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Malawi

Malaria Operational Plan FY 2022

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This FY 2022 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 2022 appropriation from U.S. Congress. Any updates will be reflected in revised postings.

This document was prepared in the early months of 2021 as the COVID-19 pandemic continued to evolve worldwide, including in PMI-focus countries. The effects of the pandemic on malaria control and elimination work in 2022 are difficult to predict. However, because U.S. Congressional appropriations for PMI are specific to work against malaria and any appropriations for work against the COVID-19 are specific for that purpose and planned through separate future U.S. Government planning processes, this FY 2022 MOP will not specifically address the malaria-COVID-19 interface and will reassess any complementary work through timely reprogramming in countries.

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CONTENTS

ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine (known locally as LA)
AMP	Alliance for Malaria Prevention
ANC	Antenatal care
CDC	U.S. Centers for Disease Control and Prevention
CHAG	Community Health Action Group
CMED	Central Monitoring and Evaluation Division
CMST	Central Medical Stores Trust
CY	Calendar year
DHA/PPQ	Dihydroartemisinin/piperaquine
DHIS2	District Health Information Software 2
DHS	Demographic and Health Survey
DOT	Directly observed treatment
DP	Dihydroartemisinin-piperaquine
EIR	Entomological inoculation rate
EPI	Expanded Program on Immunization
FY	Fiscal year
Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GOM	Government of Malawi
HES	Health Education Section
HMIS	Health Management Information System
HSA	Health Surveillance Assistant
HSS	Health systems strengthening
iCCM	Integrated community case management
IG2	Interceptor G2
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
IVM	Integrated Vector Management
L&D	Labor and Delivery
LMIS	Logistics Management Information System
MBS	Malaria Behavior Survey
MCS	Malaria Communication Strategy
MICS	Multiple Indicator Cluster Survey
MIP	Malaria in pregnancy
MIS	Malaria indicator survey
MOH	Ministry of Health
MOP	Malaria Operational Plan
MSCTP	Master Supply Chain Transformation Plan
MSP	Malaria Strategic Plan
NMCP	National Malaria Control Program
OR	Operations research

OTSS	Outreach training and supportive supervision
PBO	Piperonyl butoxide
PCR	Polymerase chain reaction
PE	Program evaluation
PMI	U.S. President's Malaria Initiative
QA	Quality assurance
RDT	Rapid diagnostic test
SBC	Social and behavior change
SBCC	Social and behavior change communication
SM&E	Surveillance, monitoring, and evaluation
SMC	Seasonal malaria chemoprevention
SP	Sulfadoxine-pyrimethamine
TES	Therapeutic efficacy study
TWG	Technical working group
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

The U.S. President's Malaria Initiative (PMI)—led by the U.S. Agency for International Development (USAID) and implemented together with the U.S. Centers for Disease Control and Prevention (CDC)—delivers cost-effective, lifesaving malaria interventions alongside catalytic technical and operational assistance to support Malawi to end malaria. PMI has been a proud partner of Malawi since 2007, helping to decrease child death rates by 48 percent through investments totaling almost $318 million.

The proposed PMI fiscal year (FY) 2022 budget for Malawi is $23 million. This Malaria Operational Plan (MOP) outlines planned PMI activities in Malawi using FY 2022 funds. Developed in consultation with the National Malaria Control Program (NMCP) 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 Malawi (GOM) as well as other donors and partners.

Malaria is endemic in more than 95 percent of Malawi. The principal malaria vector is *Anopheles funestus* s.s., though *An. gambiae s.s. and An. arabiensis* may predominate in some areas at certain times of the year. Transmission is perennial in most parts of the country and peaks after the start of the annual rains that typically begin in November/December and last through April. Malaria continues to be a major public health problem and is responsible for approximately seven million cases and 36 percent of outpatient visits across all ages (2020 Health Management Information System [HMIS] data). That said, since 2006, Malawi has seen improvements in prevention coverage (insecticide-treated mosquito net [ITN] ownership and use and intermittent preventive treatment for pregnant women [IPTp] uptake), a 48 percent decrease in all-cause mortality in children under five years of age, and a decrease in malaria prevalence among children under five years of age from 43 percent (2010 Malaria Indicator Survey [MIS]) to 24 percent (2017 MIS).

Recent progress and PMI-planned support with FY 2022 funds include the following:

- Vector Control
  - Entomological Monitoring: PMI is continuing to support entomological monitoring in 13 sentinel sites in six targeted districts, including insecticide resistance, vector bionomics, and insecticide residual efficacy monitoring. PMI is also continuing to provide technical assistance to build the capacity of local research institutions.
  - Insecticide-Treated Nets (ITNs): PMI will continue to support procurement and distribution of ITNs through continuous distribution (antenatal care [ANC] and labor and delivery [L&D]). PMI provides technical support to the country's mass distributions through participation on a national task force. PMI also supports social and behavior change (SBC) to improve use and care of ITNs and to mitigate against misuse. PMI will support streamlined durability monitoring of three new types of nets (piperonyl butoxide [PBO], Interceptor G2 [IG2] and Royal Guard) to be distributed in October 2021. In addition, PMI will initiate an IRS and ITN impact evaluation in calendar year (CY) 2021.
  - Indoor Residual Spraying (IRS): In CY 2021, PMI is supporting the planning, implementation, and evaluation of the fourth year of IRS in Nkhotakota District, and is providing technical assistance to the NMCP and District Health Officers in Global Fund-supported districts (Mangochi, Balaka, and

Nkhata Bay). PMI plans to continue this implementation and technical support in the same geographic areas with FY 2022 funding.

- Human Health
  - Case Management: PMI procures and distributes rapid diagnostic tests (RDTs) and ancillary diagnostic supplies, artemisinin-based combination therapy (ACT), and rectal artesunate, and continues to coordinate procurement and delivery schedules with the NMCP and the Global Fund to ensure that appropriate central and facility stock levels of RDTs and antimalarials are maintained. PMI supported the NMCP and the Case Management technical working group (TWG) to finalize the updated *Guidelines for the Treatment of Malaria in Malawi* (2020). PMI continues to coordinate with the Case Management TWG and National Malaria Advisory Board, and will support updates to pre-service and in-service training and integrated supportive supervision checklists. PMI also supports facility-level outreach training and supportive supervision (OTSS) activities in selected focus districts, mentorship of Health Surveillance Assistants (HSAs) [community health workers] in integrated community case management (iCCM), and malaria-specific, cluster-based review meetings with key workers to better use malaria data at district, facility, and community levels. Furthermore, with FY 2022 funds, PMI plans to support activities aimed at addressing the substantial vacancies among HSAs to accelerate progress toward the national goal of employing one HSA for every 1,000 population.
  - Drug-based Prevention (Malaria in Pregnancy [MIP]): PMI supports procurement and delivery of sulfadoxine-pyrimethamine (SP), distribution of ITNs through ANC and at L&D, and appropriate case management of pregnant women. PMI supports supportive supervision of health facility providers to reinforce IPTp3+ and strengthen IPTp documentation in ANC registers. With FY 2022 funds, PMI plans to support the national MIP TWG meetings, integrated laboratory and clinical supportive supervision at facilities, and to support OTSS MIP module implementation in three districts at the facility level to ensure appropriate distribution of SP and ITNs. In CY 2021, PMI completed a cluster-randomized controlled trial of community IPTp administration by HSAs compared with IPTp delivery at health facilities (routine practice) in Ntcheu and Nkhata Bay on IPTp3+ and ANC4+ coverage.
- Cross-cutting and Other Health Systems
  - Supply Chain: PMI supports commodity quantification, procurement, warehousing, and distribution of ITNs, SP, ACTs, RDTs, as well as supply chain technical assistance. PMI operates a parallel supply chain for its commodities, and it will continue to store and distribute its commodities through a private sector managed parallel supply chain until the Central Medical Stores Trust (CMST) is able to manage an integrated national supply chain system. PMI supports the NMCP's quarterly Drug Management Task Force Meetings, the National Product Catalogue, the national OpenLMIS (Logistics Management Information System), and the Ministry of Health's (MOH's) Drug Theft Investigation Unit. PMI also supports the NMCP with commodity accountability performance tracking and data quality assessments.
  - Surveillance, Monitoring, and Evaluation (SM&E): PMI provides technical assistance to support monthly HMIS data collection and validation, quarterly data quality assessments, and data review meetings. PMI supports the GOM Central Monitoring and Evaluation Division (CMED) and supports training and mentorship of national and district NMCP staff on routine data quality. In CY 2020–2021, PMI has participated in the national Digital Health Task Force to develop a digital health roadmap and work plan. With FY 2022 funds, PMI plans to continue to support SM&E health systems strengthening (HSS) at the national and district levels, as well as continue to collaborate with the

GOM Community Health Services Section to provide technical input in the development of the Integrated Community Health Information System.

- Program Evaluation (PE) and Operational Research (OR): PMI recently completed two OR studies. One assessed the efficacy of intermittent preventive treatment in pregnancy (IPTp) with dihydroartemisinin-piperaquine (IPTp-DP) compared to IPTp-sulfadoxine-pyrimethamine (SP). This study's results will aid the program in determining whether switching to IPTp-DP is warranted. The second study assessed the effects of community delivery of IPTp-SP on IPTp and ANC uptake; study results are being disseminated during 2021 for consideration by the NMCP, Reproductive Health, and Community Health in planning policy and programming. PMI plans to undertake a study in 2021–2022 assessing the effect of expanding the age range of community case management of malaria versus the status quo.
- Social and Behavior Change (SBC): PMI's SBC support includes development and dissemination of print materials, radio programs, social media engagement, community mobilization and engagement, and capacity-building. In CY 2020–2021, PMI supported the preparation for the Malaria Behavior Survey (MBS), which is being implemented in CY 2021. PMI also supported the NMCP to amplify malaria prevention and treatment messages in the context of COVID-19 on radio stations nationwide. PMI plans to continue SBC interventions at the community, district, and national levels, including facilitating national-level coordination and capacity-building through the Malaria social and behavior change communication (SBCC) TWG, supporting district-level working group meetings, and finalizing SBC monitoring and evaluation reporting forms capturing community-level care-seeking behaviors for District Health Information Software 2 (DHIS2).
- General Health System Strengthening (HSS): PMI supports the NMCP to improve program management and performance with respect to human resource capacity, program planning and reviews, partnerships and coordination, resource mobilization, cross-border initiatives, and malaria epidemic preparedness and response.

I. INTRODUCTION

The U.S. President's Malaria Initiative (PMI)—led by the U.S. Agency for International Development (USAID) and implemented together with the U.S. Centers for Disease Control and Prevention (CDC)—delivers cost-effective, lifesaving malaria interventions alongside catalytic technical and operational assistance to support Malawi to end malaria. PMI has been a proud partner of Malawi since 2007, helping to decrease child death rates by 48 percent through investments totaling almost $318 million.

The proposed PMI fiscal year (FY) 2022 budget for Malawi is $23 million. This Malaria Operational Plan (MOP) outlines planned PMI activities in Malawi using FY 2022 funds. Developed in consultation with the National Malaria Control Program (NMCP) 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 Malawi (GOM) as well as other donors and partners.

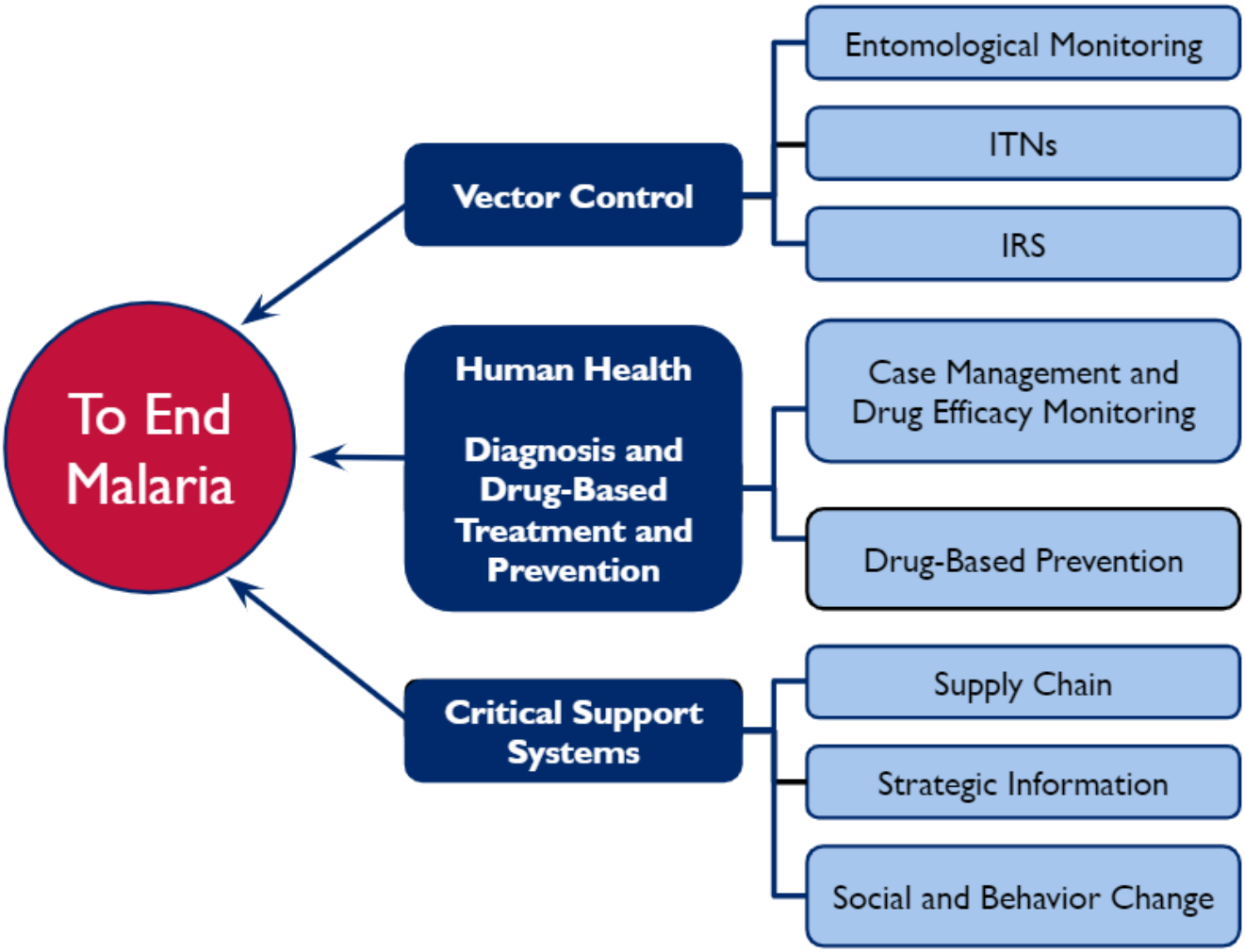
Malawi at a Glance

- **Geography:** Malawi is a landlocked country bordered by Tanzania to the north, Zambia to the west, and Mozambique to the east and south.
- **Climate and Malaria Transmission Seasonality:** Annual rains typically begin in November/ December and last through April. The low-lying areas are hotter and wetter, while the highlands are cooler.
- **Population in 2021:** 18,898,441 (Malawi National Statistics Office Projections)
- **Population at Risk of Malaria:** 100 percent
- **Principal Malaria Parasites:** *Plasmodium falciparum* (Malawi MOH Malaria Strategic Plan [MSP] 2017–2022)
- **Principal Malaria Vectors:** *Anopheles funestus s.s.*; *An. gambiae s.s. and An. arabiensis,* may predominate in some areas at certain times of the year (Malawi MOH MSP 2017–2022)
- **Malaria Case Incidence per 1,000 Population:** 385 (Malawi National Malaria Program 2020 data)
- **Under-Five Mortality Rate:** 63 (2017 Malaria Indicator Survey)
- **World Bank Income Classification and Gross Domestic Product (GDP):** Low-income, $7.667B (2019 World Bank Data)
- **Government Health Budget:** K187.2 billion (1.8 percent of GDP) (Malawi Government 2021–2022 Budget Statement)
- **Trafficking in Persons Designations, 2018–2020:** Tier 2 (U.S. Department of State)
- **Malaria Funding and Program Support Partners Include:**
  - U.S. President's Malaria Initiative (PMI)
  - Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund)
  - World Health Organization (WHO)
- **PMI Support of National Malaria Control Strategy:** PMI supports all elements of Malawi's National Malaria Control Strategy 2017–2022 except for larval source management. See III. Overview of PMI's support of Malawi's Malaria Control Strategy for additional details).

- **PMI Investments:** Malawi began implementation as a PMI-focus country in FY 2006. The proposed FY 2022 PMI budget for Malawi is $23 million; this brings the total PMI investment to nearly $318 million.

PMI organizes its investments around the activities below, in line with Malawi's National MSP 2017–2022.

Figure 1. PMI's approach to end malaria[1]



Building and strengthening the capacity of Malawi's people and institutions—from the central level to communities—to effectively lead and implement evidence-based malaria control and elimination activities is paramount to PMI. The majority of PMI's planned support for FY 2022, across the areas of vector control, human health, and critical support systems such as supply chain, contains elements of capacity-building and system

[1]A number of actions are cross-cutting in nature. For example, social and behavioral change (SBC) is embedded in all vector control and human health work; program evaluation (PE) and operational research (OR) are relevant in all of the fieldwork; finance and management support and the introduction of new tools/interventions are critical for all programs; and elimination requires work across the full spectrum of transmission.

strengthening. In FY 2021, PMI/Malawi developed direct partnerships with two local organizations as part of USAID/Malawi's efforts to bolster and leverage local capacity. PMI/Malawi will continue to rely on and engage with local partners.

II. MALARIA SITUATION AND PROGRESS

Malaria is endemic in more than 95 percent of the country. Transmission is perennial in most parts of the country and peaks after the start of the annual rains that typically begin in November/December and last through April. Malaria continues to be a major public health problem and is responsible for approximately seven million cases, as reported annually from health facilities and by the community case management program, and 36 percent of outpatient visits across all ages (2020 Health Management Information System [HMIS] data, unpublished). Among children under five years of age, malaria parasite prevalence by microscopy is 24 percent nationally (2017 Malaria Indicator Survey [MIS]). Pregnant women and their fetuses remain at high risk of the negative consequences of malaria; however, from 1996 to 2007, the incidence of placental malaria fell from 25 percent to 7 percent at the main referral hospital in Blantyre (Feng, et al., 2010).

Figure 2. Trends in malaria prevalence

Children 6 to 59 months of age who tested positive for malaria by microscopy/RDT MIS 2017

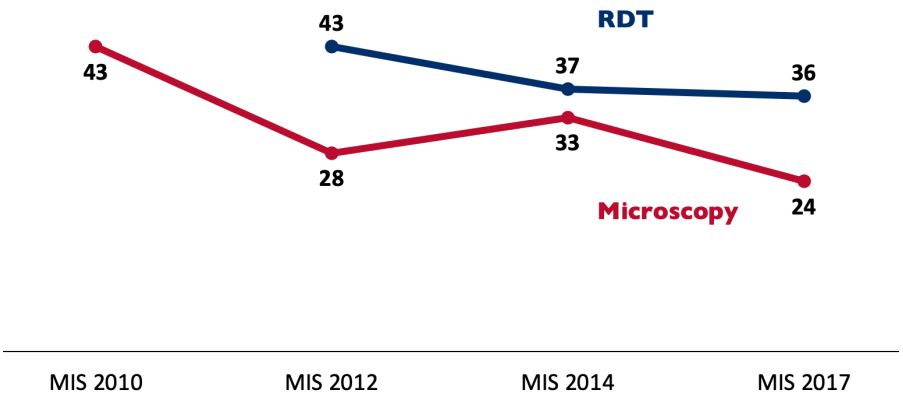


Figure 3. Malaria prevalence by geographic area

Children 6 to 59 months of age who tested positive for malaria by microscopy/RDT MIS 2017

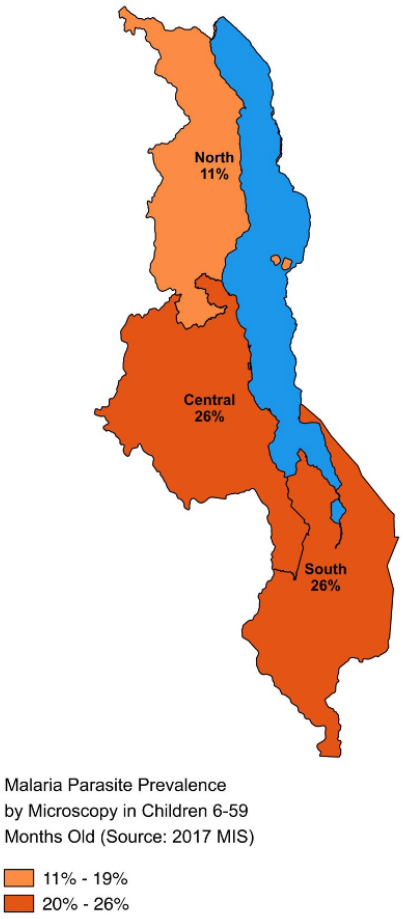


Table 1. Key indicators from demographic health surveys (DHS) and malaria indicator surveys (MIS)

Indicator	2006 MICS*	2010 MIS	2012 MIS	2014 MIS	2017 MIS
% Households with at least one ITN	38	58	55	70	82
% Households with at least one ITN for every two people	N/A	N/A	19	30	42
% Population with access to an ITN	N/A	N/A	37	52	63
% Population that slept under an ITN the previous night	N/A	N/A	41	53	55
% Children under five years of age who slept under an ITN the previous night	25	55	56	67	68
% Pregnant women who slept under an ITN the previous night	N/A	49	51	62	63
% Children under five years of age with a fever in the last two weeks for whom advice or treatment was sought	N/A	N/A	58	59	54
% Children under five years of age with a fever in the last two weeks who had a finger or heel stick	n/a	7	21	32	38
% Children receiving an ACT among children under five years of age with a fever in the last two weeks who received any antimalarial drug	N/A	N/A	91	93	96
% Women who received two or more doses of IPTp during their last pregnancy in the last two years	47	60	54	64	76
% Women who received three or more doses of IPTp during their last pregnancy in the last two years	N/A	N/A	N/A	13	41
Under five years of age mortality rate per 1,000 live births	122	N/A	N/A	N/A	N/A
% Children under five years of age with parasitemia by microscopy	N/A	43	28	33	24
% Children under five years of age with parasitemia by RDT	N/A	N/A	43	37	36
% Children under five years of age with severe anemia (Hb<8gm/dl)	N/A	12	9	6	5

*MICS = Multiple Indicator Cluster Survey

Table 2. Evolution of key malaria indicators reported through routine surveillance systems

Indicator	2016	2017	2018	2019	2020
# Suspect malaria cases[1]	N/A	11,180,300	13,164,827	11,860,203	12,594,287
# Patients receiving diagnostic test for malaria[2]	N/A	10,982,821	13,077,088	11,468,349	12,559,902
Total # malaria cases[3]	6,423,422	6,105,930	7,145,094	5,517,111	7,101,222
# Confirmed cases[4]	*5,478,323*	*6,040,009*	*6,997,200*	*5,457,218*	*7,073,242*
# Presumed cases[5]	*945,099*	*65,921*	*147,894*	*59,893*	*27,980*
% Malaria cases confirmed[6]	85%	99%	98%	99%	99.6%
Test positivity rate (TPR)[7]	54%	55%	54%	48%	56%
Total # <5 malaria cases[8]	3,231,445	2,918,304	3,395,529	2,355,766	2,867,042
% Cases in children under five years of age[9]	50%	48%	48%	43%	41%
Total # severe cases (inpatient malaria cases)[10]	-	76,477	86,257	84,906	82,111
Total # malaria deaths[11]	2,671	3,613	2,967	2,430	3,332
# Facilities reporting[12]	7,341	7,622	8,116	8,256	8,260
% Data completeness[13]	85%	88%	92%	94%	93%

