PMI | U.S. PRESIDENT'S MALARIA INITIATIVE

LED BY USAID FROM THE AMERICAN PEOPLE

U.S. PRESIDENT'S MALARIA INITIATIVE

Benin

Malaria Operational Plan FY 2024

Suggested Citation: U.S. President's Malaria Initiative Benin 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

ACT	Artemisinin-based combination therapy
AI	Active ingredient
AL	Artemether-lumefantrine
ANC	Antenatal care
ASCQ	Agent de Santé Communautaire Qualifié
ASPY	Artesunate-pyronaridine
BMGF	Bill & Melinda Gates Foundation
CDC	U.S. Centers for Disease Control and Prevention
CHAI	Clinton Health Access Initiative
CREC	Centre de Recherche Entomologique de Cotonou
CRS	Catholic Relief Services
CY	Calendar Year
DDS	Direction Départementale de la Santé
DHS	Demographic and Health Survey
DHIS2	District Health Information Software 2
EUV	End-Use Verification Survey
FY	Fiscal year
G2G	Government to Government
Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GOB	Government of Benin
HFS	Health Facility Survey
HMIS	Health Management Information System
HZ	Health Zone
IPC	Interpersonal communication
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
LSM	Larval source management
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MOH	Ministry of Health
MOP	Malaria Operational Plan
NMP	National Malaria Program
NSP	National Strategic Plan
PBO	Piperonyl Butoxide
PIC	*Plan intégré de communication* (Integrated Communication Plan*)*
PMI	U.S. President's Malaria Initiative
RDT	Rapid diagnostic test
RC	*Relais Communautaire*
SBC	Social and behavior change

SMC	Seasonal Malaria Chemoprevention
SP	Sulfadoxine-pyrimethamine
SPAQ	Sulfadoxine-Pyrimethamine +Amodiaquine
TA	Technical assistance
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization
YLP	Young Logisticians Professionnel

EXECUTIVE SUMMARY

To review specific country context for Benin, please refer to the country malaria profile, which provides an overview of the country malaria situation, key indicators, the National Malaria (NMP) 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. Benin began implementation as a PMI partner country in fiscal year (FY) 2008.

Rationale for PMI's Approach in Benin

This Malaria Operational Plan (MOP) outlines planned PMI activities using fiscal year (FY) 2024 funds. Developed in consultation with the NMP and key malaria stakeholders, proposed activities reflect national and PMI strategies, draw on best-available data, and align with the country context and health system. Proposed PMI investments support and build on those made by the Government of Benin (GOB) as well as other donors and partners.

Overview of Planned Interventions

The proposed FY 2024 PMI funding for Benin is $15 million. PMI will support the following intervention areas with these funds:

1. Vector Monitoring and Control

PMI will maintain 12 entomological monitoring sites to cover key geo-epidemiologic areas. The activities include monitoring insecticide resistance and vector bionomics, species composition, biting behaviors and sporozoite rates of local vector species that transmit malaria in all 12 entomological monitoring sites. PMI will continue to strengthen the capacity of local research institutions in malaria surveillance and control and reinforce the country's capacity in the surveillance of new invasive malaria vector *An. stephensi*. Furthermore, PMI will support the distribution of insecticide-treated mosquito nets (ITNs) through routine distribution channels by procuring 990,000 piperonyl butoxide (PBO) ITNs during calendar year (CY) 2025. Social and behavior change (SBC) interventions will also be funded to optimize the coverage, use, and care of ITNs. With reprogrammed FY 2023 resources, PMI will support the monitoring of the

entomological and epidemiological impact of PBO and dual active ingredient (AI) nets [pyrethroid + chlorfenapyr-based ITNs] that will be distributed during the 2023 campaign. PMI does not currently support indoor residual spraying (IRS) or other vector control interventions.

2. Drug-Based Prevention

Intermittent preventive treatment for pregnant women: Routine data collected using District Health Information Software 2 (DHIS2) shows a notable improvement in intermittent preventive treatment for pregnant women (IPTp) 3 uptake (27 percent national uptake in 2019, 38 percent in 2020, 47 percent in 2021, 50 percent in 2022).

With support from PMI and the Global Fund to fight AIDS, Tuberculosis, and Malaria (Global Fund), the NMP developed a closer partnership with the country's maternal and child health (MCH) services to improve health facilities' antenatal care (ANC) attendance and IPTp uptake. The NMP continued conducting community-based distribution of sulfadoxine-pyrimethamine (SP) by midwives working with community health workers known as *Relais Communautaires* (RCs) for mobilization and referral of pregnant women to health facilities at a select number of health zones (HZs) where IPTp3+ uptake rates were among the lowest nationwide. Four HZs were part of this activity in CY 2019, four in CY 2020, three in CY 2021 and 14 in CY 2022. Community-based distribution of IPTp is thought to have contributed to increased IPTp3+ uptake, along with other interventions, especially in areas where performance had been suboptimal.

Consequently, with the support of the GF, the NMP is planning ANC community outreach and IPTp administration in an additional HZ to achieve coverage in all 34 HZs. PMI will continue its efforts aimed at institutionalizing the role of malaria in pregnancy (MIP) technical working group (TWG) that would help reinforce collaboration and coordination between the NMP and the National Agency for Primary Healthcare. PMI will continue to support the supervision of health providers on IPTp, and through the IPTp TWG and will support the NMP to update and align the national guidelines on IPTp with the ANC guidelines based on 2016 recommendations from the World Health Organization (WHO).

Seasonal malaria chemoprevention: Seasonal malaria chemoprevention (SMC) implementation began in 2019; PMI supported two HZs in the northern departments of Alibori and Atacora through their bilateral partner, and the GF supported the NMP to implement in two HZs (Kandi-Gogounou-Segbana and Banikoara) in Alibori Department. In 2021, the GF expanded SMC activities from two to four HZs. Starting in 2023, the NMP will implement SMC in PMI-supported HZs in addition to the HZs where they have been implementing SMC with GF support. A descriptive analysis of monthly malaria incidence among children under five years of age indicated that SMC, in combination with other malaria control interventions, has likely contributed to mitigating the anticipated peak in malaria cases (NMP, unpublished data). The NMP is considering extending SMC to four additional HZs in 2024 and an additional five

HZs in 2025 with GF support for a total of 15 HZs by the end of 2025. PMI will continue to support the NMP's efforts to apply quality standards effectively to the implementation of SMC-related activities, including training, supervision, data management, and commodity procurement. PMI will maintain its level of contribution for SMC commodities (580,000 treatments) throughout the next 2-3 years, ensuring that the overall campaign needs are consistently met. Analysis of HMIS data revealed that starting the first cycle of SMC in Atacora one month earlier (i.e., June) may prove to be effective in mitigating the July peak observed in some SMC-covered communes in 2019-2021 and the NMP may continue with this schedule.

3. Case Management

PMI supports the NMP's case management (CM) strengthening efforts through procurement and distribution of commodities (artemisinin-based combination therapy [ACT], injectable artesunate, malaria rapid diagnostic tests [RDTs], and rectal artesunate [RAS]) and national-level policy and programmatic activities. Until the end of FY 2022, PMI supported MSH's Integrated Health Services Activity (IHSA) mechanism, which strengthened CM activities in 29 communes located in four departments (Atacora, Alibori, Plateau and Oueme), both at the health facility (HF)—including on-site supportive supervision (OTSS) activities—and community levels (e.g., training, supervision and data management). Through its partnership with three local NGOs delivering a package of high-impact interventions, PMI supported CM exclusively at the community level (e.g., stipends, training, quality improvement and equipment) in 17 communes located in four departments (five communes in Atlantique, six in Mono, two in Zou and four in Donga). Starting in FY 2024, PMI activities will be aligned with The U.S. Agency for International Development (USAID)'s approach to implement new community health and HF projects in four departments (Atacora, Donga, Mono and Plateau).

PMI will continue to support using injectable artesunate for the first-line treatment of severe malaria (followed by a full ACT course) and RAS for pre-referral treatment of severe disease among children under five years of age. PMI will also continue to collaborate with the NMP, the Global Fund, and other partners to coordinate procurement and delivery schedules to ensure appropriate stock levels of CM commodities at service delivery points and communities. Based on the most recent national quantification estimates, PMI plans to procure 2,000,000 malaria RDTs, 2,000,000 ACTs, 9,000 RAS, and 300,000 vials of injectable artesunate to meet the projected need. PMI will monitor quantifications and pipeline and adjust as needed. PMI will also continue to support OTSS at the HF and community levels.

4. Health Supply Chain and Pharmaceutical Management

The NMP continues to work closely with central medical stores and health zone warehouses in order to coordinate malaria commodities management and to ensure their availability at all health facilities. Its strategy is to adopt and sustain the use of the various supply chain-related harmonized tools and good practices designed and implemented in the recent few years with

PMI's substantial contribution. In addition, the Benin Agency for Pharmaceutical Regulation and National Agency for the Quality Control of Medicines are reinforced to ensure best regulatory functions, compliance on malaria commodities-related issues and pharmaceutical market surveillance. Over the past 16 months (CY 2022-2023), PMI has accomplished a lot in strengthening the malaria commodities supply chain including providing technical assistance (TA) for quantification, supply plan, procurement planning and monitoring report for malaria; implementing the end-use verification survey [EUV]; supporting 30 Young Logisticians Professionals (YLP); rolling out the electronic logistics information management system (eLMIS) nationwide; improving storage conditions; managing antimalarial commodities; and reducing malaria commodities stock outs at health facilities level (less than 1 percent for the last semester).

With the FY 2024 funds, PMI will continue to provide TA to the NMP for coordinating and implementing activities related to quantification, supply planning, procurement planning and monitoring report for malaria, SMC, Global Health Supply Chain-Procurement and Supply Management Coordination, and EUV. PMI will also continue to reinforce the common basket approach for storage improvement; contribute to central medical stores storage capacity strengthening, management, and distribution of malaria commodities; closely support the health zones warehouses and health facilities supervision by the YLPs; and support sustainability of the eLMIS used.

5. Malaria Vaccine

The malaria vaccine will be deployed in health facilities to infants at 5, 6, 7, and 17 months of age as a part of routine Expanded Program on Immunization service delivery and complemented by periodic intensification of routine immunization activities. Benin plans to introduce the malaria vaccine in 16 health zones with the highest burden of malaria at the start of calendar year 2024. These health zones include Banikoara, Malanville-Kandi, Tchaorou, Tanguieta-Materi-Cobli, Natitingou-Toucoutouna-Boukoumbe, Kouande-Kerou-Pehounco, Djougou-Copargo-Ouake, Bassila, Dassa-Glazoue, Savalou-Bante, Save- Ouesse, Djidja-Abomey-Agbangnizoun, Zogbodome-Bohicon-Zakpota, Aplahoué-Djakotomey-Dogbo, Klouékamè-Toviklin-Lalo, and Allada-Toffo-Zè. Beginning in FY 2024, PMI funding will contribute to providing supportive supervision to health care workers who provide the malaria vaccine in these communes. All malaria vaccine procurement will be supported by United Nations Children's Fund (UNICEF) with GAVI funding. New SBC investments in message development will focus on malaria vaccine delivery by health care workers and demand generation for parents. PMI support is intended to maximize vaccine uptake without affecting coverage of other malaria interventions.

6. Social and Behavior Change

In CY 2022–2023, PMI provided technical and financial support for: the development and dissemination of an SBC strategy for the NMP; contracting with local radios for awareness-raising on malaria prevention and care-seeking, especially targeting pregnant women and children under five years of age; development of over 140 local radio programs which were transmitted in targeted HZs; formative supervision in the communes RCs to strengthen prevention communication activities; and TA to implement the Malaria Behavior Survey (MBS) and the Health Facility Survey (HFS) for more in-depth information on the determinants of behavior of population and provider behaviors.

SBC activities planned with FY 2024 funds will concentrate on designing and implementing evidence-based SBC interventions according to the results of the MBS and the HFS. While SBC activities encouraging correct and consistent use of ITNs will continue, priority will be placed on addressing prompt care-seeking behavior and provider adherence to guidelines in CM and IPTp. Emphasis will also be placed on working with political and social influencers such as parliamentarians, renowned musicians, and religious and local leaders to further raise awareness and the need for concerted efforts against malaria as well as on improving institutional capacity to manage and implement SBC activities at the national, HZ, and community levels, including strengthening the SBC TWG.

7. Surveillance, Monitoring, and Evaluation

PMI continues to support the implementation of the DHIS2 platform to facilitate the reporting and use of routine surveillance and malaria service delivery data. PMI supported the training and supervision of health workers and managers at facility and commune levels on data collection, management and use. With FY 2024 funds, PMI will continue to support a wide range of Health Management Information System (HMIS) strengthening activities to improve data reporting at the community, facility, commune, and national levels. Other NMP partners in the area of malaria surveillance systems (e.g., Clinton Health Access Initiative [CHAI] and Catholic Relief Services [CRS]) will also provide support. PMI continues to support the country's efforts toward the rollout and use of digital platforms in routine and campaign-related malaria prevention and control activities. PMI investments will also be used to provide TA to strengthen the institutional capacity within the NMP to improve data quality (especially completeness and timeliness) to integrate all malaria-related data (HMIS, LMIS, surveys, campaign) in one place.

8. Operational Research and Program Evaluation

In 2022, the field phase of the study "Assessing the Impact of Group ANC on IPTp Uptake in Benin" concluded. Data analysis is underway and dissemination of results is planned in CY 2023. In May 2023, the field activities for the Malaria RDT Capturing and Reporting study began and the study is expected to last 7 months (June–December 2023). The study's overall

purpose is to better understand determinants of health provider behaviors and attitudes towards malaria diagnosis and reporting using RDTs.

No PMI operational research (OR)- or program evaluation (PE)-supported activities are currently anticipated with FY 2024 funds. However, efforts are underway to identify relevant program challenges that would potentially warrant considering further OR/PE-related activities.

9. Capacity Strengthening

The Conseil National de Lutte Contre le SIDA, la Tuberculose, le Paludisme, les Hépatites et les Épidémies/National AIDS Council on Sexually Transmitted Infections, Tuberculosis, Malaria, Hepatitis, and Epidemics oversees all disease programs, including the malaria program. The NMP's Strategic Plan is aligned to the revised 'Plan Strategique Integre oriente vers l'elimination du VIH, la tuberculose, le paludisme, les hepatites virales, les IST et les maladies à potentiel épidémique'/National Integrated Strategic Plan to Eliminate HIV/AIDS, TB, Malaria, STIs and Communicable Diseases 2024–2030, whose role is to provide technical and coordination support on malaria-related activities.

PMI supports the NMP capacity strengthening through a direct government-to-government agreement (fixed amount reimbursement agreement) and the commodity import program. Through the two agreements, PMI has and will continue to support the NMP's management and capacity development needs including staff training support, equipment, and infrastructure needs. In addition, Peace Corps volunteers have returned to the country and PMI has resumed its support for volunteer malaria activities.

10. Staffing and Administration

A minimum of four health professionals represent the core in-country team that oversees PMI. The single interagency team led by the USAID health office director consists of resident advisors representing the USAID and the U.S. Centers for Disease Control (CDC), and two locally hired experts known as foreign service nationals who include a malaria program specialist and a data manager. The PMI interagency team works together to oversee all technical and administrative aspects of PMI, including finalizing details of the project design, implementing malaria prevention and treatment activities, M&E of outcomes and impact, reporting results, and providing guidance and direction to PMI implementing partners.

I. CONTEXT & STRATEGY

1. Introduction

Benin began implementation as a PMI partner country in fiscal year (FY) 2008. This FY 2024 Malaria Operational Plan (MOP) presents a detailed implementation plan for Benin, based on the strategies of PMI and the National Malaria Program (NMP). It was developed in consultation with the NMP and with the participation of national and international partners. The activities that PMI is proposing build on investments made by partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund). This document provides an overview of the strategies and interventions, 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 NMP strategic plan, and partner landscape.

