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# U.S. PRESIDENT'S MALARIA INITIATIVE

# Nigeria

# Malaria Operational Plan FY 2024

Suggested Citation: U.S. President's Malaria Initiative Nigeria Malaria Operational Plan FY 2024. Retrieved from www.pmi.gov

This 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.

# TABLE OF CONTENTS

## ABBREVIATIONS

| | |
|---|---|
| ACSM | Advocacy, Communication, and Social Mobilization |
| ACT | Artemisinin-based combination therapy |
| AI | Active ingredient |
| AL | Artemether-lumefantrine |
| AMF | Against Malaria Foundation |
| *An.* | *Anopheles* |
| ANC | Antenatal care |
| ASAQ | Artesunate-amodiaquine |
| ASPY | Artesunate-pyronaridine |
| BSS | Behavioral Sentinel Surveillance |
| CbHWs | Community-based Health Workers |
| CDC | Centers for Disease Control and Prevention |
| CHIPS | Community Health Influencers, Promoters and Services |
| CHW | Community Health Worker |
| CY | Calendar Year |
| DHIS2 | District Health Information System 2 |
| DHP | Dihydroartemisinin-piperaquine |
| DHS | Demographic and Health Survey |
| DMA | Drug Management Agency |
| DRF | Drug Revolving Fund |
| eLMIS | Electronic Logistics Management Information System |
| EPI | Expanded Program on Immunization |
| FCT | Federal Capital Territory |
| FETP | Field Epidemiology Training Program |
| FSN | Foreign Service National |
| FY | Fiscal year |
| Global Fund | Global Fund to Fight AIDS, Tuberculosis and Malaria |
| HF | Health facility |
| HMIS | Health Management Information System |
| HWs | Health workers |
| iCCM | Integrated community case management |
| IPC | Interpersonal Communication |
| IPTp | Intermittent preventive treatment for pregnant women |
| IRS | Indoor residual spraying |
| ITN | Insecticide-treated mosquito net |
| LGA | Local government area |
| LSM | Larval source management |
| MIP | Malaria in pregnancy |
| MIS | Malaria Indicator Survey |
| MOH | Ministry of Health |

| | |
|---|---|
| MOP | Malaria Operational Plan |
| NAFDAC | National Agency for Food and Drug Administration and Control |
| NHLMIS | National Health Logistics Management Information System |
| NMDR | National Malaria Data Repository |
| NMEP | National Malaria Elimination Programme |
| NMORA | National Malaria Operations Research Agenda |
| NMSP | National Malaria Strategic Program |
| OR | Operations Research |
| PBO | Piperonyl butoxide |
| PI | Primary Impact |
| PHC | Primary health care |
| PMI | U.S. President's Malaria Initiative |
| PPMV | Proprietary Patent Medicine Vendors |
| RDT | Rapid diagnostic test |
| SBC | Social and behavior change |
| SMC | Seasonal Malaria Chemoprevention |
| SM&E | Surveillance, Monitoring, and Evaluation |
| SMOH | State Ministry of Health |
| SMEP | State Malaria Elimination Program |
| SP | Sulfadoxine-pyrimethamine |
| SPAQ | Sulphadoxine-pyrimethamine plus amodiaquine |
| TES | Therapeutic efficacy study |
| UNICEF | United Nations Children's Fund |
| USAID | United States Agency for International Development |
| WHO | World Health Organization |
| WHO PQ | World Health Organization Pre-qualification |

# EXECUTIVE SUMMARY

To review specific country context for Nigeria, please refer to the country malaria profile, which provides an overview of the country's malaria situation, key indicators, the National Malaria Program strategic plan, and the partner landscape.

### U.S. President's Malaria Initiative

Launched in 2005, the U.S. President's Malaria Initiative (PMI) supports implementation of malaria prevention and treatment measures as well as cross-cutting interventions. PMI's 2021–2026 strategy, *End Malaria Faster*, envisions a world free of malaria within our generation with the goal of preventing malaria cases, reducing malaria deaths and illness, and eliminating malaria in PMI partner countries. PMI currently supports 27 countries in Sub-Saharan Africa and three programs across the Greater Mekong Subregion in Southeast Asia to control and eliminate malaria. Nigeria began implementation as a PMI partner country in FY 2011.

### Rationale for PMI's Approach in Nigeria

According to the World Malaria Report 2022,[1] Nigeria accounts for the highest percentage of the global malaria burden compared to any other country, with 27 percent of the global estimated malaria cases and 31 percent of the estimated deaths due to malaria. Malaria is transmitted throughout Nigeria with 97 percent of the population at risk.[2] Nigeria has made progress towards achieving malaria control, but these efforts are hampered by multiple challenges, particularly widespread insecurity and weak governance structures that result in inadequate host-country funding. The current 2021–2025 National Malaria Strategic Plan (NMSP) aims to reduce malaria morbidity to less than 10 percent parasite prevalence and mortality attributable to malaria to less than 50 deaths per 1,000 by 2025. To support these ambitious goals, PMI aligns its funding to implement interventions and provide technical assistance in support of the strategies outlined in the NMSP 2021–2025. By doing so, PMI prioritizes the areas of Nigeria with the highest burden of malaria (15–49% prevalence among children aged 6–59 months, 2021 National Malaria Indicator Survey), focusing efforts in 11 states to achieve the greatest reduction in malaria morbidity and mortality.

### Overview of Planned Interventions

The proposed FY 2024 PMI funding for Nigeria is $68 million. PMI will support the following intervention areas with these funds:

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[1] World Malaria Report 2022. World Health Organization. (Geneva, Switzerland, December 2022): https://www.who.int/teams/global-malaria-programme/reports/world-malaria-report-2022.
[2]The NMSP 2021-2025 states that 97% of the population is at risk of malaria. However, for national quantification, 100% of the population at risk is used for quantification of malaria commodities; this is reflected in the gap analysis table.

## 1. Vector Monitoring and Control

PMI Nigeria will support entomological monitoring activities which include insecticide resistance testing in all 11 PMI-focus states and five non PMI-focus states (Abia, Ekiti, Enugu, Kaduna, and Kogi states), vector bionomics in six PMI-focus states, and continued support of enhanced surveillance for *Anopheles* (*An.) stephensi*. PMI will also continue to provide technical assistance to strengthen the capacity of local research institutions. In addition, PMI will continue to support the procurement and distribution of insecticide-treated mosquito nets (ITNs) through mass campaigns, provide technical support to the country's calendar year (CY) 2025 mass distributions, and promote social and behavioral change (SBC) to improve ITN use and care. PMI will maintain support for the final (36 month) time point of the streamlined durability monitoring of Interceptor G2 nets in Kebbi State. PMI also plans to procure and distribute 1.8 million piperonyl butoxide (PBO)-treated nets in Nasarawa, distribute 3.6 million PBO nets in Sokoto, 3.3 million dual active ingredient (AI) nets in Kebbi, and 4.1 million PBO nets in Akwa Ibom, with plans for procurement support from the Against Malaria Foundation for the three campaigns. PMI also plans to front fund the procurement of 2.0 million PBO nets for the Ebonyi campaign which will take place in early CY 2026.

## 2. Malaria in Pregnancy

PMI Nigeria will continue to support activities to strengthen malaria in pregnancy (MIP) services and improve uptake of intermittent preventive treatment for pregnant women (IPTp). This will include strengthening national and state level MIP coordination structures in collaboration with the Ministry of Health (MOH) Reproductive Health (RH) Division, supporting the revision of MIP guidelines, standard operating procedures, training manuals, and job aids to address barriers to IPTp uptake, and expanding the introduction of the revised guidelines to medical training institutions and other relevant professional associations. PMI will continue to support facility antenatal care (ANC) provider training and mentoring on MIP. PMI Nigeria will fund ANC health worker supervision and clinical meetings in targeted health facilities (HFs) to strengthen MIP implementation and intensify advocacy to federal and state health authorities to procure sulfadoxine-pyrimethamine for IPTp in the ANC facilities through existing platforms. PMI will also support the uptake of IPTp through the ANC platform, leveraging maternal child health funds that support ANC promotion efforts through the implementing partner in the three states that use an integrated health mechanism.

## 3. Drug-Based Prevention

PMI Nigeria will support seasonal malaria chemoprevention in two states, Benue and Zamfara, covering more than 2.2 million children aged 3–59 months with four cycles using sulphadoxine-pyrimethamine plus amodiaquine.

## 4. Case Management

PMI Nigeria will support key case management activities through technical assistance at the federal and state levels, commodity procurements, and facility and community level activities. Activities will include providing updated guidelines for malaria case management, conducting therapeutic efficacy studies, and continuing efforts to establish a national malaria slide bank. With FY 2024 funds, PMI Nigeria will procure 15 million rapid diagnostic tests, 15.5 million artemisinin-based combination therapies (ACTs): 14.6 million artemether-lumefantrine plus 900,000 Pyramax), 400,000 vials of injectable artesunate, and microscopy supplies, to be distributed to over 5,000 HFs in the 11 PMI-focus states. At the facility level, PMI will continue to support the training of health workers in primary health care and secondary HFs to conduct clinical meetings to increase the quality of malaria case management. At the community level, PMI will expand integrated community case management to five states through community health influencers, promoters and services program, including paying program agents.

## 5. Health Supply Chain and Pharmaceutical Management

PMI Nigeria will support the strengthening of the health supply chain and pharmaceutical management system through various activities. PMI will continue to support warehousing and distribution of malaria commodities to HFs in PMI-focus states. PMI will strengthen the state drug management agencies (DMAs) and logistics management coordination units' capacity to coordinate all supply chain activities at the state and HFs levels. The support will include drug management agencies and the logistics management coordination units integrated warehousing management, and last-mile distribution contracts. PMI will continue to support the enhancement of the national health logistics management information system, supporting the inclusion of all HFs in PMI-focus states and advocating for the integration of the Logistics Management Information System and District Health Information System 2 systems. PMI will also support the activities of the national drug regulatory agencies, including post-marketing surveillance and global standards, and efforts of local manufacturers of antimalarials to meet World Health Organization-prequalification standards.

## 6. Malaria Vaccine

Nigeria MOH in collaboration with the National Malaria Elimination Programme (NMEP) and other malaria stakeholders submitted an application to GAVI on April 18, 2023 for possible implementation of the RTS,S malaria vaccine. Nigeria accounts for 31 percent (191,890) of malaria deaths in children under five and RTS,S is sorely needed to mitigate this intolerable burden. However, due to the limited global production capacity, Nigeria has prioritized possible malaria vaccine implementation zones and developed a phased implementation

plan which prioritizes the highest burden locations and then expands the coverage. The country and PMI are awaiting GAVI's response to the Nigeria malaria vaccine request.

## 7. Social and Behavior Change

PMI Nigeria's SBC support is achieved through quality data-driven, coordinated communication and other interventions to increase correct and consistent ITN use and care, prompt care-seeking for fever, uptake of rapid diagnostic tests and IPTp, and provider adherence to diagnostic results for treatment with artemisinin-based combination therapies. With FY 2024 funds, PMI's SBC support will continue to prioritize these behaviors and sustain mass media, digital media, and community-level interpersonal communication activities. Interventions will deploy enhanced audience segmentation approaches to prioritize and sustain coverage; engage Community Health Influencers, Promoters and Services agents in delivering data-informed messaging, and service referrals; and strengthen capacity of local media and civil society organizations, ward health committees, and state malaria elimination program (SMEP) advocacy, communication and social mobilization staff for the design, implementation, and coordination of SBC activities. Finally, funding will support continued analysis, translation, and use of malaria SBC evidence for program strategy and policy adaptations.

## 8. Surveillance, Monitoring, and Evaluation

PMI Nigeria will build on previous successes to further strengthen the Health Management Information System (HMIS) with emphasis on data use, using the NMEP and SMEP as entry points. In addition, PMI will continue to support the web hosting of the National Malaria Data Repository and capacity-building of data personnel and other health personnel to increase coverage of its use at all levels. PMI will also use the data from Nigeria's 2021 Malaria Indicator Survey (MIS) and Nigeria's 2023 Demographic and Health Survey for program planning and for the preliminary planning for the MIS in CY 2026. Support to the NMEP in the operationalisation of community HMIS tools will be sustained while providing on-the-job capacity strengthening for community health workers (CHWs) and assessment of quality of service in the states where community interventions are being implemented.

## 9. Operational Research and Program Evaluation

PMI Nigeria will use findings from a larval source management feasibility assessment in Kebbi State for the development of a PMI Operational Research concept note. The assessment detailed rice paddies formed by irrigation as the predominant larval habitats during the dry season, which will be used to guide the pilot of larval source management in Kebbi State.

## 10. Capacity Strengthening

PMI Nigeria supports a mix of long- and short-term interventions aimed at strengthening the capacity of individual malaria program personnel and teams, strengthening the various line systems (e.g., HMIS, logistics management information system), and strengthening institutional capacity of the NMEP and State Ministries of Health. With FY 2024 funds, PMI will continue to support the Nigeria Center for Disease Control to train eligible NMEP and MOH staff, train two fellows under the advanced Nigeria Field Epidemiology and Laboratory Training Program course and conduct frontline FETPs, which are short-term three-month basic field epidemiology trainings. PMI will also continue to fund technical experts to be seconded to selected branches of the NMEP, oral or poster presentations by NMEP and SMEPs, and their participation at conferences. In addition, PMI will support activities to strengthen SMEPs capacity for program planning.

## 11. Staffing and Administration

PMI Nigeria is a single interagency team led by the United States Agency for International Development Mission Director. The team consists of resident advisors representing the United States Agency for International Development and the Centers for Disease Control and Prevention and five locally hired experts known as foreign service nationals. The team works together to oversee all technical and administrative aspects of PMI covering finalizing project designs, implementing malaria prevention and treatment activities, procurement, management and delivery of safe and effective malaria commodities and monitoring and evaluating outcomes and impact.

# I. CONTEXT & STRATEGY

## 1. Introduction

Nigeria began implementation as a President's Malaria Initiative (PMI) partner country in FY 2011. This FY 2024 Malaria Operational Plan presents a detailed implementation plan for Nigeria, based on the strategies of both PMI and the National Malaria Elimination Program (NMEP). It was developed in consultation with the NMEP and with the participation of national and international partners. The activities that PMI are proposing build on investments to improve and expand malaria-related prevention and case management services made by partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria. This document provides an overview of the strategies and interventions in Nigeria, 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 context, please refer to the Country Malaria Profile, which provides an overview of the country's malaria situation, key indicators, the NMEP strategic plan, and the partner landscape.

## 2. U.S. President's Malaria Initiative

PMI is led by the U.S. Agency for International Development (USAID) and implemented together with the U.S. Centers for Disease Control and Prevention (CDC). Launched in 2005, PMI supports implementation of malaria prevention and treatment measures—insecticide-treated mosquito nets (ITNs), indoor residual spraying, accurate diagnosis and prompt treatment with artemisinin-based combination therapies (ACTs), intermittent preventive treatment for pregnant women (IPTp), and drug-based prevention—as well as cross-cutting interventions such as surveillance, monitoring and evaluation; social and behavior change; and capacity strengthening. PMI's 2021–2026 strategy, *End Malaria Faster*, envisions a world free of malaria within our generation with the goal of preventing malaria cases, reducing malaria deaths and illness, and eliminating malaria in PMI partner countries. PMI currently supports 27 countries in Sub-Saharan Africa and three programs in the Greater Mekong Subregion in Southeast Asia to control and eliminate malaria. Over the next five years, PMI aims to save lives, reduce health inequities, and improve disease surveillance and global health security.

Under the strategy, and building upon the progress to date in PMI-supported countries, PMI will work with National Malaria 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 Nigeria

### 3.1. Malaria Overview for Nigeria

Malaria is transmitted throughout Nigeria, with 97 percent of the population at risk of malaria.[3] Five ecological zones define the intensity and seasonality of transmission and mosquito vector species: mangrove swamp, rainforest, Guinea-savannah, Sudan-savannah, and Sahel-savannah. These varying ecological zones are distinguished by rainfall and other climatic conditions. The rainfall duration ranges from about three months in the Sahel-savannah to nine months in the mangrove swamps and rainforest. These climatic patterns affect vegetation, and most flora and fauna are differentiated across ecological zones. Nigeria's NMSP 2021–2025 recommends at least three entomological sentinel sites in each ecological zone, to generate data on vector bionomics, while insecticide resistance monitoring is recommended to be carried out in each state. *Plasmodium falciparum* is the predominant malaria species. The primary vectors across most of the country are *Anopheles (An.) gambiae* s.l. (79 percent *An. coluzzii*, 20 percent *An. gambiae* s.s., and 1 percent *An. arabiensis*), with *An. funestus*, *An. marshallii*, and *An. rufipes* identified in varying abundances as a secondary vector in some areas of Nigeria (2022 Nigeria Entomology Report).