1. Number of patients presenting with signs or symptoms possibly due to malaria (e.g., fever). 2. RDT or microscopy, all ages, outpatient and inpatient. 3. Total reported malaria cases; all ages, outpatient and inpatient, confirmed and unconfirmed cases; 4. Diagnostically confirmed; all ages, outpatient and inpatient. 5. Clinical/presumed/unconfirmed; all ages, outpatient and inpatient. 6. # confirmed cases divided by total # cases. 7. Confirmed cases divided by # patients receiving a diagnostic test for malaria (RDT or microscopy). 8. Outpatient and inpatient, confirmed and unconfirmed. 9. Total # under five years of age cases divided by total # of cases. 10. Total # malaria cases, inpatient. 11. All ages, outpatient, inpatient, confirmed, and unconfirmed. 12. Total # of health facilities reporting data into the HMIS/DHIS2 system that year. 13. # monthly reports from health facilities divided by # health facility reports expected

III. OVERVIEW OF PMI'S SUPPORT OF MALAWI'S MALARIA STRATEGY

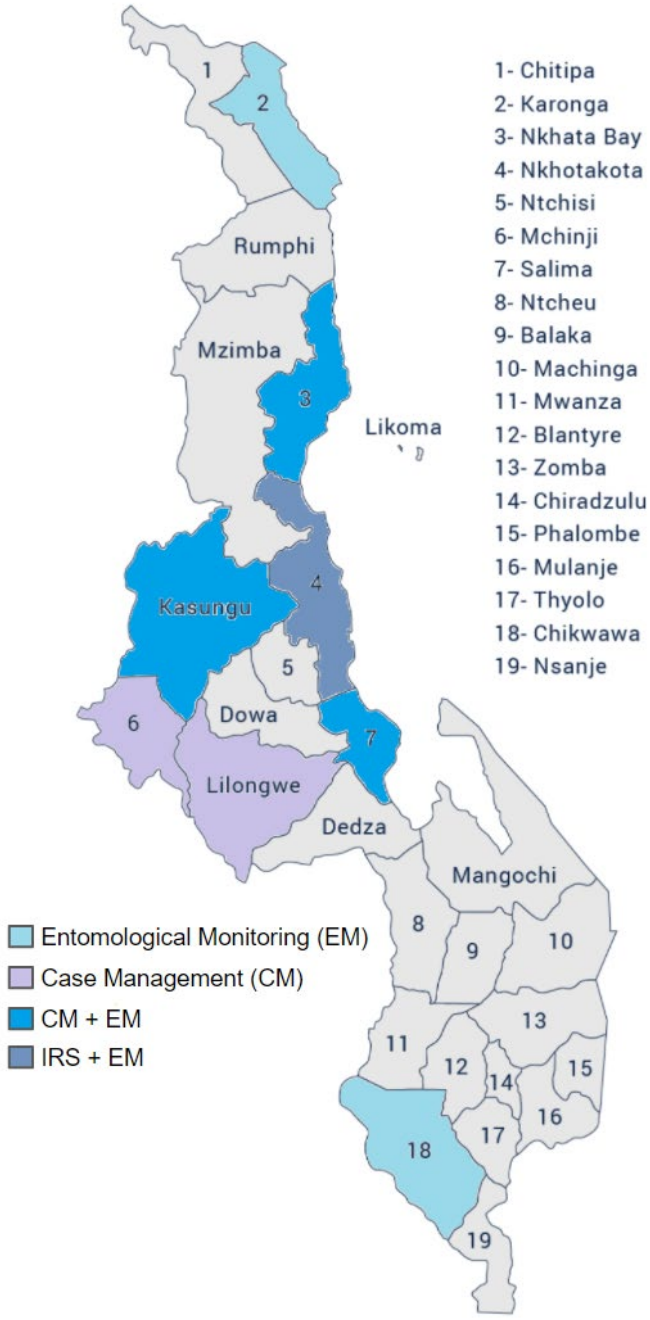
The Malawi NMCP seeks to reduce malaria incidence from 386 per 1,000 in 2015 to 193 per 1,000 in 2022 through universal coverage and equitable distribution of key malaria interventions. The implementation of the National MSP 2017–2022 is guided by evidence-based decision-making, partnership, collaboration, and appropriate innovative technologies.

Similar to PMI, Malawi's NMCP focuses on the following intervention areas: vector control, case management, social and behavior change (SBC), malaria in pregnancy (MIP), procurement and supply chain management, operational research (OR), and surveillance, monitoring, and evaluation (SM&E). One area of difference between PMI and the NMCP is larval source management, which is included as a vector control strategy in Malawi's Malaria Control Strategy, but is not currently supported by PMI. PMI's efforts related to health systems strengthening (HSS) also mostly align with Malawi's Malaria Control Strategy, but differs in a few areas, such as resource mobilization and planning and review meetings.

PMI procures and distributes RDTs, ACTs, ITNs, rectal artesunate, and SP nationwide. PMI also supports SBC activities nationwide and surveillance activities in 13 districts (Chitipa, Karonga, Kasungu, Nkhotakota, Mchinji, Lilongwe, Dowa, Salima, Balaka, Mangochi, Machinga, Zomba, and Mulanje). PMI provides focused support for entomological monitoring in six districts (Karonga, Nkhata Bay, Kasungu, Nkhotakota, Salima, and Chikwawa), case management in five districts (Nkhata Bay, Kasungu, Mchinji, Lilongwe, and Salima) and IRS in one district (Nkhotakota). (See Figure 4.)

The largest supporters of Malawi's Malaria Control Strategy are PMI and the Global Fund; there are no other major donors with malaria as a primary focus. Together, PMI and the Global Fund's investments ensure the entire country has access to life-saving interventions to prevent, diagnose, and treat malaria.

Figure 4. Map of target areas for PMI Malawi entomological monitoring, case management, and IRS intervention support*



*Districts for SBC and SME support not shown.

IV. PARTNER FUNDING LANDSCAPE

PMI emphasizes the importance of partner alignment for malaria control, recognizing that different partners bring complementary expertise and resources. In recent years, PMI, the Global Fund, and the Bill & Melinda Gates Foundation have harmonized financial, supply chain, and programmatic data. In particular, PMI and the Global

Fund agreed to a harmonized financial taxonomy to aid comparison of our investments to better identify potential overlap or gaps.

Due to the U.S. Government fiscal year budget cycle and approximate timing of annual appropriations, PMI MOP resources fund activities that largely occur during the following fiscal year. For example, this FY 2022 MOP is anticipated to largely fund implementation of activities starting in 2023. Global Fund resources are based on the calendar year and planned for a three-year grant cycle. Most partner country governments and other partners also budget based on the calendar year.

The tables below summarize contributions by key external partners and partner country governments in calendar years 2020–2022, providing insight into total country investments. Because new grants funded through the Global Fund 2021–2023 grant cycle are just beginning, or will begin later in 2021, Global Fund country investments may still evolve in some countries. The partner country government invests substantial funding into the national-to-local infrastructure and service delivery that benefits malaria programs and many others. However, it is not always possible to attribute funding for malaria specifically from the partner country government without a standardized method. There may be similar challenges for attributing other partner funds.

Table 3a. Annual budget by Level 1 category for FY 2019/CY 2020

Funder	Vector Control	Case Management	Drug-Based Prevention[1]	Supply Chain[2]	Monitoring, Evaluation & Research	Cross-cutting and HSS[3]	Total Per Funder
PMI	$8.8M	$5.8M	$0.7M	$3.0M	$1.2M	$4.5M	$24.0M
Global Fund	$10.7M	$2.4M		$3.5M	$1.1M	$1.8M	$19.5M
Total Per Category	$19.5M	$8.2M	$0.7M	$6.5M	$2.2M	$6.3M	$43.5M

Table 3b. Annual budget by Level 1 category for FY 2020/CY 2021

Funder	Vector Control	Case Management	Drug-Based Prevention[1]	Supply Chain[2]	Monitoring, Evaluation & Research	Cross-cutting and HSS[3]	Total Per Funder
PMI	$9.5M	$6.3M	$0.3M	$2.9M	$1.3M	$3.7M	$24.0M
Global Fund	$9.6M	$7.6M			$1.9M	$38.7M	$57.7M
Total Per Category	$19.1M	$13.8M	$0.3M	$2.9M	$3.2M	$42.4M	$81.7M

Table 3c. Annual budget by Level 1 category for FY 2021/CY 2022

Funder	Vector Control	Case Management	Drug-Based Prevention[1]	Supply Chain[2]	Monitoring, Evaluation & Research	Cross-cutting and HSS[3]	Total Per Funder
PMI	$8.3M	$6.2M	$0.4M	$3.1M	$1.6M	$3.4M	$23.0M
Global Fund	$8.7M	$4.3M			$1.2M	$2.1M	$16.3M
Total Per Category	$17.0M	$10.6M	$0.4M	$3.1M	$2.7M	$5.5M	$39.3M

1. Drug-based prevention, including MIP. 2. Covers management of in-country warehousing and distribution of malaria commodities, except for ITNs, which are separately captured under Vector Control. 3. HSS stands for health systems strengthening.

Table 4a. Annual budget, breakdown by commodity, FY 2019/CY 2020

Funder	ITNs *Continuous Distribution*	ITNs *Mass Distribution*	IRS[1] *Insecticide*	ACTs	RDTs	Severe Malaria	SMC-Related*	IPTp-Related	Total
PMI[2]	$2.9M		$4.2M	$0.9M	$2.6M				$10.6M
GF[3]			$5.5M	$1.9M	$0.0M				$7.5M
Total	$2.9M	$0.0M	$9.7M	$2.9M	$2.6M	$0.0M	$0.0M	$0.0M	$18.1M

*SMC = Seasonal malaria chemoprevention.

Table 4b. Annual budget, breakdown by commodity, FY 2020/CY 2021

Funder	ITNs *Continuous Distribution*	ITNs *Mass Distribution*	IRS[1] *Insecticide*	ACTs	RDTs	Severe Malaria	SMC-Related	IPTp-Related	Total
PMI[2]	$4.2M		$2.8M	$2.0M	$2.5M				$11.5M
GF[3]			$3.7M	$4.1M	$1.9M				$9.7M
Total	$4.2M	$0.0M	$6.5M	$6.1M	$4.4M	$0.0M	$0.0M	$0.0M	$21.2M

Table 4c. Annual budget, breakdown by commodity, FY 2021/CY 2022

Funder	ITNs *Continuous Distribution*	ITNs *Mass Distribution*	IRS[1] *Insecticide*	ACTs	RDTs	Severe Malaria	SMC-Related	IPTp-Related	Total
PMI[2]	$2.8M		$2.8M	$2.3M	$2.2M	$0.0M			$10.1M
GF[3]			$3.9M	$2.3M	$1.3M				$7.5M
Total	$2.8M	$0.0M	$6.7M	$4.6M	$3.4M	$0.0M	$0.0M	$0.0M	$17.6M

Note: Categories reflect the harmonized financial taxonomy (Levels 1-3) developed by Bill & Melinda Gates Foundation, Global Fund, and PMI in 2019, as part of a broader data harmonization initiative but may continue to evolve. 1. IRS insecticide: for PMI, commodity costs may be inextricable from IRS implementation costs in historical data – field identified as ND where this is the case. 2. PMI commodity costs are fully loaded, including costs for the ex-works price of the commodity, quality control, freight, insurance, and customs. 3. Global Fund commodity costs in the table above only include ex-works commodity value; additional costs, including quality control, freight, insurance, and customs totaled approximately $5,3M over the CY 2022–2024 period (as per total procurement and supply management costs for Global Fund's New Funding Model 3).

V. ACTIVITIES TO BE SUPPORTED WITH FY 2022 FUNDING

The FY 2022 budget tables contain a full list of activities that PMI proposes to support in Malawi with FY 2022 funding. Please visit www.pmi.gov/resource-library/mops for these FY 2022 budget tables. Key data used for decision-making for this MOP planned investments is provided in Annex A of this document.

ANNEX A: INTERVENTION-SPECIFIC DATA

This section outlines key data that helped inform decision-making around FY 2022 MOP funding allocations to PMI-supported activities.

1. VECTOR CONTROL

NMCP Objective

The Government of Malawi's 2017–2022 Malaria Strategic Plan (MSP) promotes an integrated vector management (IVM) strategy, including vector surveillance, insecticide resistance management, continuous and mass distribution of insecticide-treated nets (ITNs), geographically targeted indoor residual spraying (IRS), and larval source management. The MSP targets at least 90 percent of the population to use one or more malaria preventative interventions by the year 2022. Malawi aims to achieve universal coverage with ITNs, defined as one net for every two people, with the objective of increasing net ownership and net usage among pregnant women and children under five years of age to at least 90 percent. IRS will be conducted during the right time of year, in line with World Health Organization (WHO) standards, focused in high-burden districts, and scaled up in phases according to the IVM strategy.

NMCP Approach

The NMCP ITN policy promotes distribution of free ITNs for (1) children born in health facilities, (2) children attending their first visit under the Expanded Program on Immunization (EPI) if an ITN was not received at birth, and (3) pregnant women at their first visit to an antenatal care (ANC) clinic.[2] The policy also supports national, free ITN distribution campaigns that are conducted every two to three years. Malawi intends to deploy IRS in selected, suitable epidemiology areas, with a target of spraying in 11 high-burden districts by 2022.

PMI Objective in Support of NMCP

The MSP promotes an IVM strategy, including vector surveillance, insecticide resistance management, continuous and mass distribution of ITNs, geographically targeted IRS, and larval source management. PMI supports the use of all of these interventions, with the exception of larval source management.

PMI-Supported Recent Progress (CY 2020–2021)

- Supported entomological monitoring in 13 sentinel sites in six targeted districts.
- Provided technical assistance for entomological monitoring through virtual document review and technical discussions.
- Supported the procurement of 1.2 million and distribution of approximately 1.3 million PBO ITNs to pregnant women and children less than one year of age through continuous distribution (ANC and Labor and Delivery [L&D]).
- Supported ITN durability monitoring, with finalization of the report on the previous cohort and planning for a new round of monitoring for a 2021 cohort.
- Provided technical assistance for planning for the 2021 ITN mass distribution campaign, both through funding for Alliance for Malaria Prevention consultants (balance of funding remaining from the previous campaign) and through PMI/Malawi participation in the National Task Force for the campaign.

[2] In practice, ITNs are distributed for newborns following delivery at a health facility and at ANC, but not through EPI visits, as this would be logistically difficult.

- Supported national-level social and behavior change (SBC) activities to improve demand for ITNs, increase use, promote care, and mitigate against misuse.
- Supported the planning, implementation, and evaluation of the third year of IRS in Nkhotakota district, covering 114,196 structures and protecting 453,383 people (October 26–December 4, 2020).
- Provided technical assistance to the NMCP, the Global Fund Principal Recipient, and the Mangochi, Balaka, and Nkhata Bay District Health Offices with the planning, training, supervision, and closeout of IRS operations in Mangochi, Balaka, and Nkhata Bay.
- Trained and engaged 1,619 Community Health Action Group (CHAG) members in Nkhotakota district to support IRS mobilization and spray activities.

PMI-Supported Planned Activities (CY 2021–2022 with currently available funds)

- Continue entomological monitoring in 13 sentinel sites in six targeted districts.
  - Conduct insecticide resistance monitoring in six sites.
  - Conduct vector bionomics monitoring monthly in 13 sites.
  - Conduct wall bioassays to monitor residual efficacy in six sites.
- Procure 1.6 million PBO ITNs for distribution via continuous distribution channels (ANC and L&D).
- Distribute 1.3 million PBO ITNs via health facility channels.
- Provide technical support to the mass distribution campaign to be conducted in October 2021. Involvement limited to PMI/Malawi staff level of effort with no external partner technical assistance.
- Conduct pre-distribution bioassays and baseline data collection for streamlined durability monitoring data collection (around February 2022) of three new types of nets (PBO, IG2, and Royal Guard) to be distributed in October 2021.
- Initiate an IRS and ITN impact evaluation and produce a baseline data report, as well as an IRS and ITN Impact Evaluation Plan, in collaboration and coordination with NMCP and other partners.
- Implement IRS in one district and provide technical support for the NMCP-led IRS in three additional districts in October–November 2021.
- Conduct community mobilization activities in conjunction with IRS and ITN campaigns.

1.1. ENTOMOLOGICAL MONITORING

Key Goal

Determine the geographic distribution, bionomics, and insecticide resistance profiles of the main malaria vectors in the country to inform vector control decision-making.

Key Question 1

Where is entomological monitoring taking place, what types of activities are occurring, and what is the source of funding?

PMI is supporting entomological monitoring in 13 sites across six districts, including two districts that were covered by IRS in October/November 2020 (with PMI and Global Fund funding) and two that received PBO ITNs in the 2018 mass campaign (with Global Fund funding). The Global Fund is also supporting four sites across two districts that are covered by Global Fund-supported IRS. Following the 2021 mass distribution campaign,

PMI-supported entomological monitoring will continue in the same districts and will include two districts that will receive Royal Guard ITNs, one that will receive Interceptor G2 ITNs, and one that will receive PBO ITNs The four districts that receive IRS will not receive ITNs during the mass campaign.

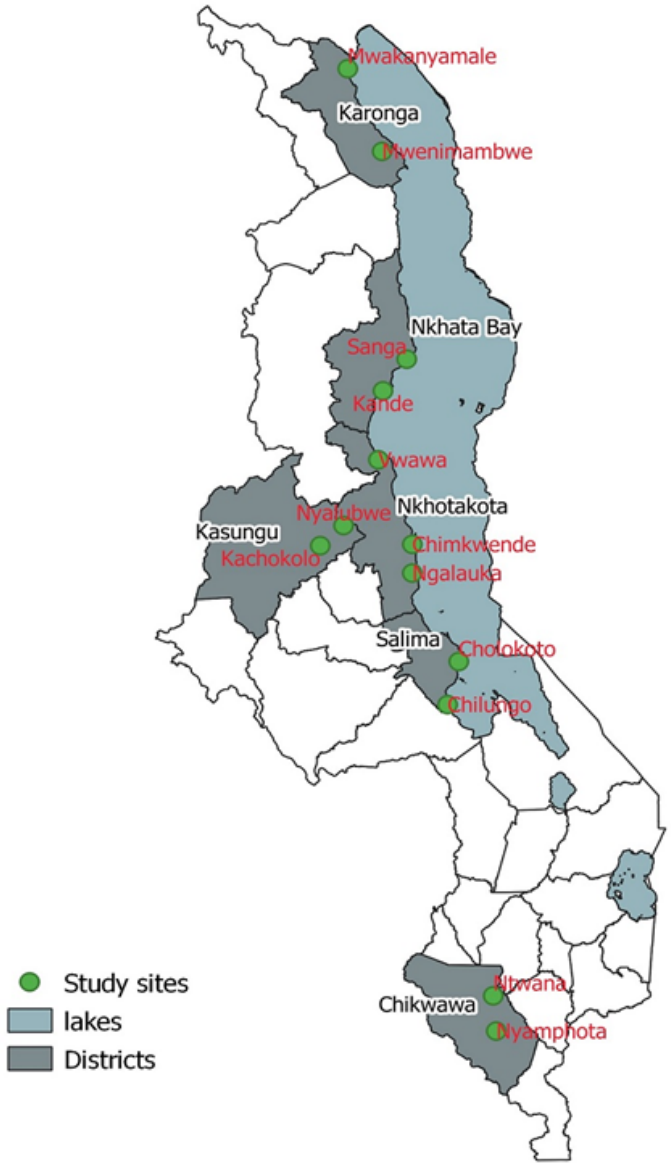
Supporting Data

Table A-1. Entomological monitoring activities

Site	District	Activities	Supported by
Mwenemambwe	Karonga	Insecticide resistance monitoring, vector bionomics monitoring	PMI
Mwakanyamale	Karonga	Vector bionomics monitoring	PMI
Sanga	Nkhata Bay	Insecticide resistance monitoring, vector bionomics monitoring, wall bioassays	PMI
Kande	Nkhata Bay	Vector bionomics monitoring, wall bioassays	PMI
Kavuzi	Nkhata Bay	Wall bioassays	PMI
Musawanika	Nkhata Bay	Wall bioassays	PMI
Kachokolo	Kasungu	Insecticide resistance monitoring, vector bionomics monitoring	PMI
Nyalubwe	Kasungu	Vector bionomics monitoring	PMI
Vwawa	Nkhotakota	Insecticide resistance monitoring, vector bionomics monitoring, wall bioassays	PMI
Chimkwende	Nkhotakota	Vector bionomics monitoring, wall bioassays	PMI
Ngalauka	Nkhotakota	Vector bionomics monitoring, wall bioassays	PMI
Chamba 1	Nkhotakota	Wall bioassays (quality check only)	PMI
Mtachi 3	Nkhotakota	Wall bioassays (quality check only)	PMI
Kalungama 1	Nkhotakota	Wall bioassays	PMI
Cholokoto	Salima	Insecticide resistance monitoring, vector bionomics monitoring	PMI
Chilungo	Salima	Insecticide resistance monitoring, vector bionomics monitoring	PMI
Ntwana	Chikwawa	Insecticide resistance monitoring, vector bionomics monitoring	PMI
Nyamphota	Chikwawa	Vector bionomics monitoring	PMI
Piyasi	Mangochi	Vector bionomics monitoring, wall bioassays	Global Fund
Koche	Mangochi	Vector bionomics monitoring	Global Fund
Maluwa	Mangochi	Vector bionomics monitoring, wall bioassays	Global Fund
Mbinda	Mangochi	Wall bioassays	Global Fund

Site	District	Activities	Supported by
Nanganga	Mangochi	Wall bioassays (quality check only)	Global Fund
Chimdikiti	Balaka	Vector bionomics monitoring, wall bioassays	Global Fund
Mazenga	Balaka	Wall bioassays (quality check only)	Global Fund
Kaumphawi	Balaka	Wall bioassays (quality check only)	Global Fund
Kabota	Balaka	Vector bionomics monitoring, wall bioassays	Global Fund
Mpale	Balaka	Insecticide resistance monitoring	Global Fund

Figure A-1. Map of PMI-supported entomological monitoring sites in Malawi



*Sites that were used for spray quality assessment only are not included on this map.

Table A-2. Distribution and bionomics of malaria vectors

Site/District	Vector*	Season (month)	Preferred Biting Location	Peak Biting Time	Preferred Resting Location**	Preferred Host	Annual EIR***
Karonga, Mwakanyamale	***An. arabiensis*** *An. funestus*	**Jan–March,** Jul–Sept	**Outdoors,** Indoors	N/A	N/A	N/A	0.0
Karonga, Mwenemambwe	***An. arabiensis***	Jan–March	Outdoors	N/A	N/A	N/A	28.2
Nkhata Bay, Kande	***An. arabiensis*** *An. funestus*	**Jan–March,** Jul–Sept	Outdoors	N/A	N/A	N/A	2.9
Nkhata Bay, Sanga	***An. funestus*** *An. arabiensis*	**Jul–Sept,** Jan–March	Indoors	10 p.m.–5 a.m.	N/A	N/A	5.0
Nkhotakota, Chimkwende	***An. arabiensis*** *An. funestus*	**Jan–March,** Jul–Sept	Outdoors	8 p.m.–3 a.m.	N/A	N/A	142.3
Nkhotakota, Vwawa	***An. funestus*** *An. arabiensis*	**Jul–Sept,** Jan–March	Indoors	2 a.m.–8 a.m.	N/A	N/A	64.9
Nkhotakota, Ngalauka	***An. arabiensis*** *An. funestus*	**Jan–March,** Jul–Sept	Outdoors	N/A	N/A	N/A	110.7
Salima, Cholokoto	***An. arabiensis*** *An. funestus*	**Jan–March,** Jul–Sept	Outdoors	N/A	N/A	N/A	9.8
Salima, Chilungo	***An. arabiensis*** *An. funestus*	**Jan–March,** Jul–Sept	Outdoors	9 p.m.–4 a.m.	N/A	N/A	2.1
Kasungu, Nyalubwe	***An. funestus*** *An. arabiensis*	**Jul–Sept,** Jan–March	Indoors	N/A	N/A	N/A	64.0
Kasungu, Kachokolo	***An. funestus*** *An. arabiensis*	**Jul–Sept,** Jan–March	Indoors	N/A	N/A	N/A	46.0
Chikwawa, Ntwana	***An. funestus*** *An. arabiensis*	**Jul–Sept,** Jan–March	Indoors	N/A	N/A	N/A	139.5
Chikwawa, Nyamphota	***An. arabiensis*** *An. funestus*	**Jan–March,** Jul–Sept	Outdoors	N/A	N/A	N/A	2.5

Site/District	Vector*	Season (month)	Preferred Biting Location	Peak Biting Time	Preferred Resting Location**	Preferred Host	Annual EIR***
Mangochi, Likulungwa	***An. arabiensis*** *An. funestus*	**Jan–March,** Jul–Sept	Outdoors	N/A	N/A	N/A	39.5
Mangochi, Piyasi	***An. arabiensis*** *An. funestus*	**Jan–March,** Jul–Sept	Outdoors	N/A	N/A	N/A	6.2

*Primary vector listed first, in bold, followed by secondary vectors.