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

The U.S. President's Malaria Initiative (PMI) is led by the U.S. Agency for International Development (USAID) and implemented together with the U.S. Centers for Disease Control (CDC). Launched in 2005, PMI supports the implementation of malaria prevention and treatment measures – insecticide-treated mosquito nets (ITNs), indoor residual spraying (IRS), accurate diagnosis and prompt treatment with artemisinin-based combination therapies (ACTs), intermittent preventive treatment of pregnant women (IPTp), and drug-based prevention – as well as cross-cutting interventions such as surveillance, monitoring, and evaluation; 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 NMPs and partners to accomplish its objectives set for the 2021–2026 period:

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 Benin

3.1. Malaria Overview for Benin

Malaria transmission across Benin is variable with seasonal and geographic patterns associated with climate, rainfall, and topography. The country is divided into three main regions: southern, central, and northern. The southern region, a sub-equatorial coastal zone, has two rainy seasons (April to July and October to November) and two dry seasons (August to September and December to March). The central plateau region is characterized by a Sudan-Guinea climate. The northern region is hilly and has a Sahelian climate with one rainy season (May to October) and one dry season (November to April). These geo-climatic variations result in three malaria transmission zones: southern (heterogeneous transmission), central (holo-endemic), and northern (seasonal peaks during the rainy season).

Benin has experienced a steady upward trend in malaria cases from approximately 3.9 million in 2014 to nearly 5 million by the end of 2021 based on modeled estimates; deaths due to malaria also increased during this period from 9,790 in 2014 to 11,154 in 2021, however, the percent increase was lower (14 percent vs 27 percent, respectively; per the 2022 World Malaria Report[1]). Malaria cases reported into District Health Information Software 2 (DHIS2) increased from nearly 1.9 million in 2017 to nearly 2.8 million in 2022 and deaths due to malaria during the same period increased from 2,182 to 3,204. Note that this is only considering data from health facilities reported into DHIS2.

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

Improving the quality of core malaria interventions such as vector control, drug-based prevention, and prompt case management (CM) all backed by strong social and behavior change (SBC) remains a key priority for the NMP and for PMI. Routine data suggest that IPTp3+ uptake has increased overall from 23 percent in 2018 to 50 percent in 2022 (see Figure 3). While HF-level IPTp3+ uptake (reported through DHIS2) has consistently increased throughout the past 5 years, community-level IPTp3+ uptake has remained low. An 11.5 percent rate shown through Benin's 2022 Malaria Indicator (MIS) survey,[2] in comparison to the 14 percent rate reported through Benin's 2017-2018 Demographic and Health Survey (DHS).[3] Seasonal malaria chemoprevention (SMC), which began in five communes of two departments (Alibori and Atacora) in 2019, increased to 15 communes of these two departments in 2021 (supported by both PMI and the GF). The most recent data regarding prompt care-seeking among febrile children is from the 2022 MIS (40.3 percent) decreased from the 2017 DHS data (53 percent),[4] showing a need for improvement.

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

3.2. Key Challenges and Contextual Factors

Benin faces several challenges to malaria control programs. For vector control interventions, insecticide resistance poses an ongoing challenge. Entomologic monitoring has revealed widespread resistance to the current ITN pyrethroids (alpha-cypermethrin, deltamethrin, and permethrin) in the main malaria vector, *An. gambiae* sensu lato. Exposure of these vector populations to piperonyl butoxide (PBO) and a pyrethroid has induced partial restoration of pyrethroid susceptibility. Mosquito exposure to chlorfenapyr and clothianidin leads to 99-100 percent mortality for both insecticides as of May 2023. For nets, less than one year before a new ITN mass campaign in 2020, ITN coverage was 71.6 percent, and usage was 61.9 percent (86.5 percent among those with a net). Furthermore, usage was found to be low even after accounting for geographic differences (58.0 percent in rural areas versus 65.9 percent in urban areas). Despite progress achieved throughout the past five years, performance related to key malaria-related indicators remains suboptimal, including with regards to prevention of malaria among pregnant women, low antenatal care (ANC) participation, according to end-use verification survey (EUV) 2022 results, stockouts have been observed of sulfadoxine-pyrimethamine (SP) at health facility level in specific geographic areas mainly in the northern part of the country. These challenges continue to undermine the overall country and its partners efforts aimed at achieving a significant progress towards control/elimination of malaria as ambitioned by Benin. Access to prompt, quality CM for fever illness and appropriate referrals continue to be a challenge at all levels of the health care system. A new community health policy is being rolled out; however, details of this system with respect to malaria CM are

[2] Benin 2022 Malaria Indicator Survey. Conotou, Benin, Calverton, Maryland, 2023)
[3] Institut National de la Statistique et de l'Analyse Économique INSAE and ICF. Enquête Démographique et de Santé au Bénin, 2017-2018. (Cotonou, Bénin and Rockville, Maryland, USA , 2019): https://dhsprogram.com/publications/publication-FR350-DHS-Final-Reports.cfm .
[4] Institut National de la Statistique et de l'Analyse Économique INSAE and ICF. Enquête Démographique et de Santé au Bénin, 2017-2018. (Cotonou, Bénin and Rockville, Maryland, USA, 2019): https://dhsprogram.com/publications/publication-FR350-DHS-Final-Reports.cfm.

unclear and potentially problematic (see the Case Management section below for additional information). Additional system-level constraints also pose challenges. For example, frequent rotations of health providers make implementing training and mentorship programs difficult. Data quality indicators including completeness, timeliness of reporting, and the use of health data in the DHIS2 for decision-making remain suboptimal.

Benin has implemented policies to address some of these challenges. For example, fiscal decentralization of the governance in its 77 communes was initiated and virtual platforms have been used for training to reduce time-away-from-post for health care workers. In addition, a universal health coverage scheme, Assurance Pour le Renforcement du Capital Humain-Assurance Maladies (ARCH-AM), was launched. To date, approximately one million Beninese have health coverage under ARCH-AM and the numbers are increasing. These initiatives face challenges and will require ongoing attention. For example, commune- and department-level governments remain dependent on fund transfers from central accounts, and weak governance structures result in limited direct fund allocation and release for health institutions at commune and department levels.

The lack of domestic resources to support malaria control interventions remains an important challenge. Much of the financing for malaria control comes from international sources. In some sectors, Benin is progressively graduating from international support as its economy grows. Although the NMP budget almost doubled this year, mobilization of domestic resources for malaria control remains limited. PMI Benin continues to engage through partners such as Speak Up Africa in advocacy activities with parliamentarians to increase funding.

Flooding poses another threat to PMI interventions, especially to SMC campaigns. This is one of the main climate change concerns facing the country; the government is mobilizing resources from partners like the World Bank to address it.

Growing violent extremism in West Africa has become a major destabilizing factor in the region. Violent extremist groups operating in the Sahel have launched a series of attacks in northern Benin. As the U.S. works to promote stability and prevent conflict in Coastal West Africa under the Strategy to Prevent Conflict and Promote Stability and Global Fragility Act GFA, PMI programs will support efforts to strengthen communities that are most vulnerable to threats, notably those in border regions, through effective community and facility provision of health services.

3.3. PMI's Approach for Benin

The revised Integrated Strategic Plan to Eliminate HIV/AIDS, TB, Malaria, STIs and Communicable Diseases 2024–2030 aims to contribute to the elimination of malaria in Benin by 2030 with the specific objectives of reducing new malaria-related infections by 100 percent and reducing mortality and morbidity linked to malaria by 100 percent by 2030. The strategies include IPTp, SMC, diagnosis, and treatment of malaria through routine health services and

iCCM, the distribution of ITNs, the anti malaria vaccination for children, targeted IRS, and larval source management (LSM). Cross-cutting strategies include procurement and supply chain management and SBC.

PMI aligns its funding and technical assistance (TA) to support Benin's overall malaria strategies that reflect the five focus areas of the PMI End Malaria Faster Strategy (2021–2026).[5] PMI supports key intervention areas with the highest burden of malaria (Alibori, Atacora, Donga, Oueme, Mono, and Zou) to achieve the greatest reduction in malaria morbidity and mortality. PMI support is also focused on addressing key challenges by sustaining malaria vector insecticide resistance monitoring in 12 sites and prioritizing the susceptibility testing of new classes of insecticide to allow the deployment of dual active ingredient (AI) ITNs to address insecticide resistance challenges. PMI will also support data quality improvement by strengthening the national malaria M&E systems with the monthly validation of data at the decentralized health zone–level. PMI will continue its support for capacity-building and training of health workers involved in malaria CM both in the public and private sectors to ensure full compliance to the new national malaria treatment policy and guidance. PMI will also help the country reinforce SBC using existing community-level structures and groups (e.g., religious groups, local authorities, and health workers) to improve ANC attendance and the IPTp uptake in 34 health zones (HZs), where IPTp uptake is low.

PMI promotes accountability through its citizen oversight activities, building the capacity of community members, local government leaders, and healthcare workers to use health data to monitor performance in the health sector and hold leaders accountable for the availability and quality of health services.

3.4. Key Changes in this MOP

PMI plans to continue the above-mentioned initiatives. This includes support for monthly validation of HZ data to improve quality and use and engagement of community-level leaders in SBC activities to address challenges identified in Benin's 2022 MIS**,** and Benin's 2021 Malaria Behavior Survey (MBS) including inconsistent ITN use and poor IPTp uptake. In addition, PMI will support country efforts to decentralize malaria program management. New activities will include the revitalization of community outreach involving the collaboration of religious groups, local authorities, and health workers through the establishment of *comités villageois de lutte contre le paludisme*/village health committees to develop more effective SBC activities. Other changes occurring in calendar year (CY) 2023, and planned to be reinforced throughout calendar years (CYs) 2024 and 2025, include strengthening M&E systems by shifting from a central-level quarterly malaria data validation and review to monthly validation at the HZ-level. PMI will also initiate support for a pilot of community-level entomological monitoring.

[5] U.S. President's Malaria Initiative. End Malaria Faster: Strategy 2021-2026. (Washington, D.C., 2020): https://www.pmi.gov/home/pmis-strategy/.

The results of this pilot will inform mid- and long-term plans for community-level entomological monitoring. PMI will pilot the use of automated rapid diagnostic test (RDT) readers to estimate RDT positivity rates and explore determinants of provider adherence to malaria treatment guidelines. PMI will foster efforts to optimize in-country data sharing and dissemination to inform planning and decision-making among key malaria control stakeholders. Finally, PMI will continue to support the monitoring for *An. stephensi*, an invasive malaria vector recently introduced to the African continent, but not yet detected in Benin. Finally, Benin will receive GAVI support to introduce RTS,S/AS01 malaria vaccine in 2024; PMI Benin will actively support the Ministry of Health (MOH) in this process.

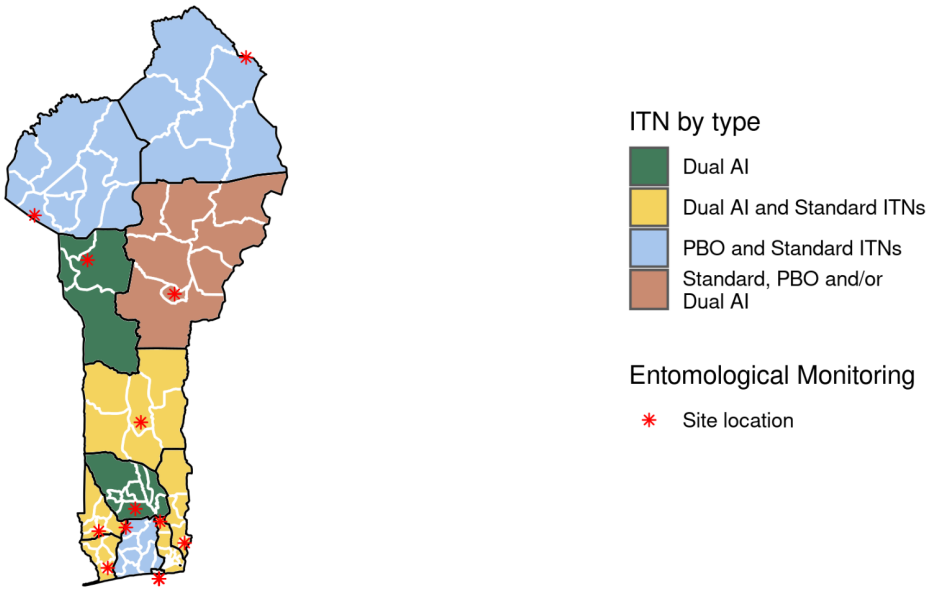
OPERATIONAL PLAN FOR FY 2024

1. Vector Monitoring and Control

1.1. PMI Goal and Strategic Approach

The revised National Integrated Strategic Plan 2024–2030 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 all of these interventions, with the exception of IRS (PMI ended support for IRS with FY 2021 MOP) and LSM. PMI supports insecticide resistance monitoring and bionomics surveillance in 12 communes (see Figure 1). Global Fund and PMI support mass ITN campaigns every three years, while PMI supports continuous distribution of ITNs via ANC and Expanded Program on Immunization (EPI) channels nationwide. PMI's support for Benin's primary vector control strategy includes the procurement and distribution of ITNs, and the promotion of net use. PMI is also supporting insecticide resistance testing of malaria vectors to monitor insecticide effectiveness, with a priority placed on chlorfenapyr, pyrethroids, and the oxidase inhibitor synergist, PBO.

Figure 1. Map of Vector Control Activities in Benin in CY 2025



1.2. Recent Progress (between January 2022 and March 2023)

Vector control activities in Benin included the following:

- Supported entomological monitoring in 12 sentinel sites in four departments, in partnership with Centre de Recherche Entomologique de Cotonou (CREC). Monitoring activities included insecticide resistance monitoring, and vector bionomics monitoring . For more information about entomological monitoring, please refer to the PMI Resources page.
- Supported community-based entomology activities. This included technical assistance with the planning of community-based entomological monitoring activities (i.e. technical suggestions for deployment and PMI technical documents on community-based entomological surveillance [see link]).
- Supported surveillance for *Anopheles (An.) stephensi* in 13 sites in Cotonou in coordination with CREC. This included passive surveillance of insecticide resistance specimens that did not resemble the typical *Anopheles* in Benin. Also, active collections around 12 sites consisting of the seaport, fish ponds, and animal/cattle enclosures were also done in 2022. *An. stephensi* has not been detected as of May 2023.
- Supported activities collecting data on human/vector behavior in 12 sites. Provided technical assistance to CREC for entomological monitoring.
- PMI supported capacity-strengthening and results-dissemination of entomological monitoring activities for NMCP and CREC. The NMCP and CREC researchers presented six posters at the 2022 American Society of Tropical Medicine and Hygiene Annual Meeting.[6]

[6] American Society for Tropical Medicine and Hygiene (ASTMH). ASTMH 2022 Annual Meeting Abstract Book: https://www.astmh.org/getmedia/65cc0d8d-1208-4d9a-9f77-734d40de4c02/ASTMH-2022-Annual-Meeting-Abstract-Book.pdf.

- During CY 2022, researchers and scientists from CREC and the NMCP submitted two manuscripts that are in press/under review depicting insecticide resistance monitoring activities that were funded by PMI.[7]
- Supported the procurement and distribution of PBO ITNs to pregnant women and children under five years of age nationwide through continuous distribution channels.
- Supported prevention of malaria in pregnancy (MIP) by providing ITNs to women at their first ANC visit.
- Supported standard ITN durability monitoring, by implementing 24-month data collection, monitoring the standard and PBO nets from the 2020 cohort.

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

PMI will conduct entomological monitoring in several communes receiving PBO and dual active ingredient (AI) ITNs (see Figure 1; the entomological sentinel sites on the map are provisional and may change). These data will provide insights into any change in epidemiological trends that may occur as a result of the wider-scale distribution of these ITNs. Also, with reprogrammed FY 2023 resources, PMI will support the monitoring of the entomological and epidemiological impact of PBO and dual AI nets [pyrethroid + chlorfenapyr-based ITNs] that will be distributed during the 2023 campaign.

Also, Benin has started monitoring for the presence of *An. stephensi,* an invasive malaria vector from Asia recently introduced to the continent of Africa. As of May 2023, *An. stephensi* has not yet been detected in Benin, but the risk of introduction is high due to high habitat suitability and the reported presence of the vector in Ghana and Nigeria. Activities for enhanced surveillance of *An. stephensi* (consisting of passive monitoring of mosquito specimens from routine insecticide resistance testing and active monitoring around Benin's ports and cattle enclosures in Cotonou) will be included in entomological monitoring activities in accordance with the PMI *An. stephensi* action plan guidance for countries at-risk of *An. stephensi* invasion.