According to the World Malaria Report 2022, Nigeria contributed to 27 percent (67 million) of the global malaria cases (247 million) in 2021 and accounts for 31 percent (191,890) of the global estimated malaria deaths (619,000). The 2021 Nigeria MIS reported a fever prevalence

[3]The NMSP 2021-2025 states that 97% of the population is at risk of malaria, actual population at risk in Nigeria is 97%, however, for the national quantification 100% of the population at risk is used was used for quantification of malaria commodities and is reflected as such within in the gap analysis table.

of 22 percent in children two weeks before the survey. Of those with fever, 63 percent sought advice or treatment. Microscopy data showed that the prevalence of malaria parasitemia in children under five years of age was 22 percent, with regional differences, ranging from 16 percent in the South West to 30 percent in the North West Zone. Kebbi State (a PMI-focus state in the North West Zone) has the highest malaria prevalence at 49 percent in children under five years. The prevalence of malaria parasitemia in rural populations is 2.5 times that in urban populations (27 percent vs. 11 percent), and, when compared to the highest socioeconomic group, the prevalence among children in the lowest socioeconomic group is six times higher (31 percent vs. 5 percent). A further molecular analysis of blood samples collected for the Nigerian HIV/AIDS Indicator and Impact Survey 2018 provided first time estimates of malaria prevalence across all age groups and showed the highest prevalence of malaria among children aged 5–9 years (49.3 percent) and 10–14 years (43.9 percent).

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

### 3.2. Key Challenges and Contextual Factors

Nigeria has made tremendous progress toward achieving malaria control. However, it also faces multiple challenges including widespread insecurity due to criminality and armed conflict which is worsening in the northeast, northwest, north central and southeast. This has resulted in internal displacement of people and increased challenges and delays in program implementation of some malaria interventions, some of which are time sensitive (e.g.,seasonal malaria chemoprevention [SMC]). Nigeria is fully fiscally decentralized; each of the 36 state governors, parliaments and state level ministries resemble the federal-level structure, determine the state's budget and funds the same way as at the national level, despite being dependent on the consolidated income transfers from the Federation account. Therefore, subnational engagement with individual state governments is required to effectively support, implement, and capacitate ownership of malaria programming. Other challenges are a weak governance structure, which often results in inadequate funding allocated and released for the health sector at national and subnational levels.

### 3.3. PMI's Approach for Nigeria

The current NMSP 2021–2025 is based on the vision of achieving a malaria-free Nigeria, with a goal of reducing malaria morbidity to less than 10 percent parasite prevalence and mortality attributable to malaria to less than 50 deaths per 1,000 by 2025. Under the strategic plan, the Government of Nigeria implements universal coverage with ITNs, targeted indoor residual spraying (IRS), targeted Larval source management (LSM), IPTp, SMC, and diagnosis and treatment of uncomplicated malaria through routine health services and integrated community case management (iCCM). The strategy also supports the treatment of severe malaria using injectable artesunate and improvement in the generation and use of evidence for decision making, including surveillance, surveys, and operations research (OR). There are two cross-cutting strategies: i) Advocacy, Communication and Social Mobilization (ACSM); and ii) Procurement and Supply Management (PSM) which are listed in the Strategic Framework. The

entire strategic plan is built on the foundation of health system strengthening. The NMSP 2021–2025 is aligned with the 2018–2022 National Strategic Health Development Plan and the September 2019 National Health Council theme “Consolidating the Journey towards Achieving Universal Health Coverage" to underscore the global and national goal of achieving Universal Health Coverage by 2030.

PMI contributes to the country’s overall malaria strategy and aligns its funding and technical assistance to implement interventions that reflect most of the country’s strategies above, excluding indoor residual spraying (IRS) or LSM. These strategies align with all five focus areas of the PMI Strategy (2021–2026). PMI supports key intervention areas in the national malaria control strategy but prioritizes the areas of Nigeria with the highest burden of malaria (15–49% prevalence among children aged 6–59 months) to achieve the greatest reduction in malaria morbidity and mortality. As such, PMI support is focused in the 11 states of Akwa Ibom, Bauchi, Benue, Cross River, Ebonyi, Kebbi, Nasarawa, Oyo, Plateau, Sokoto, and Zamfara (Figure 4 in the Nigeria Malaria Profile). In other areas of Nigeria, PMI provides support for vector surveillance, insecticide resistance monitoring, surveillance of antimalarial medicines and other technical areas through collaborative efforts led by the NMEP and other partners.

PMI Nigeria is represented in the Mission’s Primary Impact[4] (PI) team. The Nigeria U.S. Agency for International Development (USAID) mission is currently developing a Nigeria PI country action plan through a collaborative effort between various offices. PMI’s strategic approach for the country places emphasis on strengthening the frontline health system at facility and community levels and reflects the PI technical domains. PMI is working to strengthen primary health care (PHC), supporting over 5,000 primary HFs. In three of the 11 PMI-focus states (Bauchi, Kebbi, and Sokoto), PMI’s malaria program is implemented in an integrated program with reproductive, maternal, neonatal, child, and adolescent health and nutrition activities at state, local government area (LGA) and health facility levels.

Examples of PMI support across the five PI technical domains include:

1. **Effective models of Delivery for PHC**: Models of care are optimally structured and implemented to deliver integrated and well-coordinated patient-centered services within communities, including community-based care and use of empanelment.
    - Support to implement iCCM of malaria, pneumonia, and diarrhea through the Community Health Influencers, Promoters and Services (CHIPS) program in selected LGAs in three states with plans to scale up.

[4]Nigeria is one of seven USAID Global Health Bureau Primary Impact focus countries. Primary Impact is a USAID initiative to accelerate progress on primary health care (PHC), with the recognition that PHC is the foundation to improve health outcomes across the lifespan. Primary Impact aims to improve coordination and integration of PHC programming across USAID with a focus on five priority domains: effective models of PHC delivery, community engagement and partnership, sub-national and facility management, system integration and interoperability, and resilient health systems and services.

- Referral of pregnant women to HFs for antenatal care (ANC) including IPTp, which increases ANC attendance.
- Funding support to improve ANC service provision., including training primary HF ANC health workers on MIP (including giving IPTp through directly observed therapy and job aids).
- Training of primary HF health workers on malaria diagnosis and treatment and how to diagnose other common causes of fever in the absence of malaria.

2. **Community Engagement and Partnership**: Effectively empowered communities with established governance structures that engage in planning and provision of feedback related to PHC service delivery, including in determining local priority setting.

- Establishing and reactivating existing Ward development committees, to support a government strategy for encouraging community participation and access to primary healthcare services. Goals include strengthening the Ward development committee members' capacity to identify health needs of the ward and plan solutions to them; developing work plans and supervising their implementation; identifying locally available human and material resources required to meet the needs of the ward. These members are also trained on interpersonal communication (IPC). They learn how to conduct community dialogues and refer community members with fever for diagnosis to health facilities for treatment and pregnant women for ANC.

3. **Sub-National and Facility Management**: Optimal management functions within subnational units and in facilities to effectively manage budget allocation and execution, health workforce planning and performance, quality improvement and assurance systems, and processes for PHC service delivery.

- Provide technical and funding support to conduct integrated supportive supervisory visits to HFs and communities (iCCM) and develop facility action plans. Strengthen the capacity of LGA officers for supportive supervision to health facilities and support the conduct of supervisory visits. Also, develop and review sub-national level malaria annual operational plans.
- Establish malaria diagnosis quality assurance and quality control system in each state. Support state ministries of health (SMOH) and State Health Management Boards to operationalize identified government owned laboratories to function as state level malaria diagnosis reference centers where health worker (HWs) capacity to diagnose malaria can be strengthened. This can be leveraged for other diseases. It also supports the conduct of malaria microscopy external quality assessment visits, procurement and supply management, training of HWs in malaria diagnosis and treatment, MIP, and HMIS.

4. **System Integration and Interoperability**: Advance integration and interoperability of supply chain, laboratory, and information systems to increase efficiencies and further enable patient-centered care.

- PMI supports efforts to improve data quality, visualization, and use at PHC level. It supports the improvement in the quality of data entered by individual HFs into the routine HMIS, District Health Information System 2 (DHIS2). It funds the monthly data validation meeting, a quality assurance platform used for strengthening HF workers' capacity to correctly enter data for malaria and other diseases.

5. **Resilient Health Systems and Services**: Ability of subnational units and facility systems to effectively respond and adapt to public health and other emergencies, and for continuity of operations to maintain essential PHC service provision.

- Made COVID-19 adaptations for health workers to maintain continuity of essential services.

### 3.4. Key Changes in this Malaria Operational Plan

There have been no significant changes in strategies or budget levels compared to the previous Malaria Operational Plan (MOP). However, a targeted larviciding pilot will be implemented in selected LGAs in Kebbi State as operational research with reprogrammed funds from FY 2023. This follows recommendations from a larval source management feasibility study conducted in 2022 in three LGAs in Kebbi State.

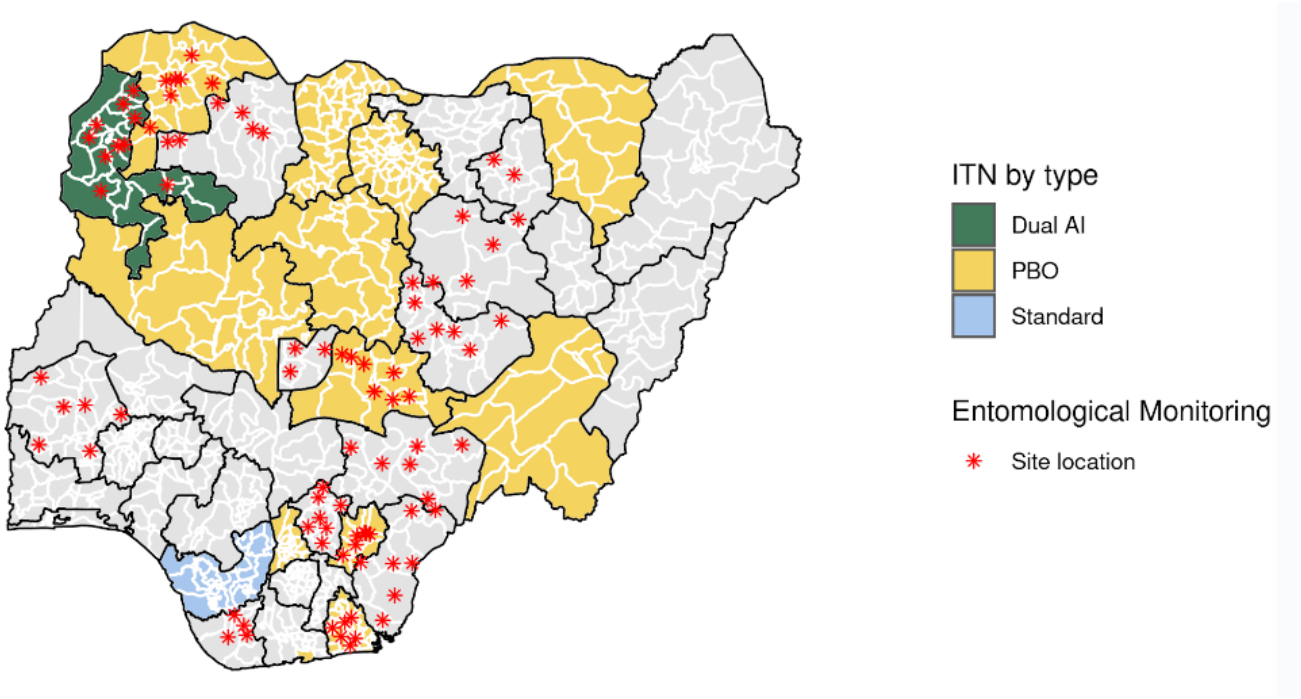
## II. OPERATIONAL PLAN FOR FY 2024

### 1. Vector Monitoring and Control

### 1.1. PMI Goal and Strategic Approach

The NMEP Malaria Strategic Plan 2021-2025 promotes an integrated vector management strategy, including vector surveillance, insecticide resistance management, continuous and mass distribution for universal access to ITNs, geographically targeted IRS, and LSM. PMI supports the use of these interventions, with the exception of IRS and LSM. PMI supports longitudinal vector bionomics monitoring in six PMI-focus states, in addition to insecticide resistance monitoring in all 11 PMI-focus states and five non PMI-focus states. The Global Fund supports entomological monitoring activities in 12 states. Through both PMI and Global Fund support, entomological monitoring activities are conducted in 23 states, in alignment with the national strategy. PMI and the Global Fund support mass ITN campaigns every three years, while Global Fund also supports continuous distribution of ITNs via ANC and Expanded Program on Immunizations (EPI) channels in its focus states.

**Figure 1. Map of Vector Control Activities in Nigeria**




### 1.2. Recent Progress (January 2022–March 2023)

- Supported entomological monitoring in sentinel sites in 91 LGAs, in collaboration and partnership with 15 universities and two research institutes. Activities included insecticide resistance monitoring in all 11 PMI-focus states and four non PMI-focus states (Bayelsa, Enugu, Federal Capital Territory [FCT], and Kaduna), and vector bionomics monitoring in six PMI-focus states. For more information about entomological monitoring, please refer to the 2022 Entomological Report.
- Supported collection of human-vector behavior data in two states (Kebbi and Sokoto).
- Supported enhanced surveillance for *An. stephensi* in seven states in coordination with NMEP, which included providing support for participation in a week-long training in Ethiopia and cascading the training to seven university principal investigators and 14 technicians on surveillance methods and morphological identification.
- Provided technical assistance to the Nigeria Institute of Medical Research, Nasarawa State University Keffi, and NMEP for entomological monitoring, insecticide resistance testing, and to strengthen molecular skills. Expanded support included the training and use of mobile digital technology for entomological data collections, digital laboratory labeling system processes, further discussions on status and utilization of the national entomology information system, and supporting regional training to entomology technicians for all sentinel sites in Nigeria.
- Supported prevention of MIP by providing ITNs for ANC and EPI from undistributed ITNs following mass ITN distribution.

- Provided technical assistance for planning for the FY 2022 ITN mass distribution campaigns, which distributed PBO (Akwa Ibom, Nasarawa, and Sokoto) and dual AI (Kebbi) ITNs at sub-national (state) level. The activity is in collaboration with Against Malaria Foundation (AMF), NMEP, state malaria elimination program (SMEP), and SMOH.
- PMI supported a digital tool for ITN campaign management developed for NMEP which was piloted in two LGAs of Ebonyi State, electronic household mobilization for net quantification for micropositioning at distribution points, collection of household data, and verification during net redemption. Personnel data captured was also used for fast tracking payments of *ad hoc* staff.
- Supported the finalization of the impact evaluation of PBO ITNs distributed in Ebonyi in 2019 and dissemination of results at the Annual Entomology Review meeting held in December 2022.
- Supported ITN streamlined durability monitoring by implementing pre-distribution time point data collection, monitoring the Interceptor G2 nets from the Kebbi 2022 cohort.
- In collaboration with the NMEP and two local universities (Federal University Birnin, Kebbi and Usman Danfodio University, Sokoto), continued baseline entomological data collections and conducted baseline data analysis of the enhanced entomological and epidemiological monitoring to assess the impact of Interceptor G2 and PBO nets distributed in Kebbi and Sokoto states, respectively, in 2022.
- Provided limited technical assistance on Bonny Island as the entomological surveillance activity has fully transitioned to the Nigeria Liquified Natural Gas Ltd. team.
- Supported a feasibility assessment of LSM in Kebbi State.
- Supported national, state, and community-level social and behavior change (SBC) activities to improve demand for ITNs, increase appropriate use, promote care, and mitigate against misuse. For more information, please refer to the SBC section.