** Marked as N/A if simultaneous indoor and outdoor collections are not conducted.

***EIR = Entomological inoculation rate; rates were estimated for nine months from July 2019 to March 2020.

The predominant malaria vectors in Malawi are *An. funestus* s.s. and *An. gambiae* s.l. In most sites, nearly all of the *An. gambiae* s.l. are *An. arabiensis* by polymerase chain reaction (PCR), although *An. gambiae* s.s. makes up approximately 25 percent of the *An. gambiae* s.l. in sites in Salima district. All *An. funestus* s.l. tested by PCR were identified as *An. funestus* s.s.

Although *An. arabiensis* is the predominant species in many sites in Malawi, its relative contribution to malaria transmission is often lower than *An. funestus* due to host preferences. Though not formally measured, *An. arabiensis* frequently feeds on cattle and as a result, sporozoite infections in *An. arabiensis* ranged from 0.6 to 1.8 percent compared with 5.0 to 6.5 percent for *An. funestus*, depending on the collection method. Estimated entomological inoculation rates (EIRs) were calculated for the nine months from July 2019 to March 2020 and ranged from 0.0 infectious bites per person per year in one site in Karonga to 142.3 infectious bites per person per year in one site in Nkhotakota. The highest EIRs were generally associated with *An. funestus* including sites within Nkhotakota, which had been sprayed with Actellic in October/November of 2018. The peak EIRs in this district were observed in July through September, at least eight months after spraying. Combined with the residual activity data (see Table A-11 "**IRS Insecticide Residual Efficacy**"), these observations suggest that the residual activity of Actellic is not long enough to completely cover the transmission season.

An. coustani has also been frequently observed in both human landing catches and light trap collections. However, sporozoites have never been detected in this species and it likely contributes very little, if at all, to malaria transmission.

Key Question 2

What is the current insecticide resistance profile of the primary malaria vectors?

Table A-3. Insecticide resistance in *An. funestus* in Malawi

District	Site	Insecticide	Source	No. Tested	No. Dead	% Mortality*	Time at Final Mortality
Chikwawa	Chakanira	Deltamethrin 0.05%	F_1	94	13	13.8	24 Hours
		Deltamethrin 0.25% (5x)	F_1	105	67	63.8	24 Hours
		4% PBO + Deltamethrin 0.05%	F_1	102	98	96.1	24 Hours
		Permethrin 0.75%	F_1	111	18	16.2	24 Hours
		Permethrin 3.75% (5x)	F_1	101	61	60.4	24 Hours
		4% PBO + Permethrin 0.75%	F_1	111	109	98.2	24 Hours
		Alpha-cypermethrin 0.05%	F_1	115	44	38.3	24 Hours
		4% PBO + Alpha-cypermethrin 0.05%	F_1	112	109	97.3	24 Hours
		Chlorfenapyr 100µg/bottle	F_1	100	100	100	24 Hours
		Clothianidin 13.2mg/paper	F_1	106	106	100	4 Days
Kasungu	Kachokolo	Deltamethrin 0.05%	F_1	106	3	2.8	24 Hours
		4%PBO + Deltamethrin 0.05%	F_1	99	99	100	24 Hours
		Permethrin 0.75%	F_1	105	5	4.8	24 Hours
		4%PBO + Permethrin 0.75%	F_1	105	105	100	24 Hours
		Alpha-cypermethrin 0.05%	F_1	102	4	3.9	24 Hours
		Pirimiphos-methyl 0.25%	F_1	104	104	100	24 Hours
		Chlorfenapyr 100µg/bottle	F_1	104	102	98	5 Days
		Clothianidin 13.2mg/paper	F_1	110	110	100	4 Days
Mangochi	Likulungwa	Chlorfenapyr 100µg/bottle	F_1	48	48	100	2 Days
Nkhotakota	Chimkwende	Permethrin 0.75%	F_1	56	21	37.5	24 Hours
		Clothianidin 13.2mg/paper	F_1	106	106	100	2 Days
Nkhata-Bay	Kande	Alpha-cypermethrin 5X	F_1	90	69	76.7	30 Mins
		Alpha-cypermethrin 10X	F_1	89	72	80.9	30 Mins
		4% PBO + Alpha-cypermethrin 0.05%	F_1	103	90	87.4	24 Hours
		Deltamethrin 0.05%	F_1	105	13	12.4	24 Hours
		4% PBO+ Deltamethrin 0.05%	F_1	124	121	97.6	24 Hours

District	Site	Insecticide	Source	No. Tested	No. Dead	% Mortality*	Time at Final Mortality
		Permethrin 0.75%	F_1	117	5	4.3	24 Hours
		4% PBO + Permethrin 0.75%	F_1	109	107	98.2	24 Hours
		Pirimiphos-methyl 0.25%	F_1	103	103	100	24 Hours
		Chlorfenapyr 100µg/ml	F_1	99	99	100	24 Hours
		Clothianidin 13.2mg/ml	F_1	90	90	100	24 Hours

*Cells highlighted in green indicate full susceptibility as defined by WHO (≥98% mosquito mortality); cells highlighted in red indicate confirmed resistance (<80% mosquito mortality); and cells highlighted in yellow indicate suspected resistance (mosquito mortality >80% but <98%) that requires further investigation.

Anopheles funestus is highly resistant to pyrethroid insecticides (alpha-cypermethrin, deltamethrin, and permethrin) throughout Malawi, including resistance at 5X and 10X concentrations where tested. However, pre-exposure to PBO completely or partially restored susceptibility in all populations except for the Kande site in Nkhata Bay where mortality against alpha-cypermethrin was 87.4 percent after pre-exposure to PBO. In that same population, *An. funestus* was resistant up to 10X alpha-cypermethrin.

An. funestus was fully susceptible to pirimiphos-methyl (organophosphate), clothianidin (neonicotinoid), and chlorfenapyr (pyrrole) in all populations tested (not all tests were conducted everywhere due to low number of available mosquitoes in the field).

Table A-4. Insecticide resistance in *An. gambiae* in Malawi

District	Site	Insecticide	Source	No. Tested	No. Dead	% Mortality*	Time at Final Mortality
Chikwawa	Mwamphanzi	Pirimiphos-methyl 0.25%	Larvae	111	111	100	24 Hours
Salima	Nzembela	Deltamethrin 0.05%	Larvae	103	42	40.8	24 Hours
		4% PBO + Deltamethrin 0.05%	Larvae	95	87	91.6	24 Hours
		Permethrin 0.75%	Larvae	100	21	21	24 Hours
		4% PBO + Permethrin 0.75%	Larvae	104	90	86.5	24 Hours
	Fifizi	Alpha-cypermethrin 0.05%	Larvae	73	52	71.2	24 Hours
		Pirimiphos-methyl 0.25%	Larvae	57	57	100	24 Hours

District	Site	Insecticide	Source	No. Tested	No. Dead	% Mortality*	Time at Final Mortality
Mangochi	Malindi	Pirimiphos-methyl 0.25%	Larvae	90	89	98.9	24 Hours
		Clothianidin 13.2mg/ml	Larvae	96	96	100	2Days
		Alpha-cypermethrin 0.05%	Larvae	99	76	76.8	24 Hours
		4% PBO + Alpha-cypermethrin 0.05%	Larvae	29	29	100	24 Hours
	Kafulumila	Deltamethrin 0.05%	Larvae	104	87	83.7	24 Hours
		4% PBO + Deltamethrin 0.05%	Larvae	102	102	100	24 Hours
		Permethrin 0.75%	Larvae	107	40	37.4	24 Hours
		4% PBO + Permethrin 0.75%	Larvae	103	96	93.2	24 Hours
Nkhotakota	Chimkwende	Pirimiphos-methyl 0.25%	Larvae	107	107	100	24 Hours
		Deltamethrin 0.05%	F_1	77	28	36.4	24 Hours
Karonga	Mwenemambwe	Deltamethrin 0.05%	Larvae	100	83	83	24 Hours
		Permethrin 0.75%	Larvae	41	19	46.3	24 Hours

*Cells highlighted in green indicate full susceptibility as defined by WHO (≥98% mosquito mortality); cells highlighted in red indicate confirmed resistance (<80% mosquito mortality); and cells highlighted in yellow indicate suspected resistance (mosquito mortality >80% but <98%) that requires further investigation.

An. gambiae s.l. (predominantly *An. arabiensis*), was resistant to pyrethroid insecticides (alpha-cypermethrin, deltamethrin, and permethrin) throughout Malawi. Pre-exposure to PBO restored full or partial susceptibility in most populations. *An. gambiae* s.l. was fully susceptible to pirimiphos-methyl (organophosphate) and clothianidin (neonicotinoid) in the population tested.

Conclusions for Entomologic Monitoring Investments

- PMI will conduct entomological monitoring in districts receiving the dual active ingredient and PBO ITNs, as well as the districts that received IRS; these data will feed into the durability monitoring and evaluation activities and will help to inform decisions about future vector control interventions.
- **ITNs**: Both *An. funestus* and *An. gambiae* s.l. were highly resistant to pyrethroids (permethrin, deltamethrin, and alpha-cypermethrin) in all sentinel sites in the six districts. In nearly all sites, partial or

full restoration of susceptibility was observed in *An. funestus* and *An. gambiae* s.l. when pre-exposed to 4 percent PBO, indicating the presence of the oxidase resistance mechanism. This means that long-lasting insecticidal nets that incorporate PBO would be effective against *Anopheles* vectors of malaria in Malawi. *An. funestus* was demonstrated to be fully susceptible to chlorfenapyr and previous tests have indicated full susceptibility in *An. gambiae* s.l. It is recommended that PBO ITNs or dual active ingredient ITNs be distributed in areas with moderate and high pyrethroid resistance in mass distribution campaigns in Malawi, as well as via continuous distribution.

- IRS: Actellic 300CS, clothianidin, and chlorfenapyr showed high efficacy against both *An. funestus* s.l. and *An. gambiae* s.l. The three insecticides should be considered in IRS rotation in Malawi, assuming an IRS formulation of chlorfenapyr becomes available. However, clothianidin should be prioritized due to its longer residual life (at least 6–10 months) because current formulations of Actellic 300CS do not appear to cover the full transmission season (~6 months) (see Table A-11. IRS Insecticide Residual Efficacy). If new IRS products become available, these should be prioritized for testing both their efficacy against the malaria vectors in Malawi and their residual efficacy given concerns about the residual activity of Actellic 300CS.
- Based on vector bionomics data, the seasonality of *An. funestus* combined with the relatively short residual life of Actellic raised concerns about its use for IRS in this context. PMI, the NMCP, and implementing partners have been investigating the reasons for the unexpectedly short residual activity of Actellic and the NMCP has recommended that the use of Actellic be put on hold until issues of reduced residual life have been resolved. This has implications for the insecticide rotation strategy recommended by the Malawi Integrated Vector Control Strategy as indicated in Table A-12 in that only one class of insecticide is available for use in Malawi making the rotation impossible.

Please see FY 2022 PMI budget tables for a detailed list of proposed activities with FY 2022 funding.

1.2. INSECTICIDE-TREATED NETS (ITNs)

Key Goal

Achieve high ITN coverage and use targets with effective nets, based on insecticide resistance data, in PMI-supported areas; and maintain high coverage and use with consistent ITN distribution (via mass distribution campaigns and/or continuous distribution channels).

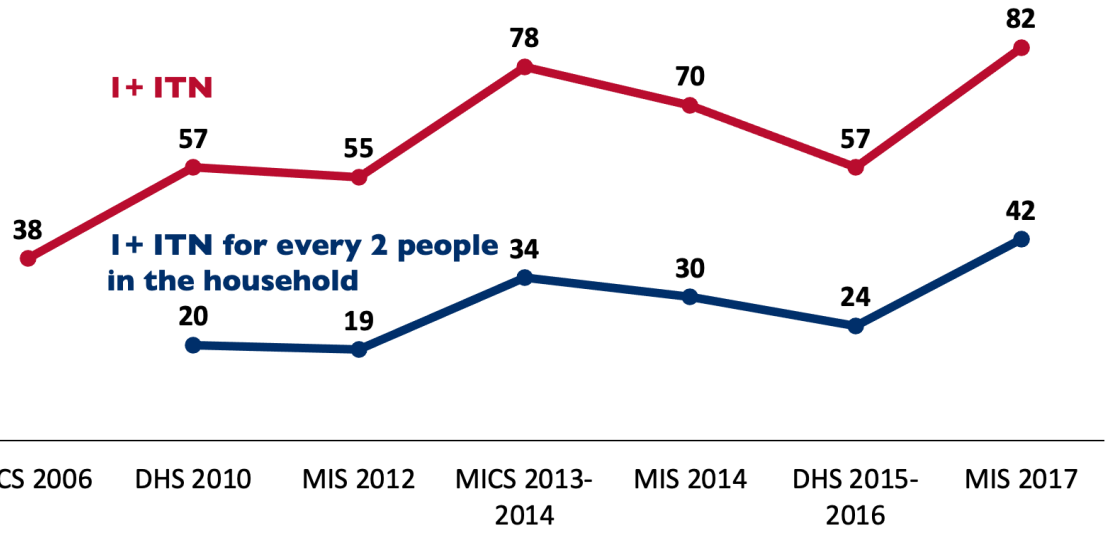
Key Question 1

How has net ownership evolved since the start of PMI in the country?

Supporting Data

Figure A-2. Trends in ITN ownership

Line graph shows households owning at least one ITN increased from 38 percent in 2006 Multiple Indicator Cluster Survey (MICS) to 82 percent in the 2017 MIS, while the percentage of households with at least one ITN for every two people in the household increased from 20 percent in 2010 DHS to 42 percent in 2017 MIS. ITN ownership with at least one ITN has remained fair since Malawi became a PMI-focus country, reaching a peak of 82 percent of households with at least one ITN in 2017. It should be noted that the 2017 MIS was conducted in April, just prior to the October mass distribution campaigns, so it does not reflect peak coverage achieved by the mass distribution campaigns. While the majority of households own at least one ITN, there may not be full coverage of all household members.



Key Question 2a

What proportion of the population has access to an ITN? Of those who have access, what proportion of the population reports using an ITN?

Figure A-3. Trends in ITN access and use

The line graph below shows that population access to an ITN increased from 19 percent in the 2004 DHS to 63 percent in the 2017 MIS. Use of ITNs among the household population with access to an ITN increased from 12 percent in the 2004 DHS to 55 percent in the 2017 MIS. Access and use track closely, indicating that when people have access to an ITN, they are likely to sleep under it.

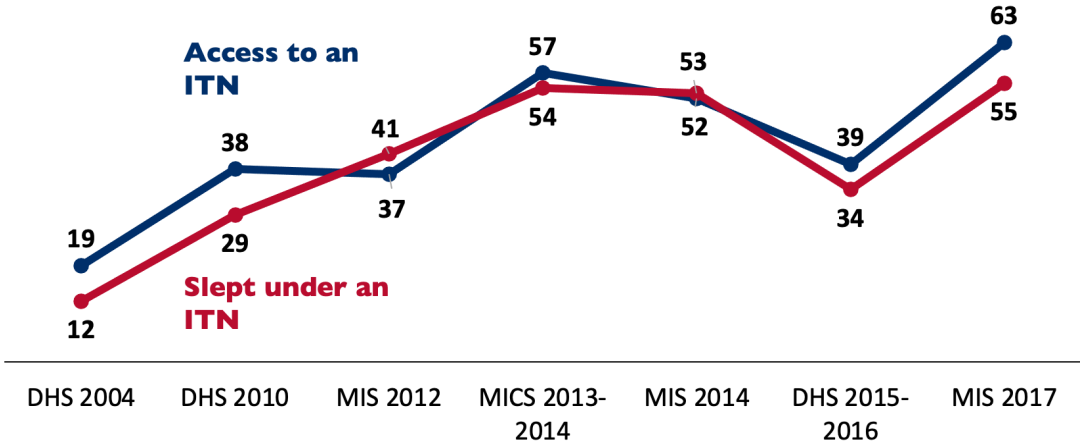
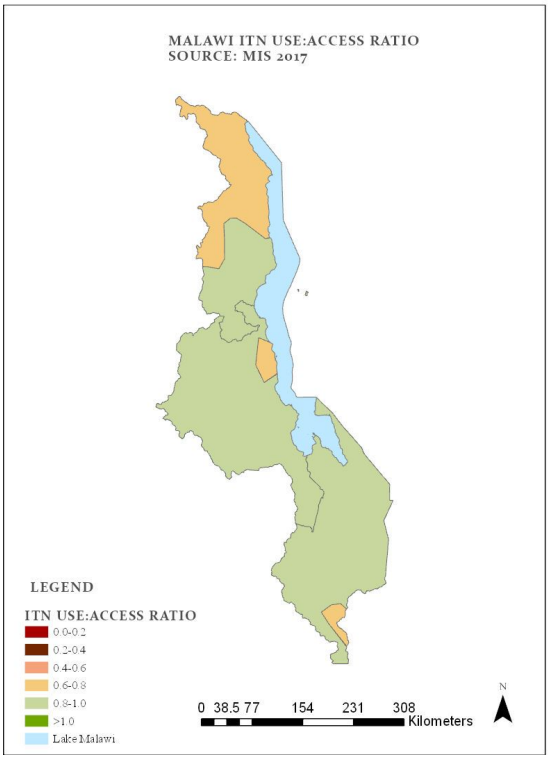


Figure A-4. Malawi country map from ITN access and use report



Trends across national household surveys indicate Malawi continues to have an ITN use:access ratio of at least 0.80 across all regions and groups (0.80, 0.86, and 0.91 in the Northern, Central, and Southern regions, respectively), indicating a strong culture of net use.[3] SBC activities should therefore emphasize maintaining net use and promoting net care as access improves.

Key Question 2b

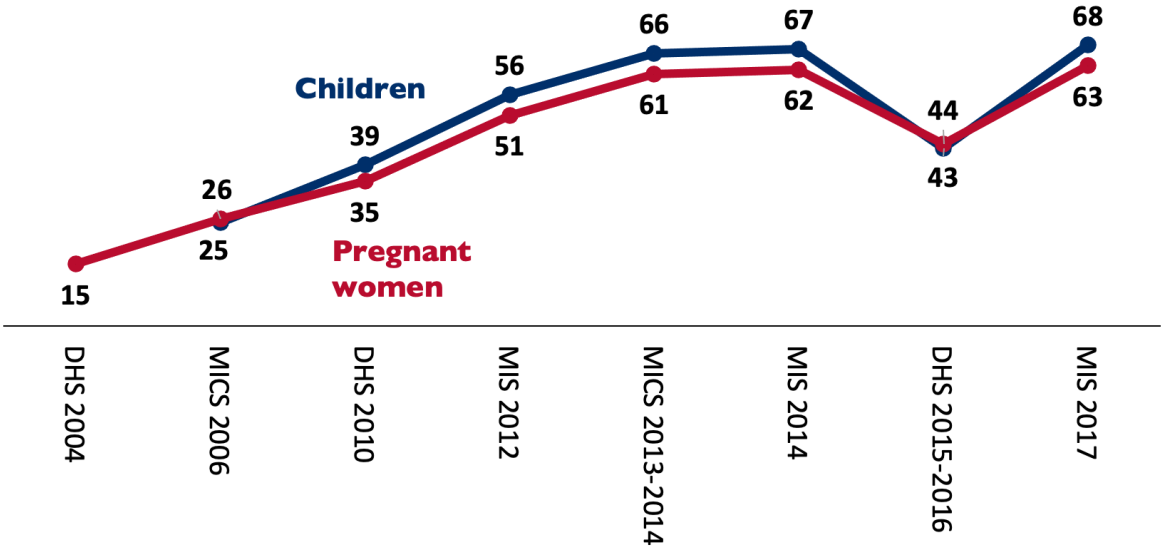
What percent of pregnant women and children under five years of age report sleeping under an ITN?

Supporting Data

Figure A-5. Trends in ITN use among children and pregnant women

Children under five years of age and pregnant women 15 to 49 years of age who slept under an ITN the night before the survey

Line graph shows that ITN use among children has generally increased from 2006 and remained steady with a high of 68 percent according to the 2017 MIS. ITN use among pregnant women has tracked similarly, with a high of 63 percent according to the 2017 MIS.



Key Question 3

If ITN access is high but use is low, what significant structural and/or behavioral challenges affect the adoption and maintenance of ITN use and care behaviors?

[3] While the map above displays some subregional areas with ratios below 0.80, the MIS was not powered to undertake analyses below the regional level. Of the areas shown with lower ratios, only Nkhotakota is supported by PMI, whereas 90% of all supported districts have >0.80 use:access ratios.

Supporting Data

The ITN use:access ratio is generally high across Malawi although use drops somewhat during the dry season and may need boosting in the early transmission season. At present, limited data on the factors affecting the adoption and maintenance of ITN use and care behaviors exist; however, indicators from the 2017 MIS and implementing partner program data offer some insights. Facilitators identified include knowledge and risk perception. Specifically, the 2017 MIS found that 87 percent of respondents cited mosquito nets as a method of malaria prevention, while partner-level program data from participatory action media indicates that prior experience with a severe case of malaria has been shown to facilitate greater ITN use. Barriers reported through partner program data include the following:

- *Beliefs that ITNs do not keep mosquitoes or other problem insects away:* Community members believe that ITNs bring bed bugs and other nuisance insects. Therefore, community members do not wish to use them.
- *Beliefs that ITNs inconvenience couples:* Community members believe that ITNs make it difficult for couples to engage in sexual activities.
- *Missed opportunities at health facilities to emphasize ITN use:* Audience feedback through field visits and community theatre group performances indicated there are missed opportunities for community members to receive counseling on net use during health facility visits for ANC and L&D.

More information is needed to fully assess the internal, social, structural, and environmental factors that influence net use and care at the community level and the role that providers play in promoting net use. Malawi will implement the MBS in CY 2021, and the ideational factors associated with ITN use and care will be explored further. Data gathered will be used to help further inform the focus of PMI's SBC investments; however, PMI support will continue to promote consistent and correct net use as well as proper care.

Key Question 4

What type of nets are being distributed via which channels?

During the 2018 mass distribution campaign, the GOM distributed a combination of PBO and standard nets. PMI supports distribution of PBO nets through ANC and L&D across the entire country.

Supporting Data

Table A-5. Insecticide-treated net (ITN) distribution in Malawi

Level Nationwide/Region/ State/Province	Mass Campaign	ANC/L&D
Nationwide	2018, PBO and standard – PBOs distributed in the following districts: Mwanza, Neno, Nsanje, Machinga, Ntchisi, Salima, Mchinji, Rumphi, Karonga, and Likoma. The remaining districts received standard ITNs; Nkhotakota, which received IRS, did not receive nets via the campaign.	PBO
Nationwide	2021 – Three types of nets (PBO, IG2, and Royal Guard) will be distributed during the mass campaign. The four districts receiving IRS (Nkhotokota, Mangochi, Nkhata Bay, and Balaka) will not receive ITNs via the campaign.	

Key Question 5

What is the estimated need for ITNs during calendar years 2021–2023? How many, and what types, of ITNs will be procured, and by what partners? Through what channels will ITNs be distributed? Are there any projected ITN gaps?

