR and other USAID health programs to expand the open logistics management information system (LMIS) to 140 additional direct sites to improve logistics data quality and timeliness. The expansion also included new vaccine tracking features (both COVID-19 and other childhood immunization program vaccines). Currently, 400 out of approximately 650 sites provide direct data entry into OpenLMIS, and the system provides supply chain data across 10 disease areas, including malaria.
- Providing technical and financial assistance for the development of resources and tools for the national drug regulatory body, the Pharmacy and Medicines Regulatory Authority, to conduct postmarket surveillance for malaria medicines in the public and private sector.
- Funding the Drug Theft Investigation Unit to use the commodity accountability performance tracking tool and LMIS data to conduct investigations on suspected drug thefts and leakage at all levels of the supply chain.

5.3. Plans and Justification with FY 2024 Funding

The FY 2024 funding tables contain a full list of health supply chain and pharmaceutical management systems strengthening that PMI proposes to support in Malawi with FY 2024 funding.

PMI will continue to coordinate resources with the Global Fund, PEPFAR, and other USAID health programs; with FY 2024 funding, PMI will continue to provide financial support and technical assistance to NMCP and relevant MOH departments to complete the following:

- National quantification of malaria commodities, including semiannual forecast reviews;
- Procurement, warehousing, and distribution of ITNs, SP, ACTs, RDTs, and severe malaria medicines to service delivery points;
- Strengthening of the MOH's capacity to manage warehousing and distribution for all health commodities, including those for malaria;
- Implementing district-led integrated supply chain supervision;
- Enhancing the functionality and interoperability of digital supply chain systems for all diseases, including integration of the OpenLMIS system with Central Medical Stores and parallel supply chain warehouse management system/enterprise resource planning systems to automate data exchange with OpenLMIS;
- Integration of the national product catalog with the MOH's interoperability layer to ensure compliance with global standards, such as GS1.
- Exploring opportunities to track and trace ITNs distributed through the mass campaign using the National Product Catalog mobile application.
- Exploring opportunities to expand commodity tracking of malaria commodities to the community level (village health clinics).
- Conducting quarterly drug management task force meetings to review data, address supply chain bottlenecks, and ensure the availability of commodities.
- Conducting medicine audits, implementing risk mitigation plans, investigating theft cases, and ensuring accountability of malaria commodities by the MOH's Drug Theft Investigation Unit.
- Conducting commodity accountability performance tracking and data quality assessments.
- Implementing recommendations from the 2023 WHO assessment on Malawi's pharmaceutical regulatory capacity using the WHO global benchmarking tool. Malawi's regulatory capacity was rated as maturity level 1. PMI will coordinate with other donors to leverage the outcomes of the assessment to support specific regulatory elements to strengthen the capacity of the Pharmacy and Medicines Regulatory Authority to attain maturity level 3.
- Strengthening Drug Theft Investigation Unit activities, including enhanced coordination with the MOH's Department of Human Resource Management and Development at the central and district council level to strengthen follow up and payroll removal of public sector staff convicted of drug theft.
- Strengthening the MOH's capacity to provide supply chain oversight and continuing to facilitate the integration of parallel supply chains, including creating a logistics management unit to manage the integration process for all parallel public sector supply chains in the country, per HSSP III and the Malawi Master Supply Chain Transformation Plan 2023–2030.

6. Malaria Vaccine

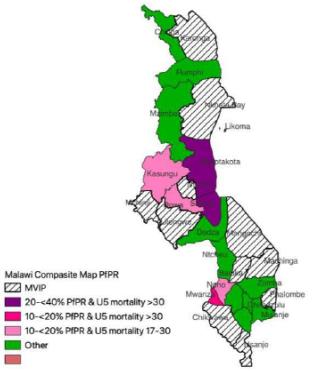
6.1. PMI Goal and Strategic Approach

The PMI Malawi goal for the malaria vaccine is to support the Ministry of Health to strategically deploy this intervention as a complementary tool to existing core interventions. This includes technical assistance to NMCP as it engages with EPI to strategically use data to decide on where to introduce the malaria vaccine. Malawi participated in the MVIP; select clusters in 11 districts with high malaria burdens were included in the pilot. Following WHO's recommendation of the vaccine, the country rolled out malaria vaccine implementation in all MVIP clusters, including comparator clusters, in the 11 districts. Furthermore, the country successfully applied to Gavi as a MVIP country for the continuation of the malaria vaccine implementation in the 11 districts with high malaria burdens. Vaccine introduction was led by the national EPI. USAID/Malawi supports integrated family health outreach clinics to increase access to routine vaccinations, including in four districts that offer the malaria vaccine. Additionally, PMI will work with NMCP and national immunization colleagues to provide complementary support for planning, SBC, and monitoring of vaccine deployment, if requested, including support to maximize uptake of the vaccine without adversely affecting coverage of other malaria interventions. PMI will not allocate funding until the deployment timeline and specific resource requirements have been determined.

6.2. Recent Progress (October 2021–September 2022)

No PMI resources were allocated for the MVIP.