PMI is maintaining its support for 12 sites. Six sites will be retained for community-based entomological monitoring activities led by local communities. The monitoring activity in the six remaining sites will continue with the lead and full support from CREC. Entomological monitoring will include insecticide resistance and vector bionomics monitoring; however, in community-based sites, these activities will be modified to fit the capabilities of the

[7] a) Zoungbédji, D.M., Padonou, G.G., Konkon, A.K. et al. Assessing the susceptibility and efficacy of traditional neurotoxic (pyrethroid) and new-generation insecticides (chlorfenapyr, clothianidin, and pyriproxyfen), on wild pyrethroid-resistant populations of *Anopheles gambiae* from southern Benin. Malar J 22, 245 (2023). https://doi.org/10.1186/s12936-023-04664-6
b) Evolution of resistance alleles L1014F and G119S of the Kdr and Ace-1 gene in *Anopheles gambiae* s.l. four years after the withdrawal of indoor residual spraying in the Atacora department. Under review.

community-based staff. Susceptibility testing for new classes of insecticides including clothianidin, pyriproxyfen, and chlorfenapyr is a priority to mitigate insecticide resistance. PMI will continue to provide technical assistance to strengthen the administrative and analytical capacity of CREC. PMI will also identify opportunities to support other local research institutions such as the Institut régional de santé publique, an academic research institution, and a World Health Organization (WHO) collaborating center. PMI's engagement with this institution is ongoing involving discussions and sharing of updates.

Summary of distribution and Bionomics of Malaria Vectors in Benin

As of 2022, the primary malaria vector is *An. gambiae* s.l. (~91 percent of *An. coluzzii*, 8 percent *An. gambiae* s.s., and 1 percent *An. gambiae/coluzzi* hybrids); the secondary vector is *An. funestus* s.l. Of the *An.* found, there is a consistently higher abundance of *An. gambiae* s.l. (~97 percent) over *An. funestus* s.l. (less than 1 percent) throughout the country. Oth*er An.* found included, *An. pharoensis* (approximately 2 percent) and *An. ziemanni* (approximately 1 percent); their role in malaria transmission is not completely known.

The peak transmission season is from April to October, which generally aligns with rainfall and peak mosquito biting. Peak mosquito biting times are generally bimodal with a peak occurring from midnight to 1:00 AM (18.63 bites/person/hour) and a second peak occurring from 3:00 AM to 4:00 AM (18.45 bites/person/hour); this is followed by a gradual drop till early morning (13.11 bites/person/hour). Currently, there are no studies on the preferred resting locations of malaria vectors. Resting behavior is evaluated only by pyrethrum spray catches done indoors. The average indoor resting density was 1.31 mosquitoes per house. However, exophily rates, determined by counting the number of mosquitoes that escape a household, measured in past studies in other sites show rates ranging between 22 and 44 percent after IRS withdrawal.[8]

Status of Insecticide Resistance in Benin

PMI/Benin performed insecticide resistance testing in 12 communes in 2022. They tested susceptibility of local vectors to different insecticides for pirimiphos-methyl, alpha-cypermethrin with/without PBO, deltamethrin with/without PBO, clothianidin, and chlorfenapyr. All mosquito populations tested were susceptible to pirimiphos-methyl (mortality>98 percent). For pyrethroids (deltamethrin and alpha-cypermethrin), *An. gambiae* s.l. mosquitoes were resistant in all communes (mortality <90 percent). They did not test PBO in 2022, however, as of 2021, PBO partially restores susceptibility to pyrethroids in *An. gambiae* s.l. populations (mortality range: approximately 43 to 98 percent).

[8] Ossè, Razaki A., Rock Aïkpon, Ghélus Louis Gbédjissi, Virgile Gnanguenon, Michel Sézonlin, Renaud Govoétchan, Arthur Sovi, and Martin Akogbéto. "A Shift from Indoor Residual Spraying (IRS) with Bendiocarb to Long-Lasting Insecticidal (Mosquito) Nets (LLINS) Associated with Changes in Malaria Transmission Indicators in Pyrethroid Resistance Areas in Benin." Parasites & Vectors 6, no. 73 (16 March 2013): doi: 10.1186/1756-3305-6-73.

In 2022, PMI/Benin test chlorfenapyr and clothianidin, respectively, in 15 communes (Ifangni, Akpro-Missérété, Porto-Novo, Cotonou, Abomey-Calavi, Allada, Lokossa, Bohicon, Djidja, Glazoue, Bassila, Djougou, Gogounou, Banikoara, and Malanville). All the *An. gambiae* s.l. populations were susceptible (mortality = 100 percent) to chlorfenapyr within 48 hours. For clothianidin,[9] they observed total susceptibility (mortality = 100 percent) between the fifth and the sixth day in all *An. gambiae* s.l. populations tested.

1.3.2. Insecticide-Treated Nets

PMI will continue to support the procurement and distribution of PBO ITNs through continuous distribution. PMI will also continue to support SBC to improve the use and care of ITNs and to mitigate misuse. PMI supported the durability monitoring of PBO nets distributed during the 2020 mass distribution, but will not support the durability monitoring of any ITNs distributed in the 2023 campaign. Instead, through reprogramming of FY 2023 funds, an evaluation on the impact of new types of nets will take place.

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

Insecticide-treated Net Distribution in Benin

ITNs are distributed via mass campaigns every three years with a target of universal coverage of one net per two people. ITNs that remain after campaigns are transitioned to the continuous distribution channels of ANC for pregnant women and EPI clinics for children under five years of age. In CY 2020, Benin distributed both standard and PBO nets during the mass ITN distribution campaign. There are plans to include dual AI nets during the CY 2023 mass ITN distribution campaign in select communes based on resistance data. Of the total 9,941,994 nets required for both the CY 2023 mass campaign and the continuous distribution, PMI has procured 1,392,103 PBO ITNs. The Global Fund procured a mix of 6,996,794 standard, PBO, and dual AI ITNs; the Government of Benin (GOB) contributed 545,000 comprising both PBO and standard ITNs; and United Nations Children's Fund (UNICEF) covered the remaining gap with 894,877 standard ITNs. Standard ITNs will be distributed in the CY 2023 mass ITN campaign due to the lack of resources to procure enough PBO or dual AI ITNs to achieve universal coverage with these types of nets. Therefore, the NMCP and CREC used insecticide resistance data to strategically distribute standard, PBO and dual AI ITNs nationally to maximize accessibility to effective ITNs.

For CY 2025, PMI plans to procure 990,000 PBO nets for continuous distribution to cover 100 percent of the need.

[9] PMI used a modified protocol using the WHO tube assay with self-prepared SumiShield™ 50WG impregnated filter paper rather than the 2022 WHO bottle bioassay because the WHO protocol for clothianidin was not available at the time of the clothianidin susceptibility test.

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

Of note, a standard durability monitoring study of PBO ITNs was conducted after the 2020 mass-distribution campaign; however, this will not be repeated after the 2023 campaign. PMI/Benin will focus on monitoring the epidemiological and entomological impact of PBO ITNs.

Table 1. Standard Durability Monitoring

Campaign Date	Site	Brand	Baseline	12-month	21-month	36-month
Mar 2020	Adja-Ouèrè	Yorkool®	Jan 2021*	Mar 2021	Jan 2022	ND
Mar 2020	Masse	PermaNet®3.0	Jan 2021*	Mar 2021	Jan 2022	ND
Mar 2020	Agbangnizoun	PermaNet®3.0	Jan 2021*	Mar 2021	Jan 2022	ND

*Baseline data collection was delayed due to administrative issues: ND: Not done.

1.3.3. Indoor Residual Spraying

PMI does not currently support IRS.

2. Malaria in Pregnancy

2.1. PMI Goal and Strategic Approach

PMI will continue supporting the national strategy for MIP which includes providing ITNs at the first ANC visit and facilitating their effective use, ensuring pregnant women have access to a minimum of three doses of IPTp in malaria endemic areas starting at 13 weeks gestational age, and ensuring prompt access to quality CM of malaria per WHO guidelines.

2.2. Recent Progress (between October 21 to September 2022)

The IPTp3+ overall uptake rate from Benin's 2022 MIS was estimated at 11.5 percent, with a third of the nation's 12 departments HZ-specific coverage featuring uptake rates below 5 percent. Departments from the southern part of the country showed relatively higher uptake rates (10-30 percent). These results imply a significant gap with the country's ANC3+ uptake rates, based on the same survey. For instance, the ANC3+ overall uptake rate was estimated at 59.6 percent.

While community-level IPTp3+ uptake levels remained strikingly low in the past several years based on the Benin 2017-18 DHS[10] and 2022 MIS surveys, facility-based rates reported through the country's DHIS2 routine reporting system were relatively higher.

[10] Institut National de la Statistique et de l'Analyse Économique INSAE and ICF. Enquête Démographique et de Santé au Bénin, 2017-2018. (Cotonou, Bénin and Rockville, Maryland, USA, 2019): https://dhsprogram.com/publications/publication-FR350-DHS-Final-Reports.cfm.

For example, in CY 2022, 50 percent of the estimated number of newly seen pregnant women at the HF received three doses of SP. A slight progress when compared to 2021's IPTp3+ 47 percent uptake rate but about 100 percent increase compared to 2019's uptake rate. (Figure 2) Furthermore, in 2018, none of the departments had more than 30 percent IPTp3+ uptake. By 2022, 100 percent (12/12) reported greater than 30 percent IPTp3+ uptake, including 6 of 12 departments having reported at least 50 percent IPTp3+ uptake (Figure 3 and 4).

Concurrently, DHIS2's routine data in 2022 showed a similar increase in the proportion of pregnant women having attended facility-based ANC visits out of the total number of projected/expected pregnancies during the CY 2022 period. For instance, facility-based ANC4 coverage was estimated to be 45 percent in CY 2022, a 50 percent improvement when compared to 2019's ANC4 coverage rate. This upward trajectory aligns with that of ANC3+ coverage rates estimated through Benin's 2022 MIS.

Figure 2: Trend of IPTp3+ and ANC4 uptake rates from 2018 to 2022 (DHIS2-based data)

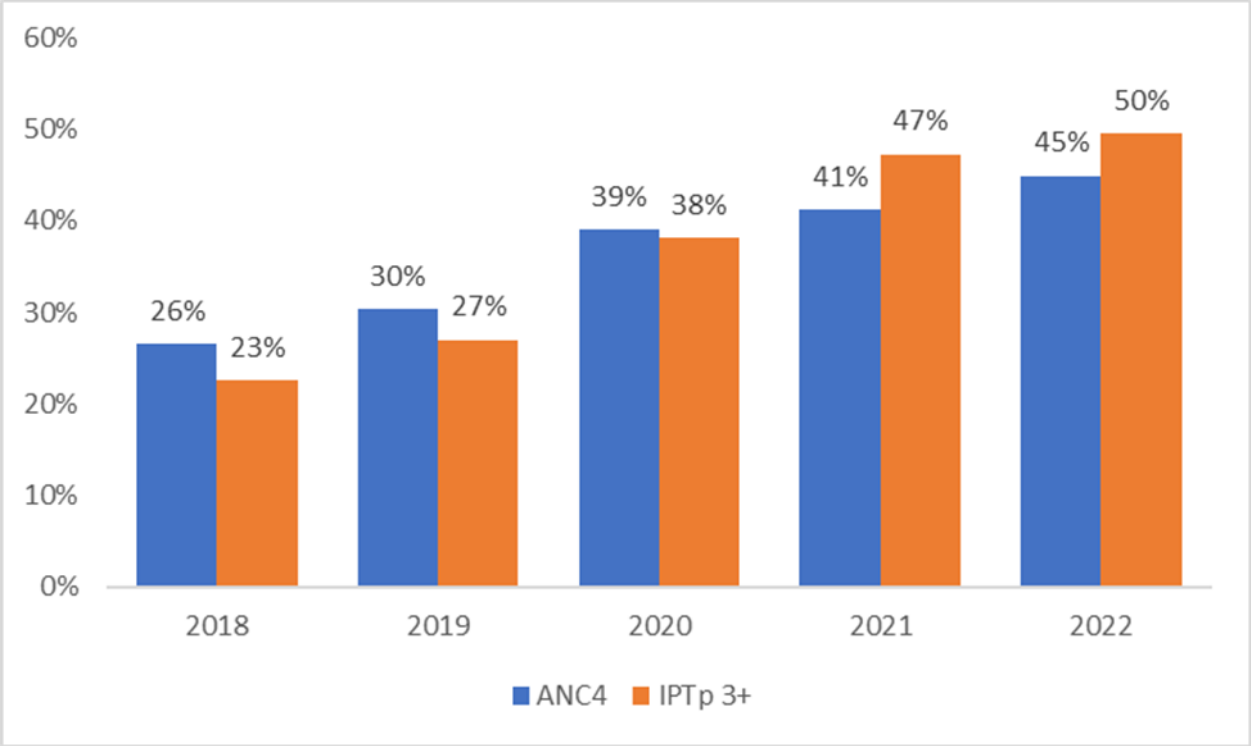


Figure 3: IPTp3+ Uptake by Year and Department (DHIS2), 2018–2022 by Department

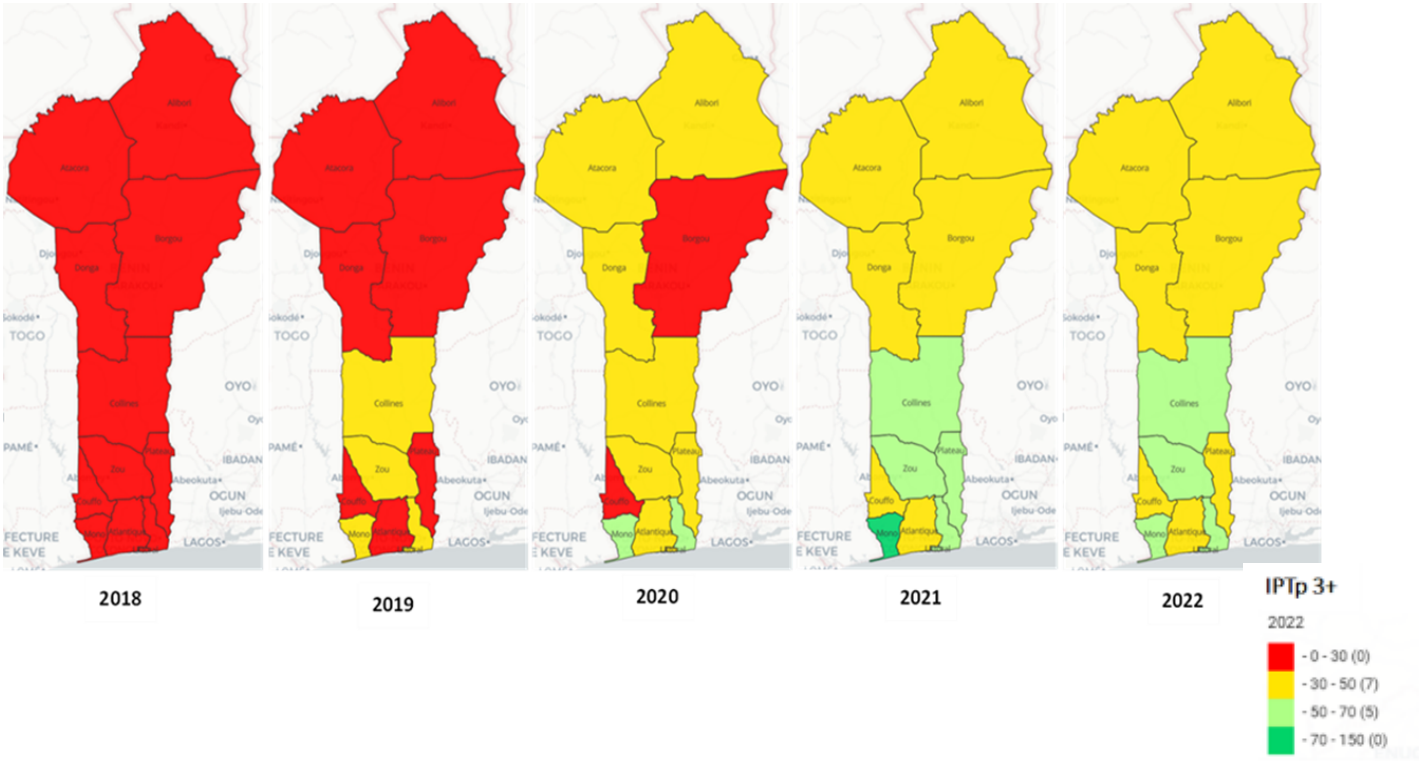
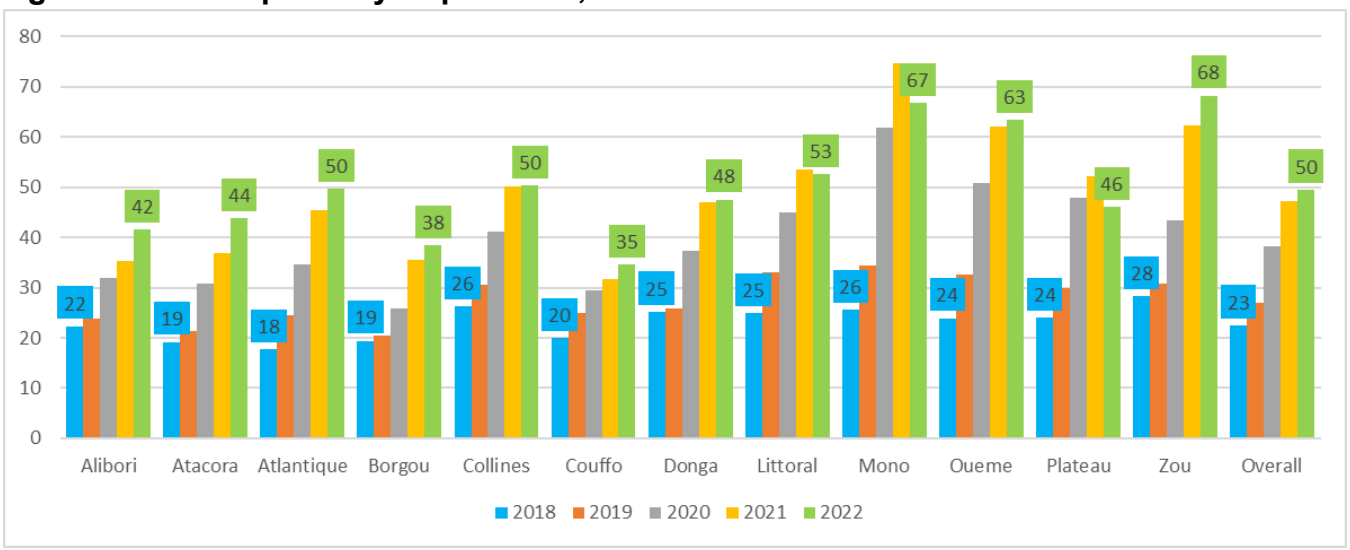