Table A-6. ITN Gap Analysis Table

Calendar Year	2021	2022	2023
Total country population	19,136,537	19,691,496	20,262,550
Total population at risk for malaria	19,136,537	19,691,496	20,262,550
PMI-targeted at-risk population	19,136,537	19,691,496	20,262,550
Population targeted for ITNs	19,136,537	19,691,496	20,262,550
Continuous Distribution Needs			
Channel 1: ANC	735,518	756,848	778,797
Channel 2: L&D	735,518	756,848	778,797
Channel 3: School	0	0	0
Channel 3: Pilot Channel (TBD)	0	0	200,000
Additional ITNs required to avoid ITN stockouts	400,000	0	0
Estimated Total Need for Continuous Channels	1,871,036	1,513,696	1,757,593
Mass Campaign Distribution Needs			
Mass distribution campaigns	9,258,645	0	0
Total ITN Need: Continuous and Campaign	***11,129,681***	***1,513,696***	***1,757,593***
Partner Contributions			
ITNs carried over from previous year	639,889	368,853	0
ITNs from Government	*0*	*0*	*0*
ITNs from Global Fund	9,258,645	0	0
ITNs from other donors	0	0	0
ITNs planned with PMI funding	1,600,000	990,000	1,200,000
Total ITNs Contribution Per Calendar Year	***11,498,534***	***1,358,853***	***1,200,000***
Total ITN Surplus (Gap)	***368,853***	***(154,843)***	***(557,593)***

Supporting Data

Key Question 6

What is the current status of durability monitoring?

Table A-7. Planned durability monitoring (2021 cohort)

Campaign Date	Site	Brand	Baseline	12-month	24-month	36-month
October 2021	Kasungu	PBO *(Brand TBD)*	o/a Feb 2022			
	Chikwawa	Interceptor G2				
	Salima	Royal Guard				

Table A-8. Results of durability monitoring (2016 cohort)

Site	Survey and Time Since Distribution (months)	Attrition to Wear and Tear (%)	Nets in Serviceable Condition (%)	Optimal Insecticidal Effectiveness in Bioassay (%)
Kasungu (Yorkool)	12	14.8%	87.8%	73.3%
	24	37.1%	75.4%	72.4%
	36	73.3%	68.1%	68.0%
Mangochi (Royal Sentry)	12	17%	86.0%	96.7%
	24	52.9%	68.6%	96.2%
	36	90.1%	59.1%	95.5%

This study (2016–2019) monitored two nets brands (Yorkool and Royal Sentry) that were distributed nationwide in 2016. Data shows that physical integrity of mass distribution campaign nets was less than three years. In Kasungu, Yorkool nets lasted 2.4 years, on average, and in Mangochi, Royal Sentry nets lasted 1.9 years, on average. Furthermore, this survey shows high attrition of nets over 36 months. It should be noted that a mass distribution campaign was conducted in October 2018, prior to the 36-month data collection. High use of nets to sleep under the previous night was observed among study participants. The use of campaign nets the night before and every night the week before the survey was higher (>70 percent) in Mangochi than in Kasungu (>60 percent). Mangochi is considered a malaria endemic district and malaria transmission is high throughout the year, which may explain the slightly higher usage of nets than in Kasungu. This study seems to suggest that most people who have nets are likely to use them.

The study also revealed that many households do not repair their nets despite most households observing holes on the net. Only a few households in Mangochi (22.7 percent) and Kasungu (14.7 percent) repaired nets at 36 months. This suggests a need for SBC to underscore the importance of sleeping under an intact net. Net effectiveness did decrease over time, but not substantially for either net brand. Results of net bioassays showed

that both Royal Sentry and Yorkool nets remained effective up to 36 months. These findings provide evidence that the insecticide on the two ITNs tested was available to kill mosquitoes for up to three years.

Given the results of durability monitoring, to sustain coverage between mass distribution campaigns, alternative continuous distribution channels may be needed to inject additional ITNs into households and maintain coverage levels. The study can be found in the results section of the durability monitoring website.

Conclusions for ITN Investments

- Based on durability monitoring data that ITNs are lasting less than three years in the field, PMI plans to increase the quantities of ITNs it procures for distribution via continuous distribution channels. Depending on the findings of a NetCalc activity planned for CY 2021, PMI will consider piloting an additional continuous distribution channel to increase the quantity of ITNs being provided and better sustain coverage levels between mass distribution campaigns.
- Based on the ITN Access and Use Report, PMI plans to focus its SBC activities to sustain proper use, encourage appropriate care, target activities at the subnational level, and field the MBS to better understand barriers to use.
- Based on durability monitoring and entomological data showing pyrethroid resistance, PMI plans to continue to support the NMCP in transitioning to new types of nets nationwide. PMI will continue to support an evaluation (starting in CY 2021) to compare the impact of IRS and the new ITNs, compare the impact of Interceptor G2 and Royal Guard ITNs to PBO ITNs, and to assess non-inferiority between Interceptor G2 and Royal Guard ITNs. The findings from this evaluation will help inform PMI's support to vector control interventions in Malawi.

Please see FY 2022 PMI budget tables for a detailed list of proposed activities with FY 2022 funding.

1.3. INDOOR RESIDUAL SPRAYING (IRS)

Key Goal

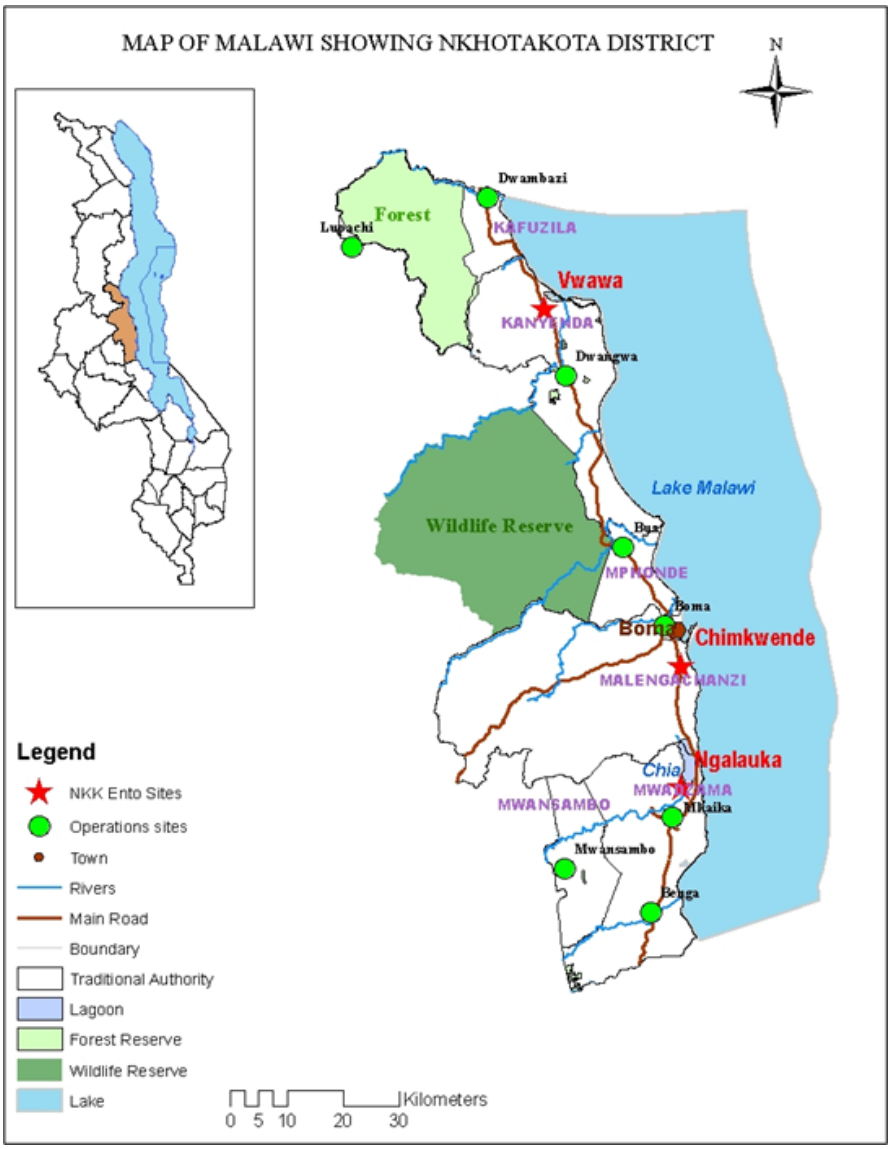
Ensure high spray quality and coverage, with an appropriate insecticide, in targeted endemic PMI-supported areas, in alignment with the national insecticide resistance management strategy.

Key Question 1

What areas are targeted for IRS and why?

Supporting Data

Figure A-6. PMI VectorLink-supported* IRS in Nkhotakota District (2021)



*The NMCP implements IRS with Global Fund financial support and PMI VectorLink technical support in Balaka, Mangochi, and Nkhata Bay (see Table A-10 for details).

Key Question 2

In PMI-supported areas, what spray coverage rates have been achieved in the past three years and what are the plans for 2021?

Supporting Data

Table A-9. PMI-supported IRS coverage

Calendar Year	District	Structures Sprayed (#)	Coverage Rate (%)	Population Protected (#)	Insecticide
2018	Nkhotakota	112,264	94.9%	501,324	Actellic 300CS
2019		107,565	88.8%.	441,375	Actellic 300CS (7 operations sites) and SumiShield® 50WG (2 operations sites)
2020		114,196	91.0%	453,383	SumiShield 50WG (in all operations sites) and Actellic 300CS (in one area under Bua operations site)
2021*		125,521	85%	TBD	Fludora® Fusion (66%) and SumiShield 50WG (34%)

*Denotes targets for current year.

Table A-10. Global Fund-supported IRS coverage

Calendar Year	Districts	Structures Sprayed (#)	Coverage Rate (%)	Population Protected (#)	Insecticide
2019	Mangochi	266086	95.3	1,014,763	Actellic 300CS
2020	Nkhata Bay	62,993	90.8%	298,406	Actellic 300 CS
	Balaka	126,219	94.3%	446,045	SumiShield 50WG
	Mangochi	324,532	96.5%	1,181,830	Actellic 300CS and SumiShield 50WG
2020 Totals		**513,744**	**95.2%**	**1,926,281**	
2021*	Nkhata Bay	69,384	85%	TBD	SumiShield 50WG
	Balaka	133,846	85%	TBD	Fludora Fusion
	Mangochi	336,257	85%	TBD	Fludora Fusion and SumiShield 50WG
2021 Totals*		**539,847**			

*Denotes targets for current year.

Key Question 3

What is the residual efficacy of the insecticides used for IRS in PMI-supported areas?

Supporting Data

Residual efficacy of Actellic 300CS was assessed using a susceptible colony strain after application in 2019 in three sites in Nkhotakota district (PMI support) and four sites in Mangochi district (Global Fund support). In all sites and on all surfaces, residual efficacy as measured in cone bioassays declined below the acceptable threshold

between two and four months after spraying. The one exception was at the Chipoka site in Mangochi where Actellic provided continued efficacy for at least four months when monitoring was suspended due to COVID-19. Upon resumption at eight months post-spray, mosquito mortality had fallen below the 80 percent threshold. SumiShield was piloted in one operational site in Nkhotakota. Residual efficacy monitoring of SumiShield indicated that mortality of susceptible colony mosquitoes up to five days after exposure in cone bioassays remained above 80 percent for at least 10 months.

Residual efficacy data following the 2020 IRS campaign indicated similar trends. Mosquito mortality in Nkhata Bay, which had been sprayed with Actellic, remained above 80 percent for two to three months in all sites except Kalungama, Nkhotakota, where mosquito mortality remained above 80 percent for four to five months. In other sites in Nkhotakota that had been sprayed with SumiShield, mosquito mortality remained above 80 percent for at least five months at the time of writing with monitoring continuing until mortality falls below this threshold.

Table A-11. IRS insecticide residual efficacy

Site/District	Year	Insecticide	Average Residual Efficacy (months)
Chiwawula (Nkhotakota)	2019–2020	Actellic	3-4
Chimkwende (Nkhotakota)	2019–2020	Actellic	3
Ngalauka (Nkhotakota)	2019–2020	Actellic	3
Piyasi (Mangochi)	2019–2020	Actellic	2-4
Makokola (Mangochi)	2019–2020	Actellic	4
Mwenda (Mangochi)	2019–2020	Actellic	2-3
Chipoka (Mangochi)	2019–2020	Actellic	4-8*
Muyande(Nkhotakota)	2019–2020	SumiShield	>10
Vwawa (Nkhotakota)	2020–2021	SumiShield	>5**
Chimkwende (Nkhotkota)	2020–2021	SumiShield	>5**
Ngalauka (Nkhotakota)	2020–2021	SumiShield	>5**
Kalungama (Nkhotakota)	2020–2021	Actellic	4-5
Kande (Nkhata Bay)	2020–2021	Actellic	2-3
Sanga (Nkhata Bay)	2020–2021	Actellic	2
Kavuzi (Nkhata Bay)	2020–2021	Actellic	2
Musawanika (Nkhata Bay)	2020–2021	Actellic	2

*Monitoring was suspended for several months due to COVID-19. However, Actellic was effective for at least four months but less than eight months in Chipoka, Mangochi.

**At the time of writing, SumiShield had been monitored for five months in Nkhotakota following the 2020 IRS campaign and cone bioassays showed >95 percent mosquito mortality in all sites. Monitoring will continue until mortality declines to below 80 percent for two consecutive months.

Key Question 4

What is the insecticide rotation plan in PMI-supported areas?

Supporting Data

Table A-12. Insecticide rotation plan

Target Spray Area	2020	2021*	2022*	2023*
Nkhotakota	Neonicatinoid	Neonicatinoid	Organophosphate**	TBD
Nkhata Bay	Organophosphate	Neonicatinoid	Organophosphate**	TBD
Balaka	Neonicatinoid	Neonicatinoid	Organophosphate**	TBD
Mangochi	Organophosphate and Neonicatinoid	Neonicatinoid	Organophosphate**	TBD

*Denotes planned insecticide classes

**According to the Malawi Integrated Vector Control Strategy (IVCS) 2020–2025, IRS is scheduled to be conducted using an organophosphate insecticide in 2022. However, the only available product has demonstrated low residual efficacy based on cone bioassays and unless the reason can be determined and resolved, IRS may be conducted with a neonicatinoid insecticide again in 2022 even though the Malawi IVCS recommends annual rotation.

Conclusions for IRS Investments

- With FY 2022 funds, PMI plans to sustain implementation coverage in one district and continue to provide technical support, as needed, to the NMCP for IRS implementation in additional Global Fund-funded districts.
- Previous spray coverage rates have been acceptable. Based on challenges with rains and homeowners out farming in past years, the timing of PMI-funded IRS has been shifted slightly earlier. PMI, NMCP, and implementing partners will continue to assess optimal spray timing.
- Based on residual efficacy data, as mentioned above, clothianidin should be prioritized due to its longer residual life. A series of investigations has yet to conclusively identify the cause for the short persistence of Actellic in Malawi; PMI continues to collaborate with partners to investigate the possible causes of the observed short residual life. Given concerns about the residual efficacy of pirimiphos-methyl, PMI will continue to carefully monitor efficacy of insecticides.
- IRS withdrawal is not planned for this MOP. Based on the findings from the evaluation, PMI and partners will discuss the most cost-effective and appropriate vector control intervention(s) in the future.
- Please see FY 2022 PMI budget tables for a detailed list of proposed activities with FY 2022 funding.

2. HUMAN HEALTH

2.1. CASE MANAGEMENT

NMCP Objective

Increase capacity to ensure prompt and effective case management and reduce the presumptive use of antimalarial medications focusing its efforts in the following areas:

- Ensuring consistent availability of high-quality diagnostic and treatment commodities through proper quantification, procurement, and distribution.
- Strengthening quality assurance for malaria diagnostics.
- Training and supervising health workers on malaria case management at all levels of the health system.

- Supporting and expanding community case management in hard-to-reach areas.

NMCP Approach

The NMCP's Guidelines for the Treatment of Malaria in Malawi were updated in 2020, and include:

- A suspected case of malaria is defined as fever (or history of fever) in a child under five years of age or in a pregnant woman, or fever (or history of fever) plus one other symptom or sign suggestive of malaria in a person five years of age or older.
- All suspected uncomplicated malaria cases should be confirmed using either microscopy or mRDT.
- Microscopy is recommended for the following purposes: (1) to confirm malaria diagnosis in hospitalized patients with suspected severe malaria; (2) to monitor treatment progress in persons with severe malaria who receive parenteral treatment; and (3) to confirm first-line treatment failures.
- Artemether-lumefantrine (AL), locally known as LA, is recommended as the first-line treatment, and artesunate-amodiaquine is the second-line treatment; the *Guidelines* now recommend treating infants weighing less than five kilograms with uncomplicated malaria with an ACT at the same milligrams/kilograms body weight target dose as children weighing five kilograms or more, and LA is recommended for the treatment of uncomplicated malaria in pregnant women in all trimesters.
- Parenteral artesunate is recommended as definitive treatment of severe malaria, and children weighing less than 20 kilograms are treated with a higher dose of injectable artesunate (3 mg/kg) than larger children and adults (2.4 mg/kg).
- Pre-referral treatment for suspected severe malaria is recommended in peripheral health facilities using intramuscular artesunate in adults and children, and at the community level using rectal artesunate in children under six years of age.

The NMCP's approach to quality assurance (QA) includes the provision of guidelines and job aids, outreach training and supportive supervision (OTSS), and lessons learned workshops. The OTSS activities are the core of the QA approach, and utilize on-site training and long-term, ongoing support to strengthen diagnostic and treatment services. During scheduled visits, supervisors identify areas for improvement and provide immediate feedback to laboratory and clinical staff. The NMCP recommends that facilities receive quarterly visits at enrollment and then two visits per year after minimum compliance standards are met.

The existing community health worker program consists of Health Surveillance Assistants (HSAs) and is intended to serve communities more than five kilometers from a health facility. HSAs perform a variety of activities, including integrated community case management (iCCM) and malaria case management, for children under five years of age at the community level; approximately 54 percent of HSAs are trained in iCCM. The GOM intends to reach a target of 1 HSA per 1,000 population by 2022. As of 2021, the ratio was 1 HSA per 2,095 population; HSAs receive a stipend of approximately US$150 per month but there is not a retention policy specific for HSAs.

The national policy allows testing and treatment to occur in the private sector. According to the 2017 MIS, 21 percent of patients with fever seek care in the private sector. In addition to LA and artesunate-amodiaquine as recommended first- and second-line treatment options, dihydroartemisinin-piperaquine (DHA/PPQ) is registered in Malawi and is estimated to comprise ~5 percent to 10 percent of treatments in the private sector.

PMI Objective in Support of NMCP

- Procurement and distribution of approximately half of the RDTs and ACTs for the management of uncomplicated malaria, with the remainder supported by the Global Fund.
- Procurement and distribution of rectal artesunate for pre-referral management of severe malaria; the Global Fund supports procurement and distribution of injectable artesunate.
- National-level coordination meetings, including the Case Management TWG and the National Malaria Advisory Board, and the updating of critical case management policy, guidelines, and job aids and tools.
- Maintenance of the National Archives for Malaria Slides, malaria microscopy external competency assessments, and diagnostic refresher training.
- Strengthening of diagnostic and case management activities in support of the NMCP Case Management Strategy through the OTSS program.
- Supervision of HSAs in the use of RDTs, adherence to RDT results, appropriate use of ACTs, and pre-referral use of rectal artesunate.

PMI-Supported Recent Progress (CY 2020–2021)

- Coordinated procurement and delivery schedules with the NMCP and the Global Fund to ensure that appropriate central and facility stock levels of RDTs and antimalarials were maintained. During CY 2020–2021, PMI/Malawi procured approximately 8.3 million RDTs and 10.5 million ACTs, including commodities procured through reprogrammed pipeline funds.
- Supported the NMCP and the Case Management TWG to finalize the updated *Guidelines for the Treatment of Malaria in Malawi* (2020).
- Conducted two rounds of OTSS in 246 health facilities reaching 817 health workers.
- Conducted pediatric and malaria facility case reviews with 197 health workers (121 males, 76 females) to improve the quality of care to admitted severe malaria cases.
- Supported malaria-specific cluster-based review meetings with key workers (data clerks, staff conducting mRDTs, clinicians, nurses, and pharmacists) to better use malaria data at district, facility, and community levels.
- Mentored 128 HSAs (106 males and 22 females) in iCCM.
- During the COVID-19 pandemic, supported the MOH and the NMCP to maintain provision of malaria case management services by strengthening infection and control practices; adapting OTSS to include e-learning approaches, providing hardware support, coordinating virtual meetings and virtual trainings; and training 2,606 HSAs (1,678 males and 929 females) in 16 districts.

PMI-Supported Planned Activities (CY 2021–2022 with currently available funds)

- Procure approximately four million RDTs and ancillary diagnostic supplies (gloves and sharps containers) for RDT implementation, approximately four million courses of AL, and approximately 40,000 rectal artesunate suppositories.
- Support national-level review and development of policies and guidelines, coordination of the Case Management TWG and National Malaria Advisory Board, and updates to pre-service and in-service training and integrated supportive supervision checklists.

- Provide support at the facility and community level including OTSS activities in selected focus districts (Nkhata Bay, Mchinji, Kasungu, Salima, and Lilongwe rural), concentrating on recognition and appropriate diagnostic testing of suspected malaria cases, adherence to diagnostic test results, quality improvement for diagnostics, appropriate use of severe malaria treatments, and supervision and mentorship in facility and community settings in all districts.
- Support activities aimed at addressing the substantial vacancies among HSAs in order to accelerate progress toward the goal of 1 HSA to 1,000 population, including technical assistance to District Councils to develop local policy documents on recruitment, training, and retention of district staff, including Community Health Teams; and creation and strengthening of quarterly district-level health partner coordination meetings to plan, discuss, and review community health priorities, performance metrics, and financial plans.

Key Goal

Improve access to and use of timely, quality, and well-documented malaria testing and treatment by providing facility- and community-based health workers with training, supervision, and malaria commodities to provide quality, effective care.

Key Question 1a

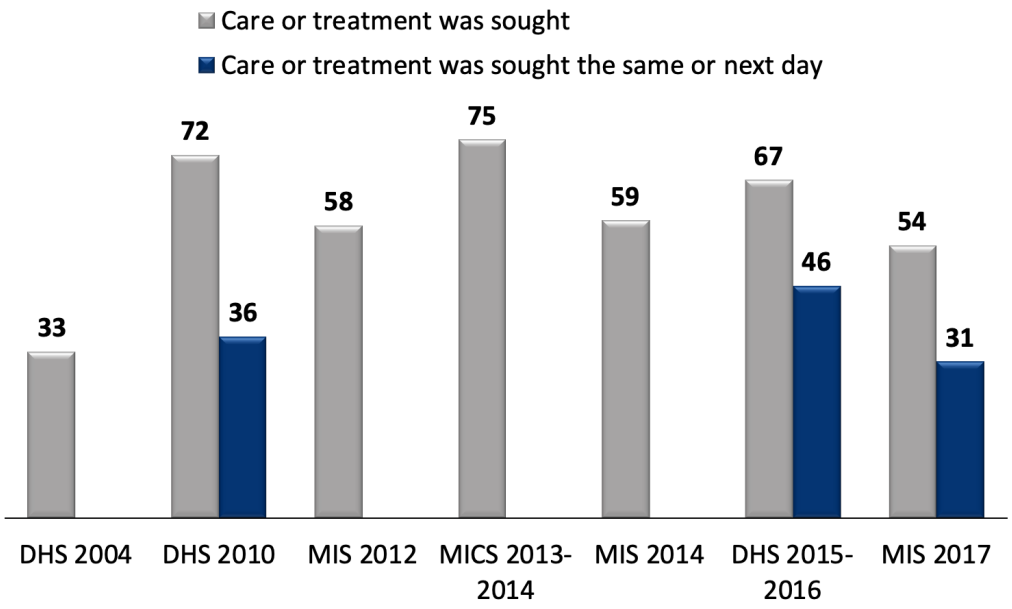
What is the status of care-seeking and/or access to care for children under five years of age with fever?

Care-seeking, including prompt care-seeking, remains at moderate levels and relatively unchanged (after accounting for the variation in surveys) over the past decade in Malawi.

Supporting Data

Figure A-7. Trends in care-seeking for fever

Among children under five years of age with fever in the two weeks before the survey, percentage for whom advice or treatment was sought



**Excludes treatment or advice from a traditional practitioner*

Key Question 1b

What significant structural and/or behavioral challenges affect prompt care-seeking?

Supporting Data

Known facilitators to care-seeking include knowledge of fever as a symptom of malaria (71 percent of respondents according to the 2017 MIS) and previous experience with severe malaria in the household or immediate community. Information on barriers to prompt care-seeking from implementing partner program data is limited. However, known barriers include low risk perception for malaria when fever is in the early stages (i.e., low risk perception at fever onset) and a social norm of self-diagnosis and treatment using local herbs or medicines.