Figure 3. Map of Malaria Vaccine Plans in Malawi



District	MVIP	Prevalence (=>10%)	Incidence =>450/1000 pop)	Malaria Mortality (=>8%)	All Cause Mortality (=>8%)	IRS	Mass LLINs	Routine LLINs
Karonga	√					x	√	√
Nkhata Bay	√					√		√
Ntchisi	√					x	√	√
Lilongwe	√					x	√	√
Mchinji	√					x	√	√
Phalombe	√					x	√	√
Balaka	√					√		√
Chikwawa	√					x	√	√
Nsanje	√					x	√	√
Machinga	√					x	√	√
Mangochi	√					√		√
Salima	x	√	√	√	√	x	√	√
Mwanza	x	√	√	√	√	x	√	√
Nkhotakota	x	x	√	√	√	√		√
Kasungu	x	x	√	√	√	x	√	√
Rumphi	x	x	√	√	√	x	√	√
Dowa	x	x	√	x	x	x	√	√
Neno	x	x	√	x	x	x	√	√

Priority 1:MVIP Comparator areas 11 districts

Priority 2:7districts

6.2.3. Plans and Justification for FY 2024 Funding

No PMI funding has been allocated for the continued support of the malaria vaccine implementation.

7. Social and Behavior Change

7.1. PMI Goal and Strategic Approach

At the national level, PMI supports NMCP's SBC goals through the provision of technical assistance and support for capacity strengthening activities and coordination, including financing the health education services TWG. For example, PMI supports the "Malungo Zii" (malaria-free) slogan developed by NMCP and its partners as a component of the central campaign platform "Moyo ndi Mpamba, Usamalireni" (life is precious, take care of it), which is at the core of the national health communications strategy. PMI also supports NMCP's implementation of the "Zero Malaria Starts with Me" campaign as a part of the country's larger, more comprehensive SBC strategy, which clearly outlines a strategic process, key target behaviors, specified target populations, the use of formative research, and continuous monitoring of key behaviors and known behavioral determinants.

In 2022–early 2023, PMI provided financial and technical support for the development of the revised National Malaria Communication Strategy 2022–2030 to align with the new NMSP 2023–2030. Using available data from the 2021 MIS and 2021 MBS, the communication strategy includes behavioral and communication objectives for each malaria intervention and was used to inform the 2023 Malaria Message Guide.

Through partnerships with local media organizations and community-based organizations at the district level, and in collaboration with CHWs, PMI supports NMCP's efforts to expand mass media and community-level interpersonal communication activities aimed at increasing correct and consistent ITN use and care, prompt care seeking for fever, demand for RDTs and IPTp by patients, and early ANC attendance. With the withdrawal of IRS in four districts after calendar year 2023, PMI will transition SBC support to Nkhotakota, Nkhata Bay, Mangochi, Balaka, and at least one more yet-to-be-determined district to support a comprehensive IRS exit strategy.

6.2. Recent Progress (October 2021–September 2022)

SBC progress in the last year included:

- **Radio programs:** PMI produced and aired radio spots at the national, regional, and community level across 13 radio stations, reaching an estimated 13 million people. The key messages in the radio spots were: (1) prompt care seeking within 24 hours of the onset of fever; (2) dangers of self-medication without a parasitological test; and (3) importance of adherence to a full-treatment regimen.
- **Social media engagement:** PMI oriented and engaged nine social media influencers to promote malaria positive prevention and management behaviors, reaching 760,862 people through Facebook.

- **Community mobilization and engagement:**
    - PMI oriented and engaged faith leaders under the Public Affairs Committee and the Malawi Interfaith AIDS Association to promote key prevention, case management, and family health behaviors, reaching 50,852 people in their congregations and communities.
    - PMI conducted community action cycle training to 66 CHAGs, 45 members of community-based organizations, and 9 Village Beach Committee chairpersons using the community action cycle manual, the Wheel of Life Saving Practice interpersonal communication cards, and the “Moyo ndi Mpamba” (life is precious) family health flipchart. CHAGs conducted 85 community sensitization meetings, reaching a total of 60,664 people. The disseminated malaria and family health messages included consistent ITN use, seeking early antenatal services, prompt care seeking within 24 hours of onset of fever; treatment adherence; pregnant women delivering by skilled personnel; six food groups; water, sanitation, and hygiene; growth monitoring; and immunization.
    - CHAGs and Village Beach Committees, in collaboration with the district health management team and the Department of Fisheries, conducted 13 sensitization meetings to discourage net misuse, reaching 2,442 people.
    - PMI oriented and engaged 15 head teachers from primary schools within traditional authorities Maganga and Ndindi to disseminate malaria messages to school-going children through existing routine school-based activities.
    - Collaborated with the Salima health promotion team to conduct roadshows in the three traditional authorities to disseminate malaria prevention/management and family health messages at strategic trading centers and markets. The roadshows reached a total of 18,948 people across the three traditional authorities.
- **Capacity strengthening:**
    - PMI provided technical and financial assistance to NMCP and the Health Education Services Unit (HES) to lead the development of the National Malaria Communication Strategy 2022–2030 and accompanying message guide (for finalization in 2023).
    - PMI developed recommendations for strengthening the national monitoring and evaluation system for SBC interventions.
    - PMI designed a feedback system to facilitate strengthened connections among health facilities, communities, and clients.
    - PMI provided technical and financial assistance to NMCP and HES to lead the development of an SBC research and learning agenda.
    - PMI conducted an SBC capacity assessment for the Salima health promotion TWG.
    - PMI conducted data orientation and review sessions with HES, NMCP, and implementing partners on MBS findings and data visualizations to inform design, implementation, and coordination of SBC activities at the district level.