### 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.

#### 1.3.1. Entomological Monitoring

Nigeria will continue to support entomological monitoring activities as described in the Recent Progress section. Entomological monitoring activities include insecticide resistance in all 11 PMI-focus states and five non PMI-focus states (Abia, Ekiti, Enugu, Kaduna, and Kogi), vector bionomics in six PMI-focus states, human-vector behavior observations in two PMI-focus states, and continued use of mobile digital technology for entomological data collections and laboratory processes. PMI will support the final time point (36 months) for the streamlined durability monitoring activity of the Interceptor G2 nets distributed in the 2022 mass campaign in Kebbi State. PMI will continue to support enhanced surveillance for *An. stephensi* with a focus towards relevant port(s) and other suitable habitats, in coordination with other partners.

PMI is also continuing to provide technical assistance and support for equipment and supplies to strengthen the capacity of local research institutions.

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

As of 2022, the primary vector was *An. gambiae* s.l.. Secondary vectors include: *An. marshallii* complex (in Akwa Ibom only), *An. funestus*, and *An. rufipes*. Peak transmission season varies across the states, with an increased biting rate during that late rainy season (August-September), compared to previous years findings where peak biting rates were observed during the early rainy season (April-July). Delayed rainfall may be responsible for the shift. Additionally, biting rates of *An. marshallii* were during the dry season and late rains. The preferred biting location of the primary vector was indoors (estimated from CDC Light Trap collections). The preferred resting location was indoors, and the peak biting time of *An. gambiae* s.l. was primarily between 11 p.m. and 2 a.m., with early morning peaks observed in Ebonyi and Plateau from 3-4 a.m. The preferred host was human. *Anopheles stephensi* was detected in Gombe State (a non PMI-focus state) in 2022, from insecticide resistance samples collected in 2020.

**Status of Insecticide Resistance in Nigeria**

In 2022, insecticide resistance testing was conducted in 11 PMI-focus states and four non PMI-focus states, and patterns were generally similar to those observed over the previous two years with pyrethroid resistance patterns in *An. gambiae* s.l. varied within and among the states. Generally, widespread resistance to pyrethroids (alpha-cypermethrin, deltamethrin, and permethrin) was detected, with resistance to all three pyrethroids in all sampled LGAs in three states (Akwa Ibom, Ebonyi, and Plateau). Pre-exposure of *An. gambiae* s.l. to PBO synergist increased mortality to varying degrees across sites. Most notably, PBO did not restore alpha-cypermethrin susceptibility in Akwa Ibom, Bauchi, Kaduna, and Plateau; did not restore deltamethrin susceptibility in Bauchi, Enugu, Kaduna, and Plateau; and did not restore permethrin susceptibility in Akwa Ibom, Bauchi, Baylesa, Benue, Cross River, Enugu, Federal Capital Territory (FCT), Kaduna, Kebbi, Nasarawa, Oyo, Plateau, and Zamfara. *An. gambiae* s.l. populations from all LGAs across all ecozones were susceptible to chlorfenapyr (100 microgram/bottle) with 100 percent mortality at 72 hours, whereas in 2021 one LGA each in Enugu and Federal Capital Territory had mortality less than 98 percent. Mortality rates of *An. gambiae* s.l. to clothianidin 24 hours post-exposure were 98-100 percent in 12 states, 94-99 percent in Akwa Ibom, 94-100 percent in FCT, and 82-96 percent in Nasarawa. Lastly, while IRS has not been widely implemented in Nigeria, the susceptibility of *An. gambiae* s.l. to pirimiphos-methyl is still monitored, with resistance observed in Oyo, in addition to results from 2021 which indicated pirimiphos-methyl resistance in Benue, Cross River, Nasarawa, and Plateau.

### 1.3.2. Insecticide-Treated Nets

Nigeria will continue to support ITN activities as described in the Recent Progress section. PMI will continue to support the procurement and distribution of new types of ITNs through mass campaigns. PMI will provide technical support to the country's calendar year (CY) 2025 mass distributions through participation in a national task force and the funding of a local partner to implement net distribution. PMI also supports SBC to improve the use and care of ITNs. PMI will maintain the support for the final (36 month) time point of streamlined durability monitoring of Interceptor G2s in Kebbi State.

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

**Insecticide-Treated Net Distribution in Nigeria**

In Nigeria, ITNs are distributed via mass campaigns every three years. ITNs that remain after campaigns are transitioned to continuous distribution channels targeting pregnant women at ANC clinics and children at EPI clinics. Given the high prevalence of malaria in Kebbi State, PMI reprogrammed funds to provide dual AI nets for continuous distribution in CY 2023 and CY 2024. The country transitioned from standard nets to new types of nets with distribution of PBO nets during the 2019 mass distribution campaign in Ebonyi. In CY 2022, PMI supported procurement of half of the dual AI nets (1.5 million) for mass campaign in Plateau (the other half was procured by AMF), and distribution of 11 million nets in Akwa Ibom (PBO), Kebbi (dual AI), Nasarawa (PBO), and Sokoto (PBO). In CY 2023, PMI will support distribution of 2.8 million PBO nets in Cross River (procurement supported by MOP FY 2021 funds) along with distribution of AMF-procured nets in Benue (standard, 4.1 million), Plateau (dual AI, 3 million), and Zamfara (PBO, 3.2 million). In CY 2024, there are plans for PMI to procure and distribute 5.6 million dual AI nets for Oyo State.

With FY 2024 MOP funds, PMI plans to procure and distribute 1.8 million PBO nets in Nasarawa. PMI plans to continue to work in partnership with AMF to help fill the ITN gaps and keep mass campaign timelines on track. With discussions currently ongoing about the extent of AMF support to the CY 2025 mass campaigns, PMI is planning to support the distribution of 3.6 million PBO nets in Sokoto, 3.3 million dual AI nets in Kebbi, and 4.1 million PBO nets in Akwa Ibom, with AMF taking on the procurement of these nets. Also, given campaign timing and net procurement lead times, PMI also plans to procure 2.0 million PBO nets for the Ebonyi mass campaign to take place in early CY 2026. There are gaps with nets for continuous distributions as PMI does not currently procure routine nets.

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

**Table 1. Streamlined Durability Monitoring**

| Campaign Date | Site | Brand | Pre-distribution | 12-month | 24-month | 36-month |
|---|---|---|---|---|---|---|
| 2022 | Kebbi | Interceptor G2 | 2022 | Planned 2023 | Planned 2024 | Planned 2025 |

### 1.3.3. Indoor Residual Spraying

PMI does not support IRS in Nigeria.

## 2. Malaria in Pregnancy

### 2.1. PMI Goal and Strategic Approach

PMI Nigeria supports Objective 2 of the NMSP 2021–2025 which is to "Ensure provision of chemoprevention, diagnosis and appropriate treatment for 80 percent of the target populations at risk by 2025." The strategy is to deploy intermittent IPTp to all pregnant women and align the timing of delivery with the 2016 World Health Organization recommended number of ANC contacts.

The national MIP guideline and strategies for malaria prevention and control during pregnancy (2022) recommends at least four doses of sulfadoxine-pyrimethamine (SP) administered as Directly Observed Therapy to all pregnant women attending ANC, with the first dose given at 13-19 weeks gestation, and each dose thereafter given four weeks apart. At ANC pregnant women are also provided oral daily doses of elemental iron (30mg - 60mg) and folic acid (0.4mg). The current National Guideline for Diagnosis and Treatment of Malaria (2020) recommends ACTs for treatment of malaria in all trimesters of pregnancy.

PMI supports MIP activities through the ANC service delivery platform in collaboration with NMEP and Reproductive/Maternal Health Programs of the MOH. It supports the establishment of a national technical working group, the development and review of MIP policy/guidelines/standard operating procedures/job aids and its subnational level dissemination. PMI also supports the training, mentoring, and supervision of health facility workers on malaria prevention, SP administration, prompt diagnosis and effective treatment of uncomplicated and severe malaria in pregnancy, and provision of ITN at first ANC visit. In addition, PMI continues to engage with the national and state level governments for the procurement of SP. In two states (Plateau and Oyo) these PMI efforts are complemented by Accelerating Nutrition Results in Nigeria project (not US Government funded) which provides SP to selected numbers of HFs.

The country's target for the percentage of women to receive three or more doses of IPTp (NMSP 2021–2025) for CY 2022 is 44 percent, and for CY 2024 is 63 percent. The percentage of women who received three or more doses of IPTp for malaria during their last pregnancy in

Nigeria was 7 percent in 2013 Demographic and Health Survey (DHS),[5] 21 percent in 2015 (MIS), 17 percent in 2018 (DHS)[6] and 31 percent in 2021 (MIS). In CY 2022 in the 11 PMI-focus states, health facility data from DHIS2 showed an uptake of 70, 46, and 28 percent for one, two, and three or more doses of IPTp, respectively; in CY 2021 this was 56, 43, and 30 percent, respectively.

Individual and collective barriers to improving IPTp uptake and IPTp uptake reporting include poor ANC attendance at HFs, pregnant women delaying commencement of ANC, inconsistent availability of SP, stockout of reporting tools, underreporting of SP administration and inconsistent administration of SP as Directly Observed Therapy in facilities where SP is not dispensed at the point of ANC. In Kebbi, Sokoto, and Zamfara states, only 48, 39, and 39 percent, respectively, of pregnant women received ANC from a skilled provider (MIS 2021). The use of the National HMIS tools designed to capture IPTp3 and IPTp4 for the first time commenced late in 2021. The country has placed SP on the importation restriction list, meaning it can only be procured locally, but no local manufacturers yet exist who have obtained WHO pre-qualification (WHO PQ). Therefore, PMI has stopped procurement of SP and supports other efforts targeted at improving national and state government procurement of SP. PMI provides technical assistance to local pharmaceutical manufacturers of antimalarials (ACT and SP) to facilitate WHO PQ. It provided TA support to two local SP manufacturers in the submission of SP medical product dossiers for WHO PQ. In addition, PMI provides TA support to product dossier reviews, review of quality management systems, and batch related documents to prepare for WHO PQ inspection.

### 2.2. Recent Progress (January 2022–March 2023)

PMI strengthened IPTp at federal, state, and facility levels in the following ways:

- Supported the revision of MIP guidelines, standard operating procedures, and job aids to address barriers to uptake of IPTp at the federal level.
- Funded regular MIP sub-committee meetings made up of a broad stakeholder representation and tasked with providing technical assistance to the state malaria technical working group to address MIP challenges and improve access, uptake, coverage, and quality of ANC services provided to clients at the state level.
- Funded integrated supportive supervisory visits by supervisors to 366 ANC facilities and clinical meetings in targeted facilities.
- Funded the training and mentoring of 1102 health workers in primary and secondary HFs to correctly administer, document, and report SP doses administered as well as to promptly diagnose and effectively treat uncomplicated malaria in pregnant women.
- Trained 155 Health Workers in secondary HFs on managing severe malaria including in pregnant women. HFs serve as referral centers for management of severe malaria.

[5] National Population Commission (NPC) [Nigeria] and ICF International. Nigeria Demographic and Health Survey 2013. (Abuja, Nigeria, and Rockville, Maryland, USA, 2014): https://dhsprogram.com/pubs/pdf/fr293/fr293.pdf.
[6] National Population Commission (NPC) [Nigeria] and ICF. Nigeria Demographic and Health Survey 2018. (Abuja, Nigeria, and Rockville, Maryland, USA, 2019): https://dhsprogram.com/pubs/pdf/FR359/FR359.pdf.

- Advocated for federal and state authorities to procure SP using domestic resources leveraging the drug revolving fund (DRF) system operated by the drug management agencies (DMAs) or the Basic Health Care Provision Fund. This resulted in the following SP procurements by the state: Akwa Ibom (31,565), Cross River (23,700), Ebonyi (29,160), Nasarawa (443,364), Plateau (26,000), Oyo (465,000) and Zamfara (75,000). This corresponds to between one to nineteen months of stock. In Bauchi State, the DMA has included SP in its DRF scheme and in Zamfara, the MIP subcommittee advocated to the State DMA to include of SP in the DRF scheme for secondary HFs; 7 secondary HFs and 11 PHCs have been enrolled to get SP through the DRF.

**2.3. Plans and Justification for FY 2024 Funding**

The FY 2024 funding tables contain a full list of malaria in pregnancy activities that PMI proposes to support.

Please refer to the SP Gap Table in annex for more detail on planned quantities and distribution channels and see the SBC section for details on challenges and opportunities to improve intervention uptake or maintenance.

PMI Nigeria will continue to support the implementation of MIP and IPTp activities to strengthen MIP and improve IPTp uptake by:

- Supporting continuous strengthening of national and state level MIP coordination structures in collaboration with the MOH Reproductive Health Division.
- Supporting the revision and dissemination of MIP guidelines, standard operating procedures, training manuals, job aids, and other tools to address barriers to uptake of IPTp.
- Expanding the introduction of the revised guidelines to medical training institutions and other relevant professional associations.
- Continuing to support facility ANC provider training and mentoring on MIP, including IPTp and prompt diagnosis and effective treatment of malaria in pregnancy. The current National Guideline for Diagnosis and Treatment of Malaria (2020) recommends ACTs for treatment of malaria in all trimesters of pregnancy.
- Funding facility ANC HWs supervision and clinical meetings in targeted HFs to strengthen MIP implementation.
- Supporting intensified advocacy to Federal and the state health authorities to procure SP for IPTp in the ANC facilities through the various existing platforms (DMA/DRF, Basic Health Care Provision Fund).
- Supporting the uptake of IPTp through the ANC platform and community IPTp (cIPTp) through health workers providing community-based health services. This will be actively linked to ANC services.
- Leveraging existing Maternal Neonatal and Child Health funds to support ANC promotion efforts via Integrated Health Program in states as applicable.

## 3. Drug-Based Prevention

### 3.1. Seasonal Malaria Chemoprevention

#### 3.1.1. PMI Goal and Strategic Approach

The NMEP supports SMC in LGAs with highly seasonal malaria transmission. There are 21 states in Nigeria with LGAs that are eligible for SMC (Table 2). In all LGAs, in accordance with the WHO guidelines, SMC is distributed in monthly cycles during the peak malaria transmission season to eligible children between 3 and 59 months of age. In five of the states (Bauchi, Kogi, Nasarawa, Oyo, and Plateau) SMC is implemented in five cycles and in the other 16 states, it's provided in four cycles.

