

The following document is an abbreviated malaria operational plan. The principles guiding development of this document—country-led, inclusive, consultative with a broad audience, and transparent—are consistent with best practices that the U.S. President’s Malaria Initiative (PMI) has instituted since its inception. While an in-depth background of malaria in this country can be found in the detailed [FY 2018 malaria operational plan](#) on [pmi.gov](#), this abbreviated document provides a high-level overview of PMI’s program in this country, including key strategic updates, country data and progress updates, and a detailed list of activities to be supported with FY 2019 U.S. Government PMI funding.

This abbreviated malaria operational plan has been approved by the U.S. Global Malaria Coordinator and reflects collaborative discussions with the national malaria control programs and partners in country. The final funding available to support the plan outlined here is pending final FY 2019 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.



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PRESIDENT'S MALARIA INITIATIVE

Malawi

Abbreviated Malaria Operational Plan FY 2019

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ABBREVIATIONS and ACRONYMS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
AMF	Against Malaria Foundation
ANC	Antenatal care
CDC	Centers for Disease Control and Prevention
CMST	Central Medical Stores Trust
DHIS2	District Health Information System 2
DHS	Demographic and Health Survey
EUV	End-use verification
FY	Fiscal year
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HMIS	Health management information system
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
MICS	Multiple Indicator Cluster Survey
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MoH	Ministry of Health
MOP	Malaria Operational Plan
NMCP	National Malaria Control Program
PBO	Piperonyl butoxide
PMI	President's Malaria Initiative
RDT	Rapid diagnostic test
SARA	Service availability and readiness assessment
SBCC	Social and behavior change communication
M&E	Monitoring, and evaluation
SP	Sulfadoxine-pyrimethamine
SPA	Service provision assessment
USAID	United States Agency for International Development

I. INTRODUCTION

This abbreviated fiscal year (FY) 2019 Malaria Operational Plan (MOP) presents an implementation plan for Malawi, based on the strategies of PMI and the National Malaria Control Program (NMCP) and building on investments made by PMI and other partners to improve and expand malaria-related services. It was developed in consultation with the NMCP and with the participation of national and international partners involved in malaria prevention and control in the country. The [FY 2018 MOP](#) contains a more detailed and comprehensive description of the malaria situation in Malawi, country health system delivery structure, Ministry of Health (MoH) organization, and PMI's progress through April/May of 2017. This abbreviated MOP describes critical changes/updates to overall NMCP and PMI strategic approaches, as well as newly proposed activities under each technical area to be supported with FY 2019 funds.

II. OVERVIEW OF PMI IN MALAWI

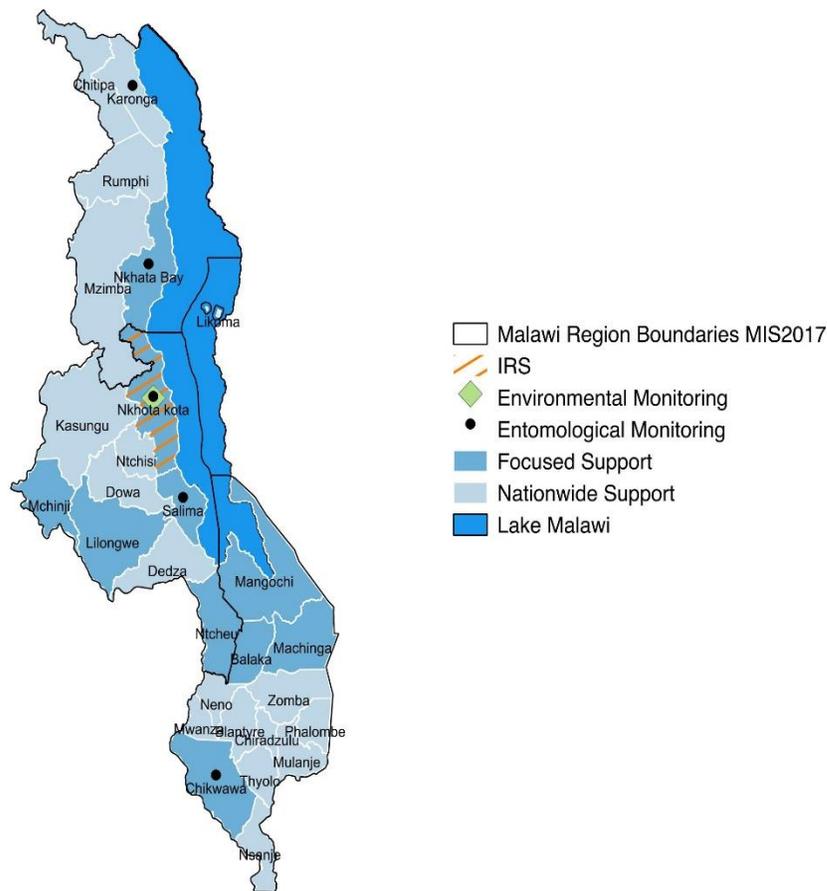
Malawi began implementation as a PMI focus country in FY 2006. The proposed FY 2019 PMI budget for Malawi is \$23 million.