Despite the progress to date, the following technical areas present significant challenges for which greater SBC investment or attention is needed to improve the uptake and/or maintenance of behaviors.

- **Net misuse:** Anecdotal evidence suggests there are high levels of ITN misuse, particularly for fishing. Because this issue is cross-cutting, several small studies on net misuse have been conducted recently. An environmental assessment on the impact of fishing with ITNs on Lake Malawi (and other bodies of water) is underway. During the initial scoping visit, high levels of ITN misuse for fishing were documented, but during the follow-up assessment, observations found ITNs were not found in fishing gears at assessment sites from Mangochi to Karonga, with multiple possible drivers of this change, including market and enforcement considerations. However, the assessment also noted that ITNs do remain in fishing gears in smaller bodies of water such as in Lake Chiuta and Lake Chilwa, despite recent enforcement efforts, and may pose a larger contamination risk than Lake Malawi beach seines.[7] With IRS withdrawal in Balaka, Mangochi, Nkhata Bay, and Nkhotakota, there will be an influx of ITNs along the lakeshore in environmentally vulnerable areas. Therefore, targeted SBC, including continuing work with Beach Village Committees and other community structures to monitor fishing practices and enforce bylaws, will be implemented in coordination with other strategies to comprehensively mitigate misuse for fishing and to promote uptake and correct, consistent net use, addressing potential shifts in perceived risk.
- **MIP:** Although Malawi has achieved great success in improving coverage for IPTp 3+ (currently at 56 percent), NMCP has increased the target to 80 percent to be in line with global best practices. Additional SBC investments are needed to further sensitize pregnant women, community gatekeepers, faith-based leaders, and ANC providers to support continued adoption and maintenance of early and repeat ANC visits and improved IPTp uptake to reach these goals.
- **Case management:** Although Malawi has a salaried cadre of HSAs who staff village health clinics in hard-to-reach areas, the rate of care seeking within 24 hours of the onset of fever is 46 percent (2021 MIS). To improve uptake of prompt care seeking, PMI provided financial and technical support to the MOH to configure community-based care-seeking indicators for common childhood illnesses (malaria, pneumonia, and diarrhea), ensuring the availability of routine granular-level data at health facilities. Further, with IRS withdrawal, perceived risk for malaria may decrease, and targeted SBC will be needed to promote prompt care seeking and address specific factors that influence uptake.

[7] A fishing net that hangs vertically in the water with floatation devices at the top and weights at the bottom edge, with the ends drawn together to encircle the fish.

- **Malaria vaccine:** Given the vaccine's effectiveness level, SBC is needed to emphasize the uptake and maintenance of existing proven malaria interventions along with vaccine implementation. Further, there is a need to support behavior change among providers to advocate for the malaria vaccine and other malaria control interventions through service communication.

6.3. Plans and Justification with FY 2024 Funding

The FY 2024 funding tables contain a full list of SBC activities that PMI proposes to support in Malawi with FY 2024 funding.

With FY 2024 funding, PMI will support and facilitate the following activities:

- National-level coordination and capacity strengthening through the Malaria SBC TWG.
- Promotion of malaria behaviors through national and community-level radio stations.
- Strengthening of community-based SBC activities through continued implementation of interpersonal communication activities, including CHAGs, care groups, and household visits, in the four IRS withdrawal districts and at least one other yet-to-be-determined district to promote the uptake and maintenance of prompt care seeking; correct ITN use and care; and uptake of IPTp3+.
- Strengthening the SBC monitoring and evaluation system by improving DHIS2 data capture, reporting, analysis, and decision making for community-level care-seeking behaviors.
- Designing and implementing data-driven SBC interventions to address behavioral factors and specific needs of target audiences while leveraging existing channels for implementation.

Priorities

While PMI supports SBC activities that promote the uptake and maintenance of all key malaria interventions, FY 2024 funds will prioritize two behaviors (see Table 4).

Table 4. Priority Behaviors to Address

Behavior	Target Population	Geographic Focus	Programming to Address Behavior
Proper ITN use and care (mitigation against misuse for fishing)	All community members	IRS withdrawal districts—Balaka, Mangochi, Nkhata Bay, and Nkhotakota— and others (TBD)	● Coordinate with partners at all levels to comprehensively implement SBC tailored to the audience and informed by data to promote proper ITN use and care while addressing changes in risk perception due to IRS withdrawal. ● Coordinate with partners to quantify the issue of ITN misuse for fishing (use of nets and impact of leaching of chemicals) and contribute to the development of an adaptive mitigation plan, including SBC activities.
Prompt care seeking for fever in children under the age of five	Caregivers of children under the age of five	IRS withdrawal districts—Balaka, Mangochi, Nkhata Bay, and Nkhotakota—and others (TBD)	Coordinate with partners at all levels to comprehensively implement SBC targeted by audience and informed by data to promote prompt care seeking for fever and address changes in risk perception due to IRS withdrawal. Activities may include: ● Community radio spots to promote prompt care seeking; ● Community- and household-level interpersonal communication and community-level engagement through care groups and CHAGs; and ● Promotion of improved quality of care at health facilities and village clinics through community health action groups and community scorecards.

CHAGs: community health action groups; IRS: indoor residual spraying; ITN: insecticide-treated net; SBC: social and behavior change; TBD: to be determined.