Figure 4: IPT3+ Uptake by Department, 2018-2022



The NMP initiated ANC outreach in 2017 as a pilot intervention (consisting of community distribution of SP, mobilization, and referral of pregnant women to health facilities) with PMI funding. The yearly geographical scope ranged from two HZs in 2017 at the start of the intervention to seven HZs by 2022. In 2023, outreach and mobilization activities are due to take place at 14 of the 34 nation's HZs. NMP is planning on potentially expanding outreach activities to the country's remaining HZs. This is contingent on the Global Fund's support. The approach uses outreach strategies where low-performing HZs are identified using data in the DHIS2, and targeted for ANC outreach activities, in which teams consisting of health facility

staff and community health workers known as *Relais Communautaires* (RCs) go to rural areas to sensitize women, provide ANC, and administer IPTp.

To ensure quality implementation of these community outreach activities, HZ management teams develop work plans based on root cause analysis of barriers to IPTp3+ uptake. NMP and HZ (and/or commune) officials signed memoranda of understanding that include clearly defined standards with indicators to assure accountability. Expansion of community ANC outreach and IPTp administration by midwives is thought to have contributed to improving IPTp uptake, at least in some of the communes/communes in the Southern coastal part of the country that were performing poorly. DHIS2 based data shows an upward trajectory of the yearly proportion of HZs having achieved 50 percent IPTp3+ uptake which went from up to 15 percent, 41 percent and 53 percent respectively in 2019, 2020 and 2022.

However, there continues to be a dearth of knowledge on intermediate determinants of behavior change, and additional examination of determinants of provider behavior is needed to understand why IPTp does not track with ANC attendance.

PMI supported a study that evaluated the potential effect that the health facility-based Group-ANC (G-ANC) intervention may have at the community level in terms of achieving higher ANC4 and/or IPTp3+ coverage rates. The study did not show any significant difference as to these coverage rates when comparing clusters where the intervention took place with those where there was no intervention. However, within the intervention arm, both ANC4 and IPTp3 were higher among women who participated in the G-ANC intervention compared with those who did not. The study's qualitative findings suggest barriers at patient, provider, and system levels impacted optimal enrollment, but those who participated found G-ANC to be a positive experience. The study's findings imply the need to conduct further analyses of barriers, facilitators and system requirements to gain a more nuanced understanding of the feasibility and impact of GANC in Benin and provide guidance to improve success of potential future implementation. Sub-optimal health facility staffing and mandatory fees for ANC at public sector health facilities may have played a key role in achieving sub-optimal uptake of G-ANC during the study's implementation.

PMI/Benin is establishing a robust system for monitoring progress to make sure that a continuous quality improvement process is in place at each step of the MIP clinical cascade. The NMP will also continue its support for optimal national roll-out of WHO's most up-to-date ANC guidelines, as well as their effective availability to health providers.

2.3. Plans and Justification for FY2024 Funding

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

Efforts will continue to strengthen the implementation of IPTp in public and private structures and on extending community IPTp. The community strategy has demonstrated remarkable potential to improve uptake of IPTp3+ in areas of low uptake; with the new commune-level Integrated Communication Plan, activities and messages will be designed to sensitize pregnant women to attend ANC services through existing community-level platforms including village women's groups and local opinion leaders.

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

PMI/Benin will continue to procure SP. For each of and CY25, PMI will procure 1,030,000 doses of SP in accordance with commodities gap analysis.

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

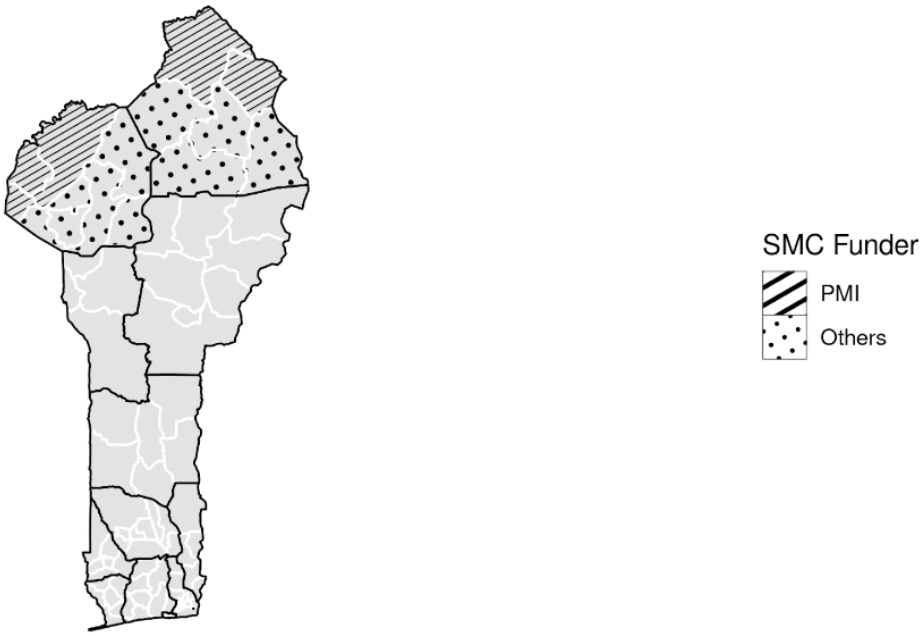
3. Drug-Based Prevention

3.1. Seasonal Malaria Chemoprevention

3.1.1. PMI Goal and Strategic Approach

The NMP's Malaria Strategic Plan promotes SMC as a malaria prevention intervention in areas with highly seasonal malaria transmission and PMI supports the use of SMC as defined in WHO guidance. In 2018-19, the NMCP identified 34 communes (15 HZs) that were eligible for SMC based on an analysis using WHO's SMC eligibility criteria. In 2019, the NMCP launched SMC in some of these identified communes in Benin with support from PMI and the Global Fund. As of 2023, SMC is implemented in 15 communes (six HZs). Of these, PMI has consistently supported implementation of SMC in the same five communes (two HZs) in the northern part of the country through its bilateral partner as well as the procurement of part of the sulfadoxine-pyrimethamine + amodiaquine (SPAQ) needs. The Global Fund and Catholic Relief Services (CRS) supports SMC in the remaining 10 communes (four HZs).

Figure 5. Map of Seasonal Malaria Chemoprevention Implementation in Benin 2022-2023



3.1.2. Recent Progress (between October 2021–September 2022)

In 2022, PMI supported the SMC campaign in five communes via four monthly door-to-door cycles during the peak malaria transmission season. This support included identifying SMC targets; quantifying and procuring SPAQ; updating tools and materials; microplanning; distributing medicines and equipment; training distributors and supervisors; supporting community mobilization; and campaign monitoring and evaluation. PMI's delivery approach consisted of one directly observed therapy (DOT-1) dose followed by two days of medication given by the child's guardian. The campaign achieved a coverage ranging from 95 to 101 percent of the target population during each of the four cycles; 121,637 children aged 3 to 59 months benefited from SMC in these PMI-supported communes (30 percent of the total number of children targeted for SMC). SMC activities in the remaining 10 communes (four HZs) were supported by the Global Fund and CRS. In the Global Fund-supported communes, all three days of medication were administered by DOT (DOT-3).

Digitalization of the SMC campaign has been supported by the Bill & Melinda Gates Foundation (BMGF) through CRS in all 10 communes (six HZs) since 2020 and has resulted in improved data quality and campaign and commodity management (e.g., more accurate pre-campaign household census). However, quality training and supervision for optimal campaign digitalization remains challenging; efforts to address these challenges are ongoing.

The NMP actively participates in the SMC Alliance, which explores methods to improve campaign coordination, implementation, digitalization, monitoring and evaluation, and identify gaps in SMC knowledge.

3.1.3. Plans and Justification for FY 2024 Funding

Benin will continue to support SMC activities as described in the Recent Progress section and BMGF will continue to support SMC campaign digitization through their partners, Clinton Health Access Initiative (CHAI) and CRS. However, a number of changes are being considered for the Global Fund's GC7 grant application, including expanding SMC in 2024 to an additional four HZs (number of communes to be determined) and an additional five HZs in 2025. This would result in SMC being implemented in 15 of Benin's 33 HZs (representing 100 percent of HZs determined to be eligible for SMC). In addition, the NMP is considering increasing the number of SMC cycles from four to five in all HZs, and harmonizing distribution strategies (i.e., DOT-1 versus DOT-3). The nine eligible HZs that are being considered for SMC expansion are: Djougou-Copargo-Ouaké, Bassila, Niki-Kalalé-Perere, Parakou-Ndali, Tchaourou, Bembereke- Sinendé, Dagla, Saba, and Sao). These plans are still being developed and funding opportunities sought.

A descriptive analysis of malaria incidence trends among children under five years of age in SMC-implementing communes during 2019-2022 revealed that cases begin to increase in June in Atacora and Entomological Inoculation Rate (EIR) data from three sites there (Copargo, Djougou, and Kouande) showed a peak EIR in June. In contrast, the EIR data from three sites in Alibori (Bembereke, Gogounou, and Kamdi) showed the peak was in July.[11] The NMP therefore shifted the SMC campaign starts in Atacora from July to June in 2022.

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

The digitized data management of the campaign activities has helped better estimate the proportion of eligible children who received all twelve recommended doses, which was estimated in 2022's campaign to be 52 percent (NMP, ASTMH 2022). This information has helped to to improve SMC campaign's activities including timely planning, effective coordination, optimal staff training, reinforced supervision and a more strategically focused approach to SBC and communication.The NMP will support SBC activities focused on demand generation at the community level through RCs, collaborations with women's groups and civil society organizations.

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

All SPAQ needs are fully covered by PMI and the Global Fund for CYs 2024 and 2025. Please see the SBC section for details on challenges and opportunities to improve intervention uptake or maintenance.

[11] *Centre de Recherche Entomologique de Cotonou*. Entomological Monitoring Report Benin 2020. (Cotonou, Benin, 2022): https://d1u4sg1s9ptc4z.cloudfront.net/uploads/2022/07/Benin-entomological-monitoirng-report-2020-finalsubmission.pdf.

3.2. Other Drug-Based Prevention (as applicable)

Benin is one of several countries participating in a Unitaid-supported project aimed at evaluating the implementation of Perennial Malaria Chemoprevention. In the Benin model, children will receive a minimum of eight treatments with SP, coinciding with the MOH's recommended immunization or vitamin A schedule for children. This project's implementation started in November 2022 in one HZ (three communes) in the North-Western province of Borgou and in the Southern provinces of Zou and Couffo in 2022. Field work will end in 2024. Although PMI is not providing financial support to this activity, PMI sits on the technical and steering committees led by the General Secretary of the MOH (*Secrétariat général du ministère,* SGM). The committees hold periodic meetings to evaluate progress of this activity. PMI and other committee members conduct site visits as part of routine monitoring and provide recommendations to the M & E team based on their observations and findings.

4. Case Management

4.1. PMI Goal and Strategic Approach

The Benin National Strategic Plan 2024–2030 promotes comprehensive CM according to WHO guidelines with the following specific goals:

- Test 100 percent of all suspected malaria cases in public and authorized private health facilities and at the community level.
- Correctly treat 100 percent of all confirmed malaria cases according to national guidelines in public,authorized private health facilities, and at the community level.
- Test 100 percent of clinically suspected malaria cases from the community using RDTs.
- Treat 100 percent of patients with uncomplicated malaria in the community with timely and effective antimalarial treatment (ACTs).
- Refer 100 percent of severe malaria cases to the health facility after administering pre-referral treatment with RAS.
- Correctly manage 100 percent of severe malaria cases according to national guidelines in public and authorized private health facilities.

PMI supports the NMP's CM approach through assistance to national-level policy and programmatic activities, commodity procurements and distribution, and support for facility- and community-level CM service delivery strengthening in 46 communes (29 through IHSA and 17 through the package of high-impact interventions; see Figure 7 below). This includes the provision of TA, supportive supervision, and other CM activities.

PMI and Global Fund procure nearly all malaria commodities (ACTs, RDTs, SP, SPAQ, parenteral artesunate, and RAS). PMI works with staff from the NMP, MOH, and Global Fund to conduct annual commodity quantification exercises, plan and ensure timely commodity procurement, and support distribution and monitoring efforts.

Benin revised its treatment policy to align with WHO ACT resistance mitigation guidance on ACT diversification to include artesunate-pyronaridine (ASPY) in addition to artemether-lumefantrine (AL) for the treatment of uncomplicated malaria and plans to have 20 percent of the country's ACT needs met with ASPY starting in 2024. The GOB funded the first ASPY order (720,000 doses), which is expected to be in-country before the end of 2023. In preparation, the NMP has begun trainings for health care providers on the use of ASPY.

The GOB (upon the technical work of Conseil National de Lutte Contre le SIDA, la Tuberculose, le Paludisme, les Hépatites et les Épidémies/National AIDS Council on Sexually Transmitted Infections, Tuberculosis, Malaria, Hepatitis, and Epidemics [CNLS-TP], MOH, Ministries of Social Affairs, Agriculture, Environment) approved the new community health policy in May 2020 based on the following vision: "By 2030, Benin has an integrated, efficient, resilient and sustainable community health system based on the 'One Health' approach through an improved, permanent availability of basic curative, promotional, preventive and palliative care services and full participation of all community stakeholders for the well-being of all." The development and rollout of the new policy is being coordinated by the MOH with the support of the executive secretariat of the CNLS-TP. The policy includes establishing two cadres of paid workers at the community level. The first, RC, conducts prevention and promotional health services, including home visits and SBC activities. RCs will assess children under five years of age for fever and refer febrile children to the second cadre of community-level workers called *agent de santé communautaires qualifiés* (ASCQ). The ASCQ are nurses or midwives who test children for malaria using an RDT and treat those who are positive with ACTs. The ASCQ can administer pre-referral rectal artesunate to children under five years of age with severe disease, and they will refer children with severe disease to health facilities. In addition, ASCQs will supervise RCs.

Benin's new community health policy is currently being scaled-up. UNICEF is supporting a pilot in six communes in the northern departements of Borgou and Alibori and completed ASCQ training in early 2023. The official launch of the new policy occurred on June 8, 2023, and financing plans for implementation are underway. PMI will modify their health programs to align with the new CH policy as it scales up. For instance, 10 communes (of a total of 77) will be supported by PMI, with a possible extension to an additional 11 communes affected by violent extremism in northern Benin in 2024.