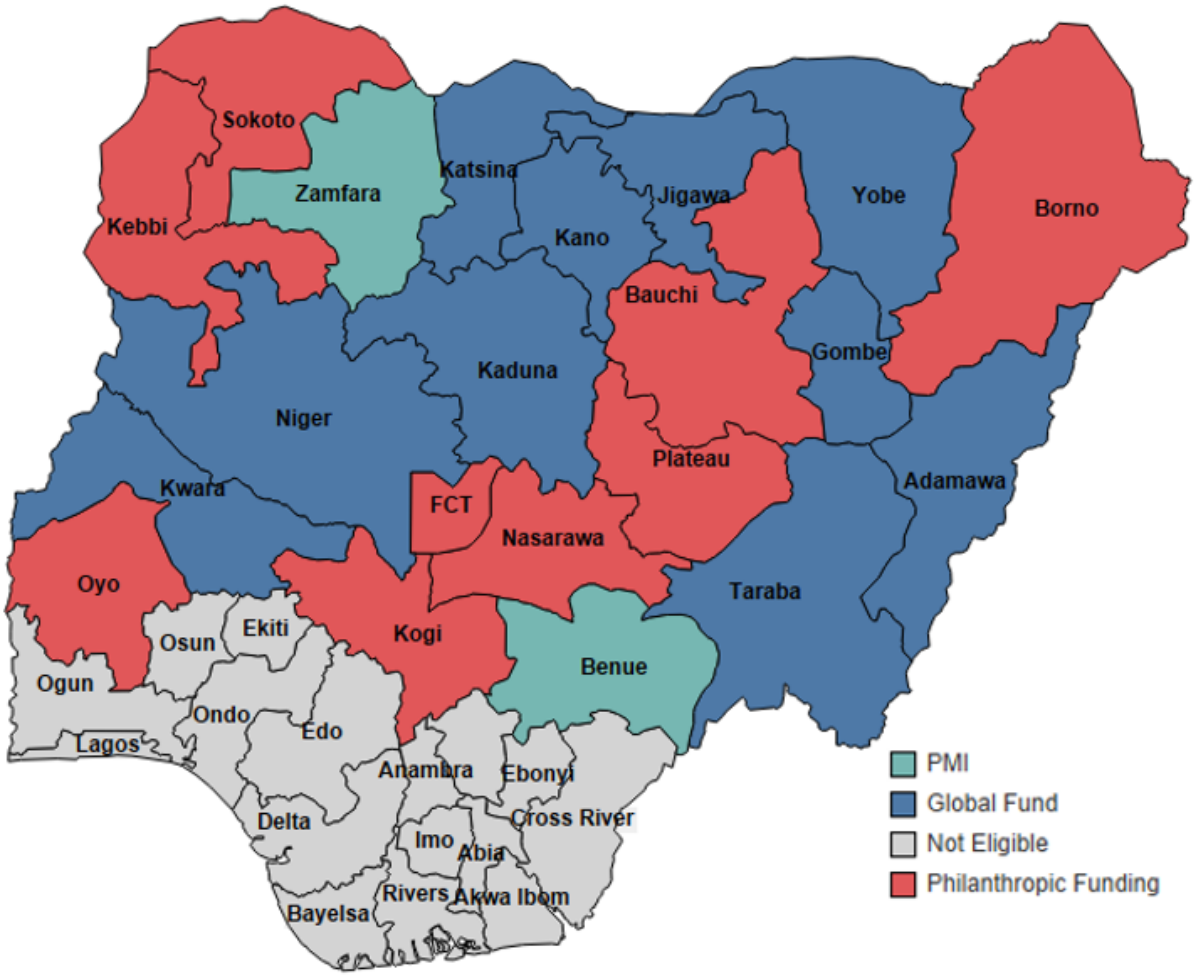
**Table 2. States and Local Government Areas Eligible for Seasonal Malaria Chemoprevention**

| SN | State | Total LGAs | SMC Eligible LGAs | Funder |
|---|---|---|---|---|
| 1 | Adamawa | 21 | 19 | Global Fund |
| 2 | Bauchi* | 20 | 20 | Philanthropic Funding |
| 3 | Benue* | 23 | 23 | PMI |
| 4 | Borno | 27 | 27 | Philanthropic Funding |
| 5 | FCT | 6 | 6 | Philanthropic Funding |
| 6 | Gombe | 11 | 11 | Global Fund |
| 7 | Jigawa | 27 | 27 | Global Fund |
| 8 | Kaduna | 23 | 23 | Global Fund |
| 9 | Kano | 44 | 44 | Global Fund |
| 10 | Katsina | 34 | 34 | Global Fund |
| 11 | Kebbi* | 21 | 21 | Philanthropic Funding |
| 12 | Kogi | 21 | 9 | Philanthropic Funding |
| 13 | Kwara | 16 | 11 | Global Fund |
| 14 | Nasarawa* | 13 | 13 | Philanthropic Funding |
| 15 | Niger | 25 | 25 | Global Fund |
| 16 | Oyo* | 33 | 6 | Philanthropic Funding |
| 17 | Plateau* | 17 | 17 | Philanthropic Funding |
| 18 | Sokoto | 23 | 23 | Philanthropic Funding |
| 19 | Taraba | 16 | 9 | Global Fund |

| | | | | |
|---|---|---|---|---|
| 20 | Yobe | 17 | 17 | Global Fund |
| 21 | Zamfara* | 14 | 14 | PMI |
| | TOTAL | 452 | 384 | |

*PMI-focus state
LGA: local government area; SMC: seasonal malaria chemoprevention.

**Figure 2. Map of Seasonal Malaria Chemoprevention Implementation in Nigeria**




### 3.1.2. Recent Progress (January 2022–March 2023)

Between July and October 2022, four cycles of SMC were administered in 23 LGAs in Benue and 14 LGAs in Zamfara targeting 1,224,652 and 1,366,725 children respectively for a total of 2,611,377 children aged 3–59 months. Coverage was high in all cycles. Cycle 1 had the lowest coverage at 93 percent while cycles 2, 3, and 4 had coverage at or above 100 percent.

Related to these campaigns the following activities were achieved:

- Procured 13,001,850 doses of sulphadoxine-pyrimethamine plus amodiaquine (SPAQ) and distributed 8,421,850 doses of SPAQ
- Engaged with Benue and Zamfara state governments to secure co-funding of the campaign which resulted in commitments of $173,000 and $178,000, respectively, for activities including demand creation, community mobilization, and last mile distribution.
- Implementation activities included support for microplanning through data triangulation to address inconsistencies in target population estimates, referral of febrile children for testing and treatment at nearby facilities, and adaptation of activities to respond to campaign challenges (e.g. ongoing insecurity in Zamfara).
- Supported the SMEPs to hold planning and post-implementation validation meetings
- Supported national level SMC workgroup by reviewing meetings and lessons learned and revising training manuals, Lot Quality Assurance Sampling methodology, and protocols for monitoring and supervision.
- Supported demand creation and other campaign SBC activities at the community level (please refer to the SBC section for more information).

### 3.1.3. Plans and Justification for FY 2024 Funding

The FY 2024 funding tables contain a full list of SMC activities that PMI proposes to support.

Nigeria will continue to support SMC activities as described in the Recent Progress section with ongoing campaigns in Benue and Zamfara. Please refer to the SPAQ Gap Table for more details on the planned quantities and distribution channels.

### 3.2. Other Drug-Based Prevention (as applicable)

PMI Nigeria does not support any other Drug-Based Prevention activities.

## 4. Case Management

### 4.1. PMI Goal and Strategic Approach

The NMSP 2021–2025 and Treatment Guidelines promote a comprehensive case management strategy which includes universal 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 emergent pre-referral and/or definitive management of severe febrile illness and severe malaria. PMI supports all aspects of this approach through support to national level policy and programmatic activities, commodity procurement, and improvement of facility and community level HW performance. The scale-up of SMC, and use of SPAQ resulted in the NMEP's move towards ACT diversification, but so far there has been limited response from donors. ACT diversification is not included in the upcoming Global Fund Grant 2024–2026, so Global Fund will procure only artemisinin-lumefantrine (AL).

AL is the primary ACT deployed programmatically in Nigeria, with artesunate-amodiaquine (AS/AQ) as an alternative. Based on current data, dihydroartemisinin-piperaquine (DHP) and

artesunate-pyronaridine (ASPY) are now included as part of the recommended ACTs in Nigeria. An in-country study on ASPY conducted in Oyo State demonstrated efficacy for the treatment of uncomplicated *P. falciparum* malaria. Pyronaridine-artesunate (PA) had a day 28 corrected adequate clinical and parasitological response of 97.4 percent.[7] ASPY was included in the 2021 therapeutic efficacy studies (TES) and the ongoing 2023 TES. The results for TES 2021 are pending and not available at the time of writing this MOP. ASPY was endorsed by the Case Management Technical Working Group and the guidelines for malaria diagnosis and treatment were updated to reflect this in 2022.

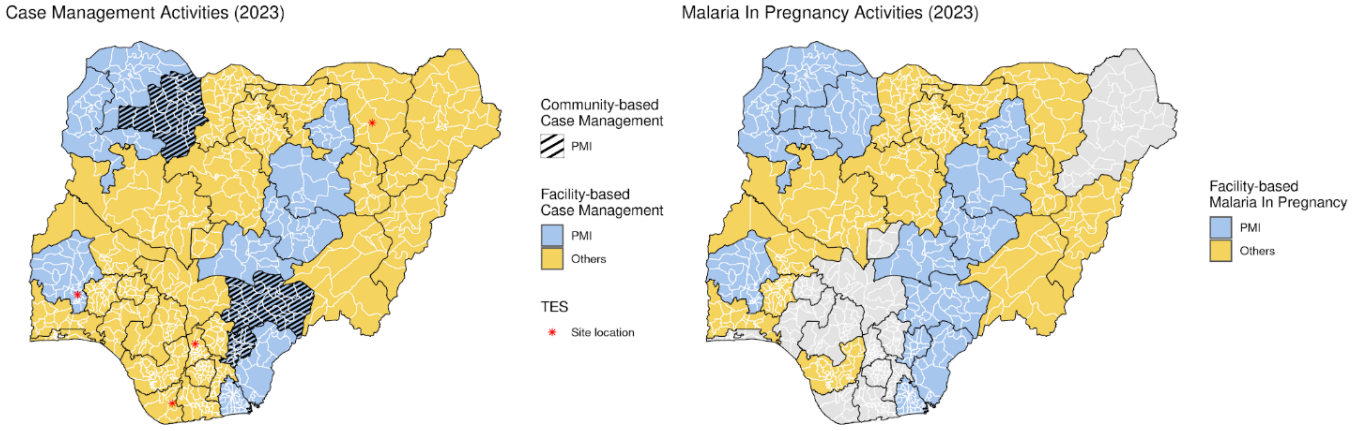
PMI supports 11 states with procurement of malaria rapid diagnostic tests (RDTs), ACTs, injectable artesunate, and microscopy supplies, while the Global Fund supports procurement of required commodities for its 13 focus states. PMI also supports outreach training and supportive supervision activities in the 11 PMI-focus states, and the Global Fund supports these same activities in 13 states. Funding from the Government of Nigeria (via loans from the World Bank and Islamic Development Bank) currently supports the remaining 13 states.

At the community level, PMI supports integrated community case management (iCCM) aimed at increasing access to health service delivery including malaria case management in select states using the CHIPS program model. CHIPS aims to facilitate task sharing and improve coordination of community health services. The CHIPS strategy seeks to transition all current Community-based Health Workers (CbHWs) from programs that are phasing out into a single national program. Both the training programs and health workers will be integrated, so that there is one training program, one curriculum and one category of CbHWs. CHIPS personnel is composed of agents and community engagement focal persons who are CbHWs. CHIPS agents provide testing and treatment for selected diseases, offer counseling, generate demand, and refer household members to PHC facilities for needed services. The community engagement focal persons support the agents' work by fostering participation, promoting community engagement, and leading community dialogues.The Community Health Extension Worker (CHEW), a community health worker (CHW) based in the health facility, provides supervision to the CHIPS personnel. PMI support to CHIPS includes provision of malaria commodities, training, supervision of CbHWs on febrile case management and reporting. This is implemented in collaboration with other maternal and child health programs. PMI supports training and provision of job aids to community HWs, provision of malaria commodities and basic equipment, reporting, monitoring, and supervision. PMI also supports advocacy to the Government of Nigeria and other partners (e.g.,United Nations Children's Fund [UNICEF] and Global Fund) to provide non-malaria commodities for management of pneumonia and diarrhea. By rolling out the CHIPS Program, PMI plans to support the further expansion of iCCM in select communities in at least three PMI-focus states where iCCM is already being implemented and in two new states. The biggest challenge for CHW programs in Nigeria is paying salaries and making non-malaria commodities available. To address these issues, PMI

[7] Falade, C.O., Orimadegun, A.E., Olusola, F.I. et al. Efficacy and safety of pyronaridine–artesunate versus artemether–lumefantrine in the treatment of acute uncomplicated malaria in children in South-West Nigeria: an open-labelled randomized controlled trial. Malar J 22, 154 (2023). https://doi.org/10.1186/s12936-023-04574-7

is working with USAID Nigeria, Global Fund, UNICEF and other donors to operationalize the existing Government of Nigeria policy and recently approved PMI policy on paying CHWs. Global Fund is working to include the procurement of non-malaria commodities for CHWs in its upcoming Global Fund grant 2024–2026.

**Figure 3. Map of Case Management, Community Health and Malaria in Pregnancy Service Delivery Activities in Nigeria**




### 4.2. Recent Progress (January 2022–March 2023)

PMI supports the NMEP objectives in case management through technical assistance at the federal level and in the 11 PMI-focus states. PMI's support has been directed at the following key areas: 1) procurement and distribution of diagnostic and treatment commodities; 2) training and supervision of laboratory and clinical care personnel in accurate malaria diagnostics and appropriate treatment; and 3) implementation of quality assurance systems for malaria diagnostics. Specific activities include:

<u>National Level Case Management Activities</u>

- Supported the revision of national training manuals, job aids, and standard operating procedures for malaria case management.
- Supported the dissemination of updated national guidelines for diagnosis and treatment of malaria and national training of core facilitators.
- Conducted training of different cadres of health care workers on malaria case management: 383 health care workers on managing severe malaria in secondary and tertiary HFs and 1757 PHC workers on managing uncomplicated malaria.
- Supported the revision of key documents for implementation of the iCCM/CHIPS Programme of the National Primary Health Care Development Agency. These include national guidelines, training manuals, and job aids for iCCM/CHIPS implementation.
- Convened and led 12 national-level coordination meetings (e.g., case management subcommittee, diagnostic working group, and severe malaria expert groups).
- Supported the establishment of the Nigeria National Core Team for Malaria Microscopists/National Competency Assessment for Malaria Microscopists.

- Supported the establishment of a malaria microscopy external quality assurance process in 11 PMI-focus states.
- Supported the ongoing national slide bank in four facilities in two states. Thus far, more than 10,000 slides passed the first level quality control check to the defense reference laboratory, Abuja for validation and storage. This will serve as a single national slide bank open for use by all the states and medical training institutions in Nigeria with a target total of 61,250 slides.
- Conducted training for improving malaria diagnosis: 59 laboratory scientists on basic malaria microscopy; 3,134 clinicians on conducting malaria RDT; 44 lab scientists on external quality assurance systems.
- Continued supporting the coordination of national malaria diagnostic quality assurance/quality control program including revisions of the operational guidelines and analysis of external quality assurance reports from different states.
- Strengthened quality assurance of malaria diagnostics in 531 private HFs and laboratories through training and professional development and laboratory supervision.

Commodities

- PMI supported the procurement of 11,835,425 malaria RDTs and distribution of 22,760,000 malaria RDTs to 5,172 HFs in 11 PMI-focus states to meet facility needs and prevent stock outs.
- Supported the procurement of various microscopy supplies (79 microscopes, slides, stains) which were distributed to 226 secondary HFs in the 11 PMI-focus states.
- Supported the procurement of 10,144,320 treatment doses of ACTs and distribution of 22,871,312 treatment doses to 5,172 HFs in 11 PMI-focus states.
- Supported the procurement of 430,834 vials of injectable artesunate and distribution of 311,141 vials for select secondary and tertiary HFs in 11 PMI-focus states.

Facility Level

- Conducted training of 1,113 private service providers on effective malaria case management from select private HFs in five PMI-focus states.
- Supported strengthening of positive provider attitudes, beliefs, and practices through peer-to-peer networks among providers of malaria, antenatal, and child services in supported primary HFs in eight states through the Officers-in-Charge (OIC) cluster-facility meetings. This has contributed to improved fever testing rates and compliance of health facility workers to adhere to malaria test negative results.
- Conducted four quarterly data quality assessments for HFs in 11 PMI-focus states. Key findings include incomplete reporting, unexplained high test positivity rates and in some facilities, disparities between testing and treatment.

Community Level

- Rolled out iCCM/CHIPS in three PMI-focus states (Benue, Ebonyi, and Zamfara).

- Trained and equipped 907 iCCM/CHIPS providers and 87 CHIPS supervisors in six LGAs in three PMI-focus states.
- Provided malaria commodities (ACTs and RDTs) to CHIPS agents for malaria case management.
- Conducted 21 rounds of CHIPS monthly data validation meetings in the three states.
- Conducted six rounds of quarterly review meetings in the three states.
- Conducted 16 rounds of monthly supportive supervision in the three states.
- Conducted four rounds of bi-monthly stock utilization/verification exercises in the three states.
- Supported the dissemination of messages on iCCM during community dialogues in the LGAs and advocated to the SMOH for supply of non-malaria commodities.
- Supported the National Primary Health Care Development Agency's development of the national CHIPS strategic plan (2023–2027).

Please note that recent progress with monitoring antimalarial efficacy and the TES approach is 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.

PMI Nigeria will continue to support key case management activities which include provision of updated guidelines for malaria case management, conducting TES, and implementation of a national malaria slide bank, as described in the Recent Progress section. In addition, PMI will support the establishment of a national core group of expert malaria microscopists and facilitators to lead the WHO external competency assessment for malaria microscopists and NMEP national competency assessment for malaria microscopists.