Additional Support Activities

Malawi conducted the MBS in 2021. In February 2023, an interactive data visualization dashboard was launched to visualize MBS data. The goals of this tool are to make it easier to quickly find key MBS data using charts and graphs and to generate SBC implications and recommendations based on the user's data selections. To facilitate further dissemination and use of the survey results, PMI worked with NMCP and partners to review the dashboard, discuss the results, and outline strategies for incorporating survey findings and lessons into planned activities. To assess progress toward addressing behavioral factors that influence the uptake of interventions, PMI will support the development of audience monitoring.

To bolster NMCP and HES capacity for the planning, design, implementation, and evaluation of SBC activities, PMI will continue to support:

- Coordination at the national level through targeted financial and technical support to improve the effectiveness of the HES TWG;
- Work with district-specific SBC focal persons to increase coordination and ensure the impact of SBC investments; and
- Strengthening capacity of key players and stakeholders to use multiple SBC-related data for decision making.

8. Surveillance, Monitoring, and Evaluation

8.1. PMI Goal and Strategic Approach

The primary goal of NMCP's SM&E and operations research intervention, as outlined in the NMSP, is to enhance the quality of malaria data. This improvement aims to raise the data quality (completeness, timeliness, and accuracy) from 94 percent in 2022 to 99 percent by 2030, thereby facilitating evidence-based program implementation, guiding policy decisions, and ensuring accountability across all levels of health care delivery. To accomplish this objective, NMCP will collaborate with other government departments, with support from PMI, the Global Fund, WHO, and other partners to conduct the following activities:

1. Strengthen capacity for data management, analysis, and use at the facility and community level;
2. Increase the proportion of private health providers regularly reporting malaria data to the national HMIS; and
3. Improve the ability of the national surveillance system to detect and respond to a malaria epidemic in a timely and effective manner.

PMI offers technical support and allocates resources to enhance malaria surveillance systems and conduct monitoring and evaluation of malaria interventions. At the central level, PMI assists the Malawi government to enhance the coordination of national health information system policy efforts and to reinforce the implementation of national policies and guidelines. At the district, facility, and community levels, PMI provides SM&E support in eight districts to improve the quality and use of data in accordance with the strategic interventions outlined by NMCP.

8.2. Recent Progress (October 2021–September 2022)

From October 2021 through September 2022, PMI provided SM&E technical assistance to NMCP, the Central Monitoring and Evaluation Division (CMED), and the Digital Health Division with a focus on three key areas:

1. Enhancing health information governance systems and coordination while ensuring effective management and coordination of health data;
2. Strengthening the enabling environment to increase the availability and interoperability of high-quality health data and information systems by providing technical support and ensuring that policies are in place to support the Malawi government's goals of having a seamless exchange and integration of data across different platforms; and
3. Improving data analysis and use, empowering stakeholders to make informed decisions based on accurate and timely information. [[start

Together, these initiatives contribute to the overall enhancement of SM&E processes in the health care sector. Key achievements include strengthening health information systems, M&E governance, and coordinated implementation of related activities by:

- Supporting the development of the National Malaria Strategy, the Monitoring, Evaluation and Health Information Strategy for 2023–2030, and the Digital Health Policy;
- Mobilizing financial resources (Gavi, World Bank, and the Global Fund) to support the national health information systems strategy; and
- Implementing the continuous improvement assessment stages for the 2017–2022 health information systems strategy to inform the development of 2023–2030 strategy.

Increased Availability of Quality Malaria Data

- In collaboration with NMCP, CMED, and the Digital Health Division, PMI developed a malaria data quality assessment job aid for routine data verification based on WHO's Data Quality Review framework. The tool uses the DHIS2 application in addition to site visits for data verification and data cleaning at the facility level in the eight PMI SM&E focus districts. It enables routine data verification, ensuring the accuracy and reliability of malaria-related information. NMCP plans to scale up to the remaining districts during the next Global Fund funding cycle (2024–2027).
- PMI trained 72 health workers from districts of PMI focus on the use of the data quality assessment job aid.
- PMI provided financial and technical support to NMCP and districts to implement the first round of facility field visits for malaria data verification, DHIS2 malaria data adjustments, and facility staff mentorship, covering eight PMI-focus districts, 265 health facilities, and over 550 facility staff.

Improved Data Analysis and Use

- PMI supported the ongoing implementation of district-level data quality improvement and national-level NMCP's integrated supportive supervision.
- PMI initiated the development of the DHIS2 automated malaria indicator bulletin, beginning in 2023.
- PMI participated and technically contributed to data reviews in the eight PMI-focus districts.
- PMI provided technical support for the implementation of five zonal data review meetings where malaria data was discussed and reviewed.
- PMI supported the development of a keynote indicator-based presentation at the annual health sector review meeting, which included malaria indicators.

Despite the progress to date, a number of challenges have been identified. CMED and Digital Health Division often have overlapping functions and responsibilities, which can lead to inefficiencies and confusion that require dedicated stakeholder management efforts to resolve. Additionally, staff turnover and restructuring initiatives have created critical gaps, redundancies, and governance issues between CMED and the Digital Health Division, which hamper capacity-strengthening initiatives. Procurement challenges related to acquiring health information system registers and reporting tools also hinder progress as these lead to stockout of data tools at service delivery points. To address these challenges, PMI has remained engaged with CMED, the Digital Health Division, and all counterparts to promptly address any emerging issues.