To further understand the specific individual, social, structural, and environmental factors that influence prompt care-seeking and to improve SBC programming, PMI/Malawi has prioritized the implementation of the MBS in CY 2021 using previous MOP funds. It is expected that data from the survey will provide insights into the most appropriate behavior change approach (factors to address, target audience, messages, etc.) for improving prompt care-seeking. PMI/Malawi also will be conducting operational research to evaluate the impact of expanding iCCM to persons over five years of age on access to care.

Please refer to Section 3.4 for information on how SBC interventions will be directed to address the challenges identified above.

Key Question 2a

What proportion of patients are being tested and appropriately treated for malaria?

Supporting Data

Figure A-8. Trends in diagnosis and treatment of children with fever

Among children under five years of age with fever in the two weeks before the survey and with fever in the two weeks before the survey who received any antimalarial

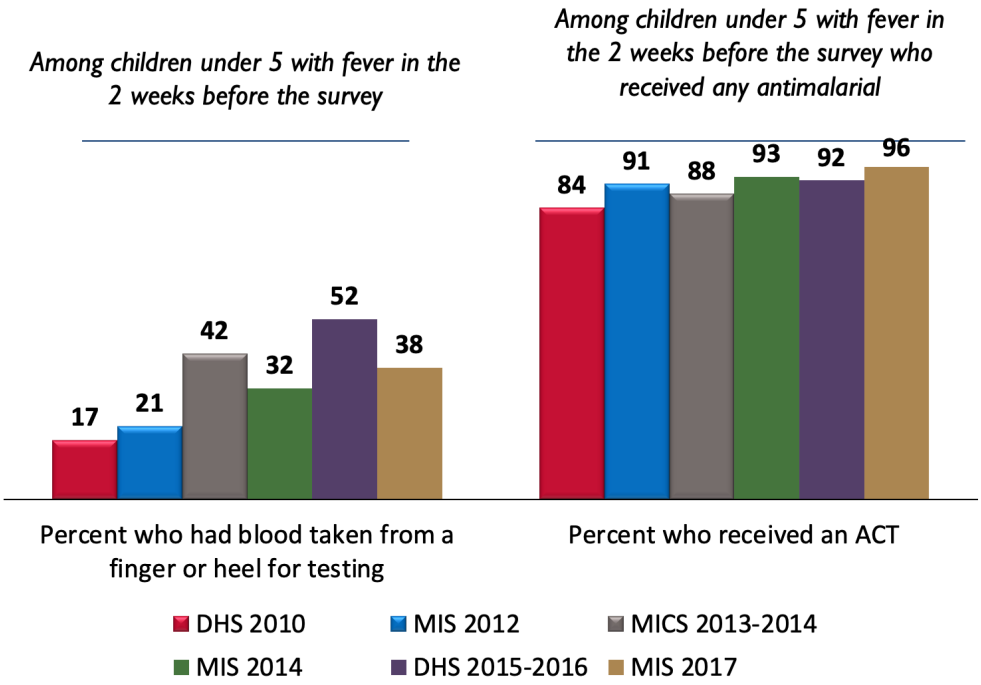


Figure A-8 shows trends in diagnostic testing based on MIS, DHS, and MICS data, which are nationally representative, population-based household cross-sectional surveys, and provides evidence that trends in diagnostic testing have improved since 2010 concomitant with the policy change and program implementation of RDTs, but that improvements have plateaued in the more recent surveys.

To supplement the household cross-sectional survey data, Figure A-7, which uses OTSS data from supervised case management assessments of healthcare workers in health facilities in PMI-supported districts, suggests that testing prior to treatment and adherence to test results by healthcare workers in health facilities has been improving in the PMI-supported malaria focus districts.

Key Question 2b

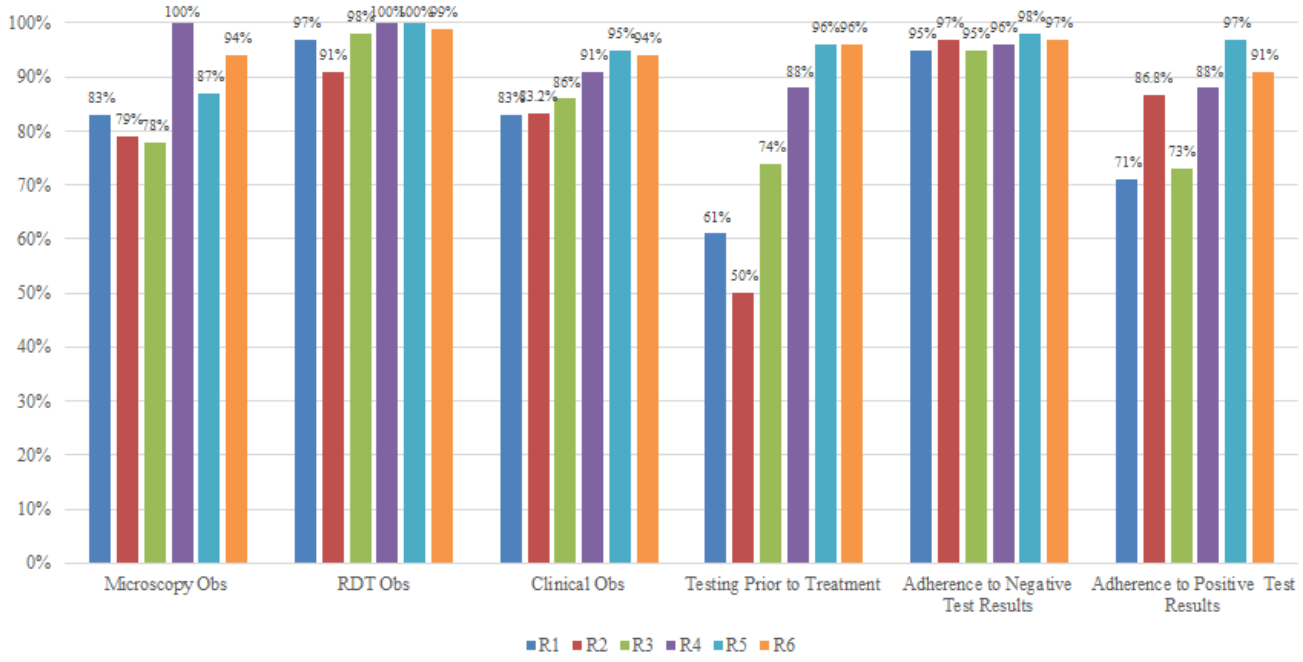
What significant structural and behavioral challenges affect testing and treatment practices among providers?

Supporting Data

While there is some available information on barriers to care-seeking within the community, there is little available data to understand the influence of provider behavior and service communication on challenges affecting

testing and treatment practices. A 2017 Service Availability and Readiness Assessment (SARA) reported that 73 percent of health facility staff had received training in malaria diagnosis and treatment practices; however, only 28.5 percent of health facilities included in the survey sample reported availability of malaria diagnostic and treatment guidelines at the health facility. However, OTSS data from supervised case management assessments of providers in PMI-supported health facilities (see Figure A-9) indicates there have been steady improvements in adherence to guidelines for testing prior to treatment. Through ongoing and planned data collection efforts, PMI/Malawi hopes to gather additional insight into provider practices around adherence to case management guidelines and the extent to which service communication influences care-seeking behavior.

Figure A-9. Results from mentoring and supervisory visit observations during OTSS rounds 1–6, Malawi, 2017–2020*



* "R" and the subsequent number refer to the OTSS rounds: R1-December 2017, R2-April 2018, R3-July/August 2018, R4-July/August 2019, R5-February/March 2020, and R6-September/October 2020.

Key Question 3

What is the current and planned support for case management at health facilities and in the communities by community health workers?

PMI/Malawi plans to work closely with the NMCP and the Global Fund to ensure that support for case management activities at the health facility and community level are maintained. Nationally, PMI/Malawi plans to support updates to pre-service and in-service training and integrated supportive supervision checklists. Additionally, specific to strengthening community case management, District Councils will be supported to develop local policy documents on recruitment, training, and retention of district staff including the Community Health Team, and creation and strengthening of quarterly district-level health partner coordination meetings to plan, discuss, and review community health priorities, performance metrics, and financial plans. In focus districts, PMI/Malawi plans to maintain support for OTSS activities and refresher training for HSAs.

Supporting Data

Table A-13. Funders for case management activities by district

Funder	Districts	Major Interventions
PMI	Kasungu, Mchinji, Nkhata Bay, Salima, Lilongwe rural	OTSS and support/training for facility and community HSAs
Global Fund	All	Integrated supportive supervision

Key Question 4

What is the estimated need for RDTs during calendar years 2021–2023? Are there any projected RDT gaps based on anticipated partner contributions compared to estimated needs?

Table A-14. RDT Gap Analysis Table

Calendar Year	2021	2022	2023
Total country population	19,136,537	19,691,496	20,262,550
Population at risk for malaria	19,136,537	19,691,496	20,262,550
PMI-targeted at-risk population	19,136,537	19,691,496	20,262,550
RDT Needs			
Total number of projected fever cases	15,203,472	12,515,498	14,488,253
Percent of fever cases tested with an RDT	100%	100%	100%
RDT Needs (tests)	**15,203,472**	**12,515,498**	**14,488,253**
Needs Estimated based on HMIS Data			
Partner Contributions (tests)			
RDTs from Government	*0*	*0*	*0*
RDTs from Global Fund	15,789,275	0	2,963,050
RDTs from other donors	0	0	0
RDTs planned with PMI funding	8,325,000	6,000,000	7,000,000
Total RDT Contributions per Calendar Year	***24,114,275***	***6,000,000***	***9,963,050***
Stock Balance (tests)			
Beginning Balance	2,895,794	11,806,597	5,291,099
- Product Need	15,203,472	12,515,498	14,488,253
+ Total Contributions (received/expected)	24,114,275	6,000,000	9,963,050
Ending Balance	11,806,597	5,291,099	765,896
Desired End of Year Stock (months of stock)	9	9	9
Desired End of Year Stock (quantities)	11,402,604	9,386,623	10,866,190
Total Surplus (Gap)	***403,993***	***(4,095,524)***	***(10,100,294)***

Supporting Data

The NMCP and partners conducted a national quantification in March 2021. The total estimated RDT needs for 2023 are approximately 14.5 million. The estimated needs were calculated based on the total number of suspected malaria cases and the methodology used assumed that all suspected malaria cases will be tested with an RTD.

Historically, PMI/Malawi and the Global Fund each procure approximately 50 percent of the RDT needed annually. Because most of the Global Fund's RDT allocation from the New Funding Model 3 (NFM3) and the COVID-19 Grant were front-loaded in FY 2020 and FY 2021, the Global Fund plans to procure only 2.9 million RTDs in 2023. Based on the estimated needs of approximately 14.5 million, a gap of about 11.6 million RDTs exists in 2023. Therefore, PMI/Malawi plans to procure about 7 million RDTs to cover part of the gap.

PMI/Malawi plans to work with the NMCP and the Global Fund to recommend that any cost savings from the Global Fund grant be used to cover the remaining gap.

Key Question 5

What is the estimated need for ACTs during calendar years 2021–2023? Are there any projected ACT gaps?

Supporting Data

Table A-15. ACT Gap Analysis Table

Calendar Year	2021	2022	2023
Total country population	19,136,537	19,691,496	20,262,550
Population at risk for malaria	19,136,537	19,691,496	20,262,550
PMI-targeted at-risk population	19,136,537	19,691,496	20,262,550
ACT Needs			
Total projected number of malaria cases	10,521,412	7,929,528	9,692,000
Total ACT Needs (treatments)	***10,521,412***	***7,929,528***	***9,692,000***
Needs Estimated based on a Combination of HMIS and Consumption Data			
Partner Contributions (treatments)			
ACTs from Government	*0*	*0*	*0*
ACTs from Global Fund	5,045,640	1,998,570	2,878,320
ACTs from other donors *[specify donor]*	0	0	0
ACTs planned with PMI funding	10,449,990	4,000,020	4,000,000
Total ACTs Contributions per Calendar Year	***15,495,630***	***5,998,590***	***6,878,320***
Stock Balance (treatments)			
Beginning Balance	4,987,455	9,961,673	8,030,735
- Product Need	10,521,412	7,929,528	9,692,000
+ Total Contributions (received/expected)	15,495,630	5,998,590	6,878,320
Ending Balance	9,961,673	8,030,735	5,217,055
Desired End of Year Stock (months of stock)	9	9	9
Desired End of Year Stock (quantities)	7,891,059	5,947,146	7,269,000
Total Surplus (Gap)	***2,070,615***	***2,083,589***	***(2,051,944)***

Key Question 6

What is the estimated need for definitive treatment and pre-referral treatment for severe malaria during calendar years 2021–2023? Are there any anticipated gaps?

Following a national quantification conducted by the NMCP and partners in March 2021, the projected needs for severe malaria management for 2023 are fully covered by Global Fund and PMI.

The NMCP had some challenges in the management of some pre-referral commodities for suspected severe malaria cases in children under five years of age at the community level where the country experienced expiries of some limited quantities of Rectal Artesunate (RA). RA is typically managed through HSAs at village clinics through the iCCM program and provides critical pre-referral treatment options in hard-to-reach areas. Slow uptake and reduced activities by HSAs at the onset of COVID-19 contributed to increased risk of expiry. To reduce the risk while ensuring this critical service is available, NMCP and partners revised the quantities of RA distributed to each HSA and plan to strengthen last mile tracking and training of HSAs.

PMI/Malawi plans to continue to work closely with the NMCP and the Global Fund to ensure that the projected need for severe malaria treatment is met and last mile accountability is strengthened

Table A-16. Inj. Artesunate Gap Analysis Table

Calendar Year	2021	2022	2023
Injectable Artesunate Needs			
Projected number of severe cases	136,778	87,225	106,612
Projected number of severe cases among children	74,271	47,363	57,890
Average number of vials required for severe cases among children	8	8	8
Projected number of severe cases among adults	62,508	39,862	48,722
Average number of vials required for severe cases among adults	12	12	12
Total Injectable Artesunate Needs (vials)	***1,344,258***	***857,245***	***1,047,783***
Needs Estimated based on a Combination of HMIS and Consumption Data			
Partner Contributions (vials)			
Injectable artesunate from Government	0	0	0
Injectable artesunate from Global Fund	2,105,856	0	947,517
Injectable artesunate from other donors [specify donor]	0	0	0
Injectable artesunate planned with PMI funding	0	0	0
Total Injectable Artesunate Contributions per Calendar Year	***2,105,856***	***0***	***947,517***
Stock Balance (vials)			
Beginning Balance	855,966	1,617,564	760,319
- Product Need	1,344,258	857,245	1,047,783
+ Total Contributions (received/expected)	2,105,856	0	947,517
Ending Balance	1,617,564	760,319	660,053
Desired End of Year Stock (months of stock)	9	9	9
Desired End of Year Stock (quantities)	1,008,193	642,934	785,837
Total Surplus (Gap)	***609,371***	***117,385***	***(125,784)***

Table A-17. RAS Gap Analysis Table

Calendar Year	2021	2022	2023
Artesunate Suppository Needs			
Total Artesunate Suppository Needs (suppositories)	***28,902***	***37,902***	***37,902***
Number of severe cases expected to require pre-referral dose	28,902	37,902	37,902
Needs Estimated based on # of providers offering pre-referral services			
Partner Contributions (suppositories)			
Artesunate suppositories from Government	0	0	0
Artesunate suppositories from Global Fund	0	0	0
Artesunate suppositories from other donors	0	0	0
Artesunate suppositories planned with PMI funding	25,074	25,000	38,000
Total Artesunate Suppositories Available	***25,074***	***25,000***	***38,000***
Stock Balance (suppositories)			
Beginning Balance	21,962	15,696	78,794
- Product Need	28,902	37,902	37,902
+ Total Contributions (received/expected)	25,074	101,000	38,000
Ending Balance	15,696	78,794	78,892
Desired End of Year Stock (months of stock)	9	9	9
Desired End of Year Stock (quantities)	21,677	28,427	28,427
Total Surplus (Gap)	***(5,981)***	***50,368***	***50,466***

Key Question 8

Are first-line ACTs effective and monitored regularly?

Therapeutic efficacy studies (TES) performed over the last decade suggest no evidence of substantial resistance to the first-line ACT treatment (LA); final data analysis from the most recent TES conducted in 2020 is pending. However, PMI has concerns regarding the methodologies and analyses from these prior TES, and PMI has engaged the NMCP to discuss these concerns and determine how to increase the quality and ensure reliable and accurate ACT resistance data is collected in Malawi. Per the agreement between PMI, Global Fund, and the MOH, PMI/Malawi is now the sole donor providing TES funding, which was included in MOP FY 2020, with planned implementation in 2022.

Key Question 9

Are there other areas (e.g., lab strengthening, private sector support, etc.) that should be considered for PMI support?

The NMCP would like to increase availability of diagnosis and treatment of malaria to school-aged children, particularly focused in a school setting. The 2015–2016 Malawi Micronutrient Survey demonstrated that 42 percent of school-aged children tested positive for malaria. PMI/Malawi will be conducting operational research to evaluate the feasibility and impact of expanding iCCM to persons over five years of age on access to care including among school-aged children.

Conclusions for Case Management Investments

PMI/Malawi's support for case management activities has been informed by discussions with the NMCP, various stakeholders including the Global Fund, and its funded partners. PMI/Malawi will continue to support the NMCP and District Health Management Teams to facilitate improved malaria case management service delivery in health facilities and in communities, including activities to strengthen recognition of and parasitological testing of suspect malaria cases, adherence to testing results, and prompt and appropriate treatment for confirmed malaria cases. PMI/Malawi plans to utilize both a field support case management partner and a local bilateral partner to provide expertise specific to malaria case management, service delivery integration, and local health system structure and function.

Please see FY 2022 PMI budget tables for a detailed list of proposed activities with FY 2022 funding.

2.2. DRUG-BASED PREVENTION

NMCP Objective

To increase uptake of at least three doses of IPTp from 12 percent in 2014 to 60 percent by 2022.

NMCP Approach

To combat the problem of malaria during pregnancy, the country will support the delivery of a comprehensive package of interventions to ensure improved pregnancy outcomes and maternal survival, including IPTp administered through ANC, provision of ITNs to pregnant women at first ANC and at delivery, and case management of malaria-infected pregnant women.

- **Health facility-based IPTp:** The MOH will promote malaria in pregnancy prevention through directly observed treatment (DOT) for IPTp that will further be strengthened by providing DOT equipment (cups and safe drinking water) at all facilities.
- **Community-based IPTp:** The MOH will also explore multiple channels for delivery of IPTp to increase uptake of IPTp. Currently, delivery is limited to one channel (ANC clinics). In 2020, the NMCP completed a pilot study on feasibility, acceptability, and effectiveness of the use of HSAs for community IPTp distribution. Results of this study are being disseminated to guide training for HSAs on community IPTp.
- **Provision of quality IPTp care:** The NMCP will improve MIP quality of care through training of ANC health service providers. The MOH will conduct quarterly integrated supervision visits to ANC providers, focusing on MIP and safe motherhood to improve their level of knowledge, skills, and attitudes in the provision of care to pregnant women. The MOH will also conduct regular meetings of the MIP Sub-Working Group Committee and other related coordinating mechanisms (e.g., Case Management TWG).

PMI Objective in Support of NMCP

PMI/Malawi supports all aspects of the NMCP's approach to MIP. Through ANC, the goal is to provide an integrated package of high impact interventions and to ensure uptake of those interventions.

PMI-Supported Recent Progress (CY 2020–2021)

- Procured and delivered 700,000 SP doses; per available supply chain data, stockout rates of SP averaged approximately 7.7 percent in 2020 and 6.3 percent in 2021 between January and March, with a 4 percent stockout rate reported in April.
- In PMI-supported districts, 48 percent of pregnant women received three or more IPTp doses during ANC.
- Supported continuous distribution of ITNs through ANC and at labor and delivery (see ITN section).
- Supported appropriate case management of malaria in pregnant women, including updating the NMCP's *Guidelines for the Treatment of Malaria in Malawi* recommending LA for the treatment of uncomplicated malaria in pregnant women in all trimesters, procurement of antimalarial drugs, OTSS, and SBC for prompt care-seeking through the integrated communication platform.
- Conducted supportive supervision of 1,076 (537 male, 539 female) providers from 284 health facilities to reinforce IPTp3+ and strengthen IPTp documentation.
- Completed a cluster randomized-controlled trial of community IPTp administration by HSAs compared with IPTp delivery at health facilities (routine practice) in 20 facility catchment areas in Ntcheu and Nkhata Bay on IPTp3+ and ANC4+ coverage. The study found an overall improvement in IPTp1+ (difference-in-differences [DiD] 13.5 percent-points, 95 percent CI 4.7 percent-22.3 percent) and ANC4+; improvement in IPTp3+ was not dramatically different (DiD 6.9 percent-points, 95 percent confidence interval -5.9 percent to 19.6 percent). HSAs made fewer than desired follow-up visits, highlighting the need to better understand HSA workload prior to rolling out this strategy on a broader scale.

PMI-Supported Planned Activities (CY 2021–2022 with currently available funds)

- Support to health facilities to report SP and ITN distribution into the OpenLMIS and improve overall data quality.
- Provision of IPTp and integration of malaria into maternal, neonatal, and child health services, including messaging into routine ANC strengthening activities.
- Support for malaria diagnostic quality assurance.
- Strengthening of monthly MIP supervision data collection to reinforce IPTp3+ and strengthen IPTp documentation in ANC registers.
- Supportive supervision, coaching, and mentoring to private sector clinics.
- Support for integrated laboratory and clinical supportive supervision at facilities.
- OTSS MIP module implementation in three districts at the facility level to ensure appropriate SP and ITN distribution.

2.2.1. MALARIA IN PREGNANCY (MIP)

Key Goal

Support the national strategy for MIP, which includes provision of ITNs at the first ANC visit, a minimum of three doses of IPTp in malaria endemic areas starting at 13 weeks gestational age, and effective case management of malaria per WHO guidelines.

Key Question 1a

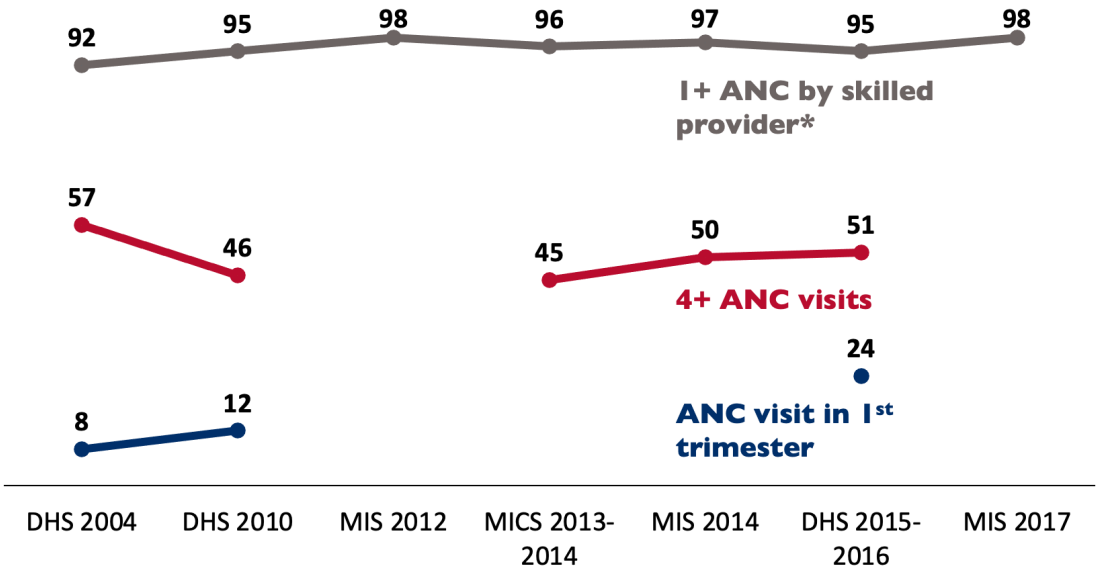
What proportion of pregnant women are accessing ANC early and frequently (as recommended by national and/or WHO strategies) during their pregnancy?