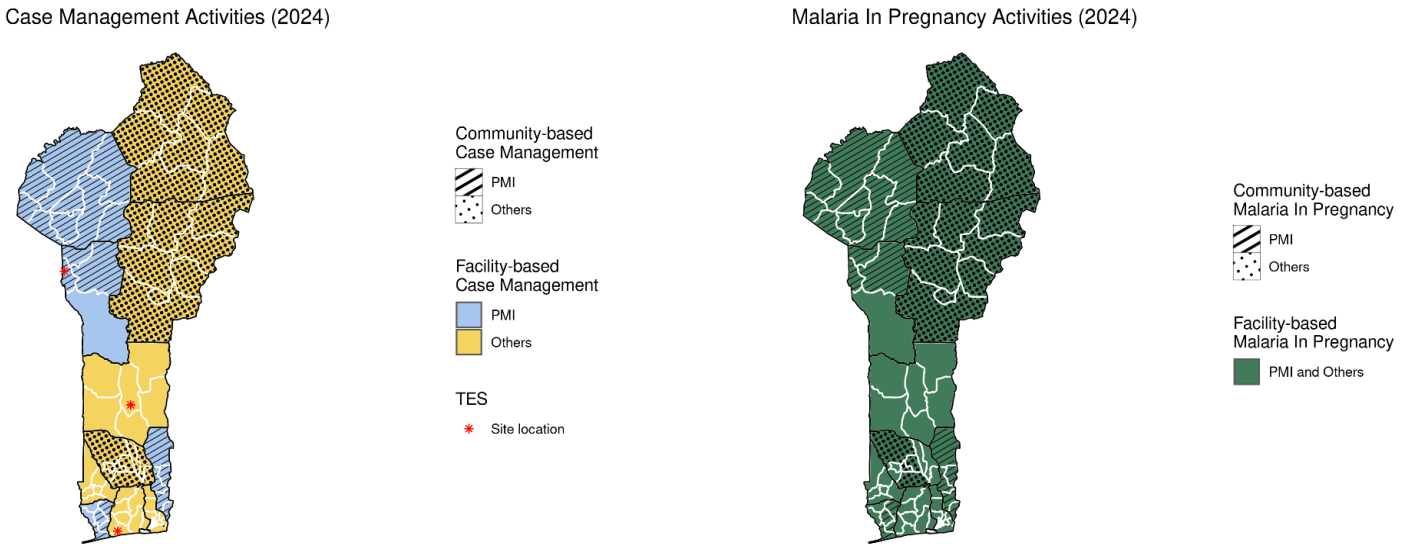
Key challenges with this new policy include potential barriers to timely malaria CM, and optimizing the pre-referral and referral processes for severe malaria. Because the community-level worker, the RC, is not permitted to test and treat for uncomplicated malaria among children under five years of age, diagnosis and treatment for uncomplicated malaria may be delayed. Febrile children will be referred by RCs for testing by the ASCQ, a new cadre of health care workers not yet trained for this purpose. The ASCQ is expected to provide community CM for an entire arrondissement as well as to provide supervision for multiple RCs serving in the catchment area. However, lessons learned from pilot activities suggest that in

remote and hard-to-reach areas, it is difficult for ASCQs to reach all the villages in the arrondissement, and the policy steering committee is considering a review of options to provide prompt malaria testing and treatment for febrile children in these areas.

In the ten PMI-supported communes, 1,740 RCs received support in 2022. PMI also provided on-site supervision and coaching, to an additional 2,664 RCs in 29 communes in four focus departments (Alibori, Atacora, Plateau and Oueme) through their bilateral partner, IHSA.

PMI supports pre-referral treatment with RAS for children under five years of age with severe malaria in all 77 communes. RC's who suspect severe malaria in children under five years of age will refer to the ASCQ for pre-referral treatment.

Figure 6. Map of Case Management, Community Health and Malaria in Pregnancy Service Delivery Activities in Benin 2024-2025



4.2. Recent Progress (October 2021–September 2022)

PMI-supported CM strengthening activities continued to be affected by the COVID-19 pandemic and the associated restrictions and mitigation measures implemented by the GOB.

Between Oct 2019–Sep 2021 PMI supported the use of the Outreach Training and Supportive Supervision (OTSS) tool via their bilateral partner, IHSA. This tool was developed to support quality improvement of malaria case management and was used for integrated supervision of health workers (HWs) in four departments: Alibori, Atacora, Oueme and Plateau. The OTSS tool was used at 287 of the 298 Health Facility Surveys (96 percent) of the four IHSA-supported departments. HFs were visited at least once a year with more frequent follow-up at underperforming sites, enabling the supervision of 1,277 HWs on maternal and neonatal health, family planning, malaria, and gender-based violence. An OTSS before-and after-comparative analysis performed showed an increased proportion of fever cases tested for

malaria from 82 percent to 92 percent ($p<0.001$), an increased proportion of HFs meeting the minimum standard (80 percent) of correct malaria testing and treatment from 70 percent to 79 percent ($p<0.05$) and an increased proportion of pregnant women receiving at least three intermittent preventive treatment doses under direct observation from 7 to 30 percent ($p<0.01$).[12]

PMI has been supporting an OTSS evaluation study through its PMI Insights central mechanism.This evaluation is aimed at developing a tool and a roadmap that would help Benin enhance the effectiveness of its supportive supervision program. Findings from this evaluation are expected in early 2024 CY.

CM strengthening activities were impacted by staffing shortages, funding limitations and technological challenges. PMI has worked with the NMP and partners to address these challenges and implement the following:

National Level Case Management Activities

PMI supported activities to improve national-level policy, governance, strategy and programmatic activities, and commodity procurement and distribution include:

- Support for the national pharmaceutical management system, including:
    - Trained the head pharmacist and supply chain manager at the National Public Health Department, supply chain managers, regional supply chain supervisors, health workers, and local supply chain committees on supply management.
    - Provided computer equipment and internet connection to facilitate supply chain improvement.
    - Conducted a national quantification workshop.
    - Developed a national pharmaceutical catalog.
    - Provided support for the technical working group (TWG) of the Agence Nationale de Contrôle de Qualité des Produits de Santé et de l'Eau to ensure availability of health products in the marketplace and monitor the quality of these products:
        - The TWG developed a monitoring protocol and training tools for 2022 implementation.
        - The agency developed tools for conducting internal audits of health products, with staff training beginning in 2022.
- Continued improvement of CM services for severe malaria including:
    - Training department-level trainers and pediatric emergency service staff in the Triage, Evaluation and Emergency Treatment approach.

[12] Jocelyn Akakpo, Hortense Kossou, Marie-Agnès Agboton- Zouménou, Serge Zountcheme, Senan Lorens Zinsalo, Floride Niyuhire, Thomas Hall, Timothé Chevaux, Ahmed Saadani Hassani, Patrick Condo, Bertille A. Onambele, William E. Houndjo, Cyriaque Affoukou, Alain Aissan. Using Outreach Training and Supportive Supervision (OTSS) To Improve the Quality of Integrated Health Services In Benin. Poster presentation, 2022 American Society of Tropical Health and Medicine Conference. [See page 25 of the Abstract Book] (Seattle, Washington, October 2022): https://www.astmh.org/getmedia/65cc0d8d-1208-4d9a-9f77-734d40de4c02/ASTMH-2022-Annual-Meeting-Abstract-Book.pdf.

- Using data collection tools for monitoring adherence to severe malaria treatment and malaria mortality in two HZs: Alibori and l'Ouémé
- Distributing updated training materials.
- Supporting the use of injectable artesunate as the first-line treatment for severe malaria (followed by a full course of ACTs) in referral hospitals.
- Supporting the implementation of rectal artesunate for pre-referral treatment for children under five years of age with severe malaria.
- Strengthening quality assurance of malaria diagnostics in private health facilities and laboratories through training, professional development, and laboratory supervision.
- Advocating the rollout of digitalized Outreach Training and Supportive Supervision (OTSS) tools for use in all 12 departments.
- Monitoring the NMCP/CNLS-TP's efforts in designing and finalizing the new CH policy's implementation roadmap including the introduction of the new health care worker cadre, the ASCQ. In the pilot areas, ASCQs began to receive enhanced training with support from UNICEF. An evaluation of this pilot is underway with support from UNICEF.

Commodity Procurement and Distribution Support including:

- 2,000,000 malaria RDTs for nationwide use, accounting for about 42 percent of needs.
- 2,000,000 ACTs for nationwide use, accounting for approximately 54 percent of needs.
- 300,000 vials of parenteral artesunate for nationwide use, accounting for approximately 34 percent of needs.
- 9,000 rectal artesunate suppositories for nationwide use in health facilities for pre-referral treatment of children under five years of age with severe malaria, accounting for approximately 100 percent of needs.

Facility Level Case Management Activities:

- 93 percent of health facilities supported by PMI received OTSS visits (IHSA Year 4 report and NMP supervision report).
- Coached 1937 health workers and 297 health supply managers during OTSS visits (IHSA Year 4 report).
- Conducted on-site training in departments with providers trained through collaboration between private sector associations and commune health teams (IHSA Year 4 report).
- Conducted OTSS for malaria diagnosis in hospitals that use microscopy.
- Conducted quarterly data quality assessments for health facilities (IHSA Year 4 report).

Community Level Case Management Activities:

- Supported RC activities in four departments where PMI's bilateral, IHSA, is focused: Alibori (three HZs); Atacora (three HZs); Plateau (two HZs) and Oueme (three HZs).

PMI/Benin co-funded an HFS in a nationally representative sample to assess malaria CM practices and health worker performance and attitudes. Results from the survey suggest there is room for improvement in management of suspect malaria cases. For example, 58 percent (95 percent confidence interval (CI): 41 to 73 percent) of suspect cases were tested for malaria by the health worker during the consultation. Among those tested who were positive, 84 percent (95 percent CI: 77 to 89 percent) were correctly treated; however, among those who tested negative for malaria, 26 percent (95 percent CI: 16 to 40 percent) received antimalarial treatment. Of the true malaria cases confirmed by the survey team during re-examination, 79 percent (95 percent CI: 68 to 87 percent) had received an appropriate antimalarial during the visit. A high level of provider knowledge about CM was associated with an over a two-fold increase in the odds of correct CM (2:3 odds [OR]; 1.2 to 4.5, 95 percent CI) (2021 Benin HFS report, Benin HFS 2022.) Results of this survey will be used when designing updates to training materials.

PMI/Benin supported a Malaria Behavior Survey to describe malaria-related behaviors including prompt care seeking for febrile illness and their ideational determinants. Results from this survey will inform SBC activities at multiple levels of the healthcare system.

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/Benin will continue to support national-level CM activities as described in the CM Recent Progress section. However, PMI plans to support CM in all 19 communes of four departments (Atakora, Donga, Mono and Plateau).

National Level Case Management Activities

PMI/Benin will continue to support national-level CM activities as described in the CM Recent Progress section.

Commodities

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

One of the key prerequisites to providing quality case management services at the facility and community level is the consistent availability and storage of malaria-related commodities. PMI has been supporting the implementation of EUV surveys aimed at continuously assessing

supply chain specific questions. Results from these surveys have been used to guide remediation of quantitative and qualitative supply chain issues.

Overall, EUV surveys revealed fewer stockouts of malaria commodities at the HF level during 2022, compared with 2021. Stockouts were rare at the central, regional and HZ distribution warehouse levels. Last-mile distribution remains a key logistical challenge and is being addressed with PMI's support to assure that the malaria commodity delivery process from transportation hub to final destination is optimized. To this end, supply chain actors including the NMCP have been working to design and validate a sound commodity delivery system to the last mile. The implementation of this system will improve the quality of HF and community-based malaria CM services.

PMI/Benin will continue to procure ACTs, artesunate suppositories, injectable artesunate, and RDTs, for CM services as described in the CM Recent Progress section**.** Quantities and types of these commodities may be adjusted through reprogramming based on contributions of partners and updated gap analyses (20 percent of PMI's ACT order will be ASPY to align with Benin's new treatment policy for uncomplicated malaria).

Facility Level (may include private sector if relevant)

With FY 2024 funding, PMI Benin will continue to support OTSS for health facility staff and supervisors to help drive higher adherence to CM guidelines and use of data for decision-making as described in the CM Recent Progress section. Modifications to the OTSS tool may be made based on the evaluation described in the CM Recent Progress Section.

Community Level

There are currently no plans for RC compensation through direct PMI funding in Benin; however, the mission has designed a commodity import program agreement with the MOH to pay a portion of RC wages with the proceeds from the sale of PMI-donated commodities.

Monitoring Antimalarial Efficacy

Table 2. Ongoing and Planned Therapeutic Efficacy Studies

Ongoing Therapeutic Efficacy Studies			
Year	**Site name**	**Treatment arm(s)**	**Plan for laboratory testing of samples**
2022 *	Bohicon, Allada, Parakou	AL	CIGASS, Senegal
Planned TESs (funded with previous or current MOP)			
2024	TBD	AL, ASPY	TBD

AL: artemether-lumefantrine; ASPY: artesunate-pyronaridine; CIGASS: Centre International de Recherche, de Formation en Génomique Appliquée et de Surveillance Sanitaire, or International Center for Research and Training in Applied Genomics and Health Surveillance; MOP: Malaria Operational Plan; TBD: to be determined
*Proposed start date is October 2022 and is subject to change.

Other Planned Case Management Activities

PMI/Benin will support the use of RDT automated readers to evaluate the test positivity rate and provider behaviors in malaria diagnosis and treatment aimed at improving adherence to treatment guidelines (see OR section for more details).

5. Health Supply Chain and Pharmaceutical Management

5.1. PMI Goal and Strategic Approach

PMI's goal and strategic approach is aligned with the NMP's objective of securing the timely availability of quality commodities to support the prevention, diagnosis, and treatment of malaria cases for the Beninese population.

PMI's interventions for health product supply chain strengthening will continue to focus on the different components, including the central medical store, the health zone warehouses, the health facilities, and the community.

PMI has supported various interventions in the implementation of the latest supply chain strategic plan. These interventions include improvement of governance, quantification and supply planning (with the introduction of the Quantification Analysis Tool), storage and distribution, the logistics information and management system (LMIS), human resource capacity building for supply chain management, malaria commodity quality assurance, and system performance monitoring. PMI will contribute to updating the supply chain strategic plan to consider the orientations and challenges revealed by the reforms of Benin's pharmaceutical sector. One of the major supply chain priorities that PMI will support is the establishment of a last-mile health commodities distribution system; a directive document was drafted and validated for this initiative by the MOH in 2023.

Together with the NMP, Global Fund, and other implementing partners, PMI will continue to procure antimalarials and other commodities based on the NMP's national quantification and procurement plan. The NMCP closely coordinates with the central medical stores to ensure malaria commodities are available. Also, the Benin Agency for Pharmaceutical Regulation and National Agency for the Quality Control of Medicines are reinforced with support from PMI to ensure best regulatory functions, compliance on malaria commodity-related issues and pharmaceutical market surveillance. The strategy is to use different tools, including the LMIS, EUV survey, joint supervision visits, and weekly monitoring summaries, to give feedback and to improve supply chain management.

Specifically, the NMP strategic approach to supply chain strengthening includes the following:

- Provide free access to ACTs and RDTs for children under five years of age at the community level and at health facilities.
- Provide free access to prevention and treatment for pregnant women.
- Integrate antimalarial commodities into the national supply chain, including conducting EUVs that include commodities for other priority programs.
- Scale up injectable artesunate in the public sector for severe malaria treatment.
- Ensure availability of malaria commodities for adolescents and adults (e.g., RDTs, ACTs, and injectable artesunate).
- Implement a "panier commun" (common basket) to secure access to products at the health facility and community levels regardless of the funding source and to ensure rational use.
- Conduct routine distribution of ITNs and mass campaigns supported by Young Logisticians Professionals (YLPs).
- Conduct annual consumption and morbidity-based quantification exercises and develop supply plans.
- Review quarterly supply plans and conduct inventories to make necessary adjustments to avoid stockouts or overstock of products at the different levels of the supply chain.
- Strengthen data collection, visibility, and analysis for malaria commodities through the use of the SVDL and scaling up the eLMIS mechanism nationwide.

5.2. Recent Progress (October 2021–September 2022)

PMI support to the NMP for the malaria commodity supply chain achieved the following:

- Provided TA to the NMP (quantification, supply plan, Procurement Planning and Monitoring Report for malaria, Global Health Supply Chain Program-Procurement and Supply Management Coordination, EUV survey, etc.).
- Supported the work of 30 YLPs.
- Provided TA to 18 health zone warehouses and their respective health facility supply chain workers by PMI-supported YLPs.
- Continued support for a data visualization platform and an eLMIS nationwide; implementation for all health commodities with good improvement of logistics data.