#### Commodities

With FY 2024 funds, PMI plans to procure 15.5 million ACTs (14.6 million AL plus 900,000 Pyramax), 400,000 vials of injectable artesunate, and microscopy supplies as described in the Recent Progress section. PMI also plans to procure 15 million RDTs using the existing pipeline. The commodities will be distributed to over 5,000 HFs in the 11 PMI-focus states. Although the gap table shows a small gap in artesunate injectable vials, actual consumption continues to be lower than the estimated need and PMI is presently procuring more vials than has been consumed in the past. The Nigeria team will monitor actual consumption and adjust procurement as needed.

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

**Facility Level**

PMI Nigeria will support all activities described in the Recent Progress section. PMI will support training of HWs in PHCs and secondary HFs in the 11 PMI-focus states. Efforts will be intensified to strengthen provider capacity to test every fever case and adhere to RDT results. Guided by data from supervisory visits, PMI will facilitate clinical meetings in facilities to increase quality of malaria case management, especially management of severe malaria at secondary and tertiary HFs. PMI will expand its support to case management strengthening activities in private sector HFs to eight states to improve the quality of care and reporting. Support will include training of selected HWs on malaria case management, post training mentoring and monitoring. Support will also continue for implementation of state strategies to engage private sector players to improve malaria services.

**Community Level**

PMI Nigeria will continue to support all the activities described in the Recent Progress section. Additionally, PMI will expand malaria community case management as part of iCCM in the three states where it is currently implemented and into two new states through the CHIPS Program. PMI plans to expand iCCM through CHIPS to 40 percent of LGAs in Benue, Ebonyi, and Zamfara and 30 percent of LGAs in two new states (Bauchi and Kebbi) through the CHIPS program. It will support a total of 3,300 CHIPS agents based on the government's implementation strategy of 10 CHIPS agents per ward and an average of ten wards per LGA.

PMI plans to commence implementation of the PMI policy for payment of CHWs in FY 2023. Nigeria has a community health worker payment policy and a minimum monthly amount that states are expected to pay CHWs.

- Train and equip iCCM/CHIPS providers and supervisors. Support monthly supportive supervisory, quarterly review meetings, and bi-monthly stock utilization/verification exercise.
- Pay stipend for 40 percent (1,320) of CHIPS Agents implementing iCCM and providing malaria services in the five states (Bauchi, Benue, Ebonyi, Kebbi, and Zamfara).
- Provide malaria commodities (ACTs and RDTs) to the CHIPS agents.
- Support the dissemination of iCCM messages in community dialogues and other community level activities.
- Support data validation meetings to improve and maintain the reporting rate and quality of reporting.

PMI will continue to work with other health offices and engage with government and relevant stakeholders on the following areas to plan for how payment of CHWs will be rolled out.

- **Foster an enabling policy environment:** PMI will engage with government entities, local partners and donors where required to update existing enabling policies for payment of CHIPS agents and community engagement focal persons who provide community based health care services. It will also engage to generate political will and develop a national investment case that prioritizes enacting enabling policies.
- **Coordinate with other donors:** PMI will plan how payment will occur when other streams of funding are available, align with other donors and/or ministries who may be financially supporting community HWs, focus on other components of strengthening the CHIPS where salaries of community HWs are covered by others.
- **Develop progressive costing and financing plan to ensure sustainability of CHW payments:** PMI will plan with MOH and other partners to use funds and include a clear plan for securing financing, with expectations defined for all parties involved, with annual benchmarks and a list of policy/regulatory actions that need to be taken to ensure the successful transition of community HW payment.
- **Determine an implementing partner or mechanism to provide payments:** (including a determination that the payment of community HWs is within scope) as Government to Government agreements with the United States Government are unlikely.
- **Design a process for paying CHWs:** PMI will consult with appropriate government partners to plan for how payments will be made, how the system will be designed to ensure timely payments, frequency of payment, criteria for enrolling a community HW in the payment scheme, mechanisms for tracking of community HWs, data sharing protocols/memorandums of understanding between a potential partner facilitating payment and the MOH.
- **Devise a plan and mechanism for tracking payments:** PMI will be expected to work with the MOH and partners to track the number of CHWs supported financially each year, the logistics around payment, nationally and disaggregated by state, and gender.

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

### Monitoring Antimalarial Efficacy

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

| Ongoing Therapeutic Efficacy Studies | | | |
|---|---|---|---|
| **Year** | **Site name** | **Treatment arm(s)** | **Plan for laboratory testing of samples** |
| 2021 | Imo, Kaduna, Kwara, Lagos | AL, ASAQ, DHP, As-Pyr | In-country at Redeemer's University |
| **Planned TESs (funded with previous or current MOP)** | | | |
| **Year** | **Site name** | **Treatment arm(s)** | **Plan for laboratory testing of samples** |
| 2023 | Anambra, Bayelsa, Oyo,Yobe | AL, ASAQ, DHP, As-Pyr | Nigerian Institute for Medical Research |

AL: artemether-lumefantrine; ASAQ: artesunate-amodiaquine; DHP: dihydroartemisinin-piperaquine; As-Pry: artesunate-pyronaridine; TES: therapeutic efficacy studies.

## 5. Health Supply Chain and Pharmaceutical Management

### 5.1. PMI Goal and Strategic Approach

PMI Nigeria health supply chain and pharmaceutical management objectives align with the eight supply chain key strategies, reflected across the five objectives, in the NMSP 2021-2025:

- Strategy 1.4: Strengthen systems for continuous availability of medicines and health products for the prevention of malaria through vector control.
- Strategy 2.4: Strengthen systems for continuous availability of medicines and health products for the chemoprevention, diagnosis and treatment of malaria.
- Strategy 3.6: Develop a functional pharmaceutical management information system to strengthen evidence-based decision making for malaria programming.
- Strategy 3.7: Collaborate with the national product supply chain management program and the national agency for food and drug administration and control (NAFDAC) for integrated supportive supervision activities and promote quality assurance for malaria medicines/commodities across all public and private facilities.
- Strategy 4.4: Strengthen private sector collaboration and participation for delivery of quality malaria services.
- Strategy 5.1: Strengthen capacity for budget tracking, internal controls and financial reporting at national and subnational levels.
- Strategy 5.2: Scale-up domestic resource mobilization.
- Strategy 5.3: Reinforce policy makers and legislature engagement for increased funding allocation and release for malaria management at all levels.

PMI's supply chain focus is to ensure that life-saving malaria commodities are available at PMI-supported health facilities and through community health workers. This includes technical assistance in: forecasting and supply planning, logistics management information systems, distribution planning, monitoring and supervision. PMI funding supports warehousing and

distribution from central warehouses (Abuja and Lagos) to axial warehouses then direct to health facilities. While operating the national public health supply chain, PMI is working to build the capacity at the state level to strengthen their supply chain capacity including establishing independent Drug Management Agencies, managing logistics data, developing distribution plans and outsourcing to private logistics providers. This approach aligns closely with the NMSP 2021-2025.

PMI's support to:

- Supply chain coordination activities at all levels of government (national and subnational) aligns with NMSP 2021-2025 objectives 1 and 2. This includes the national product supply chain management program, the logistics management coordination units, and pharmaceutical supply chain management technical working groups in all 11 PMI-focus states.
- Procure, store, and distribute malaria commodities aligns with objectives 1 and 2.
- Roll out and enhancements of the National Health Logistics Management Information System (NHLMIS), the electronic logistics management information system (eLMIS) platform for all public health supply chain data aligns with objective 3 of the NMSP 2021- 2025.
- Pharmaceutical manufacturers, third party private sector logistics service providers, and improving access to quality assured malaria medicines in the community through private sector sales outlets aligns with objective 4.
- Design and implementation of the DRF scheme in focus states, the setup of DMAs, and migration of ACTs to a sustainable funding mechanism aligns with NMSP 2021-2025 objective 5.

### 5.2. Recent Progress (January 2022–March 2023)

**Drug Revolving Fund Scheme:** PMI supported the roll out and activation of DRF schemes in Bauchi, Sokoto, Zamfara and Nasarawa states on a pilot basis and continues to support DRF implementation at the national and subnational levels. PMI paused further expansion of DRF to new states and onboarding of new HFs within the states already being supported until an evaluation of the effectiveness of delivering malaria commodities through the DRF is completed. This evaluation will inform further expansion.

The following progress was made within this time:

- Development of national guidelines for DRF and establishment of supportive DRF laws in Ebonyi State.
- DRF operational guidelines and standard operating procedures developed in Kebbi State.
- DRF governance structures established/strengthened in all 4 PMI focus states for DRF rollout.

- Community structures engaged and participating fully in DRF interventions in all PMI supported states.
- Health facility readiness assessments conducted in all four PMI focus states for DRF rollout.
- DRF monitoring and evaluation plans developed in all four PMI focus states.
- DRF supervision structures (In-State Team) established/strengthened.
- Routine DRF-focused mentoring, monitoring, and supervision conducted.
- Support for strengthening states' capacity to run the DRF at the state, LGA, and health facility levels.
- Organizational capacity assessment and standard operating procedure development was conducted for Plateau State having had their legislative bill passed.

**Storage and distribution:** Government of Nigeria and donor procured commodities flow from two national pharmaceutical grade warehouses (Abuja and Lagos) to regional/axial stores and then directly to HFs, bypassing state warehouses.

PMI continued to support delivery of malaria commodities to 5,172 HFs. PMI supported the distribution of the following commodities within the period under review:

- ACTs – 22,871,312
- RDTs – 22,760,000
- ITNs – 12,958,092
- Injectable Artesunate – 311,141
- SP – 114,350
- SPAQ – 8,421,850

The warehouse management and distribution of commodities are outsourced to private logistics providers. The regional distribution system is a medium-term solution with the states taking on increasing responsibility for the supply chain. As part of this evolution, PMI supported Bauchi State on preparatory activities for a state coordinated last mile distribution. Bauchi, Nasarawa, and Sokoto started coordinated last mile distribution in CY 2022.

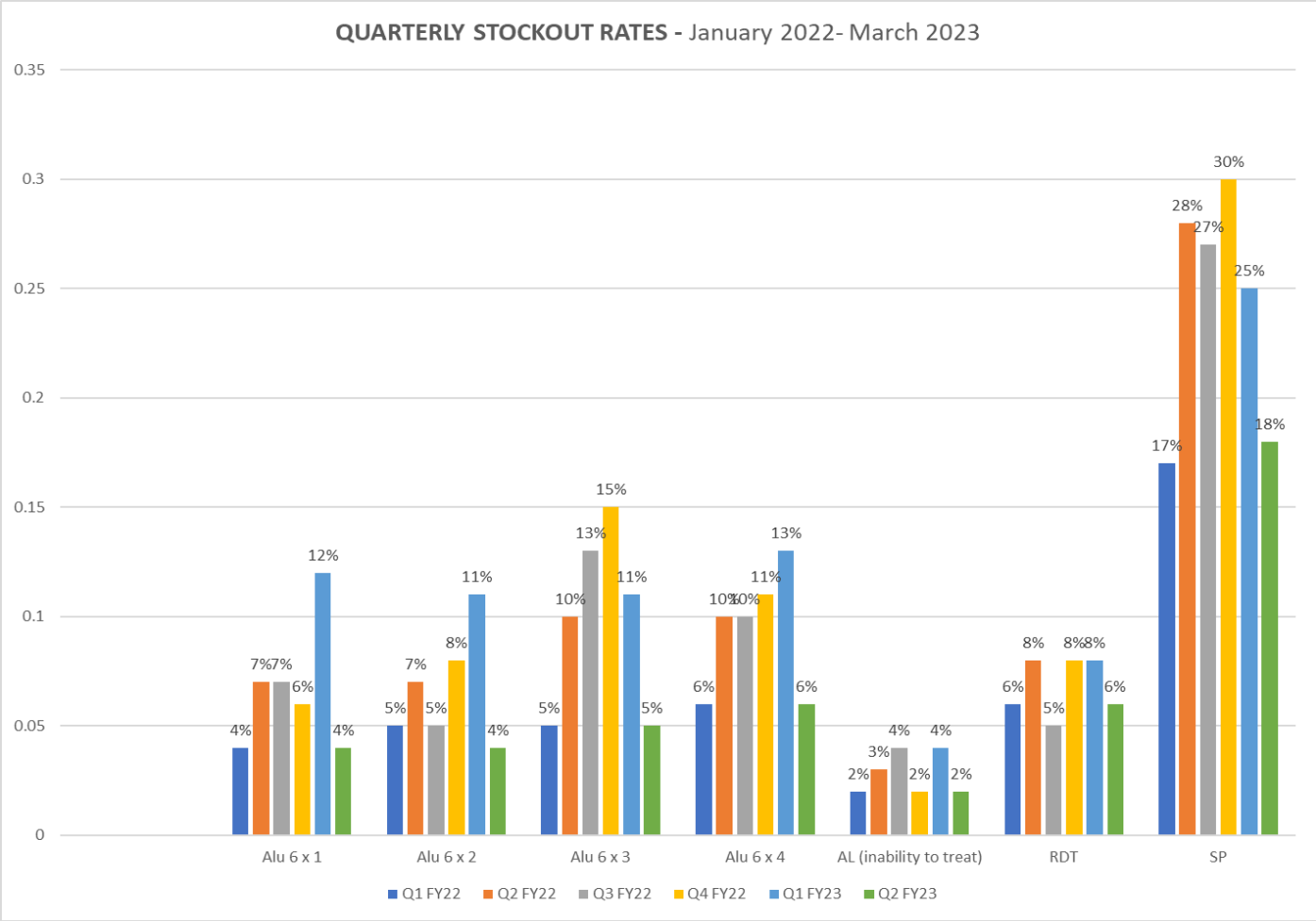
**Data management:**

PMI supported the enhancements and operations of the NHLMIS. The NHLMIS is the logistics data reporting platform for all public health programs (malaria, HIV/AIDS, family planning, maternal, newborn and child health, and tuberculosis) in Nigeria. Bi- monthly reports are pulled, giving visibility into stock on hand at facility levels, stock out rates and quantity to re-supply. The current enhancement is linking the NHLMIS to warehouse management systems to provide in-country end to end commodity visibility.

**Stockout of Malaria Commodities:**

Below is the stockout trend from the second quarter of FY 2022 (January–December 2022) through the second quarter of FY 2023 (January–March 2023). Stock out reduction strategies put in place were successfully implemented reducing the stockout rate of malaria commodities below ten percent in Q2 FY 2023 for all products except SP, which PMI does not procure.

**Figure 4. Service Delivery Point (SDP) Stockout Trend from Second Quarter of 2022 (January–March 2022) to First Quarter of 2023 (January–March 2023)**




PMI supported two rounds of End Use Verification surveys in FY 2022. PMI has been triangulating eLMIS and HMIS data (from NHLMIS and DHIS2 platforms) and following up with facilities that have a high ratio of ACTs consumed to malaria cases. This has resulted in a decline in ACT use/reported case ratio in the 11 PMI-focus states, which suggests an improvement in testing and reporting and resulted in lower ACT consumption. Under reporting of malaria cases through the HMIS, shortage of logistics tools at facilities, poor documentation of inventory control cards and outpatient department registers are contributing factors to the

discrepancy in consumption versus reported cases. Additionally, PMI-supported facilities also provide ACTs to other facilities not currently supplied by PMI.

**Medicines Quality and Regulation:**

PMI supported medicines regulatory and quality control and assurance activities. Below is a list of activities supported in FY 2022.

- Supported and continues to support provision of technical assistance to pharmaceutical manufacturers (Swipha and Emzor) in their WHO PQ process for SP.
- Supported provision of technical assistance to local manufacturers of Sulfadoxine/Pyrimethamine (SP) (500/25mg) and AL (20/120mg: 40/240; 80/140 mg) tablets in submission of product dossiers to WHO PQ dossier evaluation team.
- Supported NAFDAC with two rounds of risk-based post-marketing surveillance.
- Supported NAFDAC in building capacity for malaria vaccines lot release by providing capacity strengthening on preventive maintenance of equipment used for vaccine testing, providing TA/ guidance for biological testing, training of laboratory staff on various aspects of quality control testing for biologicals / biotherapeutics and development of procedures / guidelines for biologicals / vaccine lot release.
- Supported and continues to support NAFDAC with the ongoing WHO PQ of the central drug laboratory, Yaba.
- Supported NAFDAC systems improvement activities towards WHO global benchmark tool certification.
- Supported training of more than 2,500 operators of community pharmacies and proprietary patent medicine vendors (PPMVs) on selected supply chain best practices and quality assurance topics for medicines across the current six implementation states.
- Supported the Pharmacists Council of Nigeria to catalyze the registration of 406 community pharmacies and 4,098 PPMVs across the states, compared to 257 community pharmacies and 1,898 PPMVs in the previous period.