Figure A-10 shows that, according to national surveys, generally one or more ANC visits, four or more ANC visits, and an ANC visit during the first trimester are all increasing slowly over time nationally, but at a relatively slow pace compared to their baseline measurements.

Supporting Data

Figure A-10. Trends in ANC coverage

Women 15 to 49 years of age with a live birth in the five years before the survey (most recent birth)



**Skilled provider includes doctor, nurse, or midwife.*

Key Question 1b

Are there important health system and/or behavioral barriers to ANC attendance at health facilities?

Supporting Data

While Malawi has a relatively high proportion of women who attend three ANC visits, there is a noted drop-off between visits three and four (84 percent for ANC3+ and 50 percent for ANC4+ per cIPTp baseline survey data), which is likely a result of the fact that many women start ANC relatively late [about 50 percent start after 20 weeks; the median gestational age at first ANC is 4.8 months (DHS 2015–2016)]. Known barriers to ANC at health facilities include:

- Low knowledge of ANC: endline survey data from the community IPTp operational research study (2020) found that only 14.1 percent of women surveyed knew the correct timing for ANC initiation and 9.3 percent knew the number of ANC contact visits that should be completed.

- Cultural beliefs limiting interactions in early pregnancy: norms and beliefs that promote secrecy and nondisclosure of pregnancy in the early days/months and an inability by community mobilizers to identify pregnant women during the first three months because they may not be showing makes it difficult to promote early ANC attendance to newly pregnant women (ONSE cIPTp Quarterly Review Program Data).
- Distance traveled to receive ANC: roughly 60 percent of women reported traveling an hour or more to the health facility for ANC services in 2017, and 45 percent in 2020.

Results from the MBS conducted in CY 2021 will help to further quantify internal, social, structural, and environmental factors influencing the uptake of early and regular ANC attendance.

Please refer to Section 3.4 for information on how SBC interventions will be directed to address the challenges identified above.

Key Question 2

What proportion of pregnant women are receiving the recommended doses of IPTp?

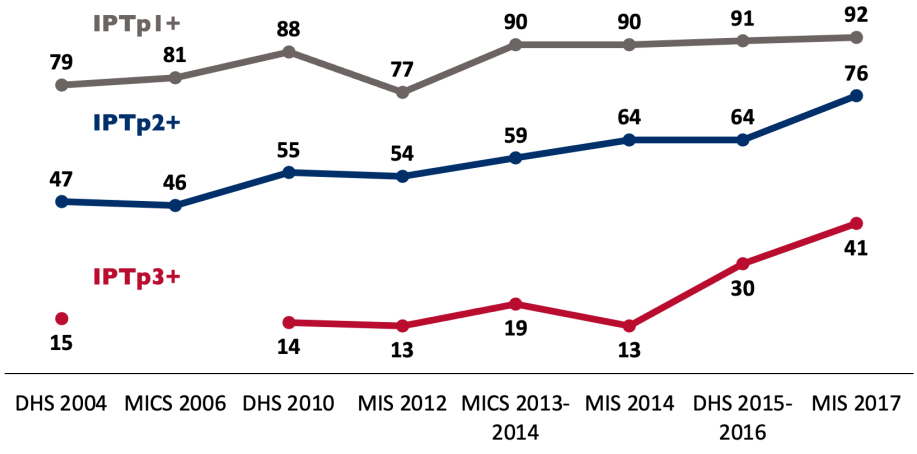
Figure A-11 shows that, according to national surveys in Malawi, women 15 to 49 years of age with a live birth in the two years before the survey have a generally increasing number of IPTp visits, including for IPTp1+, IPTp2+, and IPTp3+, with IPTp3+ increasing the most in recent years.

Supporting Data

Figure A-11. Trends in IPTp

Women 15 to 49 years of age with a live birth in the two years before the survey who received the specified number of doses of SP/Fansidar during their last pregnancy

Note: IPTp3 baseline uses the first survey available after the recommendation was updated to three or more doses.



**These indicators have changed slightly over time. Depicted here is the coverage value not restricted to doses received at ANC.*

Key Question 3a

What is the gap between ANC attendance and IPTp uptake (i.e., missed opportunities for giving IPTp at ANC)?

Figure A-12 shows that IPTp and ANC visits in Malawi have been steady or slightly increased over the past two years, according to routine health information systems in Malawi. Meanwhile, Figure A-13 shows that there are still opportunities for additional improvement in at least four ANC visits, which has been relatively stable in Malawi for more than a decade at around 50 percent. Finally, while improvements in IPTp3+ have been made in recent years, there is still opportunity for the majority of pregnant women to receive these services.

Supporting Data

Figure A-12. Coverage of IPTp and ANC from DHIS2

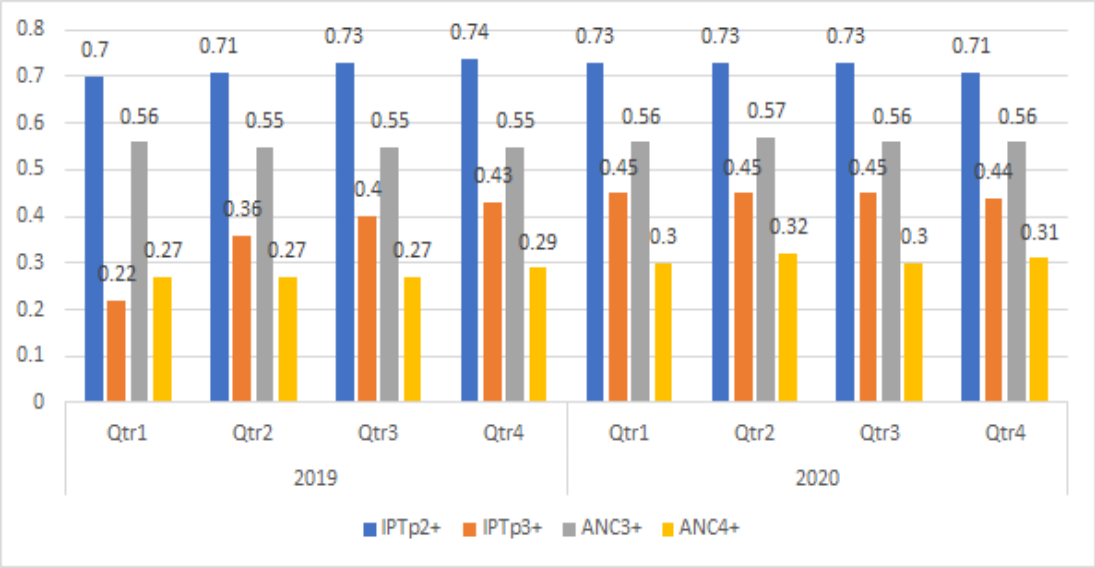
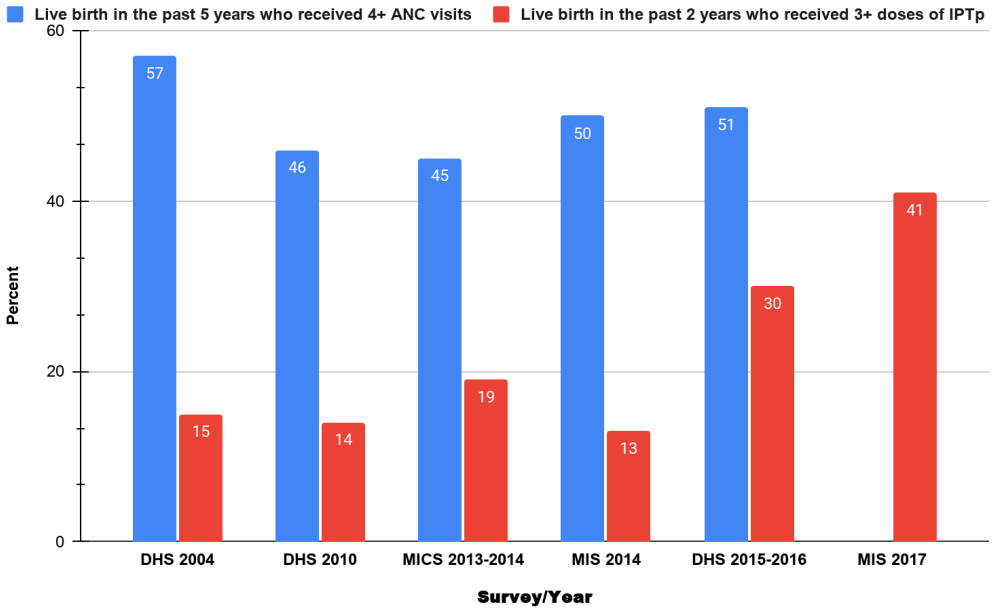


Figure A-13. Trends in missed opportunities for IPTp

Percentage of women 15 to 49 years of age



Key Question 3b

What significant health system and/or behavioral challenges affect provider delivery of MIP services (e.g., IPTp and ITN distribution at ANC)?

Supporting Data

Nearly all of what is presently known about factors contributing to missed opportunities for IPTp is from the community level. According to implementing partner data, these barriers include the following:

- Belief that SP is not an effective prevention medication because SP was withdrawn from use as a treatment medication for acute malaria in 2007.
- Fear of SP side effects (e.g., dizziness or vomiting) based on women who have experienced vomiting or know other women who experienced vomiting after taking SP, and may be resistant to taking it.
- Perception that providers do not engage in dialogue with community members to address the concerns of pregnant women and the barriers to taking SP, or to motivate pregnant women to take SP.

Additional data on provider behavior is needed to thoroughly close the gap on missed opportunities between ANC attendance and IPTp uptake. However, possibly more important to achieving high coverage is working to ensure that pregnant women make frequent ANC visits. While stockouts of SP at the facility level have been frequent in the past, they have become less frequent since March 2020. Norms and beliefs that promote secrecy and nondisclosure in early pregnancy contribute to late attendance. Women's perceptions regarding ANC and barriers/facilitators to early and frequent ANC attendance will be further explored and quantified in a planned

Malaria Behavior Survey in early 2020, and the resulting information will be used to adjust SBC activities to target pregnant women and their families.

Through ongoing and planned data collection efforts (OR study for iCCM), PMI/Malawi hopes to gather additional insight into provider practices around adherence to case management guidelines during pregnancy (HMIS currently does not disaggregate malaria cases by pregnancy status), the full extent to which provider behaviors influence IPTp uptake, and the extent to which service communication influences care-seeking behavior.

Key Question 4

Does the national ANC program or health information system collect data and track the proportion of pregnant women with fever, those tested for malaria, those found to have malaria infection, and those who are treated?

Supporting Data

Pregnant women presenting to ANC with fever/symptoms of malaria are referred to the outpatient department for diagnosis and treatment. Currently, malaria case data reported in HMIS are not disaggregated by pregnancy status.

Key Question 5

What is the estimated need for SP during 2021–2023? Are there any anticipated SP gaps? Are there gaps in other IPTp commodities?

Supporting Data

Table A-18. SP Gap Analysis Table

Calendar Year	2021	2022	2023
Total Country Population	19,136,537	19,691,496	20,262,550
Total Population at Risk for Malaria	19,136,537	19,691,496	20,262,550
PMI Targeted at Risk Population	19,136,537	19,691,496	20,262,550
SP Needs			
Total Number of Pregnant Women	735,518	756,848	778,797
Proportion of women expected to attend ANC1 at 13 weeks or greater	100%	100%	100%
Proportion of women expected to attend ANC2	79%	79%	79%
Proportion of women expected to attend ANC3	58%	60%	65%
Proportion of women expected to attend ANC4	58%	60%	65%
Total SP Needs (Treatments)	***2,170,366***	***2,263,581***	***2,407,104***
Needs Estimated based on HMIS Data			
Partner Contributions (Treatments)			
SP from Government	0	0	0
SP from Global Fund	0	0	0
SP from Other Donors	0	0	0
SP planned with PMI funding	733,333	2,100,000	1,000,000
Total SP Contributions per Calendar Year	***733,333***	***2,100,000***	***1,000,000***
Stock Balance (Treatments)			
Beginning balance	2,998,822	1,561,789	1,398,208
- Product Need	2,170,366	2,263,581	2,407,104
+ Total Contributions (Received/expected)	733,333	2,100,000	1,000,000
Ending Balance	1,561,789	1,398,208	-8,896
Desired End of Year Stock (months of stock)	9	9	9
Desired End of Year Stock (quantities)	1,627,775	1,697,686	1,805,328
Total Surplus (Gap)	***(65,986)***	***(299,478)***	***(1,814,224)***

Conclusions for MIP Investments

PMI/Malawi plans level investment for MIP programming and activities, with a continued split approach, whereby PMI supports OTSS MIP interventions in three districts while supporting group mentorship at facility and community levels in approximately 10 select priority districts. Support in all districts includes work to improve overall MIP data quality through data review and strengthening activities. In terms of MIP prevention activities, ITN quantification and a rapid assessment of ITN distribution and uptake in CY 2021 will determine whether expansion of ITN distribution at first ANC and labor and delivery is warranted. Please see Section 1.2 for further details on ITN distribution. Although one hundred percent of SP and DOT supplies will continue to be funded by PMI/Malawi, PMI/Malawi will continue to advocate for additional GOM support for the procurement of SP and

DOT supplies. PMI/Malawi will address any gaps through additional procurements as needed using savings or reprogramming.

Please see FY 2022 MOP budget tables for a detailed list of proposed activities with FY 2022 funding.

2.2.2. SEASONAL MALARIA CHEMOPREVENTION (SMC)

SMC is not a recommended intervention for Malawi.

2.2.3. ADDITIONAL DRUG-BASED PREVENTIVE STRATEGIES

This country is not a designated country for near-term pre-elimination or elimination and there is no PMI support planned for such work in Malawi.

3. CROSS-CUTTING AND OTHER HEALTH SYSTEMS

3.1. SUPPLY CHAIN

NMCP Objective

To reduce the annual average stockout rate of all artemisinin-based combination therapies from 11 percent in 2016 to 5 percent in 2022.

NMCP Approach

The NMCP has identified supply chain system strengthening as a key intervention area in its fight against malaria. Overall, the NMCP's goal is to ensure malaria commodity availability at all levels in the supply chain. The NMCP, in collaboration with donors and other partners, will work to ensure effective and efficient procurement, storage, and distribution of malaria commodities. It will ensure proper coordination of supply chain resources from all partners to avoid duplication and increase the impact of the investments. NMCP will also support district staff and health facilities to ensure good storage practices, inventory management, supply chain data management, and reporting.

PMI Objective in Support of NMCP

- PMI supports all of Malawi's supply chain priorities across the nation. As one of the major malaria donors in Malawi, PMI supports commodity quantification, procurement, warehousing, and distribution of ITNs, SP, ACTs, RDTs, as well as supply chain technical assistance.
- PMI operates a parallel supply chain for its commodities, and it will continue to store and distribute its commodities through a private sector managed parallel supply chain until the Central Medical Stores Trust (CMST) is able to manage an integrated national supply chain system. In 2021, Malawi developed a Health Products Management Strategy that includes a Master Supply Chain Transformation Plan (MSCTP) 2021–2026 and the country is currently engaging stakeholders to operationalize this plan to integrate parallel supply chains.

- PMI and other U.S. government programs support Malawi to run an integrated Open Logistics Management Information System (OpenLMIS). The OpenLMIS is a web-based data management and reporting platform that enables health facility staff to manage their commodities, report data, and order resupplies from central or regional warehouses.
- PMI supports Malawi to implement health supply chain global standards for tracking and tracing malaria commodities and other medicines.
- PMI supports the GOM's Drug Theft Investigation Unit to ensure accountability of malaria commodities and other medicines through audits of medicines, investigations, and other risk mitigation practices.

PMI-Supported Recent Progress (CY 2020–2021)

- Provided technical and financial support for the national quantification of malaria and other essential medicines in March 2021.
- Maintained stockouts of "All AL" under 2 percent from March 2019 to March 2021.
- Funded NMCP's quarterly Drug Management Task Force meetings to review data, address supply chain bottlenecks, and ensure commodity availability.
- Supported the national drug regulatory body, the Pharmacy and Medicines Regulatory Authority, to conduct post-market surveillance for malaria medicines in the public and private sector. The post-market surveillance will contribute to the GOM's effort to ensure the availability of quality assured malaria medicines in Malawi.
- Supported development of the MSCTP 2021–2026 to achieve Malawi's Supply Chain Integration.
- PMI supported development of the National Product Catalogue, a catalyst for implementation of global standards for tracking and tracing malaria commodities and other medicines.
- Supported MOH regional offices with improved supervision visits.
- Provided technical support to NMCP for Global Fund's new funding model (NFM3) grant in Malawi.
- Identified/discussed supply chain bottlenecks, which include the following:
  - Parallel supply chains require complex coordination on distribution to service delivery points.
  - Inadequate human resources and capacity for supply chain.
  - Use of untrained personnel for LMIS reporting in some facilities, which effects data quality and management of commodities.
  - Inadequate MOH budget for commodity procurement and supply chain.
  - Theft and lack of accountability of medicines.

PMI-Supported Planned Activities (CY 2021–2022 with currently available funds)

- National quantification of malaria medicines and other essential medicines in 2022.
- Procurement, warehousing, and distribution of ITNs, SP, ACTs, RDTs, DOT, and severe malaria medicines.
- Technical and financial support for district-led integrated supply chain supervision.
- Maintenance and implementation of interoperability initiatives of the national OpenLMIS system.
- Implementation of a National Product Catalogue and continued work on end-to-end commodity visibility initiative.
- Support NMCP's quarterly Drug Management Task Force meetings to review data, address supply chain bottlenecks, and ensure commodity availability.

- Support the MOH's Drug Theft Investigation Unit to conduct medicines audit, implement risk mitigation plans, investigate theft cases and ensure accountability of malaria commodities.
- Support NMCP with commodity accountability performance tracking and data quality assessments.

Key Goal

Ensure continual availability of quality products needed for malaria control and elimination (ACTs, RDTs, SP, Art. Inj., and ITNs) at health facilities and community level.

Key Question 1

Has the central level, (or subcentral level, if appropriate) been stocked according to plan for ACTs, RDTs, SP, and Art. Inj. over the last year (2020)? If not, have they been under, over, or stocked out?

Malawi continues to maintain adequate central level inventory for malaria commodities in line with the national minimum and maximum stock level threshold. Although most commodities have been stocked below minimum levels since Q3 FY 2020 due to COVID-19 related global logistics challenges, there has not been a significant negative impact on stockout rates at service delivery points. PMI/Malawi will continue to support the NMCP to maintain adequate inventory at all levels of the supply chain through supply planning and facility level commodity redistribution to avoid under and overstock at each stock holding unit in the supply chain.

Key Question 2

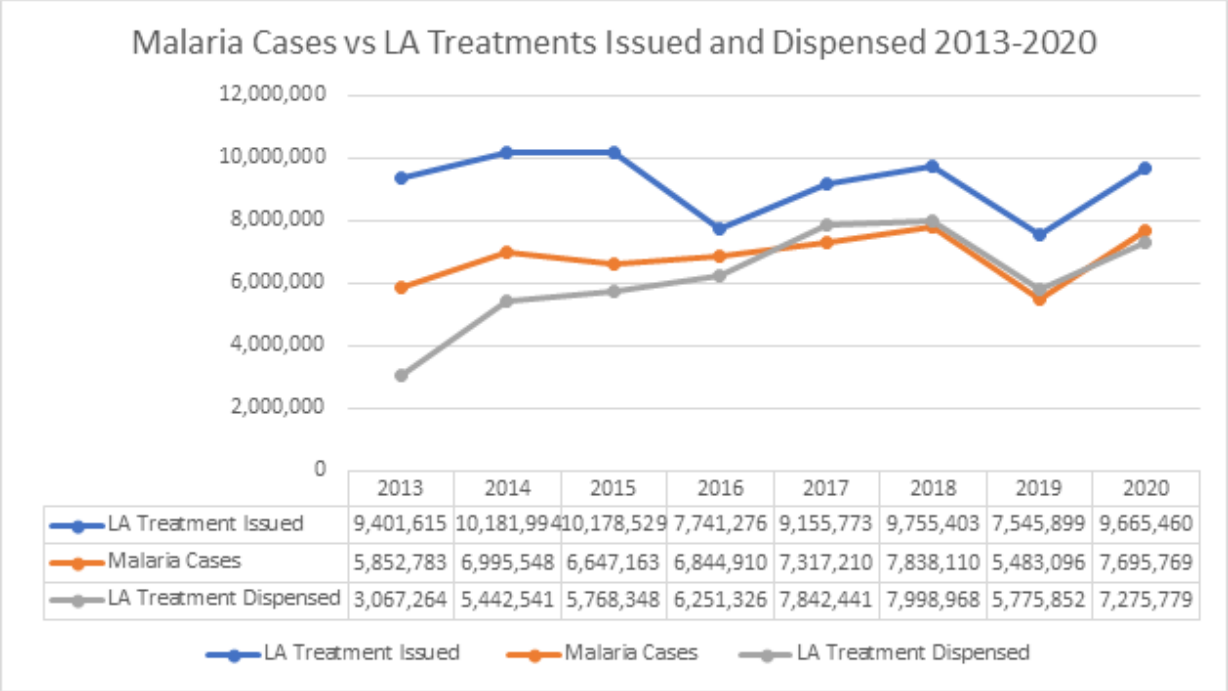
What are the trends in service delivery point stockout rates for ACTs (including ability to treat), RDTs, Art. Inj., and SP over the last year (if tracked)? Is there a seasonal or geographic difference in stockout rates?

Malawi continues to make significant improvement in its last mile malaria supply chain. The average stockout rates of 2 percent for first-line ACTs are relatively low and guarantee availability of at least one of the four presentations at service delivery points. There are no significant seasonal or geographic differences in stockout rates because the resupply decisions are informed by service delivery point consumption data. PMI/Malawi will work with the Global Fund and other partners to ensure availability and accountability of malaria medicines at service delivery points. Furthermore, PMI/Malawi will support the NMCP to implement its stockout reduction strategy, which prioritizes sustaining low stockout rates and enhancing quality of data for decision-making.

Key Question 3

What is the difference between quantities for ACTs consumed and malaria cases, and RDTs consumed and numbers tested? What is driving any differences seen?

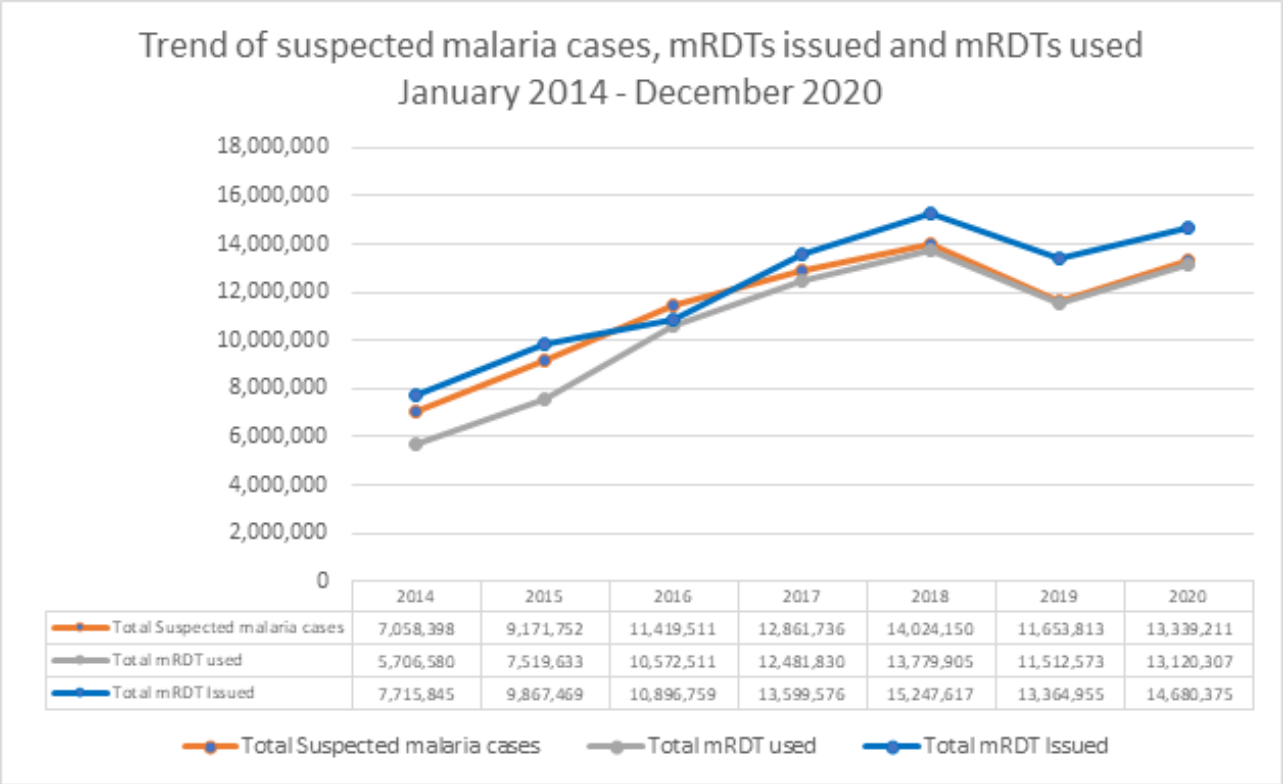
Figure A-14. Malaria cases vs. LA (lumefantrine-artemether) treatments issued and dispensed (2013–2020)



	2013	2014	2015	2016	2017	2018	2019	2020
LA Treatment Issued	9,401,615	10,181,994	10,178,529	7,741,276	9,155,773	9,755,403	7,545,899	9,665,460
Malaria Cases	5,852,783	6,995,548	6,647,163	6,844,910	7,317,210	7,838,110	5,483,096	7,695,769
LA Treatment Dispensed	3,067,264	5,442,541	5,768,348	6,251,326	7,842,441	7,998,968	5,775,852	7,275,779

Malaria cases – total number of confirmed malaria cases (DHIS2).
Total LA issued – total number of LA treatments issued from pharmacy to dispensary (LMIS).
Total LA dispensed – total of number LA treatments dispensed to users (DHIS2).