- Ensured good storage conditions and management of the procured antimalarial commodities.
- Reduced stockouts of malaria commodities at health facilities (less than 1 percent for the last semester of 2022).
- Improved quality of logistics reports.
- Reorganization of the distribution circuit of injectable artesunate with free access for all targeted populations.
- Relocation of routine ITN storage to health zone warehouses with improved visibility and traceability of usage in quarterly reports.

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.

This year, Benin will continue to support the following activities to strengthen the supply chain:

- Improving inventory, stock management, product ordering, reporting at the peripheral level through the work of the YLPs in support of health facilities and HZ warehouses.
- Advocating with MOH to develop a sustainability plan for the YLP program.
- Supporting routine long-lasting insecticidal net distribution.
- Reinforcing the reorganization of long-lasting insecticidal nets stock in the DRZS and health facilities to improve traceability and visibility.
- Contributing to the continuous availability of commodities (e.g., ACT, injectable artesunate, RAS, RDT, SP, SPAQ) at all levels of the supply chain.
- Supporting the NMP in the annual quantification and quarterly reviews of the supply plan.
- Reporting through DHIS2/Logistics Data Visualization System, using the A7 reporting form.
- Scale-up of the eLMIS. More than 1000 supply chain professionals have been trained to use the platform. It is functional in all 34 regional depots (100 percent) and in 60 percent of health facilities. PMI's goal is to scale it up to the remaining health facilities.
- Realizing the EUV study in all departments.
- Strengthening the capacity of central medical stores and the National Agency for Medicines Quality Control in the quality control of health products and the Beninese Agency for Pharmaceutical Regulation in the fight against substandard and counterfeit pharmaceuticals.
- Designing supply chain training modules and the use of eLMS through the DSI/MOH e-learning platform and work with the MOH *Direction des Systèmes d'Information* (DSI) to make them ready to take over ownership once it is fully developed.

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

6. Malaria Vaccine

6.1.1. PMI Goal and Strategic Approach

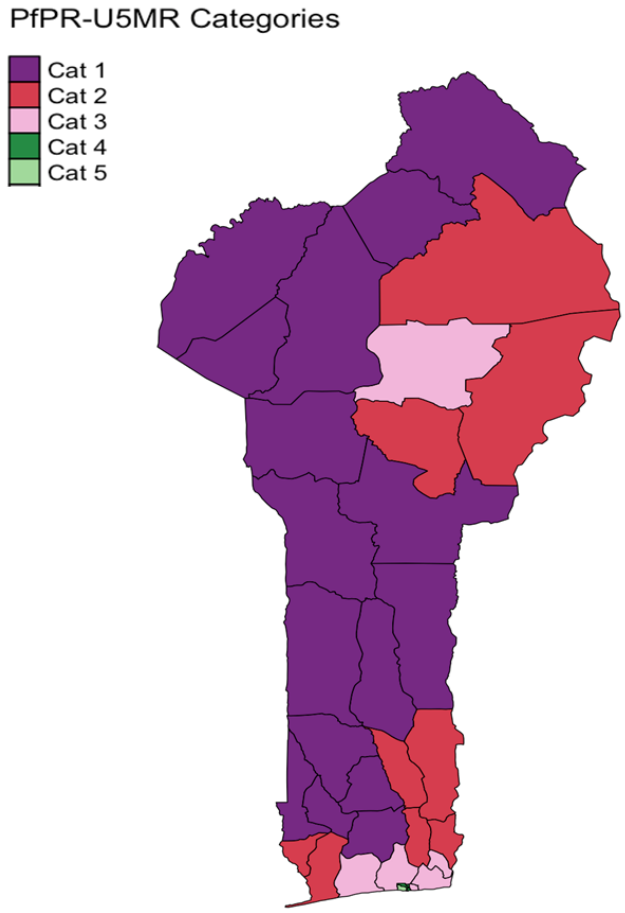
The PMI Benin goal for the malaria vaccine is to support the Ministry of Health to deploy this intervention strategically as a complementary tool to existing core malaria interventions. This includes providing technical assistance to the NMP as it engages with the national EPI to strategically use data to decide where to introduce the malaria vaccine. Vaccine introduction will be led by the national EPI, thus PMI Benin will work with the NMP and national immunization colleagues to provide complementary support in the planning, delivery and monitoring of vaccine deployment. This includes support to maximize uptake of the vaccine without adversely affecting coverage of other malaria interventions. Given that Benin has scheduled the malaria vaccine introduction for the first quarter of 2024, PMI will allocate funding to achieve a high coverage in the target zones.

6.1.2. Recent Progress (October 2021–September 2022)

Following the October 2021 WHO recommendation on the large-scale use of the RTS,S/AS01 malaria vaccine for children living in areas with moderate to high transmission, Benin has expressed interest in the deployment of the vaccine with the support of Gavi in 16 of 34 health communes belonging to 8 of 12 targeted regions. Target areas were selected based on stratification of malaria transmission with prevalence and mortality data. The 16 health communes are: Banikoara, Malanville-Kandi, Tchaorou, Tanguieta-Materi-Cobli, Natitingou-Toucoutouna-Boukoumbe, Kouande-Kerou-Pehounco, Djougou-Copargo-Ouake, Bassila, Dassa-Glazoue, Savalou-Bante, Save-Ouesse, Djidja-Abomey-Agbangnizoun, Zogbodome-Bohicon-Zakpota, Aplahoué-Djakotomey-Dogbo, Klouékamè-Toviklin-Lalo, and Allada-Toffo-Zè. The target number of children is estimated to be 167,434 for these 16 communes. The planned start of vaccination is scheduled for the first quarter of 2024.

The map in Figure 7 shows the planned phases of subnational introduction of the malaria vaccine based on malaria transmission levels, ranging from highest transmission area (Category 1-purple) to low transmission area (Category 5-light green).

Figure 7. Map of malaria vaccine plans in Benin



6.2. 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.

In January 2023, Benin applied to Gavi to support the procurement and deployment of the malaria vaccine. The malaria vaccine in Benin will be deployed in health facilities to infants at 5, 6, 7, and 17 months of age as a part of routine EPI service delivery and complemented by Periodic Intensification of Routine Immunization activities. Benin plans to introduce the malaria vaccine in 16 health communes that have the highest burden of malaria, scheduled to begin at the start of calendar year 2024. Thirteen of the targeted communes are in PMI-supported departments. FY 2024 PMI funds will be used to provide supportive supervision to health care workers who provide the malaria vaccine in these three communes. All malaria vaccine procurement will be supported by UNICEF with Gavi funding. New SBC investments will focus on malaria vaccine delivery for health care workers and demand generation for parents.

7. Social and Behavior Change

7.1. PMI Goal and Strategic Approach

PMI's SBC support to the NMP's National Strategy for Malaria Social and Behavioral Change Communication 2021–2025 (Stratégie Nationale de Communication pour le Changement Social et Comportemental contre le Paludisme 2021–2025; SNCCSC) fully aligns with and contributes to the country's vision of "a Benin without malaria by 2030" through ensuring universal access to malaria prevention and correct treatment of malaria to reduce morbidity and mortality.

The key behavioral objectives highlighted in the SNCCSC (note that this is the wording directly from the current version of the strategy) include the following:

- Getting 90 percent of the population (the whole family) to sleep every night under an insecticide treated mosquito net all year round (ITN effective use).
- Ensuring 95 percent of pregnant women know that IPTp is free and that at least three doses are administered in the presence of a health care provider during antenatal visits and other contacts (effective uptake of IPTp).
- Promoting early care-seeking (health facility attendance and easier access to community health services).

PMI's support is achieved through evidence-based, coordinated communication interventions deployed across PMI supported geographic focus areas. Through partnerships with local media organizations, community-based organizations, and collaboration with RCs, PMI supports the NMP's efforts to expand mass media and community-level interpersonal communication (IPC) activities aimed at increasing correct and consistent ITN use and care, prompt care-seeking for fever, uptake of RDTs and IPTp, and provider adherence to diagnostic results for treatment with ACTs. At the national level, PMI provides TA, support for capacity-strengthening activities including for coordination, and the development of materials and relevant guidelines. PMI is also currently supporting ongoing efforts to improve coordination and the development of other relevant guidelines to align with the National Malaria Strategic Plan. At the commune level, PMI continues to support the adaptation of the national SBC Strategy to local contexts through the development of zonal- and communal-level operational plans and communication materials; and to support partner coordination efforts. Finally, PMI will support the implementation of an adapted SBC strategic plan resulting from the analysis, and translation of malaria SBC evidence from the 2021 Malaria Behavior Survey survey.[13] The adapted strategic plan guides the review and adaptation of the commune-level operational plans and the development of current messages into easily digestible formats, tailored to multiple audiences. It's intended to inform near real-time adaptations to ongoing malaria SBC program implementation. In addition, PMI plans to work with political and social

[13] President's Malaria Initiative, *Ministère de la Santé Benin*, Global Fund, Breakthrough Action for Social and Behavior Change. Benin Malaria Behavior Survey 2021. (Washington, D.C., USA and Cotonou, Benin, 2022): https://malariabehaviorsurvey.org/wp-content/uploads/2022/11/Benin-MBS-Report-2022-En-1.pdf.

influencers such as parliamentarians, renowned musicians, religious and local leaders by strategically engaging them as malaria champions to raise awareness and the need for concerted efforts against malaria at all levels of government and in the communities.

7.2. Recent Progress (October 2021–September 2022)

During FY 2022, PMI supported HZs to develop and update their integrated communication plans (*Plans Integre de Communications,* PICs). As part of the effort to strengthen SBC at the community level, 5 HZs (KGS, BNK, ABD, Porto-Novo-Aguégués-Sèmè-Podji, and SAKIF) received technical and financial support to develop or update their PICs. This documentation is valuable for the supported HZs and will be used as a reference for other HZs that do not yet have this planning tool. In the four departments supported by PMI, the PIC validation sessions were attended by Direction Départementale de la Santé (DDS) staff, members of the HZ management team, mayoral health focal points, and local partners such as community radio station managers and non-governmental organization supervisors who implement communication initiatives for health promotion at the community level (155 participants, including 53 women).

PMI's support also contributed to the DDSs and HZs for the contracting and broadcasting of messages with local radio stations. To strengthen communication activities in the departments, PMI provided technical and financial assistance to the DDSs and HZs for contracting, broadcasting, and monitoring messages on 11 community radio stations. Malaria themes covered by the different radio stations included:

- Malaria prevention in children, mothers, and pregnant women;
- Malaria knowledge, prevention, attitudes, and management;
- Following ANC schedules, frequency and appointments;
- Social mobilization and involvement of local authorities in SMC;
- Managing side effects of SMC drug administration;
- Malaria severity and malaria management in pregnant women.

All the 11 supported community radio stations fulfilled their contractual mandate to broadcast mass awareness messages at the community level in Alibori, Atacora, and Ouémé. In order to provide community radio stations with the tools they need to better assess the impact of their programming, PMI provided technical and financial support to the DDS in one of the northern departments (Atacora department) to develop a strategy for evaluating the contribution of community radio stations in improving the uptake of health care interventions. Malaria-related strategic objectives of the analysis included: 1) promoting the adoption of helpful behaviors for malaria control, and 2) raising awareness in communities about diseases with epidemic potential. All the radio stations except one have set up clubs to monitor their programs' audiences. This activity was carried out by 17 participants (including five women) from the communes, the local radio stations, the DDS, and the HZs.

PMI supported community outreach to improve uptake of primary health care. Increasing demand for primary health care within the population remains a major challenge in general and particularly in the health zones where the RCs are no longer operating in preparation to transition to the new community health worker strategy. PMI supports social mobilization activities to promote early health care-seeking behaviors supervised by mayoral health focal points. Awareness-raising sessions focused on the importance of standard ANC1 and ANC4 and the importance of skilled birth attendance in health facilities. Mayoral health focal points sensitized 3,327 individuals (2,125 females and 1,202 males) in 12 communes.

PMI continued to support HZs in identifying messages for the PICs. The messages are developed in collaboration with journalists and health officials, including the *Chargé de la Recherche-Action et de la Mobilisation Sociale* research and social mobilization support officers and communication and community health officers of the DDS.

PMI also provided technical and financial support for bi-annual PIC assessments to the HZs of NBT, TMC, and 2KP HZs in Atacora; the 3A HZ in Ouémé; and the KGS and BNK HZs in Alibori to develop and update their PICs. The main objective of the PICs is to spur behavioral and social change in the population that contributes to the reduction of maternal, neonatal, and infant/child mortality, as well as the involvement of local authorities in community health funding. After at least six months of implementation, the activity provided technical and financial support to assess the level of progress in the implementation of the planned interventions and the results obtained through these PICS in the HZs. PMI supported the HZ management teams to develop and validate primary data collection, analysis, and results presentation tools. Data was collected in the HFs, from local radio stations, and from the organizations (NGOs, community-based organizations) that support the HZs in the implementation of communication interventions at the community level.

For example, the analysis of the data collected in the supported departments shows that the implementation of communication activities has contributed to improving the proportion of pregnant women who attended ANC1 in the first trimester of pregnancy. ANC attendance increased from 56.1 percent in December 2021 to 60.3 percent in August 2022 in the Alibori department; from 44 percent in December 2020 to 46.2 percent in August 2022 in Ouémé; and from 41 percent in December 2020 to 44.8 percent in August 2022 in the Atacora department.

Overall, the level of actual implementation of the planned communication activities in the USAID-supported communes for the reporting period varied between 43 percent and 71 percent. This variance is due to the unavailability of resource persons to animate the thematic sessions during the organization of radio broadcasts.

Several studies have been carried out showing barriers to access to care in the event of fever, which may give priority to malaria.

According to the SurEval evaluation conducted by CHAI in (2022), more than half of the population (53 percent) seeks care in the event of a fever. SurEval is a comprehensive malaria surveillance systems assessment which was conducted in 2022 by CHAI with support from BMGF. Similarly, findings from Benin's 2021 (Multiple Indicator Cluster Survey [MICS] indicate that of the 17 percent of the children under five years of age for whom the mother/guardian/ reported fever in the 15 days prior to the survey, 49 percent received medical advice or treatment.

According to the Malaria Behavior Survey (2021),[14] the population of Benin recognizes fever as the main sign of malaria, but knowledge about diagnosis and treatment for malaria (i.e. when and where to consult, drugs and services for treatment, etc.) remains low. The survey also revealed that a third of respondents or fewer correctly knew when and where to seek care for malaria (North, 34.9 percent; Center, 17.8 percent; South, 27.0 percent). Care-seeking behavior is therefore low in health centers for various reasons including self-medication, mistrust of the health system, lack of access to resources, lack of knowledge of the recommended time to seek care, and insufficient recognition of the disease's seriousness.

The proportion of surveyed sample of the population that had access to an ITN (one ITN per two individuals) fell from 77 percent to 53.6 percent in 2022, based on 2017-2018 DHS[15] and 2022 MIS, respectively, corresponding to a decrease of 30.4 percent in five years. For the same period, the proportion of those who slept under an ITN the night before the survey fell to 61.5 percent (2022 MIS) from 71.0 percent reported in 2017 (2017-2018 DHS). Benin's 2022 MIS showed that ITN use by the general population and the most vulnerable populations (children under five years of age and pregnant women) remained below the target of 80 percent, and were 62 percent and 60.7 percent, respectively. This represented a decrease from 2017 (79.3 percent and 76.3 percent, respectively, per 2017-2018 DHS). Several factors could explain this situation, such as the low use of routine distribution channels in health centers (ANC, vaccination), low community support for ITNs distribution campaigns, lack of knowledge of good practices about ITN use, low coverage of social and behavioral change interventions as well as post-distribution monitoring in households.

The survey also demonstrated that four out of ten (40.3 percent) children under five years of age sought care in the event of a fever, and 35.8 percent did so within 24 hours. Indeed, according to data from the external review, the therapeutic route is not always ideal because it is dictated by self-medication and the use of traditional healers before going to a health center. Knowledge of the recommended time to see a health worker to perform an RDT or microscopy after seeing a fever is very low.

---

[14] President's Malaria Initiative, Ministère de la Santé Benin, Global Fund, Breakthrough Action for Social and Behavior Change. Benin Malaria Behavior Survey 2021. (Washington, D.C., USA and Porto-Novo, Benin, 2022): https://malariabehaviorsurvey.org/wp-content/uploads/2022/11/Benin-MBS-Report-2022-En-1.pdf.