**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.

PMI Nigeria FY 2024 funds will be used to support the following activities:

**Drug Management Agencies Support**

PMI will strengthen the capacity of state DMAs and Logistics Management Coordination Units to coordinate all supply chain activities at the state and HFs levels. PMI-focus states will be supported to establish DMAs to coordinate all supply chain activities. This is in line with the NMSP 2021-2025 and National Health Products Supply Chain Strategy and Implementation

Plan 2021-2025. PMI will also continue to support storage and distribution of malaria commodities from state owned and private sector operated central medical stores.

**Warehousing and Distribution**

PMI will support state DMAs and Logistics Management Coordination Units to manage integrated warehousing and last mile distribution contracts at the state level. PMI will also support framework contracts for last mile distribution of malaria commodities coordinated by states' medicines management agencies.

**Procurement of Malaria Commodities**

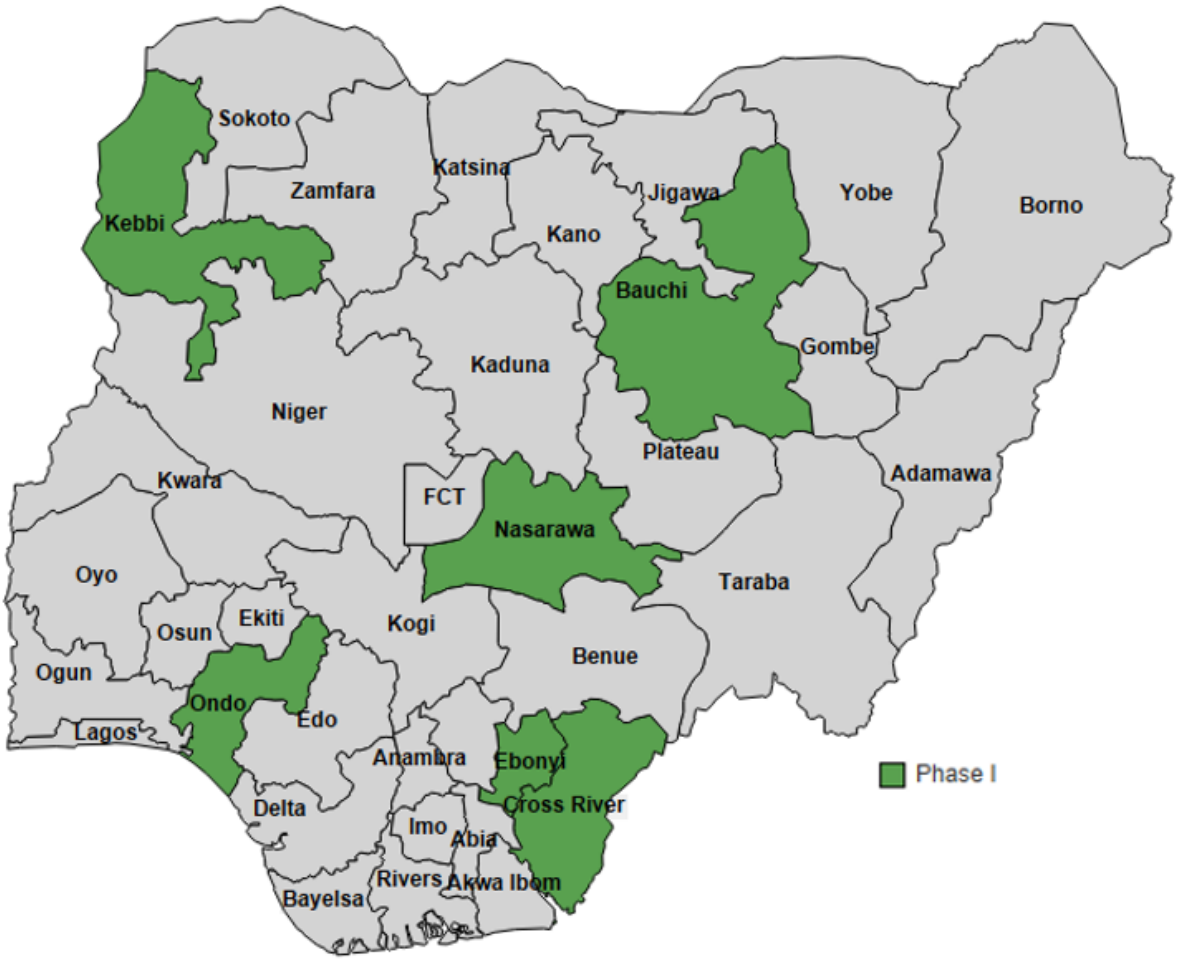
PMI will link state medicines management agencies to procure quality assured malaria medicines from local pharmaceutical manufacturers supported by PMI.

## 6. Malaria Vaccine

Nigeria MOH, in collaboration with the NMEP and other malaria stakeholders, submitted an application to GAVI for possible implementation of the RTS,S malaria vaccine (April 18, 2023). Nigeria accounts for 31 percent (191,890; World Malaria Report 2022)[8] of malaria deaths in children under five years of age and RTS,S is sorely needed to mitigate this intolerable burden. Due to the limited supply, Nigeria has prioritized possible malaria vaccine implementation zones in terms of malaria morbidity and mortality and has developed a phased implementation plan which prioritizes the highest burden and then expands the coverage. Although the Nigeria malaria vaccine plan is scheduled for 2024 implementation, global supply of RTS,S is limited and it is doubtful that enough vaccine doses will be available for distribution in Nigeria. Nigeria MOH, NMEP, and PMI are awaiting GAVI's response on the malaria vaccine request.

[8] World malaria report 2022. World Health Organization (Geneva, Switzerland, 2022): https://www.who.int/teams/global-malaria-programme/reports/world-malaria-report-2022.

**Figure 5. Map of Malaria Vaccine Prioritization and Implementation Plan for Nigeria**




| NIGERIA MALARIA INTRODUCTION APPROACH | | |
|---|---|---|
| **PHASES** | **LOCATIONS DEPLOYED** | **DATE** |
| Phase I | 17 LGAs from 6 states | April 2024 |
| Phase II | Other LGAs in Category 1 (additional 381 LGAs = 398) | April 2025 |
| Phase III | Nationwide deployment (additional 376 LGAs = 774) | April 2027 |

### 6.2.1. PMI Goal and Strategic Approach

PMI Nigeria is providing technical support to the Nigeria MOH, NMEP, and other stakeholders as the country prepares for the possible roll-out of RTS,S.

### 6.2.2. Recent Progress (January 2022–March 2023)

PMI Nigeria provided technical support for the planning and application for RTS,S roll-out. The application was submitted to GAVI on April 18, 2023.

### 6.2.3. Plans and Justification for FY 2024 Funding

The FY 2024 funding tables contain a full list of activities related to other drug-based prevention that PMI proposes to support.

No FY 2024 PMI funds are currently planned for this activity.

## 7. Social and Behavior Change

### 7.1. PMI Goal and Strategic Approach

PMI's SBC support to the NMEP aligns with, and contributes to the attainment of all five objectives of the NMSP 2021-2025 and its affiliated National Malaria ACSM Strategy. In Nigeria, ACSM is used interchangeably with SBC. The NMSP positions ACSM as a cross-cutting strategy to promote positive behaviors for the prevention and control of malaria; and keep malaria high on the political agenda through sustained, result-oriented advocacy, at all levels. The revised Malaria ACSM Strategy places emphasis on data-driven SBC that is tailored to local contexts and beneficiary needs and influences behavior at policy, service or systems, community, and household/individual levels.

PMI's support is achieved through data-driven, coordinated communication and non-communication interventions deployed across 11 PMI-focus states. Through collaborations and partnerships with local media organizations, faith and community leaders, and community volunteers, PMI supports the NMEP's efforts to expand mass media, digital media, and community level IPC activities to increase correct and consistent ITN use and care, prompt care-seeking for fever, uptake of RDT tests and IPTp, and provider adherence to diagnostic results for treatment with ACTs. At federal and subnational levels, PMI supports capacity strengthening for the design and coordination of SBC activities; implementation and monitoring of the national ACSM strategy; and development of ACSM components of annual malaria and health operational plans. Finally, PMI supports the generation, analysis, and translation of malaria SBC evidence, including through three waves of behavioral sentinel surveys (BSS) in selected program areas of Sokoto, Kebbi and Zamfara states between 2019 and 2022. The BSS surveys assessed changes in key malaria ideations and behavioral indicators among women with children under the age of two years of age and their spouses who are exposed to PMI-funded SBC interventions, to inform near real-time adaptations to program implementation.

### 7.2. Recent Progress (January 2022–March 2023)

**Priority Behaviors:** ITN use and care, provider adherence to fever case management guidelines, prompt[9] care-seeking for fever.

**Primary Audiences:** Pregnant women, caregivers of children under the age of five, health care providers at PHCs.

**Secondary Audiences:** Heads of households, officers in charge of PHCs, religious and community/traditional leaders.

**Other beneficiaries:** Local (government and privately owned) radio stations, SMEPs.

**Intervention Types:** Before, during and post ITN campaign SBC activities, mass (radio and TV), digital media (short messaging service), interactive voice response, and interpersonal communication (compound meetings, dialogues and household visits).

**Geographic Coverage:** All 11 PMI-focus states.[10]

**Key Results and Achievements**

- Sustained partnerships with media and telecom organizations extended access to "fever care" campaign messages via mass and digital channels across all 11 PMI-focus states: Malaria radio spots aired over 53,300 times, and at least 45 percent (23,989 times, valued at $216,011), were aired as complementary spots donated by 53 local media organizations. Partnership with Airtel Nigeria further extended the reach of malaria spots via the 3-2-1[11] channel, with callers accessing content over 2.8 million times (7.6 times more than other health content).
- Interpersonal communication channels doubled reach: 2,286 trained volunteers made contact with over 1.8 million people across 602 wards in eight malaria-only SBC states[12] and 3.3 million people in 579 wards in four integrated SBC states[13] through a total of 739,949 events[14] to promote appropriate malaria prevention (ITN use and care); diagnosis (testing before treatment); and treatment (prompt care-seeking for fever). As a result of volunteer-led activities, 141,583 pregnant women were referred to HFs for ANC/IPTp and 440,119 fever cases were referred for diagnosis and treatment, with 48 percent and 65 percent completion rates respectively. Referral completion rates for fever increased by 25 percentage points from the previous year while referral completion rates for ANC/IPTp increased 44 percentage points from the previous year. Improvements resulted from increased follow-up via repeat household visits and short

[9] Within 48 hours of onset of symptoms.
[10] Akwa Ibom, Bauchi, Benue, Cross River, Ebonyi, Kebbi, Nasarawa, Oyo, Plateau, Sokoto, Zamfara.
[11] Samuel Afolabi. "Airtel 3-2-1 service – Free search info for Mobile phones unveiled by Airtel in Nigeria." TechVaz Web article. https://techvaz.com/airtel-nigeria-3-2-1-free-call-search-service/.
[12] Akwa Ibom, Benue, Cross River, Nasarawa, Oyo, Plateau and Zamfara.
[13] Bauchi, Ebonyi, Kebbi and Sokoto.
[14] Community dialogues, compound meetings, and household visits.

messaging service reminders, as well as improved access to emergency transport services, organized and resourced by ward health development committees.

- Trained teachers managed school-based health clubs across thirty government-owned secondary schools across three states[15], engaging 65,295 children (900 percent increase from 2021) using the malaria SBC toolkit, games, malaria pledge, quizzes, and debates.
- Targeted advocacy and SBC support improved ownership, use and care for ITNs: PMI supported pre-, during, and post-ITN campaign SBC activities in Kebbi, Sokoto, Nasarawa, Ebonyi, Akwa-Ibom and Oyo state[16] contributing to 93-99 percent ITN redemption, 87-99 percent retention, and 56-89 percent hanging rates across states. Using end process assessment data, PMI supported post-campaign messaging across 78 LGAs with low hanging and use rates. Advocacy resulted in state government contributions ranging from $94,779 (6.9 percent of total ITN distribution cost) in Akwa-Ibom to $431,136 (33 percent of total ITN distribution cost) in Sokoto State.
- Strengthened peer-led provider networks and continued technical assistance for improved fever case management: PMI continued to support the adaptive implementation of five behavioral economics prototypes across 1,317 facilities in four states[17] and scaled up to fifty additional facilities in two states[18] through close collaboration and coordination with the service delivery partner. Analysis of pre- and post-implementation data from HMIS in March 2022 from the latter fifty facilities found improvements in fever testing rates by an average of 2.8 and 1.5 percentage points in Nasarawa and Zamfara states, respectively. In addition, 4,794 health providers were reached through over 236 peer cluster and professional association meetings to strengthen peer networks, promote shared norms and group problem-solving.
- Strategy Development, Capacity Building/Strengthening: PMI supported the development and deployment of interactive voice response technology-enabled mobile curriculum for refresher training, WhatsApp closed user groups, and short messaging service texts directed at health providers to reinforce learnings on adherence to fever case management guidelines. An after-action review of the deployment of an eight-module interactive voice response curriculum among 1,772 community volunteers and 76 supervisors across five PMI-focus states found 80 percent completion rates and 15 percent increase in pre- and post-test knowledge scores.

Despite progress, challenges remain which require continued SBC investment to address the determinants of the uptake and/or maintenance of prevention, care-seeking, and treatment behaviors.

[15] Benue, Cross River, and Oyo states.
[16] Pre, during and post ITN campaign SBC activities in Kebbi, Sokoto, Nasarawa, Ebonyi, Akwa Ibom states. Oyo state benefitted from post campaign SBC activities only—distribution held in previous year.
[17] Akwa Ibom, Cross River, Ebonyi, Oyo.
[18] Nasarawa, Zamfara.

- **ITNs:** Nigeria's use:access ratio dropped from 0.7 (DHS 2018) to 0.6 (MIS 2021) with wide variations from 0.3-0.8 across PMI-focus states, necessitating continued investments in tailored SBC interventions to address behavioral factors across states.
- **Care-Seeking Behavior:** The 2021 MIS reported a 31-percentage point difference between children for whom care was sought (62.8 percent) and sought promptly (31.7 percent). Evidence suggests a mix of internal and social factors facilitate or create barriers to prompt care-seeking, many of which may be amenable to SBC interventions.
- **Fever Case Management:** The Nigeria MIS 2021 found that providers tested 24.3 percent of children with fever, for whom formal care was sought (up from 14 percent estimated in the DHS 2018), suggesting continued room for improvement in HW adherence to diagnostic and treatment guidelines at facilities nationally.
- **MIP:** Despite improvements in the uptake of IPTp3+ from 17 percent (DHS 2018) to 31 percent (MIS 2021), gaps remain. Missed opportunities for increasing IPTp coverage mostly result from facility-level structural factors, justifying continued channeling of PMI investments through service delivery implementing partners to address clinical knowledge and skill deficits. Community-level SBC activities will continue to deploy messages across all focal states, to address behavioral barriers to early and consistent ANC uptake, improve pregnancy-related ideations, and increase IPTp uptake.