8.3. Plans and Justification with FY 2024 Funding

The FY 2024 funding tables contain a full list of SM&E activities that PMI proposes to support in Malawi with FY 2024 funding.

With FY 2024 funding, PMI will continue to collaborate with NMCP, WHO, and other partners to strengthen existing achievements, focusing on the three areas outlined above. Additionally, as part of the IRS withdrawal strategy, PMI will maintain at least three of the four IRS withdrawal districts (Nkhotakota, Nkhata Bay, and Mangochi) as PMI-supported surveillance districts. (PMI will discuss with NMCP whether Balaka should be prioritized given its current lower malaria burden.) PMI will continue its support of the use of the data quality assessment tool to conduct facility-level data verification to improve the quality of data, as well as the use of the automated malaria bulletin (currently being piloted) to increase data use and help identify and monitor any changes in trends.

Maintaining this general approach to PMI investment in malaria, SM&E will not only help sustain past achievements, but will also promote future successes.

Table 5. Available Malaria Surveillance Sources

Source	Data Collection Activity	2020	2021	2022	2023	2024	2025
Household Surveys	Demographic Health Survey					P	
Household Surveys	Malaria Indicator Survey (MIS)		*				*
Household Surveys	Multiple Indicator Cluster Survey (MICS)						
Household Surveys	EPI survey						
Health Facility Surveys	Service Provision Assessment (SPA)						
Health Facility Surveys	Service Availability Readiness Assessment (SARA) survey						
Health Facility Surveys	Other Health Facility Survey						
Malaria Surveillance and Routine System Support	Therapeutic Efficacy Studies (TES)				P		P
Malaria Surveillance and Routine System Support	Support to Parallel Malaria Surveillance System						
Malaria Surveillance and Routine System Support	Support to HMIS	X	X	X	P	P	P
Malaria Surveillance and Routine System Support	Support to Integrated Disease Surveillance and Response (IDSR)						
Malaria Surveillance and Routine System Support	Electronic Logistics Management Information System (eLMIS)	X	X	X	P	P	P
Malaria Surveillance and Routine System Support	Malaria Rapid Reporting System						
Other	EUV (CAPeT)	X	X	X	P	P	P
Other	School-based Malaria Survey						
Other	Knowledge, Attitudes and Practices Survey, Malaria Behavior Survey		X				
Other	Malaria Impact Evaluation						
Other	Entomologic Monitoring Surveys	X	X	X	P	P	P

*Non-PMI funded activities; X: completed activities; P: planned activities.

9. Operational Research and Program Evaluation

9.1. PMI Goal and Strategic Approach

The operational research objective in Malawi's National Malaria Strategic Plan (2017–2022) is to conduct priority studies as guided by the National Malaria Research Agenda (2017–2021), which lays out priority research questions in the following thematic areas: case management, MIP, and vector control. NMCP places a high value on evidence generated from research within and outside Malawi by established research institutions. NMCP uses evidence maps to identify, organize, and summarize scientific evidence, and to prioritize research priorities as outlined in the research agenda. NMCP uses such evidence to guide the implementation and monitoring and evaluation of NMSP activities.

Additionally, NMCP prioritizes the role that research institutions play in implementation and evaluation of the NMSP to include:

- Participation in appropriate TWGs;
- Provision of technical assistance in the monitoring of drug efficacy and insecticide resistance;
- Provision of technical assistance in the conduct of the MIS and other surveys; and
- Provision of technical support in essential studies on malaria epidemiology, vector control, prevention of MIP, case management, surveillance, and behavior change.

PMI works together with NMCP, implementing partners, and other donors and research institutions to support relevant operational research/program evaluation designed to provide data to inform MOH and NMCP programs and policy. PMI will support NMCP to update the research priorities for malaria when the national health research agenda is updated.

9.2. Recent Progress (October 2021–September 2022)

In February 2022, a randomized, controlled trial was launched in Malawi to assess the impact, accessibility, and feasibility of extending malaria community case management to all ages compared with standard practice (only children under five years of age). In the baseline survey, school-aged children had a higher malaria infection prevalence (31.1 percent; 95 percent CI: 28.7–33.5 percent) than children under the age of five (16.5 percent; 95 percent CI: 14.0–19.3 percent) ($p<0.001$), and were less likely to have sought care for fever (59.9 percent; 95 percent CI: 21.5–27.3 percent versus 73 percent; 95 percent CI: 66.5–78.9 percent), respectively. The study and endline survey were completed in April 2023, and analysis of the qualitative and endline survey data will be conducted in August 2023.

An update to the Malawi National Research Agenda (2017–2021) was postponed during the past year to focus on the NMSP (2023–2030), which was completed in February 2023. Additionally, there was a change in NMCP leadership as a new NMCP program manager was appointed in February 2023. The PMI/Malawi team will work with NMCP when the research agenda is updated to review and update items specifically related to malaria.