[15] Institut National de la Statistique et de l'Analyse Économique INSAE and ICF. Enquête Démographique et de Santé au Bénin, 2017-2018. Cotonou, Bénin and Rockville, Maryland, USA, 2019): https://dhsprogram.com/publications/publication-FR350-DHS-Final-Reports.cfm.

According to the 2021 MBS survey,[16] 84.1 percent of respondents know care should be sought the next day or sooner after the onset of fever, while only 40.1 percent know that a screening with a blood test is the best way to find out if you have malaria. Regarding treatment, almost 100 percent of respondents know that a health facility is the best place to treat malaria, which is a very positive result.

These results demonstrate that the Beninese population recognizes the positive aspects related to health facilities in terms of care. Better interpersonal communication at the facility level could therefore help people better understand why laboratory diagnosis remains the best means of screening for malaria.

To improve care-seeking, more information is needed on intermediate determinants of care-seeking behavior among caregivers for children under five years of age as well as the frequency of use of unqualified private or non-traditional providers as the first recourse for caregivers of children under five years of age.

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.

Priorities

Through the use of SBC interventions and in alignment with the NMP communication strategy, PMI will support the uptake of correct and consistent malaria interventions, thereby improving the overall quality of malaria control efforts that contribute to reducing the malaria burden.

The NMP is planning to establish *comités villageois de lutte contre le paludisme*/village health committees for malaria prevention and control in HZs. Each committee will be composed of five members including the head of the village (*chef du village*), a community leader, and key representatives, including at least one youth and woman. A minimum package of activities will be entrusted to them and they will carry out sensitization activities in their respective villages and be involved in implementing SMC and ITN campaign activities. In alignment with the NMCP strategy, PMI will provide direct support to the establishment of the village health committees as a major SBC communication platform.

SBC activities funded under this MOP will concentrate on designing and implementing evidence-based SBC interventions based on the results of the MBS (2021)[17] and the Health Facility Survey (2022). While SBC activities to encourage correct and consistent use of ITNs will continue, priority will be placed on addressing prompt care-seeking behavior and provider

[16] President's Malaria Initiative, Ministère de la Santé Benin, Global Fund, Breakthrough Action for Social and Behavior Change. Benin Malaria Behavior Survey 2021. (Washington, D.C., USA and Porto-Novo, Benin, 2022): https://malariabehaviorsurvey.org/wp-content/uploads/2022/11/Benin-MBS-Report-2022-En-1.pdf.
[17] Ibid.

adherence to guidelines on CM and IPTp. Emphasis will also be placed on improving institutional capacity to manage and implement SBC activities at the national, HZ, and community levels including strengthening the SBC operational plan elaboration sessions in the communes and the TWG coordination functions at the central and decentralized levels (HZ, communes and the village health committees).

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

Table 3. Priority Behaviors to Address

Behavior	Target Population	Geographic Focus	Programming to Address Behavior
Prompt care-seeking for fever for children under five years of age	Caregivers of children under five years of age	All PMI-supported HZs	● Conduct community and household level IPC informed by data in prompt care-seeking and disseminating data at all levels including at the community level. ● Promote improved quality of care at health facilities through quality assurance committees and the village health committees. ● Provide evidence-adapted messages to local radio stations airing and spots to promote prompt care-seeking. ● Re-enforce household visits by the RCs and ensure that they are well trained and equipped with appropriate social and behavior change communication tools/messages.
Adherence to CM guidelines	Health facility–based providers	All PMI-supported HZs	● Support TA in service delivery for the scaling up of behavioral design to all PMI-supported health facilities and RCs using recommendations from the MBS and the HFS to promote provider behavior change regarding the use of RDTs for testing and treatment decisions.

HFS: Health Facility Survey; HZs: health zones; IPC: interpersonal communication; RC: *Relais Communautaires;* RDT: rapid diagnostic tests; TA: technical assistance.

Though most activities will be a continuation of ongoing activities, the results of the MBS and HFS will inform the design of new activities. Special emphasis will be put on strengthening NMP capacity through the government-to-government (G2G) agreement to manage SBC implementation including:

- Implement MBS and HFS recommendations.
- Support further dissemination of the final SNCCSC.
- Support the implementation of the validated SNCCSC.

- Support the update of the SNCCSC including the integration of MBS and HFS data when available.
- Support the SBC TWG to increase coordination of SBC activities in the country and collaboration among relevant stakeholders.
- Support departmental and HZ teams to develop and implement integrated communication plans, including training health workers in SBC.
- Continue to support local radios to raise awareness on malaria prevention and care-seeking.
- Continue to support ASQCHWs and RCs to implement community mobilization and interpersonal communication activities (e.g., group education sessions and household visits) in PMI-supported zones. (Note: Details for this support may change due to the new Community Health Strategy.)
- Support to NMP and partners to prepare and celebrate World Malaria Day, including satellite activities and events.
- For NMP, continue malaria school clubs and increase the number of schools in the targeted HZs.
- Support the design, validation, reproduction, and distribution of communication tools.
- Support educational sessions to engage men and gain their support for early care seeking and involvement and commitment for women's regular participation in ANC.
- Continued contracting with local radios for awareness-raising on malaria prevention and care-seeking, especially targeting pregnant women and children under five years of age. The support will include technical and financial assistance to contract with local radio stations and broadcast messages in the four targeted departments (Atakora, Donga, Mono and Plateau).
- Technical and financial support to communes for formative supervision of RCs to strengthen local prevention communication activities (household visits and group education sessions) in the four PMI departments.

PMI will collaborate with the NMP and Speak Up Africa to identify political and social influencers, e.g. parliamentarians, renown musicians, religious and local leaders to partner with in sensitization activities to raise awareness and promote uptake of interventions against malaria. PMI will leverage its government-to-government (G2G) resources and connections to re-enforce the collaboration, and will participate and play an advisory role in the events organized by the NMCP and Speak-Up Africa in raising awareness and mobilizing resources for malaria control.

With the results from the MBS, the HFS, the MIS, the SurEval, and the MICS, PMI will collaborate with the stakeholders to disseminate the results nationwide and ensure that they inform action plans and guide capacity strengthening at both the national and subnational levels, with increased effort at the zonal and the communal levels. To bolster the NMP's capacity for the planning, design, implementation, and evaluation of SBC activities, PMI will continue to support:

- Coordination at the national level through targeted support to improve the effectiveness of the SBC Technical Working Group;
- Development of decentralized-level SBC operational plans;
- Increased coordination to ensure the impact of SBC investments, specifically by:
    - Capacity strengthening of key partners and stakeholders for effective SBC design, implementation, and evaluation;
    - Capacity strengthening-building for NMP staff on data use (e.g. from the MBS, the HFSA, and upcoming Malaria Indicator Survey; the MIS, the SurEval, the MICS) to inform SBC program priorities and strategies.

8. Surveillance, Monitoring, and Evaluation

8.1. PMI Goal and Strategic Approach

The current National Strategic Plan (NSP) covers the period from 2020 to 2024. A mid-term review of the malaria control program's current NSP was conducted in 2023 and generated recommendations used to guide the design of the next NSP that will cover 2024 to 2030. The new 2024 to 2030 NSP describes indicators and targets set forth to help measure progress in reaching the country's goal of malaria elimination by 2030. PMI's investment in surveillance, monitoring, and evaluation in Benin supports the NMP and MOH to improve the accuracy, timeliness, and completeness of malaria related data in the HMIS. Through direct G2G support to the NMP, PMI seeks to strengthen HMIS at commune and national levels by supporting the NMP to conduct monthly data review meetings and analysis of routine malaria data at the commune level. In the four USAID focus departments of Alibori, Atacora, Oueme, and Plateau, PMI provides more intensive TA to the MOH to strengthen the HMIS, including at the community level. PMI's support for surveillance, monitoring, and evaluation complements efforts supported by other USAID health programs, the Global Fund, and other donors. This includes the roll-out of digital tools for key interventions and activities to maximize efficiency and overall data quality for decision-making. This includes the digitalization of SMC and mass ITN campaigns from 2020, and digitized tools for community health data collection and supervision, which is planned for 2023. SurEval was conducted in 2022 by CHAI with support from BMGF. The main results and recommendations highlight the need to support the NMP in the following ways:

- Improve the representativeness of the real malaria burden by strengthening information systems, sensitizing the population on care seeking, and improving the coverage of the community surveillance system.
- Strengthen the integration of malaria surveillance data from various information systems (entomological, campaigns, surveys) in DHIS2 to foster ease of data visualization and triangulation.
- Ensure availability of resources such as equipment, guidelines and malaria commodities (RDTs, ACTs) to facilitate surveillance activities.

- Improve data quality by using available validation rules in DHIS2, monthly data validation workshops for priority indicators to monitor performance and progress of the program, and the realization of malaria data audits supported by supervisions.
- Strengthen the analysis and use of data through continuous capacity building and refresher training, development of a malaria analysis guide, use of malaria dashboards adapted for each level to allow visualizations that will better meet the needs of the program and stakeholders for decision-making at relevant levels.
- Strengthen operational research and entomological surveillance to obtain additional data to inform operational and strategic decisions for malaria control.

8.2. Recent Progress (October 2021–September 2022)

PMI supported the following activities:

National and Department (Admin I) Levels

- Supervision of health workers responsible for HMIS data collection at the national and department levels

HZ and Commune (Admin II) Levels

- Supported planning and initiation of a shift from quarterly HMIS data validation workshops at the department level to monthly HMIS data validation workshops in all 77 communes of the country (initiated in 2022). One goal of the workshops is to ensure consistency between RDT results and the data reported in the outpatient registers and reported into DHIS2. Health workers from all public and private health facilities reporting into DHIS2 attend the workshops and bring their RDTs used from the previous month and the RDT results are compared to the data in the outpatient registers used to collect and report data into DHIS2. The data review workshops are planned by the NMP and occur under the direction of the “Medecin Chef” of the commune with additional support and supervision by the NMP staff and local health authorities. Errors detected are corrected in DHIS2. Thanks to the validation of the 2nd semester of 2022, the number of malaria cases decreased by 14 percent after the corrections. This activity has been planned since 2022 and will be supported in 2023 by PMI.

- Conducted audit of malaria death data in all health zones to ensure accuracy of reported malaria deaths. The quarter three 2022 audits helped confirm that 97 percent of malaria death cases were linked to malaria.

Facility and Community Levels

- AlafiaComm is a community health app for data collection, reporting and services delivery, including malaria. It is interoperable with DHIS2 and can be used by all partners implementing community health activities. The app was developed by DIMAGI at the request of PMI and supported by IHSA. It was developed based on the ComCare platform and in line with the existing registers. The app was initially piloted by 50 RCs in select communes in 2019 and 2020. In addition to its data management functions, it is

also expected to improve the referral system, ensuring that community health is linked to higher levels of care. Other digital tools were also explored in 2021, but based on the results of the pilot phase of the AlafiaComm app, the MOH made a final decision to adopt it as the community health digital tool of choice in November 2022. In the first quarter of 2023, training of trainers was conducted for field staff involved in the implementation of the new community health policy. In the upcoming months, the main activities will include daily monitoring of community health workers to correct any issues encountered with the application, capacity-building for actors in HMIS management at central level, effective interoperability with DHIS2, and hosting of the AlafiaComm platform at national level.

8.3. Plans and Justification with FY 2024 Funding

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

SurEval was conducted in 2022 to assess Benin's overall malaria surveillance system, including its personnel-related component. The SurEval report depicted key system weaknesses and highlighted recommendations and a roadmap with which PMI Benin has aligned activities. PMI plans to continue its support to NMP Benin's efforts aimed at timely and regular use of accurate malaria data at all levels of the health system pyramid. PMI will continue to emphasize implementing and evaluating recently implemented monthly data review and analysis workshops at the commune level, and routine data quality monitoring performed by the commune health offices. PMI support for this activity is part of a broader HMIS strengthening effort supported by USAID, Global Fund, and other partners. This includes the decentralization of the data validation workshops to the commune level and biannual audit of all malaria deaths. Also, PMI will provide support to the MOH to strengthen HMIS, including strengthening data collection, making data validation workshops more efficient and structured, decentralizing data supervision responsibilities, improving data quality, and disseminating data in a timely manner.

Once the new community health policy is operationalized, PMI will support RCs training and refresher training as well as group and on-site-supervision to improve community-level data collection. Review of clinical record reporting as part of supportive supervision to ensure high quality case management practices will take place at all registered private hospitals and health centers. Department and Health Zone staff will be actively involved in these supervision activities. PMI will also support the NMP to build capacity and conduct surveillance as a core malaria intervention using high-quality data from both surveys and routine HMIS as outlined above.

Table 4. Available Malaria Surveillance Sources

Source	Data Collection Activity	2020	2021	2022	2023	2024	2025
Household Surveys	Demographic Health Survey				P		
Household Surveys	Malaria Indicator Survey			X*			
Household Surveys	Multiple Indicator Cluster Survey	X*		X			
Household Surveys	Expanded Program on Immunization survey						
Household Surveys	Malaria Behavior Survey			X			
Health Facility Surveys	Service Provision Assessment						
Health Facility Surveys	Service Availability Readiness Assessment survey						
Health Facility Surveys	Other Health Facility Survey		X	X			
Malaria Surveillance and Routine System Support	Therapeutic Efficacy Studies	X		X		P	
Malaria Surveillance and Routine System Support	Support to Parallel Malaria Surveillance System						
Malaria Surveillance and Routine System Support	Support to Health Management Information System	X	X	X	X	P	P
Malaria Surveillance and Routine System Support	Support to Integrated Disease Surveillance and Response						
Malaria Surveillance and Routine System Support	Electronic Logistics Management Information System	X	X	X	X	P	P
Malaria Surveillance and Routine System Support	Malaria Rapid Reporting System						

Other	End-Use Verification Survey	X	X	X	X	P	P
Other	School-based Malaria Survey						
Other	Knowledge, Attitudes and Practices Survey, Malaria Behavior Survey						
Other	Malaria Impact Evaluation						
Other	Entomologic Monitoring Surveys	X	X	X	X	P	P

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

PMI investments also support household and facility surveys to provide additional information to complement and triangulate with routine HMIS data. Additional PMI investments are being programmed through the G2G agreement with the NMP and are envisaged as a way to address long-standing timeliness reporting issues that have impeded the country's ability to use data to inform program planning and monitoring. PMI will continue to support the NMP as they transition from department level quarterly data validation workshops to monthly commune level data validation workshops. The Benin NMP is committed to advocate that the DDS finance the monthly validation workshop with local resources, and PMI will support this effort.

9. Operational Research and Program Evaluation

9.1. PMI Goal and Strategic Approach

Although the NMP is involved in research design, implementation, publication, and is putting in place a strategy and repository of past and ongoing malaria research projects, there is no official research committee in place at the NMP. PMI continues to support NMP's annual plans of organizing the national malaria research symposium.

9.2. Recent Progress (October 2021—September 2022)

The Group Antenatal Care study field activities ended in December 2022. Qualitative and quantitative data collected is being analyzed and in the process of being readied for dissemination at the national and subnational levels, and for presentations at international conferences and publication in peer reviewed journals. It is anticipated that the operational and health system challenges and weaknesses that were identified will help contribute to a better understanding and a more strategic approach to increase ANC attendance and IPTp uptake.

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

Recently Completed OR/PE Studies*	Status of Dissemination	Start date	End date
Group ANC-study	Ongoing analysis	2020	2023
Ongoing or Planned OR/PE Studies**	**Status**	**Start date**	**End date**
Malaria RDT Capturing and Reporting study	Ongoing field data collection	May 2023	2024
ITN Assessment	Underdevelopment	TBD	TBD

*Only list OR/PE completed in 2022 or 2023. For status of dissemination, please specify if the study has been published (if so, list references for publications arising from the study), results shared with stakeholders e.g. NMP, and/or report/manuscript under development.
**Only list ongoing or planned OR/PE being funded with FY23 or earlier funding. Studies being planned with FY24 funding should be Plans and Justifications with FY 2024 Funding below. Please specify the status of the study e.g. CN or protocol development, IRB review, field data collection, analysis of samples/results, etc.
ANC: antenatal care; ITN; insecticide-treated mosquito net; RDT: rapid diagnostic test.