### 7.3. Plans and Justification with FY 2024 Funding

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

While PMI supports SBC activities that promote the uptake and maintenance of all key malaria interventions, the following three behaviors will be prioritized with FY 2024 funds:

**Table 4. Priority Behaviors to Address**

| Behavior | Target Population | Geographic Focus | Programming to Address Behavior |
|---|---|---|---|
| Consistent ITN Use/Maintenance and Care | All members of a household | Akwa-Ibom, Kebbi, Nasarawa, Sokoto, and Oyo states | • Coordinate and implement pre-, during, and post-campaign SBC activities (Akwa-Ibom, Nasarawa, Kebbi, Sokoto) through multi-communication channels while maintaining post-campaign messaging in Oyo State.<br>• Post-campaign SBC activities across all five states (use:access ratio ranging from 0.3-0.7), will increase the prevalence of known predictors of ITN use and care, all-year-round, deployed mainly through mass media, community-level interpersonal and digital channels. |

| | | | |
|---|---|---|---|
| Prompt Care-Seeking for Fever for Children Under Five Years of Age | Caregivers of Children Under 5 Years of Age | All 11 PMI-focus states | • Increase reach, exposure to, and recall of PMI-funded national "fever care" campaign to modulate evidence-based determinants[19] of care-seeking behavior via mass, digital, social media, and IPC channels.<br>• Channel-mix[20] will include community-level IPC (primary channel) and mass media. |
| Adherence to Case Management Guidelines | Health Facility Based Providers (across cadres) | All 11 PMI-focus states | • Sustain peer-to-peer engagement and group problem solving through provider cluster and professional association meetings.<br>• Provision of SBC technical assistance to service delivery partners for the continued deployment of behavioral prototypes. |

IPC: interpersonal communication; ITN: insecticide-treated mosquito nets; SBC: social and behavior change.

Across all prioritized behaviors, and defined geographies, SBC interventions will continue to deploy enhanced audience segmentation approaches to prioritize and strengthen coverage. At projected funding levels, geographic coverage for community-level activities will remain at the same levels as the previous implementation year. Current PMI investments support select states to operationalize the CHIPS program and community-level interpersonal SBC activities will leverage CHIPS agents for the delivery of data-informed messaging, and service referrals.[21] As more states recruit, train, and integrate CHIPS agents into the PHC human resource database and fund their remuneration (in part or wholly) using basic health care provision funds, as well as through national and state government health plans and operational budgets, it is anticipated that this will result in cost gains.

**Additional Support Activities:**

**SBC Research:** Following analysis of malaria behavioral data from the DHS 2023 (results available in CY 2024), and continued analysis of the BSS data set from Sokoto, Kebbi, and Zamfara, it is anticipated that gaps in SBC evidence will be addressed. No SBC research is proposed with FY 2024 funding.

**Malaria Vaccine SBC:** While promoting increased coverage of priority malaria prevention and treatment behaviors (outlined in 6.3 above), and subject to availability of vaccine products, PMI

[19] 2022 behavioral sentinel surveillance (BSS) survey among 3,144 women with children under the age of two and their spouses randomly selected from 86 intervention wards in Kebbi, Sokoto & Zamfara found statistically significant determinants of care-seeking for fever to include perceived severity of malaria; perceptions of health service readiness & (women) self-efficacy to convince partner to seek care for sick child.

[20] 2017 PMI-funded end-line evaluation of HC3 Nigeria found that caregivers in community intervention areas were 67 percent more likely to seek care promptly than those in non-intervention wards, exposure to mass media interventions is associated with a significant increase in general malaria ideation and believe that women should participate in household decisions about child health.

[21] Nigeria National Primary Health Care Development Agency. Community Health Influencers Promoters And Services (Chips) Programme National Implementation Guidelines. (Lagos, Nigeria, February 2022): https://www.health.gov.ng/doc/CHIPS_Programme_Guide_Design_NEW-1-3_(1).pdf.

will support the NMEP, primary healthcare development agency, and other stakeholders to develop and implement communication and demand aspects of the malaria vaccine strategy as part of national child routine immunization strategies and plans. PMI support will be data-driven, tailored to subnational contexts and will aim to increase community and caregiver acceptance and demand for vaccines; promote adherence to four-dose schedule; promote continued and sustained use of existing malaria interventions; and leverage rumor management systems to monitor and address mis/disinformation. SBC support will complement service delivery-led efforts to improve health provider competencies.

**SBC Capacity Strengthening:** There is a need for continued SBC capacity strengthening at both the national and subnational levels, with sustained and increased level of effort at the state level. To bolster the NMEP and SMEP ACSM capacity for the planning, design, implementation, and evaluation of SBC activities, PMI will continue to support:

- Improved partner coordination through targeted support to relevant SBC technical working groups and communities of practice at national and sub-national levels.
- Timely development of annual ACSM operational plans (as part of malaria program operational plans), as well as funding and execution rates.
- Capacity strengthening and “upskilling” of the elimination program staff (at national and subnational levels) for data triangulation and use e.g., analyzing and interpreting “service-demand-commodity” data (drawn from HMIS, eLMIS, insights from behavioral surveys etc.) to inform SBC priorities and strategies.
- Strengthen capacity at the national and subnational level for SBC for *An. stephensi*. Focus will be limited to adapting the global SBC guidance, which provides key recommendations for areas where *An. stephensi* has and has not been identified, to the Nigeria context.

## 8. Surveillance, Monitoring, and Evaluation

### 8.1. PMI Goal and Strategic Approach

The PMI objectives are to support malaria surveillance system strengthening and monitoring and evaluation (M&E) of malaria interventions as stated in the country’s National M&E Strategy Plan (2021–2025) in the 11 PMI-focus states. Below are key data-related areas that PMI will support in collaboration with other partners like the Global Fund, WHO, World Bank, Islamic Development Bank, UNICEF, and local non-governmental organizations:

- Strengthen the generation and reporting of quality malaria data through routine and non-routine sources; improve data flow from public and private HFs (primary, secondary, and tertiary).
- Strengthen data flow from community health providers (PPMVs, community pharmacists, and community HWs).
- Strengthen Data Quality Assessment and broader surveillance systems assessments.
- Strengthen local partnership and collaboration.

- Improve generation of evidence from evaluations, TES, and entomological surveillance studies to guide the strategic deployment of interventions.
- Improve the generation of evidence by conducting program reviews at different levels.
- Improve integration of malaria data and surveillance systems and strengthen the capacity of M&E and malaria program officers at all levels of surveillance, monitoring, and evaluation (SM&E).

**8.2. Recent Progress (January 2022–March 2023)**

At the national level, PMI supported the following activities:

- Provision of technical support and leadership in the coordination of SM&E sub-committees. PMI led 12 National SM&E sub-committees meetings.
- Development and piloting of a digital ITN campaign management tool (using mobile app *Ipolongo*).
- Provision of technical guidance and oversight function over the TES sites to generate local evidence on the efficacy of currently used antimalarial medicines.
- Development and dissemination of four quarterly National Malaria Data Repository (NMDR) bulletins to improve the availability of evidence for informed decision-making and planning.
- Provision of technical expertise for the collection, analysis, and use of entomological surveillance data across the country to improve malaria vector control.
- Harnessing and storage of routine and non-routine data on the NMDR.
- Dissemination of MIS 2021 results in the national and six geopolitical zones of the country. The results are being used to make programmatic decisions towards malaria control at both the national and subnational levels.

At the subnational levels, PMI supported the following activities:

- Strengthened the M&E systems to ensure continuous availability of quality data at the community, HF, LGA, state, and national level in both public and private HFs by developing SM&E training manuals, building the capacity of 71 HWs on data quality assessment, National Health Management Information System tools quantification to sustain the data reporting tools pipeline and the correct use of the tools in the 11 PMI-focus states; these will yield better results as the push for the Government to be more responsive in the printing of data reporting tools is sustained.
- Supported the use of Information Communication Technology digital tools at the community level for data generation and reporting. These tools provided more timely data at all levels for informed decision-making. This continued to help address part of the persistently emerging security challenges in the country.
- Strengthened the capacity of 55 data managers on the use of the NMDR.
- Strengthened the capacity of 55 data managers on the use of available data for better planning and timely decision-making.

### 8.3. Plans and Justification with FY 2024 Funding

In FY 2022, PMI focused on strengthening the HMIS and data use at the national and subnational levels by ensuring the capacity of personnel and the availability of tools for enhancing performance in an enabling environment for optimal performance. During that period, 181 personnel were trained. The training covered interpretation of malaria indicators, data management, data quality assessment, utilization of NMDR for data use for planning and decision-making.

With FY 2024 funding, building on the success from the previous years and with a focus on data quality improvement and data use strategies as data quality remains a challenge, PMI will support the NMEP in the following:

- Improve malaria data availability for decision-making by continuously mentoring the program on quantification of data reporting tools. Expand the coverage of data reporting by public and private high-volume sites (Secondary and Tertiary). Ensure that NMDR has the capacity to harness and house routine and non-routine data including pulling climatic data from available climatic data services while scaling up its use to all PMI-focus states by supporting the web hosting of the platform and building the capacity of data management personnel and other health personnel on its use.
- Sustain support for strengthening data quality and by extension quality decisions using data quality improvement platforms including data quality assurance, data validation and data quality control room. Digital tools will be used to monitor data quality and provide near real time feedback to stakeholders for follow-up.
- Strengthen the capacity of M&E, epidemiology and data personnel on data analysis and use using state-of-the-art digital tools.
- Provide advisory roles to NMEP on the role of national malaria digitalization expert group, its adherence to ensuring harmonized malaria and non-malaria digital tools and its alignment with state of the technology.
- Use 2021 MIS data, 2023 DHS data and data from other sources as shown in Table 5 for program planning and for preliminary planning for the MIS in CY 2026.
- Deploy the digital tool, *Ipolongo*, for planned ITN campaigns in CY 2025 focusing on PMI- focus states. This is expected to improve the efficiency, accountability and coverage of the campaigns.
- Scale up the operationalization of community health information system tools while providing on-the-job capacity strengthening for community HWs and assessment of the quality of service in Bauchi, Benue, Ebonyi, Kebbi, Sokoto, and Zamfara where community interventions are either being implemented or plans are in place for implementation. The scale up is expected to make available a wider spectrum of quality data for evidence-based malaria programming.

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

**Table 5. Available Malaria Surveillance Sources**

| Source | Data Collection Activity | CY 2021 | CY 2022 | CY 2023 | CY 2024 | CY 2025 | CY 2026 |
|---|---|---|---|---|---|---|---|
| Household Surveys | Demographic Health Survey | | | P | | | |
| Household Surveys | Malaria Indicator Survey | X | | | | | P |
| Household Surveys | Multiple Indicator Cluster Survey | X* | | | | P* | |
| Household Surveys | Expanded Program on Immunizations Survey | | | | | | |
| Health Facility Surveys | Service Provision Assessment | | | | | | |
| Health Facility Surveys | Service Availability Readiness Assessment Survey | | | | | | |
| Health Facility Surveys | Other Health Facility Survey | | | | | | |
| Malaria Surveillance and Routine System Support | Therapeutic Efficacy Studies | X | | P | P | P | P |
| Malaria Surveillance and Routine System Support | Support to Parallel Malaria Surveillance System | | | | | | |
| Malaria Surveillance and Routine System Support | Support to Health Management Information System | X | X | P | P | P | P |
| Malaria Surveillance and Routine System Support | Support to Integrated Disease Surveillance and Response | X* | X* | P* | P* | P* | P* |
| Malaria Surveillance and Routine System Support | Electronic Logistics Management Information System | X | X | P | P | P | P |
| Malaria Surveillance and Routine System Support | Malaria Rapid Reporting System | | | | | | |
| Other | End Use Verification | X | X | P | P | P | P |
| Other | School-based Malaria Survey | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Other | Knowledge, Attitudes and Practices Survey, Malaria Behavior Survey | X | X | | | | |
| Other | Malaria Impact Evaluation | | | | | | |
| Other | Entomologic Monitoring Surveys | X | X | P | P | P | P |

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

## 9. Operational Research and Program Evaluation

### 9.1. PMI Goal and Strategic Approach

The NMEP objective for operational research is included under Objective 3 of the NMSP 2021–2025, which states: “To improve the generation of evidence for decision-making and impact through reporting of quality malaria data and information from at least 80 percent of HFs (public and private) and other data sources including surveillance, surveys, and operations research by 2025.” Specifically, strategies 3.3, 3.4, and 3.5 address the important areas ranging from the capacity to conduct operational research to data use for decision-making. The goal of the NMSP 2021–2025 is to reduce malaria morbidity to less than 10 percent parasite prevalence and mortality attributable to malaria to less than 50 deaths per 1,000 by 2025. A key element in achieving this goal is the need for well-tailored malaria operational research to implement the most impactful interventions. The NMEP in collaboration with its partners developed a National Malaria Operations Research Agenda (NMORA).

The goal of the NMORA is to provide a situational analysis of the progress in malaria research and guide researchers, academic institutions, program implementers, health development partners, donors, policymakers, non-governmental organizations, and other stakeholders to identify malaria research priorities by thematic areas for Nigeria. However, implementation of the NMORA has been slow due to the absence of a critical framework and inadequate funding to coordinate and communicate the NMORA priorities for improved uptake by research institutions.

The implementation framework for the NMORA includes coordination, resource mobilization, engagement with stakeholders, capacity-building, review, monitoring and evaluation of the NMORA, and dissemination of research findings. To address these challenges, the NMEP included the funding of the operational research agenda coordination in the Global Fund request for the 2024–2026 Malaria grant. The grant supported studies on fever surveillance and test positivity rate in some states.

An operational research stakeholder prioritization meeting was held on July 23–24, 2019. The meeting was coordinated by NMEP alongside partners to achieve the following objectives:

- Prioritize areas in the project cycle that may require operational research to optimize delivery.
- Promote awareness of operational research priorities for malaria among researchers in Nigeria.
- Strengthen mechanisms for establishing links and coordination between NMEP and research institutions.
- Explore resource mobilization options to support the malaria operational research agenda.
- Establish systems to enhance the translation of malaria operational research into use for decision-making.

### 9.2. Recent Progress (January 2022–March 2023)

Kebbi has the highest malaria prevalence among children under 5 years of age at 49 percent. PMI Nigeria in collaboration with the NMEP, SMEPs and malaria stakeholders have prioritized malaria prevention (ITNs, SMC) in Kebbi State. While malaria reductions in Kebbi to date have yet to be realized following the CY 2022 ITN campaign (with dual AI nets), PMI Nigeria is focused on innovative approaches to malaria control in Kebbi. Given Kebbi has a high number of malaria favorable agriculture activities (i.e., rice paddies potentially supporting perennial transmission), PMI Nigeria supported a LSM feasibility assessment in Kebbi in CY 2022. The assessment confirmed the preponderance of larval habitats formed in rice paddies by irrigation as a major breeding source during the dry season. The assessment also identified the best time to implement larviciding due to the increased mosquito abundance, indoor resting density, and biting rate associated with malaria transmission. As such, a pilot project will be designed and a PMI Operational Research concept note will be developed in consultation with relevant stakeholders, to be submitted to the PMI Operational Research committee for review, along with reprogramming of FY 2023 funds.

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

| **Recently Completed OR/PE Studies*** | **Status of Dissemination** | **Start date** | **End date** |
|---|---|---|---|
| Feasibility Assessment of Larval Source Management in Kebbi | Pending | March, 2022 | August, 2022 |
| **Ongoing or Planned OR/PE Studies**** | **Status** | **Start date** | **End date** |
| Pilot of Larval Source Management in Kebbi | PMI OR concept note under development | TBD | TBD |

PE: program evaluation; OR: operations research. TBD: to be determined.

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

| Source of Funding | Implementing institution | Research Question/Topic | Current status/ timeline |
|---|---|---|---|
| PMI core funding and Bill & Melinda Gates Foundation | PMI Insights: PATH and Sydani Group | To measure the degree of agreement between RDT results as recorded in health facility registers and results determined by an independent, objective panel that will independently review high-quality photographs of the RDTs taken through a smartphone-based application. | The data collection began in May 2023; the study results will be available in June 2024. |

### 9.3. Plans and Justification with FY 2024 Funding

The FY 2024 funding tables contain a full list of OR/PE activities that PMI proposes to support.

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

## 10. Capacity Strengthening

### 10.1. PMI Goal and Strategic Approach

PMI Nigeria supports interventions which aim to strengthen the institutional and individual capacity of national, subnational, and local level malaria programs and teams to lead, manage, implement, and oversee their own programs effectively to achieve their own objectives. It provides this support through a multipronged approach consisting of a mix of long and short-term interventions aimed at strengthening the capacity of individual malaria program personnel and teams. This includes building line systems and the institutional capacity of the S/NMEP and SMOH.

PMI uses training, coaching, mentoring, supportive supervision, and on-the-job capacity strengthening to enhance individuals' and teams' capacity to deliver malaria services and manage programs at all levels. Techniques used to enhance institutional capacity include supporting a functional organizational structure, benchmarking of malaria planning and review processes, coordinating internal activities, and tracking performance.