Figure A-15. Malaria cases vs. mRDTs issued and used (2014–2020)



	2014	2015	2016	2017	2018	2019	2020
Total Suspected malaria cases	7,058,398	9,171,752	11,419,511	12,861,736	14,024,150	11,653,813	13,339,211
Total mRDT used	5,706,580	7,519,633	10,572,511	12,481,830	13,779,905	11,512,573	13,120,307
Total mRDT Issued	7,715,845	9,867,469	10,896,759	13,599,576	15,247,617	13,364,955	14,680,375

Suspected cases – number of individuals with malaria-related symptoms (DHIS2).
Total mRDT issued – total number of mRDTs issued from pharmacy to dispensary (LMIS).
Total mRDT used – total of number suspected cases tested (DHIS2).

Conclusion

The difference between quantities of ACTs issued and malaria cases was 26 percent in 2020 compared with 50 percent in 2015. Key drivers for the discrepancy include poor data quality, presumptive treatment, theft, and poor record management (services and commodity). The difference has been narrowing since 2016 when as a result of approaches such as a facility-level whistleblower initiative and field-based supervision and accountability activities, including Commodity Accountability Performance Tracking, a Drug Theft Investigation Unit and district-level data review meetings were introduced. Since 2020, a slight increase in the gap was noticed and partly attributed to reduced level of field-based interventions due to COVID-19 related restrictions.

There has been a general increase in the number of suspected malaria cases and the number of RDTs used over the period partly due to the onboarding of village clinics and national scale-up of RDT testing at village clinics in 2016.

The NMCP is actively monitoring its service and commodity data through DHIS2 and OpenLMIS to ensure alignment between malaria cases treated and quantity of treatments issued to patients. NMCP and partners will work to improve the quality of data from both systems to increase the accuracy of the comparison. PMI and partners will support the NMCP to continue implementing interventions like the Drug Theft Investigation Unit, Commodity Accountability Performance Tracking, and data review meetings and to adopt alternatives such as

virtual site visits and virtual data review meetings to continue these interventions in periods of field-based activity restrictions.

PMI and partners will continue to support the NMCP to enhance monitoring at the last mile to ensure that all commodities issued are being appropriately used by beneficiaries.

Key Question 4

To what extent does a functional LMIS provide visibility into timely and quality logistics data from various levels of the system? To what extent is commodity data visibility dependent on surveys or supervisory data rather than routine data reported by an LMIS?

LMIS Reporting Rate

Malawi's integrated LMIS system for malaria, HIV, tuberculosis, contraceptives, COVID-19 and other essential medicines has an average monthly reporting rate of more than 95 percent. PMI/Malawi and other stakeholders will continue to support health facilities and MOH to sustain these impressive results and improve the quality of data for decision-making.

Key Question 5

What are the main supply chain technical assistance functions supported by PMI? Are there additional investments that PMI should make (e.g., increasing visibility of demand at health facilities) to ensure continual availability of quality products needed for malaria control and elimination at health facilities and the community level? In areas performing well, is it dependent on PMI/donor funding (e.g., PMI and Global Fund pay for warehousing and distribution)? Should more be done to foster self-reliance in domestic systems and, if so, what approaches should be considered?

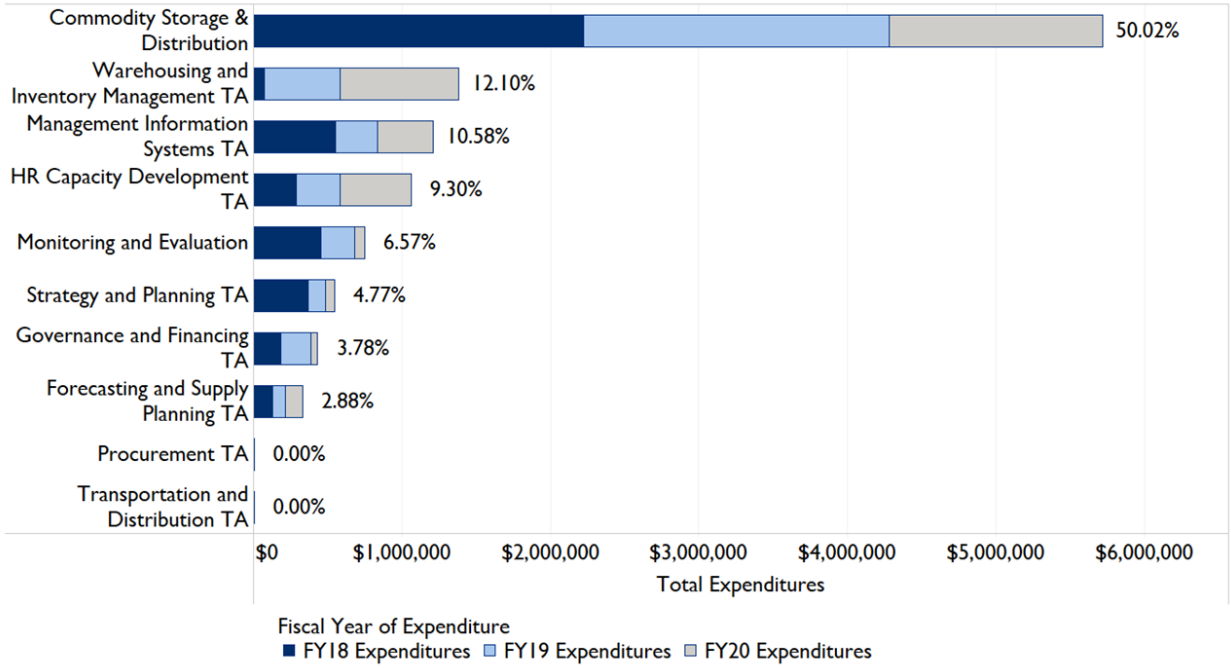
PMI has been making considerable investments to ensure continuous availability of malaria commodities in Malawi. Concurrent to operating a parallel supply chain to maintain commodity security, which can be seen below in the graph with the large investment under commodity storage and warehousing, PMI supports technical assistance and capacity-building to foster greater sustainability. Supply chain technical assistance functions supported by PMI include:

- Warehousing and distribution of key malaria commodities including ACTs, RDTs, long-lasting insecticide-treated nets, SP, DOT, and rectal artesunate.
- Annual technical and financial support for the national quantification of malaria and other essential medicines.
- Technical assistance with two embedded staff, one at the NMCP and one at the Drug Theft Investigation Unit.
- Support for NMCP's quarterly Drug Management Task Force meetings to review data, address supply chain bottlenecks, and ensure commodity availability.
- Support for the national drug regulatory body (the Pharmacy, Medicines, and Poison Board) to conduct post-market surveillance for malaria medicines in the public and private sector. Post-market surveillance contributes to the GOM's effort to ensure the availability of quality assured malaria medicines in Malawi.
- Support for the development of the MSCTP 2021–2026 to achieve Malawi's supply chain integration.

- Support for the development of the National Product Catalogue, a catalyst for implementation of global standards for tracking and tracing malaria commodities and other medicines.
- Support to MOH regional offices for improved supervision and oversight of supply chain operations at service delivery points.

Supporting Data

Figure A-16. PMI supply chain investment by technical area



Key Question 6

Are there any other considerations that impact funding allocation in this category?

Considerable gaps in human resource capacity exist across all cadres at service delivery points within Malawi's public sector. According to the Malawi Health Sector Strategic Plan II (2017–2022), the vacancy rates for Pharmacy Technicians, who make up a bulk of the supply chain workforce, is estimated at 79 percent.

Supporting Data

Conclusions for Supply Chain Investments

PMI/Malawi will continue to support core supply chain functions such as in-country storage and distribution, the supply chain data management system (Open LMIS), human resource development, forecasting, and supply planning. The PMI-supported parallel supply chain is anticipated to continue through 2022. Although some parts of the malaria supply chain are doing well, quantification, warehousing, and distribution are heavily dependent on donor funding and PMI's supply chain management implementing partner. PMI's implementing partner often warehouses and/or distributes Global Fund supported commodities, per request of the NMCP.

Following the development of the National Product Catalog, Malawi formed the National End-to-End Steering Committee, which will oversee the implementation of the traceability strategy, including end-to-end tracking of malaria commodities. PMI/Malawi will continue to support the NMCP to implement the National Product Catalog, including integration with the interoperability layer and other health information systems, such as OpenLMIS, the Central Medical Stores tracking tools, and the Pharmacy and Medicines Regulatory Authority tools, to ensure end-to-end tracking of commodities.

Following a 2017 multi-stakeholder group agreement on a refined Integration Roadmap with detailed activities to strengthen the CMST and the national supply chain, the GOM developed a Health Products Management Strategy that includes the MSCTP 2021–2026. The plan serves to leverage gains achieved through parallel supply chains to support supply chain integration. The GOM and stakeholders will be working toward operationalizing this plan to achieve an integrated pharmaceutical supply chain, with the aim of attaining efficient and timely delivery of health commodities and essential medicines to the population. For this integrated supply chain to be functional, the GOM must ensure these reforms are supported with budgets to strengthen the CMST and outsource certain components of the supply chain system.

Until that is achieved, the supply chain for malaria commodities requires PMI and Global Fund support; therefore, donor support should be maintained.

3.2. SURVEILLANCE, MONITORING, AND EVALUATION (SM&E)

NMCP Objective

Maintaining a sustainable, integrated national health information system capable of generating evidence-based malaria surveillance systems that guide program implementation, policy direction and accountability is the SM&E objective of the MSP 2017–2022.

NMCP Approach

The SM&E and Operation Research activity in the MSP 2017–2022 identified the following main priority areas: data quality improvements, implementation of the Three One's principle (i.e., one implementation plan, one coordination mechanism, one monitoring and evaluation plan), conduct of priority studies guided by the malaria research agenda, the strengthening of coordination with research institutions, and the strengthening of information sharing and use.

PMI Objective in Support of NMCP

PMI's support fully aligns with the GOM NMCP's SM&E plan vision of strengthening the malaria surveillance system to a state that it is functional, responsive, and reliable to produce evidence-based information from quality data that is routinely used for planning and decision-making. It is also in line with the goal articulated in the Monitoring, Evaluation, and Health Information Systems Strategy (MEHIS) 2017–2022: Maintaining a sustainable, integrated national health information system capable of generating and managing quality health information for supporting evidence-based decision-making by all stakeholders at all levels of the health system.

PMI-Supported Recent Progress (CY 2020–2021)

PMI currently provides technical support to the MOH and NMCP in strengthening routine HMIS activities at all levels, including support to MOH CMED, strengthening of routine data collection through training and supervision at the district and health facility level and data validation, data quality assessments, and review meetings at all levels. In addition PMI provides technical support in strengthening LMIS data and data quality audits. Recent PMI-supported activities include:

- Routine monthly HMIS data collection and validation.
- Quarterly data quality assessments.
- Data review meetings focusing on malaria.
- Support for 2017–2022 MEHIS Strategy and digital health coordination.
- Supported the GOM Central Monitoring and Evaluation Division (CMED) to develop the Digital Health Roadmap 2021–2022.
- Supported the development of a harmonized Digital Health Work Plan.
- Supported the development and initiation of the national Digital Health Task Force and the revision of DHIS2 Core Team terms of reference.
- Provided technical input for the development of an integrated community health information system roadmap and budgeting.
- Support for DHIS2 expansion to referral hospitals and health facility data entry points.
- Supported training and mentorship of national and district NMCP staff on routine data quality.
- Provided technical input to the malaria data reviews and dissemination of key indicator bulletin.
- Supported resource mobilization that enabled procurement and distribution of HMIS registers to all districts.
- Supported CMED to implement the 2020 harmonized facility level data quality assessment, implemented in 15 districts covering 50 percent of the facilities in each district.

In FY 2020, the COVID-19 pandemic affected the implementation of activities that needed in-person involvement. Therefore, these districts were not able conduct facility level data verification, data review meetings for key HMIS indicators, and HMIS facility supervision.

PMI-Supported Planned Activities (CY 2021–2022 with currently available funds)

- Support the MOH and the NMCP to implement national and district-level health systems strengthening interventions.
- Work with NMCP to improve the malaria monitoring and evaluation systems such that data are reliable and consistent in order to assess progress toward achieving universal coverage of malaria interventions and reducing disease burden.
- Continue to focus support for strengthening data systems, coordination and governance, data analysis and use at all levels, including relevant facility visualizations.

Key Goal

To support the NMCP to build their capacity to conduct surveillance as a core malaria intervention using high-quality data from both surveys and routine health information systems.

Key Question 1

Which data sources are available to inform estimates of intervention coverage, service availability and readiness, and morbidity and mortality?

Supporting Data

Table A-19. Available malaria surveillance sources

Source	Data Collection Activity	2019	2020	2021	2022	2023	2024
Household Surveys	Demographic Health Survey (DHS)				P		
Household Surveys	Malaria Indicator Survey (MIS)			P*			
Household Surveys	Multiple Indicator Cluster Survey (MICS)		X*				
Household Surveys	EPI survey						
Health Facility Surveys	Service Provision Assessment (SPA)						
Health Facility Surveys	Service Availability Readiness Assessment (SARA) survey	X*					
Health Facility Surveys	Other Health Facility Survey						
Malaria Surveillance and Routine System Support	Therapeutic Efficacy Studies (TES)		X*		P		P
Malaria Surveillance and Routine System Support	Support to Parallel Malaria Surveillance System						
Malaria Surveillance and Routine System Support	Support to HMIS	X	X	X	P	P	P
Malaria Surveillance and Routine System Support	Support to Integrated Disease Surveillance and Response (IDSR)	X*	X*	X*	P*		
Malaria Surveillance and Routine System Support	Electronic Logistics Management Information System (eLMIS)	X	X	X	P	P	P
Malaria Surveillance and Routine System Support	Malaria Rapid Reporting System						
Other	End Use Verification (EUV) Survey						
Other	School-based Malaria Survey						
Other	Malaria Behavior Survey			X			

Source	Data Collection Activity	2019	2020	2021	2022	2023	2024
Other	Malaria Impact Evaluation						
Other	Entomologic Monitoring Surveys	X	X	X	P		

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

Key Question 2

What HMIS activities have been supported? What current priorities will be supported with FY 2022 MOP funding?

Nationally, PMI currently provides support to a broad array of SM&E activities, such as technical support to the NMCP and CMED; strengthening coordination capacity to ensure systems integration and harmonization; strengthening of HMIS data management, quality, and use; and coordination for implementation of the digital health strategy. Support at district and facility levels includes strengthening routine HMIS data collection and entry into DHIS2 through provision of data bundles, targeted supportive supervision to facilities in conducting data review, and data verification exercises in 13 districts. With FY 2022 funds, PMI will continue to support NMCP and CMED efforts in sustaining gains on HMIS strengthening activities and focus on improving the data quality interventions and promoting data use.

Supporting Data

Key Question 3

Are there specific outcomes of past/current HMIS strengthening efforts that can be identified?

In FY 2020, 89 percent (267 of the 301 PMI targeted facilities) had complied with data quality as defined by the MOH, which encompasses timeliness, precision, validity, integrity, and reliability.

PMI invests in capacity-building of MOH HMIS staff at the district level to effectively implement HMIS activities and strengthen the implementation of the DHIS2 database, which has contributed to improved reporting rates, 94 percent, and 84 percent for malaria and IMCI reports, respectively.

Supporting Data

Table A-20. Outcomes of HMIS strengthening efforts

	Indicator	2019		2020*	
		Malaria Report	IMCI Report	Malaria Report	IMCI Report
Timeliness	% of reports received on time^	67%	60%	42%*	33%*
Completeness	"Confirmed malaria cases for children under five years of age" was reported in X [number or percent] of facility-months	94%	85%	93%†	79%†
Accuracy	Data accuracy (national average)	Confirmed malaria	Suspected malaria cases tested	Artemether-lumefantrine (LA) treatments issued	
		96%	100%	99%	

^Health facility will be considered to have submitted data on time if data is entered into DHIS2 before the 15th of the following month as defined by HIS policy (timeliness). *It should be noted that most facilities would submit data on time by 5th of the following month; however, entry is delayed due to workload at the district or cluster data entry point.*

*In FY 2020, The Malawi DHIS2 suffered a catastrophic data loss and this affected data completeness and timelines. However, data was re-entered and measures were taken to prevent reoccurrence.

†NMCP program report on integrated malaria supervision and mentorship reported 99 percent and 90 percent malaria data completeness and timeliness as of September 2020.

Key Question 4

Are there any other considerations that impact your funding allocation in this category (e.g., strategic information or capacity-building in-country)?

N/A

Supporting Data

Conclusions for Surveillance, Monitoring, and Evaluation Investments

There has been notable progress in data availability and completeness; however, timeliness of data reported in DHIS2 is generally low. District Health Offices (HMIS) and health facilities face significant challenges in reporting their data into the national HMIS. At a given health center or DHIS2 data entry point, staff are expected to report into a multitude of registers, varying in complexity by the type of facility, and have all data entered, which leads to less time to do it; this and may affect data quality. Further complicating the timeliness of data reporting was the data loss in the national DHIS2 system during 2020; notably, the data was recovered through reentry. Thus, PMI

will continue providing support to build capacity in expanding DHIS2 data entry points, data analysis, interpretation, and use at all levels that will in turn establish a data use and data-to-action culture.

Over the past three years, Malawi has had three household surveys that measure malaria-related indicators, namely the Demographic and Health Survey (DHS), Multiple Indicator Cluster Survey (MICS), and the Malaria Indicator Survey (MIS). At the time of writing, the DHS is in the planning stage, being led by the National Statistics Office within the GOM and with support from a variety of donors. The MICS has been completed and final reports are being written and reviewed before further dissemination; this process is also being led by the National Statistics Office. Finally, the Global Fund-supported MIS is being implemented by the NMCP and recently concluded the data collection phase of the survey. PMI/Malawi contributed funding to the MICS and is planning to contribute to the DHS, but will not contribute to the MIS. Support for national surveys is not included in the FY 2022 MOP.

PMI/Malawi will continue its support to the NMCP and CMED in strengthening SM&E systems at all levels. At the time of writing, funding levels have been reduced for support to SM&E activities as PMI/Malawi works to identify appropriate implementing partners for this work. Please see FY 2022 PMI budget tables for a detailed list of proposed activities with FY 2022 funding.

3.3. OPERATIONAL RESEARCH

NMCP Objective

The MSP (2017–2022) operational research objective is to conduct priority studies as guided by the National Malaria Research Agenda (2017–2021), which lays out priority research questions in the following thematic areas: case management, malaria in pregnancy, and vector control.

NMCP Approach

The NMCP places a high value on evidence generated from research within and outside Malawi by established research institutions. The NMCP uses evidence maps to identify, organize, and summarize scientific evidence, and to prioritize research priorities as outlined in the National Malaria Research Agenda. The National Malaria Research Agenda encourages all research institutions to disseminate their findings in a timely manner across a variety of platforms. The NMCP uses such evidence to guide the implementation and monitoring and evaluation of MSP activities.

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

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

PMI Objective in Support of NMCP

PMI works together with the NMCP, implementing partners, and other donors and research institutions to support relevant OR/PE that is designed to provide data to inform MOH and NMCP programs and policy. PMI will support the NMCP to update the research priorities for malaria when the National Health Research Agenda is updated.

PMI-Supported Recent Progress (CY 2020–2021)

PMI recently completed two OR studies:

- PMI supported a study to assess the efficacy of IPTp-DP compared with IPTp-SP. The results of this study show that DP is more effective as an antimalarial, but did not improve birthweight relative to SP. These data will aid the program in determining whether switching to IPTp-DP is warranted.
- PMI supported a study to assess the effects of community delivery of IPTp-SP on IPTp and ANC uptake. Implementation was generally poor, with HSAs conducting limited follow-up of pregnant women. There was no increase in IPTp3+ coverage, although early initiation of ANC, retention in ANC, and IPTp1+ increased, and there was evidence that coverage of IPTp among women living more than 5 km from a facility was increased as a result of the intervention. Study results are being disseminated during 2021 for consideration by the NMCP, Reproductive Health, and Community Health in planning policy and programming.

PMI-Supported Planned Activities (CY 2021–2022 with currently available funds)

PMI/Malawi plans to undertake a study in 2021–2022 assessing the impact of expanding the age range of community case management of malaria.

PMI Goal

PMI will conduct PE/OR that helps to evaluate coverage of population at-risk, intervention quality, or delivery efficiency; study reducing malaria transmission and disease burden; test effectiveness of new or evolved priority interventions and strategies; or explore new metrics and mechanisms to assess intervention impact.

Key Question 1

In consultation with the NMCP, have technical challenges or operational bottlenecks in program interventions been identified that require PE/OR? How have they been prioritized?

The NMCP has prioritized the need to understand and address the high burden of malaria among school-aged children. Using previous year funds, PMI/Malawi plans to undertake a study to assess the feasibility, acceptance, implementation, and impact of expanding the age range of community case management of malaria. No additional funding has been allocated to OR in FY 2022.

Supporting Data

Table A-21. Ongoing program evaluation and operational research

Funding Source	Implementing Institution	Research Question/Topic	Status/Timeline
Gavi, the Vaccine Alliance; the Global Fund to Fight AIDS, Tuberculosis, and Malaria; and Unitaid	Malawi College of Medicine, Malaria Alert Center; Malawi Liverpool Wellcome Trust	Malaria Vaccine Implementation Programme	Implementation ongoing
U.S. National Institute of Allergy and Infectious Diseases	Michigan State University, University of Malawi College of Medicine/Malaria Alert Centre, Boston University School of Public Health, University of Maryland School of Medicine, University of Michigan	International Centers of Excellence for Malaria Research: identify why the standard malaria control and prevention efforts in Malawi have not had significant impacts on malaria disease incidence and parasite prevalence, including studies on barriers to bed net use; effect of insecticide resistance and impact of PBO nets on bed net efficacy; impact of the RTS malaria vaccine on infection prevalence and transmission; non-random contact between human hosts and *Anopheles* vectors (especially school-age children); human and parasite determinants of developing asymptomatic infection vs. life-threatening malaria illness	Implementation ongoing

Key Question 2

Are there specific challenges in any intervention areas that merit further exploration or research with the potential of establishing strategies or interventions applicable in the near future?