Table 6. PMI-Funded Operational Research/Program Evaluation Studies in Malawi

Recently Completed OR/PE Studies	Dissemination Status	Start Date	End Date
Malawi Community Case Management Study (extending to all ages)	Field data and endline survey just completed, analysis pending	February 2022	April 2023
Ongoing or Planned OR/PE Studies	**Dissemination Status**	**Start Date**	**End Date**
N/A			

Table 7. Non-PMI-Funded Operational Research/Program Evaluation Studies Planned/Ongoing in Malawi

Source of Funding	Implementing Institution	Research Question/Topic	Current Status/Time Line
Gavi, the Vaccine Alliance; the Global Fund; and Unitaid	WHO (coordinator), Malawi College of Medicine's Malaria Alert Centre, Malawi Liverpool Wellcome Trust, PATH, UNICEF, GSK	Malaria vaccine implementation program	Pilot implementation began in 2019. Implementation expansion began in November 2022 to areas in the 11 pilot districts that were not receiving the vaccine. Pilots will continue through 2023 to understand the added value of the fourth vaccine dose and to measure the longer-term impact of the vaccine on child mortality.
WHO (Grant 2020/1034519)	PATH; MOHs in Kenya, Ghana and Malawi	Cost of introducing and delivering RTS,S/AS01 malaria vaccine within the malaria vaccine implementation program	(Completed study) Baral R et al. Cost of introducing and delivering RTS,S/AS01 malaria vaccine within the malaria vaccine implementation program. Vaccine. 2023 Feb 17;41(8):1496–1502. Doi:10.1016/j.vaccine. 2023.01.043. Epub 2023 Jan 27.
U.S. National Institute of Allergy and Infectious Diseases	Michigan State University, University of Malawi College of Medicine's Malaria Alert Centre, Boston University School of Public Health, University of Maryland School of Medicine, University of Michigan	International Centers of Excellence for Malaria Research: Identify why standard malaria control and prevention efforts in Malawi have not had a significant effect on malaria disease incidence and parasite prevalence, including studies on barriers to bed net use, effect of insecticide resistance, and impact of PBO nets on bed net efficacy; evaluate the impact of the RTS,S malaria vaccine on infection	Implementation is ongoing.

		prevalence and transmission, nonrandom contact between human hosts, and Anopheles vectors (especially in school-age children), and human and parasite determinants of developing asymptomatic infection versus life-threatening malaria illness.	
Essential Entomological Indicators for Assessment of Long-Lasting Insecticidal Nets (ESSENTIALS)	Liverpool School of Tropical Medicine, University of Malawi College of Medicine's Malaria Alert Centre	The project aims to collect essential entomological indicators to monitor the impact of new nets (Interceptor G2 and Royal Guard). The goal is to develop robust entomological indicators that are predictive of the epidemiological impact of new vector control tools. Anopheles population dynamics, biting patterns, experimental hut trials, insecticide resistance, and behavioral assays/net probing behaviors are monitored in Chikwawa, where Interceptor G2 was distributed.	Implementation is ongoing.

9.3. Plans and Justification with FY 2024 Funding

No OR/PE activities are proposed with FY 2024 funding. PMI will work with NMCP in FY 2023 to update the national research agenda to identify malaria research priorities that may be potentially funded through reprogramming.

10. Capacity Strengthening

9.1. PMI Goal and Strategic Approach

PMI continues to strengthen health systems through capacity-strengthening interventions that further enable the Malawi government and communities to lead, manage, and implement their own programs. Capacity-strengthening initiatives increase health workers' competencies, skills, and knowledge to prevent, test, and treat malaria at all levels. These efforts respond to all of the interventions of NMCP's 2023–2030 strategic plan. PMI's commitment to strengthening health systems is aligned with the development objectives of USAID and the Malawi government.

PMI will provide FY 2024 funding directly to the District Council of Mangochi through a G2G agreement, strengthening its capacity to provide supervision and mentorship for community-based case management and to administer funds and manage performance.

Through various capacity-strengthening initiatives, such as training, coaching, mentorship, and supervision, PMI enhances the competencies, skills, and knowledge of health workers at all

levels. This comprehensive approach covers prevention, testing, and treatment of malaria, aligned with the case management thematic areas outlined in NMCP's 2023–2030 strategic plan.

Furthermore, PMI plays a pivotal role in strengthening the necessary skills, knowledge, and competencies in data collection, aggregation, reporting, and use at the community, facility, and national level. This concerted effort leads to significant improvements in the quality of malaria data and evidence-based interventions, directly addressing the SM&E and operations research intervention thematic area of NMCP's 2023–2030 strategic plan.

9.2. Recent Progress (October 2021–September 2022)

Vector Control

- PMI provided technical support to NMCP in the planning, implementation, and monitoring of the 2022 IRS campaign in three districts funded by the Global Fund—Mangochi, Balaka, and Nkhata Bay—particularly with respect to monitoring and evaluation and environmental compliance.
- PMI conducted an ITN and IRS evaluation and discussed interim findings and programmatic implications with NMCP.

Malaria Case Management at Facility and Community Level

- PMI financed the training of 59 malaria microscopists, 241 HSAs in RDT, and 495 HSAs in iCCM, in addition to providing technical and financial support to NMCP and the IMCI unit to supervise 239 village health clinics and 330 HSAs.
- PMI oriented 206 ANC providers on MIP guidelines.
- PMI mentored 576 health workers on case management, MIP, and facility data.
- PMI funded six participants in the Malawi Field Epidemiology Training Program, drawn from PMI-focus districts and selected by NMCP in consultation with district health management teams. The Malawi Field Epidemiology Training Program aims to build sustainable capacity for timely detection and response to health threats. It also develops expertise to detect and prevent disease outbreaks.

Procurement and Supply Chain Management of Malaria Commodities

- PMI financed Open LMIS training and scale up to 140 additional facilities, bringing the total number of data entry sites to 400.