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

PMI funds short-term training of permanent government staff in the technical aspects of malaria, management, and leadership. It also supports providing three technical experts seconded to selected branches of the NMEP (PSM, SM&E) as integral members of these teams to transfer knowledge, skills, and strengthen capacity. In addition, it funds oral or poster presentations by S/NMEP at conferences at which the outcome is beneficial to the country's program. PMI funds training the advanced Field Epidemiology Training Program (FETP) national level two-year training and frontline FETPs to support MOH's efforts to initiate and strengthen local epidemiologic and laboratory data collection, management, analysis, and dissemination capacity. This aims to support the MOH to build sustainable capacity for local detection and response to health threats, including sudden increases in malaria transmission. PMI expects that investments in FETP will produce a cadre of public health workers that use science and data to identify, respond to, and manage acute health problems with appropriate strategies and policies and that this cadre will have a positive impact on malaria program efforts following completion of training.

**10.2. Recent Progress (January 2022–March 2023)**

PMI continues to provide technical support to NMEP, in accordance with its NMSP 2021-2025. The vision is to provide equitable, comprehensive, cost-effective, efficient and impactful malaria control interventions through transparent, accountable, client-oriented, community-owned and multisectoral approaches that contribute to a strengthened health system. To support NMEP to achieve this vision:

- PMI supported the training of eligible fellows nominated by the NMEP in the advanced Nigeria Field Epidemiology and Laboratory Training Program. The responsibility of implementing this program transitioned from Africa Field Epidemiology Network to NCDC, which resulted in delays in the completion of the ongoing course.
- PMI supported the NMEP to develop and present relevant malaria abstracts for poster sessions at the 2022 American Society of Tropical Medicine and Hygiene conference. PMI also funded the participation of selected NMEP staff at the conference and participation of SMOH staff in MIP working group meetings.
- PMI funded activities to strengthen S/NMEP's capacity for program planning by supporting the development of the S/NMEP's 2023 Annual Malaria Operational Plans and the review of the implementation of current plans.
- PMI supported mentoring of personnel of NMEP's case management, SM&E, and program management branches, as one of the activities in the NMEP institutional capacity strengthening plan.
- PMI provided support needed for malaria program in Nigeria by ensuring supply-chain and SM&E technical experts are co-located in the NMEP and WHO office.
- PMI provided the support needed to ensure NMDR is sustained by deploying a Data Manager at NMEP office whose role is to build NMEP capacity to manage the NMDR, including production of quarterly technical bulletins.

- PMI provided technical support that ensured integration of both routine and non-routine data into NMDR, and continues to explore links and sharing of datasets from the M-DIVE platform into NMDR.

### 10.3. 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.

PMI will continue to support the Nigeria Center for Disease Control (NCDC) to train eligible NMEP and MOH staff. Support will be provided to train two new and two existing fellows under the two-year, full-time, advanced Nigeria Field Epidemiology and Laboratory Training Program course ($62,500/year/trainee). Funds will also support eligible NMEP and MOH staff under the short-term three-month frontline FETP course. Technical experts will be seconded to selected branches of the NMEP as integral members of these teams, to transfer knowledge and skills, strengthen individual and organizational capacity, and support the institutionalization of relevant systems.

PMI will also support annual and bi-annual malaria program review and data review meetings. In addition, it will fund oral or poster presentations by S/NMEP at conferences and the participation of relevant government personnel, where the outcome is beneficial to the country's program. PMI will continue to support activities to strengthen S/NMEP's capacity for program planning, development of subsequent annual operating plans, as well as the review of the implementation of current plans.

## 11. Staffing and Administration

A minimum of seven health professionals oversee PMI in Nigeria. The single interagency team led by the USAID Mission Director or their designee consists of resident advisors representing USAID and CDC, and five 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, procurement, management and delivery of safe and effective malaria commodities and 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 | 2026 |
|---|---|---|---|---|
| Total country population | 241,833,954 | 249,845,979 | 258,147,677 | 266,751,593 |
| Total population at risk for malaria | 241,833,954 | 249,845,979 | 258,147,677 | 266,751,593 |
| PMI-targeted at-risk population | 65,732,414 | 67,807,456 | 69,948,234 | 72,156,838 |
| Population targeted for ITNs | 65,732,414 | 67,807,456 | 69,948,234 | 72,156,838 |
| **Continuous Distribution Needs** | | | | |
| Channel 1: ANC | 980,444 | 1,011,395 | 1,043,326 | 1,076,269 |
| Channel 1: ANC Type of ITN | Dual AI and PBO | Dual AI and PBO | Dual AI and PBO | Dual AI and PBO |
| Channel 2: EPI | 2,401,462 | 2,477,271 | 2,555,482 | 2,636,171 |
| Channel 2: EPI Type of ITN | | | | |
| Channel 3: School | | | | |
| Channel 3: School Type of ITN | | | | |
| Channel 4: Community | | | | |
| Channel 4: Community Type of ITN | | | | |
| Channel 5: | | | | |
| Channel 5: Type of ITN | | | | |
| Estimated Total Need for Continuous Channels | 3,381,906 | 3,488,666 | 3,598,808 | 3,712,440 |
| **Mass Campaign Distribution Needs** | | | | |
| Mass distribution campaigns | 14,358,903 | 5,610,737 | 14,851,604 | 18,778,525 |
| Mass distribution ITN type | Dual AI and PBO | Dual AI and PBO | Dual AI and PBO | Dual AI and PBO |
| Estimated Total Need for Campaigns | 14,358,903 | 5,610,737 | 14,851,604 | 18,778,525 |
| **Total ITN Need: Continuous and Campaign** | **17,740,809** | **9,099,403** | **18,450,412** | **22,490,965** |
| **Partner Contributions** | | | | |
| ITNs carried over from previous year | 4,400,000 | 0 | 0 | 0 |
| ITNs from Government | 0 | 0 | 0 | 0 |
| Type of ITNs from Government | | | | |
| ITNs from Global Fund | 0 | 0 | 0 | 0 |
| Type of ITNs from Global Fund | | | | |
| ITNs from other donors | 8,755,325 | 0 | 10,800,000 | 15,937,092 |
| Type of ITNs from other donors | Dual AI and PBO | | Dual AI and PBO | Dual AI and PBO |
| ITNs planned with PMI funding | 1,499,325 | 5,893,644 | 1,800,000 | 2,000,000 |
| Type of ITNs with PMI funding | Dual AI | Dual AI | PBO | PBO |
| **Total ITNs Contribution Per Calendar Year** | **14,654,650** | **5,893,644** | **12,600,000** | **17,937,092** |
| **Total ITN Surplus (Gap)** | **(3,086,159)** | **(3,205,759)** | **(5,850,412)** | **(4,553,873)** |

AI: active ingredient; ANC: antenatal care; EPI: expanded program on immunization; ITN: insecticide-treated mosquito net; PBO: piperonyl butoxide

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

| Calendar Year | 2023 | 2024 | 2025 |
|---|---|---|---|
| Total country population | 241,833,954 | 249,845,979 | 258,147,677 |
| Population at risk for malaria | 241,833,954 | 249,845,979 | 258,147,677 |
| PMI-targeted at-risk population | 65,732,414 | 67,807,456 | 69,948,234 |
| **RDT Needs** | | | |
| Total # of projected suspected malaria cases | 78,878,897 | 81,368,947 | 83,937,881 |
| Projected suspected cases tested in the Public sector | 19,092,713 | 19,695,432 | 20,317,245 |
| % of suspected malaria cases tested with an RDT | 18,423,295 | 19,004,882 | 19,604,893 |
| **RDT Needs (tests)** | **18,423,295** | **19,004,882** | **19,604,893** |
| Needs estimated based on HMIS data | | | |
| **Partner Contributions (tests)** | | | |
| RDTs from Government | 3,257,462 | | |
| RDTs from Global Fund | 0 | | |
| RDTs from other donors | 0 | | |
| RDTs planned with PMI funding | 12,631,400 | 18,782,050 | 15,000,000 |
| **Total RDT Contributions per Calendar Year** | **15,888,862** | **18,782,050** | **15,000,000** |
| **Stock Balance (tests)** | | | |
| Beginning balance | 8,741,300 | 6,206,867 | 5,984,035 |
| - Product need | 18,423,295 | 19,004,882 | 19,604,893 |
| + Total contributions (received/expected) | 15,888,862 | 18,782,050 | 15,000,000 |
| **Ending Balance** | **6,206,867** | **5,984,035** | **1,379,141** |
| Desired end of year stock (months of stock) | 6 | 6 | 6 |
| Desired end of year stock (quantities) | 9,211,648 | 9,502,441 | 9,802,447 |
| **Total Surplus (Gap)** | **(3,004,781)** | **(3,518,406)** | **(8,423,305)** |

HMIS: health management information system; RDT: rapid diagnostic test.

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

| Calendar Year | 2023 | 2024 | 2025 |
|---|---|---|---|
| Total country population | 241,833,954 | 249,845,979 | 258,147,677 |
| Population at risk for malaria | 241,833,954 | 249,845,979 | 258,147,677 |
| PMI-targeted at-risk population | 65,732,414 | 67,807,456 | 69,948,234 |
| **ACT Needs** | | | |
| **Diagnosed Positive cases** | 13,499,122 | 13,507,504 | 13,503,009 |
| **Undiagnosed cases receiving ACT** | 549,652 | 567,004 | 584,905 |
| **Negative cases receiving ACT** | 1,734,191 | 1,788,936 | 1,845,415 |
| Total projected # of malaria cases (confirmed and presumptive) | 15,782,965 | 15,863,444 | 15,933,329 |
| **Total ACT Needs (treatments)** | **15,309,476** | **15,387,541** | **15,455,329** |
| Needs Estimated based on a Combination of HMIS and Consumption Data | | | |
| **Partner Contributions (treatments)** | | | |
| ACTs from Government | 7,746,359 | | |
| ACTs from Global Fund | | | |
| ACTs from other donors | | | |
| ACTs planned with PMI funding | 14,103,180 | 12,000,000 | 15,500,000 |
| **Total ACTs Contributions per Calendar Year** | **21,849,539** | **12,000,000** | **15,500,000** |
| **Stock Balance (treatments)** | | | |
| Beginning balance | 8,742,893 | 15,282,956 | 11,895,415 |
| - Product need | 15,309,476 | 15,387,541 | 15,455,329 |
| + Total contributions (received/expected) | 21,849,539 | 12,000,000 | 15,500,000 |
| **Ending Balance** | **15,282,956** | **11,895,415** | **11,940,086** |
| Desired end of year stock (months of stock) | 6 | 6 | 6 |
| Desired end of year stock (quantities) | 7,654,738 | 7,693,770 | 7,727,664 |
| **Total Surplus (Gap)** | **7,628,218** | **4,201,645** | **4,212,422** |

ACT: artemisinin-based combination therapy.

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

| Calendar Year | 2023 | 2024 | 2025 |
|---|---|---|---|
| **Injectable Artesunate Needs** | | | |
| Projected # of severe cases | 107,776 | 107,843 | 107,807 |
| Projected # of severe cases among children | 80,832 | 80,882 | 80,855 |
| Average # of vials required for severe cases among children | 3 | 3 | 3 |
| Projected # of severe cases among adults | 26,944 | 26,961 | 26,952 |
| Average # of vials required for severe cases among adults | 6 | 6 | 6 |
| **Total Injectable Artesunate Needs (vials)** | **404,160** | **404,411** | **404,277** |
| Needs Estimated based on HMIS Data | | | |
| **Partner Contributions (vials)** | | | |
| Injectable artesunate from Government | 27,237 | | |
| Injectable artesunate from Global Fund | | | |
| Injectable artesunate from other donors | | | |
| Injectable artesunate planned with PMI funding | 348,438 | 350,000 | 400,000 |
| **Total Injectable Artesunate Contributions per Calendar Year** | **375,675** | **350,000** | **400,000** |
| **Stock Balance (vials)** | | | |
| Beginning balance | 77,280 | 48,795 | 0 |
| - Product need | 404,160 | 404,411 | 404,277 |
| + Total contributions (received/expected) | 375,675 | 350,000 | 400,000 |
| **Ending Balance** | **48,795** | **(5,617)** | **(4,277)** |
| Desired end of year stock (months of stock) | 6 | 6 | 6 |
| Desired end of year stock (quantities) | 202,080 | 202,206 | 202,138 |
| **Total Surplus (Gap)** | **(153,286)** | **(207,822)** | **(206,415)** |

HMIS: health management information system.

**Table A-5. SP Gap Analysis Table**

| Calendar Year | 2023 | 2024 | 2025 |
|---|---|---|---|
| Total country population | 241,833,954 | 249,845,979 | 258,147,677 |
| Total population at risk for malaria | 241,833,954 | 249,845,979 | 258,147,677 |
| PMI targeted at risk population | 65,732,414 | 67,807,456 | 69,948,234 |
| **SP Needs** | | | |
| Total # of pregnant women | 1,544,712 | 1,593,475 | 1,643,783 |
| % of pregnant women expected to receive IPTp1 | 56% | 56% | 56% |
| % of pregnant women expected to receive IPTp2 | 44% | 44% | 44% |
| % of pregnant women expected to receive IPTp3 | 31% | 31% | 31% |
| % of pregnant women expected to receive IPTp4 | 31% | 31% | 31% |
| **Total SP Needs (doses)** | **2,489,038** | **2,567,612** | **2,648,675** |
| Needs estimated based on household survey data (e.g. DHS) | MIS 2021 | | |
| **Partner Contributions (doses)** | | | |
| SP from Government | 3,666,725 | 3,666,725 | 3,666,725 |
| SP from Global Fund | 0 | 0 | 0 |
| SP from other donors | 0 | 0 | 0 |
| SP planned with PMI funding | 0 | 0 | 0 |
| **Total SP Contributions per Calendar Year** | **3,666,725** | **3,666,725** | **3,666,725** |
| **Stock Balance (doses)** | | | |
| Beginning balance | | 1,177,687 | 2,276,800 |
| - Product need | 2,489,038 | 2,567,612 | 2,648,675 |
| + Total contributions (received/expected) | 3,666,725 | 3,666,725 | 3,666,725 |
| **Ending Balance** | **1,177,687** | **2,276,800** | **3,294,850** |
| Desired end of year stock (months of stock) | 6 | 6 | 6 |
| Desired end of year stock (quantities) | 1,244,519 | 1,283,806 | 1,324,338 |
| **Total Surplus (Gap)** | **(66,832)** | **992,994** | **1,970,512** |

DHS: Demographic and Health Survey; IPTp: intermittent preventive treatment during pregnancy; SP: sulfadoxine-pyrimethamine.

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

| Calendar Year | 2023 | 2024 | 2025 |
|---|---|---|---|
| Total population in the SMC targeted age range | 41,353,606 | 42,723,662 | 44,143,253 |
| **SMC Drug (SP+AQ) Needs** | | | |
| National population 3-11 months targeted for SMC | 7,857,185 | 8,117,496 | 8,387,218 |
| National population 12-59 months targeted for SMC | 33,496,421 | 34,606,167 | 35,756,035 |
| **Total national population targeted for SMC** | **41,353,606** | **42,723,662** | **44,143,253** |
| PMI population 3-11 months targeted for SMC | 411,920 | 424,733 | 437,946 |
| PMI population 12-59 months targeted for SMC | 1,756,080 | 1,810,706 | 1,867,032 |
| **Total PMI population targeted for SMC** | **2,168,000** | **2,235,439** | **2,304,978** |
| **Total SP+AQ Needs (co-blisters)** | **8,671,998** | **8,941,757** | **9,219,912** |
| **Partner Contributions (co-blisters, national)** | | | |
| SP+AQ carried over from previous year | 2,183,292 | 3,489,294 | 4,400,522 |
| SP+AQ from Government | 0 | 0 | 0 |
| SP+AQ from Global Fund | 0 | 0 | 0 |
| SP+AQ from other donors | 0 | 0 | 0 |
| SP+AQ planned with PMI funding | 9,978,000 | 9,852,985 | 9,852,985 |
| **Total SP+AQ Contributions per Calendar Year** | 12,161,292 | 13,342,279 | 14,253,507 |
| **Total SP+AQ Surplus (Gap)** | **3,489,294** | **4,400,522** | **5,033,595** |

SMC: seasonal malaria chemoprevention; SP+AQ: sulphadoxine-pyrimethamine plus amodiaquine.