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

Source of Funding	Implementing institution	Research Question/Topic	Current status/ timeline
UNITAID	LSHTM/PSI	Evaluating Perennial Malaria Chemoprophylaxis implementation's pilot	Ongoing

LSHTM: London School of Hygiene and Tropical Medicine; PSI: Population Services international; UNITAID: global health initiative that works with partners to bring about innovations to prevent, diagnose and treat major diseases in low- and middle-income countries, with an emphasis on tuberculosis, malaria, and HIV/AIDS and its deadly co-infections.

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.

PMI has engaged in discussion with the program to identify key areas of research on pertinent topics. No OR/PE activities are proposed with FY 2024 funding. However, PMI will support the establishment of a research committee within the NMCP that will be meeting regularly to review available research/study results for policy and strategic decisions to inform the national strategic plan. This support will also include the development of a research database/repository.

10. Capacity Strengthening

10.1. PMI Goal and Strategic Approach

To reinforce the management capacity of the NMP and its coordination with the CNLS-TP, PMI will continue staff support within the NMP and leverage the Global Fund support through the Systems Strengthening grant under the CNLS-TP.

PMI will also continue to support the country's efforts toward universal health coverage through the provision of TA in the roll-out of ARCH-AM, including improvement of the quality of care of services offered to ARCH-AM beneficiaries, refinement of the reimbursement mechanism for health facilities, improving communication and strengthening inclusive dialogue, strengthening M&E and continuous learning to inform the national scale-up of ARCH-AM.

10.2. Recent Progress (between October 2021–September 2022)

PMI supported NMP capacity strengthening through a direct G2G agreement fixed amount reimbursement agreement and the Commodity Import Program agreement for revenues that are generated from the sale of ACTs to populations other than children under five years of age and pregnant women who receive them free of charge as per Benin government's policy. Through the fixed amount reimbursement agreement and the commodity import program, PMI has supported some of the NMP's management and capacity development needs including staff training support, equipment, and infrastructure needs (purchase of electric generator, IT equipment [e.g., laptops, software needs, and databases] and internet connectivity support).

Together with the maternal and child health (MCH) and the family planning/reproductive health programs, PMI supports other activities aimed at strengthening the health system and improving access to quality health care.

PMI supported the *Laboratoire National de Contrôle de Qualité* for quality control to perform routine testing of malaria commodities at the port and spot checks in public and private health facilities. The support included purchase of reagents and equipment for drug quality testing and staff time as well as support to the Benin Agency for Pharmaceutical Regulation to perform its functions of ensuring the quality of pharmaceutical products and monitoring of illegal malaria commodities in markets and formal health services.

Furthermore, PMI continued to support the monitoring of illegal malaria commodities in markets and formal health services, the auditing of malaria services under national health insurance and the training of journalists on malaria and governance. This activity was and continues to be co-funded with malaria, MCH, and other non-health funds. The NMP has been strengthening its ties with the private sector through the implementation of a joint convention allowing the private sector to have access to malaria commodities for children and pregnant women and tools to easily collect data to be reported back to the DHIS2. This partnership also allowed for private service providers to be trained on Benin national guidelines.

The Programme d'action du gouvernement/Government of Benin Action Plan 2021–2026 focuses on improving the accessibility of populations (including the most vulnerable) to health services by 2026 using e-health under MOH leadership. In line with this new government vision of improving health access through technology, human capacity strengthening is one area that will be prioritized. This will include the rollout of a new online training that has been developed. A few online modules, mostly related to emergency obstetric and newborn care,

have been made available through the Information Systems Department and the initial targeted health staff have been trained. PMI and other donors are closely monitoring the process to ensure that the supported area will be aligned because the plan is to expand the modules to other health areas, including malaria.

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/Benin will continue to support capacity-strengthening activities as described in the Capacity Strengthening Recent Progress section, which will include among other things:

- Conduct quality control for malaria commodities at the port and spot checks in public and private health facilities.
- Monitoring of illegal malaria commodities in markets and formal health services, audit of malaria services under national health insurance, and training journalists on malaria and governance.
- Expansion, maintenance and repair of the NMP motor pool.
- Provision of equipment and office supplies.
- Routine maintenance and repair of office equipment.
- Acquisition of IT equipment and software (e.g., laptops, electronic stock management, motor pool management, and mail management software), installation and configuration of accounting systems software, and acquisition of a video conference system.
- Support trainings for NMP staff in malaria program surveillance, monitoring, social marketing, and communication.

In the short-term, however, PMI is also exploring ways to re-enforce the NMP's leadership, management, and coordination capabilities. Some of the ideas under consideration that could be supported through reprogramming of existing funds are:

- Implementation of ISO 9001, a tool to improve the NMP's quality management system.
- Embedding a Leadership, Management and Governance Advisor for about three to four years to re-enforce the capacity of the NMP in leadership, management, and coordination.

With 97 percent of the G2G Benin Ends Malaria Faster Activities carried out by the decentralized levels, the Health Zones, and Regional Health Offices do not have the autonomy to plan and implement the activities. The Health Office has recommended the decentralization of some G2G functions/tasks to the departmental and health zone institutions including financial resource management, planning and implementation of activities. This approach is expected to lead to greater efficiencies in the implementation of G2G activities and ensure the Benin Ends Malaria Faster Activity is strategic and focused to achieve the expected results.

To address these challenges, the NMP intends to make all its training modules, manuals, and

protocols used in face-to-face training available on the MOH e-learning platform (hosted by the Information Systems Department). This will allow the NMP to reach a larger target group and offer its beneficiaries the opportunity of continuous capacity strengthening.

NMP will also be strengthening the private sector with access to malaria commodities for children and pregnant women and tools to easily collect data to be reported back to the DHIS2. This partnership also will allow training for private service providers on Benin national guidelines.

PMI will also continue to support the country's efforts toward universal health coverage through the provision of TA in the roll-out of ARCH-AM, including improvement of the quality of care of services offered to ARCH-AM beneficiaries, refinement of the reimbursement mechanism for health facilities, improving communication and strengthening inclusive dialogue, strengthening M&E and continuous learning to inform the national scale-up of ARCH-AM.

11. Staffing and Administration

A minimum of four health professionals represent the core in-country team that oversees PMI in Benin. The single interagency team led by the USAID health office director consists of resident advisors representing USAID and CDC, and two locally hired experts known as foreign service nationals who include a malaria program specialist and a data manager. The PMI interagency team works together to oversee all technical and administrative aspects of PMI, including finalizing details of the project design, implementing malaria prevention and treatment activities, M&E of outcomes and impact, reporting of results, and providing guidance and direction to PMI implementing partners.

ANNEX: GAP ANALYSIS TABLES

Table A-1. ITN Gap Analysis Table

Calendar Year	2023	2024	2025
Total country population	12,606,998	12,910,087	13,224,860
Total population at risk for malaria	12,606,998	12,910,087	13,224,860
PMI-targeted at-risk population	12,606,998	12,910,087	13,224,860
Population targeted for ITNs	12,606,998	12,910,087	13,224,860
Continuous Distribution Needs			
Channel 1: ANC	561,852	528,209	568,277
Channel 1: ANC Type of ITN	Dual AI	Dual AI	PBO
Channel 2: EPI	381,594	343,099	368,423
Channel 2: EPI Type of ITN	Dual AI	Dual AI	PBO
Channel 3: School	49,775	51,522	53,331
Channel 3: School Type of ITN	Dual AI	Dual AI	PBO
Channel 4: Community			
Channel 4: Community Type of ITN			
Channel 5:			
Channel 5: Type of ITN			
Estimated Total Need for Continuous Channels	993,220	922,830	990,031
Mass Campaign Distribution Needs			
Mass distribution campaigns	8,948,774		
Mass distribution ITN type	All three (Dual AI, PBO and Single Pyrethroid)		
Estimated Total Need for Campaigns	8,948,774		
Total ITN Need: Continuous and Campaign	**9,941,994**	**922,830**	**990,031**
Partner Contributions			
ITNs carried over from previous year	210,066	96,846	9,016
ITNs from Government	545,000	0	0
Type of ITNs from Government	PBO and Single Pyrethroid		
ITNs from Global Fund	6,996,794	0	0
Type of ITNs from Global Fund	All three (Dual AI, PBO and Single Pyrethroid)		
ITNs from other donors	894,877	0	0
Type of ITNs from other donors	Single Pyrethroid		
ITNs planned with PMI funding	1,392,103	835,000	990,000
Type of ITNs with PMI funding	PBO	PBO	PBO
Total ITNs Contribution Per Calendar Year	**10,038,840**	**931,846**	**999,016**
Total ITN Surplus (Gap)	**96,846**	**9,016**	**8,985**

AI: active ingredient; 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	12,606,998	12,910,087	13,224,860
Population at risk for malaria	12,606,998	12,910,087	13,224,860
PMI-targeted at-risk population	12,606,998	12,910,087	13,224,860
RDT Needs			
Total # of projected suspected malaria cases	7,123,824	3,873,026	3,967,458
% of suspected malaria cases tested with an RDT	90.00%	90.00%	90.00%
RDT Needs (tests)	**6,411,442**	**4,601,852**	**4,714,054**
Needs estimated based on other			
Partner Contributions (tests)			
RDTs from Government	150,000	150,000	432,800
RDTs from Global Fund	4,320,625	960,000	2,660,864
RDTs from other donors	0	0	0
RDTs planned with PMI funding	2,000,000	2,000,000	2,000,000
Total RDT Contributions per Calendar Year	**6,470,625**	**3,110,000**	**5,093,664**
Stock Balance (tests)			
Beginning balance	4,588,600	4,647,783	3,155,931
- Product need	6,411,442	4,601,852	4,714,054
+ Total contributions (received/expected)	6,470,625	3,110,000	5,093,664
Ending Balance	**4,647,783**	**3,155,931**	**3,535,541**
Desired end of year stock (months of stock)	6	6	9
Desired end of year stock (quantities)	3,205,721	2,300,926	3,535,541
Total Surplus (Gap)	**1,442,063**	**855,005**	**0**

RDT: rapid diagnostic test.

Table A-3. ACT Gap Analysis Table

Calendar Year	2023	2024	2025
Total country population	12,606,998	12,910,087	13,224,860
Population at risk for malaria	12,606,998	12,910,087	13,224,860
PMI-targeted at-risk population	12,606,998	12,910,087	13,224,860
ACT Needs			
Total projected # of malaria cases	5,214,900	2,736,938	2,803,670
Total ACT Needs (treatments)	**5,214,900**	**3,613,306**	**3,701,406**
Needs estimated based on other			
Partner Contributions (treatments)			
ACTs from Government	617,610	0	0
ACTs from Global Fund	4,258,190	0	467,690
ACTs from other donors	0	0	0
ACTs planned with PMI funding	2,000,000	2,000,000	2,000,000
Total ACTs Contributions per Calendar Year	**6,875,800**	**2,000,000**	**2,467,690**
Stock Balance (treatments)			
Beginning balance	3,962,176	5,623,076	4,009,770
- Product need	5,214,900	3,613,306	3,701,406
+ Total contributions (received/expected)	6,875,800	2,000,000	2,467,690
Ending Balance	**5,623,076**	**4,009,770**	**2,776,054**
Desired end of year stock (months of stock)	6	6	9
Desired end of year stock (quantities)	2,607,450	1,806,653	2,776,054
Total Surplus (Gap)	**3,015,626**	**2,203,117**	**0**

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	171,997	183,323	169,278
Projected # of severe cases among children	87,718	93,495	86,332
Average # of vials required for severe cases among children	3	3	3
Projected # of severe cases among adults	70,519	75,163	69,404
Average # of vials required for severe cases among adults	9	9	9
Total Injectable Artesunate Needs (vials)	**897,824**	**956,947**	**883,632**
Needs estimated based on other			
Partner Contributions (vials)			
Injectable artesunate from Government	30,000	0	0
Injectable artesunate from Global Fund	183,141	1,271,547	575,987
Injectable artesunate from other donors	0	0	0
Injectable artesunate planned with PMI funding	300,000	300,000	300,000
Total Injectable Artesunate Contributions per Calendar Year	**513,141**	**1,571,547**	**875,987**
Stock Balance (vials)			
Beginning balance	359,204	0	614,600
- Product need	897,824	956,947	883,632
+ Total Contributions (received/expected)	513,141	1,571,547	875,987
Ending Balance	**(25,479)**	**614,600**	**606,954**
Desired end of year stock (months of stock)	6	6	6
Desired end of year stock (quantities)	448,912	478,474	441,816
Total Surplus (Gap)	**(474,392)**	**136,126**	**165,138**

Table A-5. RAS Gap Analysis Table

Calendar Year	2023	2024	2025
Artesunate Suppository Needs			
# of severe cases expected to require pre-referral dose (or expected to require pre-referral dose based on # of providers for the service)	8,600	9,166	8,464
Total Artesunate Suppository Needs (suppositories)	**8,600**	**9,166**	**8,464**
Needs estimated based on other			
Partner Contributions (suppositories)			
Artesunate suppositories from Government	0	0	0
Artesunate suppositories from Global Fund	0	0	0
Artesunate suppositories from other donors	0	0	0
Artesunate suppositories planned with PMI funding	9,000	9,000	9,000
Total Artesunate Suppositories Available	**9,000**	**9,000**	**9,000**
Stock Balance (suppositories)			
Beginning balance	5,930	6,330	6,164
- Product need	8,600	9,166	8,464
+ Total contributions (received/expected)	9,000	9,000	9,000
Ending Balance	**6,330**	**6,164**	**6,700**
Desired end of year stock (months of stock)	6	6	6
Desired end of year stock (quantities)	4,300	4,583	4,232
Total Surplus (Gap)	**2,030**	**1,581**	**2,468**

Table A-6. SP Gap Analysis Table

Calendar Year	2023	2024	2025
Total Country Population	12,606,998	12,910,087	13,224,860
Total Population at Risk for Malaria	12,606,998	12,910,087	13,224,860
PMI Targeted at Risk Population	12,606,998	12,910,087	13,224,860
SP Needs			
Total Number of Pregnant Women	671509	695012	719337
% of pregnant women expected to receive IPTp1	75%	75%	75%
% of pregnant women expected to receive IPTp2	50%	50%	50%
% of pregnant women expected to receive IPTp3	35%	35%	35%
% of pregnant women expected to receive IPTp4	35%	35%	35%
Total SP Needs (doses)	**1,309,443**	**1,355,273**	**1,402,708**
Needs estimated based on other			
Partner Contributions (doses)			
SP from Government	67,280	0	0
SP from Global Fund	1,050,025	0	206,990
SP from other donors	0	0	0
SP planned with PMI funding	0	1,030,000	1,030,000
Total SP Contributions per Calendar Year	**1,117,305**	**1,030,000**	**1,236,990**
Stock Balance (doses)			
Beginning balance	1,384,483	1,192,345	867,072
- Product need	1,309,443	1,355,273	1,402,708
+ Total contributions (received/expected)	1,117,305	1,030,000	1,236,990
Ending Balance	**1,192,345**	**867,072**	**701,354**
Desired end of year stock (months of stock)	6	6	6
Desired end of year stock (quantities)	654,721	677,637	701,354
Total Surplus (Gap)	**537,624**	**189,435**	**(0)**

IPTp: intermittent preventive treatment during pregnancy; SP: sulfadoxine-pyrimethamine

Table A-7. SMC Gap Analysis Table

Calendar Year	2023	2024	2025
Total population in the SMC targeted age range	432,668	715,209	740,241
SMC Drug (SP+AQ) Needs			
National population 3-11 months targeted for SMC	86,534	102,913	106,515
National population 12-59 months targeted for SMC	346,135	612,297	633,726
Total national population targeted for SMC	**432,668**	**715,210**	**740,241**
PMI population 3-11 months targeted for SMC	15,078	16,909	17,501
PMI population 12-59 months targeted for SMC	110,828	100,602	104,123
Total PMI population targeted for SMC	**125,906**	**117,511**	**121,624**
Total SP+AQ Needs (co-blisters)	**2,249,875**	**3,146,924**	**3,257,060**
Partner Contributions (co-blisters, national)			
SP+AQ carried over from previous year	539,715	173,720	0
SP+AQ from Government	301,500	301,500	301,500
SP+AQ from Global Fund	1,002,380	2,091,704	2,375,560
SP+AQ from other donors	0	0	0
SP+AQ planned with PMI funding	580,000	580,000	580,000
Total SP+AQ Contributions per Calendar Year	2,423,595	3,146,924	3,257,060
Total SP+AQ Surplus (Gap)	**173,720**	**0**	**(0)**

AQ: amodiaquine; SMC: seasonal malaria chemoprevention; SP: Sulfadoxine-pyrimethamine.