Data Quality and Accuracy for Decision Making on Malaria Service Delivery

- PMI provided technical and financial support for quarterly data-driven health worker meetings, followed up with action plans developed from data reviews, visited 84 facilities, and coached 105 health workers.
- PMI mentored 669 health workers from select health facilities on practical routine malaria data quality verification, documentation, and reporting.

- PMI trained 72 district staff in routine malaria data quality verification and improvement.

SBC

- PMI provided technical and financial support to NMCP and HES for the development of the National Malaria Communication Strategy and the SBC research and learning agenda.
- PMI oriented NMCP, HES, and malaria stakeholders on the web-based MBS survey dashboard to promote evidence-based decision making.

9.3. Plans and Justification with FY 2024 Funding

The FY 2024 funding tables contain a full list of capacity strengthening activities that PMI proposes to support in Malawi in FY 2024.

Malawi will continue to support capacity-strengthening activities as described in the recent progress section. Additionally, Malawi will include financial support for HSAs to deliver effective iCCM and SBC through routine case management activities as well as health communication efforts in their communities through the G2G agreement with Mangochi District Council. This will include funds for routine, structured supervision of HSAs and will continue to strengthen the capacity of the district council to effectively manage funds and performance.

In addition, through a governance strengthening project, PMI will help increase the availability of high-performing staff in service delivery facilities to ensure coverage of essential malaria-related services and will support the implementation of policy and regulatory frameworks to increase the percent of commercial and artisanal fishers complying with existing laws on ITN misuse.

Furthermore, PMI will provide continued support to maintain Malawi Peace Corps volunteers to support malaria activities throughout the country.

11. Staffing and Administration

A minimum of three health professionals oversee PMI in Malawi. The single interagency team, led by the USAID Mission Director or their designee, consists of a resident advisor representing USAID, a resident advisor representing Centers for Disease Control and Prevention, and three locally hired experts known as foreign service nationals. The PMI interagency team works together to oversee all technical and administrative aspects of PMI, including finalizing details of the project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, reporting of results, and providing guidance and direction to PMI implementing partners.

ANNEX: GAP ANALYSIS TABLES

Table A-1. ITN Gap Analysis Table

Calendar Year	2023	2024	2025
Total country population	20,313,273	20,914,945	21,535,179
Total population at risk for malaria	20,313,273	20,914,945	21,535,179
PMI-targeted at-risk population	20,313,273	20,914,945	21,535,179
Population targeted for ITNs	20,313,273	20,914,945	21,535,179
Continuous distribution needs			
Channel 1: ANC	731,278	752,938	775,266
Channel 1: ANC type of ITN	PBO	Dual AI	Dual AI
Channel 2: EPI	731,278	752,938	775,266
Channel 2: EPI type of ITN	PBO	Dual AI	Dual AI
Channel 3: School			
Channel 3: School type of ITN			
Channel 4: Community			
Channel 4: Community type of ITN			
Channel 5:			
Channel 5: Type of ITN			
Estimated total need for continuous channels	1,462,556	1,505,876	1,550,533
Mass campaign distribution needs			
Mass distribution campaigns		11,698,368	
Mass distribution ITN type		Dual AI	
Estimated total need for campaigns		11,698,368	
Total ITN need: Continuous and campaign	**1,462,556**	**13,204,244**	**1,550,533**
Partner contributions			
ITNs carried over from previous year	230,316	231,010	531,605
ITNs from government			
Type of ITNs from government			
ITNs from Global Fund		11,698,368	
Type of ITNs from Global Fund		Dual AI	

ITNs from other donors			
Type of ITNs from other donors			
ITNs planned with PMI funding	1,463,250	1,806,471	1,925,410
Type of ITNs with PMI funding	Dual AI and PBO	Dual AI	Dual AI
Total ITNs contribution per calendar year	**1,693,566**	**13,735,849**	**2,457,015**
Total ITN surplus (gap)	**231,010**	**531,605**	**906,482**

Table A-2. RDT Gap Analysis Table

Calendar Year	2023	2024	2025
Total country population	20,313,273	20,914,945	21,535,179
Population at risk for malaria	20,313,273	20,914,945	21,535,179
PMI-targeted at-risk population	20,313,273	20,914,945	21,535,179
RDT needs			
Total number of projected suspected malaria cases	14,963,250	17,135,000	17,135,000
Percent of suspected malaria cases tested with an RDT	100%	100%	100%
RDT needs (tests)	14,963,250	17,135,000	17,135,000
Needs estimated based on HMIS data			
Partner contributions (tests)			
RDTs from government			
RDTs from Global Fund	2,000,000	4,958,600	12,851,256
RDTs from other donors			
RDTs planned with PMI funding	7,329,250	7,500,000	4,283,750
Total RDT contributions per calendar year	**9,329,250**	**12,458,600**	**17,135,006**
Stock balance (tests)			
Beginning balance	13,144,950	7,510,950	2,834,550
- Product need	14,963,250	17,135,000	17,135,000
+ Total contributions (received/expected)	9,329,250	12,458,600	17,135,006
Ending balance	**7,510,950**	**2,834,550**	**2,834,556**
Desired end of year stock (months of stock)	7	7	7
Desired end of year stock (quantities)	8,728,563	9,995,417	9,995,417
Total surplus (gap)	**(1,217,613)**	**(7,160,867)**	**(7,160,861)**