PMI/Malawi will continue to liaise with NMCP and the University of Malawi College of Medicine as the Malaria Vaccine Pilot Implementation progresses to determine whether all relevant questions will be sufficiently addressed. In the National Malaria Research Agenda 2017–2021, additional challenges noted for potential further exploration, operational research, or monitoring include assessing barriers and improving late entry into and the frequency of ANC visits, comparing cost-effectiveness of IRS vs. PBO and/or G2 nets, assessing novel means of combating the high burden of malaria among school-age children, and exploring surveillance as an intervention. PMI will consider supporting these research priorities should additional funds become available, for example through reprogramming.

Key Question 3

Are there any other considerations that impact your funding allocation in this category?

N/A

Conclusions for Program Evaluation and Operational Research Investments

PMI/Malawi will continue to consider priority PE/OR technical support and investments via reprogramming as PE/OR priorities are identified by PMI, the NMCP, and other partners and stakeholders.

Please see FY 2022 PMI budget tables for a detailed list of proposed activities with FY 2022 funding.

3.4. SOCIAL AND BEHAVIOR CHANGE (SBC)

NMCP Objective

The overall NMCP objective for SBC is to sustain malaria awareness and knowledge at 92.8 percent of the population and increase the proportion of people who take malaria prevention and control actions to 80 percent by the end of 2020 as identified in the National Malaria Communication Strategy (MCS) 2015–2020. The strategy is guided by nine general principles:

- Implement social and behavior change communication (SBCC) strategies year-round.
- Align the MCS with the National MSP.
- Build on existing SBCC campaigns and implementation structures.
- Sustain gains in malaria knowledge.
- Prioritize increased uptake and utilization of malaria interventions.
- Strengthen coordination within the SBCC TWG.
- Generate data on knowledge, attitudes, and practice.
- Target health workers as key change agents.
- Mobilize resources and support partners.

Further, the strategy recognizes the importance of strengthening partnerships at all levels and building the capacities of all relevant personnel on an ongoing basis. Recognizing that the current MCS is out of date, the NMCP is prioritizing its revision and update in CY 2021 with support from PMI.

NMCP Approach

The MCS draws its overall strategic approach from the National Health Communication Strategy. The foundation for this approach is the socio-ecological model, which recognizes that behavior is influenced by knowledge at the personal level, by the actions of close individuals like family and friends, by community norms and actions, and at the wider society level by environmental structures and factors. Based on this model, the MCS employs three key SBC strategies to achieve its purpose and objective at the national and subnational level:

1. Advocacy to strengthen policy and systems and mobilize resources through the engagement of political and social leadership and donor and policy makers.
2. Social/community mobilization to increase participation and ownership among community members by engaging community-based organizations and social groups such as women, youth, and other organized groups; and events such as agricultural events, household visits, community events, meetings, and dialogues.

3. Behavior change communication to influence individual behaviors by targeting them through interactive and participatory communication activities, including entertainment education using clinic/hospitals, radio, community health workers, and volunteers.

The MCS specifies a focus on four behavioral objectives:

1. Increase by 20 percent the number of Malawians who consistently sleep under and care for their ITNs by 2020.
2. Increase from 31.2 percent to 75 percent by 2020 the number of Malawians who take action to treat malaria on the same or the next day from the time of fever onset.
3. Reduce the refusal rate for IRS to less than 1 percent by 2020 (currently 3.2 percent [2020 preliminary report for Nkhotakota]).
4. Increase to 60 percent the number of pregnant women who took three doses of SP during their last pregnancy by 2020 (currently 41 percent [MICS 2017]).

These behavioral objectives are expected to be realized through the following communication objectives:

- Motivate the consistent use and care of ITNs at the household level while discouraging their use for unintended purposes.
- Promote prompt diagnosis and effective malaria treatment at the nearest health facilities within 24 hours of the onset of fever.
- Promote the acceptance of, and adherence to, post-IRS spray operations.
- Promote the prevention of malaria during pregnancy.
- Promote communities' sense of ownership of malaria commodities.

A Malaria SBCC Working Group has been established at the national level and is chaired by the Health Education Section of the Health Education Unit; however, the NMCP serves as the secretariat through a dedicated SBC focal program officer. Malaria implementing partners are asked to host the quarterly meetings on a rotating basis. In accordance with the National Health Communication Strategy, District Health Promotion Working Groups are expected to be in place so as to interpret, implement, and monitor health promotion activities, including malaria behavior change activities.

PMI Objective in Support of NMCP

PMI supports the NMCP in its effort to increase the utilization of appropriate malaria interventions in Malawi to sustain malaria awareness and knowledge at 92.8 percent of the population and increase the proportion of people who take malaria prevention and control actions to 80 percent by 2020. PMI provides support for these efforts at the national, district, and community levels. At the national level, PMI provides technical assistance and support for capacity-strengthening activities and coordination. For example, PMI supports the *Malungo Zii*, (Malaria-Free) slogan developed earlier by the NMCP and its partners as a component of the *Moyo ndi Mpamba, Usamalireni* (Life is Precious, Take Care of It) central campaign platform that is at the core of the National Health Communication Strategy.

At the district level, PMI activities are focused on assisting PMI-focus districts to implement quarterly working group meetings and develop communication materials and relevant guidelines to promote the uptake of malaria prevention and treatment behaviors, including the two prioritized behaviors (prompt care-seeking for children under five years of age and early ANC attendance). Through partnerships with local organizations, PMI supports

the NMCP's efforts to expand community level, interpersonal communication activities aimed at increasing correct and consistent ITN use, prompt care-seeking, and uptake of IPTp.

PMI-Supported Recent Progress (CY 2020–2021)

- **Print materials:** Developed and disseminated 80,525 copies of integrated print SBCC materials (that include malaria) and 30,000 malaria-specific materials on the following key malaria prevention and treatment behaviors: demand and uptake of IPTp, correct and consistent use of ITNs, and prompt care-seeking within 24 hours at the onset of fever. The materials include the Wheel of Life-Saving Practices (The Wheel), an interactive wall chart to promote adoption of life-saving behaviors related to maternal and child health and malaria within the first 1,000 days of a baby's life; interpersonal communication dialogue cards; and nudge posters and leaflets.
- **Radio programs:** Broadcast 3,776 radio magazine programs, radio spots, radio testimonials, and radio presenter mentions on the above malaria prevention and treatment behaviors. Broadcasts totaled 10,932 minutes over the past 12 months on 18 radio stations and reached an estimated 13 million people across the country.
- **Response to COVID-19 impact on malaria prevention and treatment:** Supported the NMCP to amplify malaria prevention and treatment messages in the context of COVID-19 on 10 radio stations across the country. Programs included radio spots and live call-in radio programs and presenter mentions that debunked myths and misconceptions on the relationship between malaria treatment and COVID-19 and reminded people of the continued availability of malaria prevention and treatment services at health facilities even during COVID-19.
- **Social media engagement:** Partnered with local implementing partners, 20 popular local musicians, and social media influencers to scale up the reach of malaria prevention and treatment messages on Facebook in advance of World Malaria Day 2021. By April 30, posts on malaria prevention and treatment behaviors had reached 1,392,939 people.
- **Community mobilization and engagement:** To support ongoing community mobilization and engagement on malaria prevention and treatment, the following activities were implemented:
    - Reached 113,006 people (41,812 males and 71,194 females) with integrated health messages that include information related to maternal, newborn, and child health; malaria; nutrition; water, sanitation, and hygiene; and family planning and reproductive health through small group discussions and follow-up home visits in the districts of Nkhata Bay, Nkhotakota, Salima, Mchinji, Lilongwe, Dowa, Kasungu, Mchinji, Ntcheu, Balaka, Machinga, Mangochi, Zomba, Mulanje, and Chikwawa. These activities are implemented through community mobilizers including radio listeners clubs, community health action groups (CHAGs), community theatre groups, village health committees, and community leaders.
        - CHAGs also implemented the Community Action Cycle approach to mobilize communities for action, promote positive health behaviors, and create demand for health services.
    - Oriented 21 implementing partners and 34 District Health Promotion Officers from all 28 districts of the country on the correct use of Moyo ndi Mpamba SBCC materials, which include The Wheel of Life-Saving Practices, nudge posters, leaflets, and radio programs.
    - Oriented 1,889 community mobilizers (856 males and 1,033 females) in Nkhata Bay, Nkhotakota, Salima, Chikwawa, Mulanje, Mangochi, Ntcheu, Dowa, and Kasungu districts on how to use of The

Wheel of Life-Saving Practices to promote, monitor, and track adoption of priority health behaviors during the first 1,000 days of a baby's life.
    - Distributed 8,525 copies of The Wheel of Life-Saving Practices to households with a pregnant woman or child under five years of age. Conducted follow-up home visits to 122 homes in the above districts and noted 70 percent of the household had adopted at least one of the behaviors promoted on The Wheel in the last one month before the visit.
- **Capacity-strengthening:** PMI continued to provide SBC capacity-strengthening to MOH Health Education Section (HES), NMCP, and districts to lead and coordinate SBC programs at the national and district levels. Key highlights in this area include:
    - Supported MOH to continue rollout of the national SBC monitoring and evaluation system that facilitates SBC data entry in the DHIS2. Key activities included supportive supervision visits in selected districts, district review meetings, as well as production and dissemination of reporting forms to all districts and health facilities across the country. To date, PMI is collaborating with MOH to revise the SBC monitoring and evaluation reporting form and include indicators on prompt care-seeking for childhood illnesses for malaria, pneumonia, and diarrhea.
    - Supported MOH to roll out the national SBC quality assurance and quality improvement (QA/QI) standards to improve the quality of SBC messages, minimize duplication of efforts, and enhance production of culturally sensitive messages. Over the past 12 months, a MOH-HES-led QA/QI taskforce held 15 meetings, disseminated QA/QI standards to all implementing partners, and advocated for their continued use in the design and implementation of SBC activities by all implementing partners and districts.
    - Continued to provide ongoing SBC coaching and mentoring for 42 MOH and district officers who coordinate the design and implementation of SBC activities at the national and district level. These officers include HES Officers at the national level and 34 District Health Promotion Officers.
    - Conducted SBC capacity assessment for MOH-HES, which showed a 31 percent improvement in the score of the MOH's capacity to coordinate, develop, implement, and monitor SBC interventions, against a target of 25 percent.
    - Supported the NMCP to include malaria SBC activities in the context of COVID-19 in its Global Fund concept note.
- **Planning for implementation of the MBS:** In preparation for fielding the MBS in CY 2021, PMI supported the formation of an MBS Advisory Group composed of various SBC partners and stakeholders to contextualize and finalize questionnaires, coordinated field logistics, developed a COVID-19 mitigation plan, and outlined logistics for data collection training.

PMI-Supported Planned Activities (CY 2021–2022 with currently available funds)

- Facilitate national-level coordination and capacity-building through the Malaria SBCC TWG.
- Support district-level working group meetings.
- Strengthen community-based SBC activities through continued implementation of interpersonal communication activities, including CHAGs, community challenges, and household visits, in the 10 PMI-focus districts to promote the uptake of prioritized behaviors.
- Continue support for mass media through the broadcasting of *Moyo ndi Mpamba* radio products to promote prompt care-seeking within 24 hours from the onset of fever, early ANC attendance, uptake of IPTp, and correct and consistent use of ITNs.

- Support MOH in finalizing SBC monitoring and evaluation reporting forms capturing community-level care-seeking behaviors for DHIS2.
- Support the NMCP in finalization of live radio programs on malaria prevention and treatment in the context of COVID-19 promoting prompt care-seeking.
- Implement the MBS (including data collection, analysis, and dissemination of results).
- Conduct an audience feedback survey (which includes malaria behaviors).
- Conduct SBCC capacity assessment for MOH-HES.
- Provide technical assistance to NMCP and partners on SBC messages for the mass ITN campaign and IRS.

Key Goal

Through the use of SBC interventions and in alignment with a country's national malaria control communication strategy, PMI supports the uptake and correct and consistent use of malaria interventions, thereby improving the overall quality of malaria control efforts that will contribute to reductions in malaria.

Key Question 1

What behaviors is PMI proposing to prioritize through its SBC programming? What data support this prioritization? Will support be geographically targeted or national?

Supporting Data

Table A-22. Prioritized behaviors with FY 2022 funds

Behavior	Target Population	Geographic Focus	Justification
Prompt care-seeking for children under five years of age	Caregivers of children under five years of age	TBD	According to the 2017 MIS, only 31% of caregivers sought care for fever within 24 hours. Partner program data also indicate a culture of self-diagnosis and self-treatment (e.g., use of local herbs or locally bought medicines) in some areas of the country.
Early and regular ANC attendance	Pregnant women, heads of households, community leaders	TBD	While Malawi is more than halfway to meeting their national target coverage for IPTp3+ (currently at 40%, target is 60%), additional efforts at the facility level are needed to close the gap on missed opportunities between IPTp2 and IPTp3. However, possibly more important to achieving high coverage is working to ensure that pregnant women make early and frequent ANC visits.

Key Question 2a

For prompt care-seeking, what gaps exist in understanding the barriers to the adoption and maintenance of malaria prevention and treatment behaviors?

Supporting Data

Known facilitators of prompt care-seeking include high knowledge of fever as a symptom of malaria and perceived severity (i.e., community member experience with severe malaria in household). Known barriers include low risk perception of malaria/fever immediately following symptom onset and a culture of self-diagnosis and self-treatment. More information is needed on the specific behavioral factors (beyond knowledge and awareness) that predict prompt-care-seeking in order to design, implement, and monitor impactful SBC interventions.

Through the 2021 implementation of the MBS, PMI will collect and analyze data on specific ideational factors including attitudes toward point-of-treatment services, perceived effectiveness of diagnostic testing for malaria, self-efficacy of taking relevant actions for appropriate case management, perceptions of clinical standards of care, and descriptive norms related to malaria case management. Following data analysis, PMI, in consultation with the NMCP, will incorporate findings into the new communication strategy and design PMI-supported activities with robust monitoring to ensure SBC activities are reaching specific target populations and addressing appropriate behavioral factors.

Key Question 2b

For early and regular ANC attendance, what gaps exist in understanding the barriers to the adoption and maintenance of malaria prevention and treatment behaviors?

Supporting Data

Although there is increased access to information about the timing for first ANC during the early stages of pregnancy, known barriers include cultural beliefs around nondisclosure of pregnancy, and distance to health facilities to receive ANC services. However, there are significant knowledge gaps about the specific behavioral factors that predict ANC attendance and uptake of IPTp.

The 2021 implementation of the MBS will help address current implementation gaps by assessing knowledge, attitudes, perceived severity of malaria during pregnancy, perceived response and self-efficacy of ANC and IPTp, spousal communication, and perceived community norms.

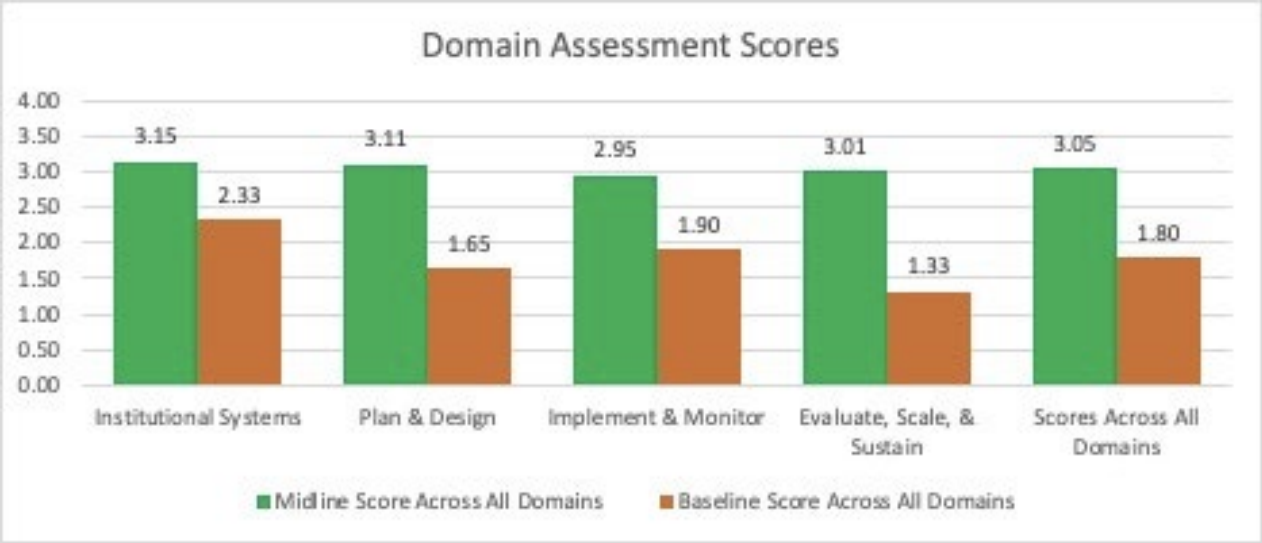
Key Question 3

What is the country's capacity to design, implement, and monitor SBC interventions at the national and subnational level?

Supporting Data

Overall country capacity for SBC has improved from 2017 to 2020 according to findings from a capacity assessment of the MOH-HES across four domains: (1) institutional systems to support SBC initiatives, (2) planning and design of targeted SBC, (3) implementation and monitoring, and (4) evaluation, scale, and sustainability. As shown in Figure A-17, the MOH-HES's overall capacity has increased from 1.80 to 3.05 (out of 4.00) with improvements across each domain. However, despite these gains, there are still opportunities for continued capacity-strengthening, to include a specific capacity assessment of NMCP's ability to design and implement SBC.

Figure A-17. MOH-HES capacity assessment scores from 2017 baseline to 2020 midline



With respect to the NMCP, national-level staff are active participants in the Roll Back Malaria SBC Working Group, quarterly SBCC TWG meetings, and activity planning. However, there is a need to improve the capacity to assess behavioral factors beyond knowledge to establish appropriate baseline indicators for behavior change and to ensure the proper alignment with the MSP. At the district level, there is a great need to improve capacity to coordinate partners, ensure appropriate design and implementation of activities based on specific behavioral factors, and monitor implementation. For example, implementing partners report that it is easier to coordinate through quarterly TWG meetings at the national level than it is at the district level. This is a challenge, because there are a number of smaller partners at the district level that are implementing activities, and yet no strong coordination mechanism. Similarly, district health officers are unaware of all the smaller partners and which one is where/implementing what for SBC.

Conclusions for SBC Investments

- PMI is supporting the collection of robust formative data on community-level behaviors and influencing factors to improve programming for SBC. Activities will be based on data collection findings and recommendations following the 2021 implementation of the MBS. FY 2022 funds will be used to support the development and implementation of streamlined SBC programming that engages audiences via multiple channels deemed most appropriate based on findings from the CY 2021 implementation of the MBS. PMI-supported SBC activities will also capitalize on community engagement structures such as CHAGs and HSAs to reinforce appropriate behaviors.
- No additional formative research is planned beyond the CY 2021 MBS; rather the focus of FY 2022 funds will be on interpreting findings from the MBS to design and implement impactful programs and monitor outcomes.
- PMI will continue to support capacity-building at national and district levels through continued engagement with the global RBM SBC Working Group. PMI will also provide support for national and district SBC coordination mechanisms and participation in conferences and workshops.
- There is an increase in the support level for SBC activities from FY 2020 to comprehensively address prioritized behaviors and associated behavioral factors at the district level.

Please see FY 2022 PMI budget tables for a detailed list of proposed activities with FY 2022 funding.

3.5. OTHER HEALTH SYSTEMS STRENGTHENING

NMCP Objective

The NMCP MSP 2017–2022, includes program management as one of the strategies and key activities. The overarching objective is to improve program performance in implementing planned MSP activities from 43 percent to at least 90 percent by 2022.

NMCP Approach

To meet the aforementioned objective, the NMCP focuses on strengthening human resource capacity, program planning and reviews, partnerships and coordination, resource mobilization, cross-border initiatives, and malaria epidemic preparedness and response.

Human Resource Capacity: Some of the NMCP staff are seconded from districts, do not have established roles at the central level of the MOH, and are working without accurate job descriptions. To address these issues among others, the NMCP is updating job descriptions and organograms, and advocating to the MOH to establish full-time supported positions at the central and district levels. Capacity-building for central-level NMCP staff and District Malaria Coordinators is a high priority for the NMCP and includes training, conference/technical meeting attendance, and learning visits among other activities.

Program Planning and Reviews: The NMCP works to ensure relevant policies, SOPs, guidelines, and strategies related to malaria are reviewed in a timely manner and updated as needed based on new technical guidance and/or the changing landscape in the country.

Partnerships and Coordination: The NMCP aims to have regular engagement with the variety of stakeholders working in malaria, including donor organizations, other ministries within the GOM and programs within the MOH, private organizations, and community-based organizations.

Resource Mobilization: Through development of a business plan and advocacy to the MOH and broader GOM, the NMCP seeks to increase the proportion of the GOM's contribution to malaria programming in-country. Additionally, the NMCP seeks to develop public–private partnerships with local and international private sector organizations.

Cross-Border Initiatives: To decrease drug theft and improve malaria prevention, diagnosis, and treatment within border communities, the NMCP plans to work closely with District Malaria Coordinators to engage their cross-border counterparts and develop strategies to meet respective malaria goals.

Malaria Epidemic Preparedness and Response: The NMCP plans to develop an Emergency Response Plan and Malaria Early Warning System to better respond to outbreaks of malaria due to natural disasters, climate change, and other shocks.

PMI Objective in Support of NMCP

PMI supports the NMCP in its objective to improve program management and performance through each of the NMCP's focus areas under that objective: human resource capacity, program planning and reviews, partnerships and coordination, resource mobilization, cross-border initiatives, and malaria epidemic preparedness and response. PMI also supports many other health systems strengthening activities, some of which were captured in previous section (e.g., SM&E, Case Management, etc.) and others which are captured below.

PMI-Supported Recent Progress (CY 2020–2021)

Human Resource Capacity: For the past several years, PMI has supported USAID/Malawi's efforts to strengthen governance at the district level. District governments have been supported to review and update staffing patterns, job descriptions, budgets for human resources, payroll (i.e., elimination of ghost workers), and to fill vacancies of health positions. The focus on human resources at the district level supports the establishment of resilient health systems that ensure mothers and children have access to primary health services, and addresses shortages of health workers in some hard to reach places.

Program Planning and Reviews: PMI/Malawi regularly engages in drafting and/or reviewing current and new policies, standard operating procedures, and guidelines related to malaria-focused activities.

Partnerships and Coordination: PMI supports scheduling and hosting regular and ad hoc TWG meetings to ensure coordination across district-level staff, the NMCP, and other donor and implementing partners.

Resource Mobilization: PMI/Malawi supports the GOM in its efforts to advocate for increased contributions to malaria via regular interactions with the Health Donor Group, the U.S. Ambassador's engagement with the Office of the President and the Minister of Health, other donors, and private sector partners.

Cross-Border Initiatives: PMI/Malawi engages with PMI/Mozambique, Zambia, Tanzania, Zimbabwe, and other PMI-focus countries in the region via regularly scheduled virtual meetings and ad hoc communications on specific technical issues.

Malaria Epidemic Preparedness and Response: During previous natural disasters and crises, such as Cyclone Idai in March 2019, PMI-supported partners responded to deliver life-saving commodities to affected regions, and will continue to be on standby for future shocks if needed.

Other Health Systems Strengthening

- Support to district-level government to develop and/or update bylaws related to the illegal use of ITNs for fishing and to develop radio spots and messaging around ITN misuse.
- Start-up of a scoping exercise to determine the focus of an environmental assessment that will look more closely at the impacts of fishing with ITNs in Lake Malawi.
- Technical assistance in writing/revising key documents, such as the NMCP's MSP, the application for the Global Fund's New Funding Model 3, and COVID-19 response grants.
- Due to the COVID-19 pandemic, Peace Corps volunteers in Malawi returned back to the United States; therefore, no PMI-supported activities took place during their absence.

PMI-Supported Planned Activities (CY 2021–2022 with currently available funds)

PMI's support to the NMCP in this area cuts across technical sectors and includes the following:

- Support to host regularly scheduled TWG meetings.
- Technical assistance to develop presentations/speeches for external events and technical meetings/conferences, and to attend and participate in said event.
- Support for annual commodities quantification.
- Support to district-level government to review and update staffing patterns and organograms, and for lakeshore districts to update bylaws related to the illegal use of ITNs for fishing.

Please see FY 2022 PMI budget tables for a detailed list of proposed activities with FY 2022 funding.