Table A-3. ACT Gap Analysis Table

Calendar Year	2023	2024	2025
Total country population	20,313,273	20,914,945	21,535,179
Population at risk for malaria	20,313,273	20,914,945	21,535,179
PMI-targeted at-risk population	20,313,273	20,914,945	21,535,179
ACT needs			
Total projected number of malaria cases	6,602,370	8,583,321	9,088,774
Total ACT needs (treatments)	**6,602,370**	**8,583,321**	**8,792,439**
Needs estimated based on HMIS data			
Partner contributions (treatments)			
ACTs from government			
ACTs from Global Fund	938,310	3,815,685	5,676,623
ACTs from other donors			
ACTs planned with PMI funding	450,000	2,000,000	3,815,370
Total ACTs contributions per calendar year	**1,388,310**	**5,815,685**	**9,491,993**
Stock balance (treatments)			
Beginning balance	13,597,560	7,666,230	3,696,254
- Product need	6,602,370	8,583,321	8,792,439
+ Total contributions (received/expected)	1,388,310	5,815,685	9,491,993
Ending balance	**8,383,500**	**4,898,594**	**4,395,808**
Desired end of year stock (months of stock)	7	7	7
Desired end of year stock (quantities)	3,851,383	5,006,937	5,128,923
Total surplus (gap)	**4,532,118**	**(108,344)**	**(733,115)**

Table A-4. Inj. Artesunate Gap Analysis Table

Calendar Year	2023	2024	2025
Injectable Artesunate Needs			
Projected number of severe cases	66,024	82,117	92,598
Projected number of severe cases among children	32,352	40,237	45,373
Average number of vials required for severe cases among children	9	9	9
Projected number of severe cases among adults	33,672	41,880	47,225
Average number of vials required for severe cases among adults	12	12	12
Total injectable artesunate needs (vials)	**695,230**	**864,691**	**691,705**
Needs estimated based on HMIS data			
Partner contributions (vials)			
Injectable artesunate from government			
Injectable artesunate from Global Fund	463,129	262,713	429,567
Injectable artesunate from other donors			
Injectable artesunate planned with PMI funding	0	0	0
Total injectable artesunate contributions per calendar year	**463,129**	**262,713**	**429,567**
Stock balance (vials)			
Beginning balance	952,557	720,456	118,478
- Product need	695,230	864,691	691,705
+ Total contributions (received/expected)	463,129	262,713	429,567
Ending balance	**720,456**	**118,478**	**(143,659)**
Desired end of year stock (months of stock)	7	7	7
Desired end of year stock (quantities)	405,551	504,403	403,494
Total surplus (gap)	**314,906**	**(385,925)**	**(547,154)**

Table A-5. RAS Gap Analysis

Calendar Year	2023	2024	2025
Artesunate suppository needs			
Number of severe cases expected to require prereferral dose (or expected to require prereferral dose based on number of providers for the service)	10,036	12,482	14,075
Total artesunate suppository needs (suppositories)	**11,583**	**14,366**	**16,259**
Needs estimated based on HMIS data			
Partner contributions (suppositories)			
Artesunate suppositories from government	0	0	0
Artesunate suppositories from Global Fund	0	0	0
Artesunate suppositories from other donors	0	0	0
Artesunate suppositories planned with PMI funding	16,000	14,000	2,904
Total artesunate suppositories available	**16,000**	**14,000**	**2,904**
Stock balance (suppositories)			
Beginning balance	18,788	23,205	22,839
- Product need	11,583	14,366	16,259
+ Total contributions (received/expected)	16,000	14,000	2,904
Ending balance	**23,205**	**22,839**	**9,484**
Desired end of year stock (months of stock)	7	7	7
Desired end of year stock (quantities)	6,757	8,380	9,484
Total surplus (gap)	**16,448**	**14,459**	**0**

Table A-6. SP Gap Analysis Table

Calendar Year	2023	2024	2025
Total country population	20,313,273	20,914,945	21,535,179
Total population at risk for malaria	20,313,273	20,914,945	21,535,179
PMI-targeted at-risk population	20,313,273	20,914,945	21,535,179
SP needs			
Total number of pregnant women	731,278	752,938	775,266
Percent of pregnant women expected to receive IPTp1	100%	100%	100%
Percent of pregnant women expected to receive IPTp2	79%	79%	80%
Percent of pregnant women expected to receive IPTp3	60%	65%	65%
Percent of pregnant women expected to receive IPTp4	30%	35%	40%
Total SP needs (doses)	**2,684,000**	**2,767,333**	**2,851,333**
Needs estimated based on consumption data			
Partner contributions (doses)			
SP from government			
SP from Global Fund			
SP from other donors			
SP planned with PMI funding	1,422,667	3,600,000	3,236,000
Total SP contributions per calendar year	**1,422,667**	**3,600,000**	**3,236,000**
Stock balance (doses)			
Beginning balance	2,420,559	1,159,226	1,991,893
- Product need	2,684,000	2,767,333	2,851,333
+ Total contributions (received/expected)	1,422,667	3,600,000	3,236,000
Ending balance	**1,159,226**	**1,991,893**	**2,376,559**
Desired end of year stock (months of stock)	7	7	7
Desired end of year stock (quantities)	1,565,667	1,614,278	1,663,278
Total surplus (gap)	**(406,441)**	**377,615**	**713,282**