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 and last through April. The highest transmission areas are found along the hotter, wetter, and more humid low-lying areas (lakeshore, Shire River Valley, and central plain), while the lowest risk areas fall along the highlands of Rumphu, Mzimba, Chitipa, and Kirk Range. *Anopheles funestus* is considered to be the primary vector species; *An. gambiae* s.s. and *An. arabiensis* also are present and may predominate in some areas at certain times of the year. *Plasmodium falciparum* is the most common species of malaria, accounting for 98% of the infections and all severe disease and deaths.

PMI supports the MoH and the NMCP to implement the Malaria Strategic Plan. Routine insecticide-treated mosquito nets (ITNs) and case management commodities, along with associated monitoring activities, are provided nationwide. PMI focuses key service delivery support, community mobilization, and district-level health systems strengthening interventions in ten of the districts with the highest malaria burden. PMI works closely with the MoH and other malaria partners to ensure PMI-funded activities in the focus districts are in line with the priorities of the NMCP, support national level initiatives, and are coordinated with the activities of other partners. Entomological monitoring is conducted in five districts throughout the year.

After initiating indoor residual spraying (IRS) in 2007, high levels of pyrethroid and carbamate resistance in *An. funestus* necessitated a shift to organophosphate insecticides in two PMI districts in 2010. At that time, only a short-acting organophosphate was available. Given the high cost and short duration of residual efficacy, PMI suspended direct support for IRS in Malawi after the 2012 spray season. Now that a long-lasting, effective organophosphate is available, PMI is resuming IRS in Nkhosakota District in October 2018.

Figure 1: Geographic Distribution of FY 2019 PMI-Supported Activities



- Nationwide support [all light and dark blue]: Procure and distribute malaria-related commodities, strengthen diagnosis and pharmaceutical management; national SBCC activities, strengthen HMIS at the central level
- Focused Support [dark blue only]: Above-listed activities + supportive supervision and mentorship; improve facility- and community-based case management services and systems; routine surveillance systems supervision and training at district and facility; SBCC at community and facility levels
- Entomological Monitoring: sites in 5 districts
- IRS and environmental monitoring: 1 district

III. STRATEGY UPDATES

N/A

IV. DATA UPDATES AND EVIDENCE OF PROGRESS

In 2017, PMI and the NMCP conducted the Malaria Indicator Survey (MIS). Results from this household survey show a mixed picture: while there has been progress, a few critical areas continue to be a challenge. Overall, availability of ITNs improved from previous surveys. The percentage of households that own at least one ITN increased from 70 percent in the 2014 MIS to 82 percent in 2017 and the percentage of households with at least one ITN for every two persons who stayed in the household the night before the survey increased from 30 percent in 2014 to 42 percent in 2017. However, while the percentage of the household population that slept under an ITN the night before the survey increased from 41 percent to 55 percent, ITN use on the night before the survey among children under 5 years of age and pregnant women in households with at least one ITN declined between 2014 and 2017, from 87 percent to 79 percent and from 85 percent to 73 percent, respectively.

Significant gains were noted in intermittent preventive treatment for pregnant women (IPTp) coverage: 76 percent of women received two or more doses of Sulfadoxine-pyrimethamine (SP), compared to 63 percent in 2014, and 41 percent of women received three or more doses of SP compared to 13 percent in 2014.

Care seeking indicators remain a challenge: advice or treatment was sought for only 54 percent of children with a fever in the 2 weeks preceding the survey, and care seeking was timely (the same or next day following fever onset) for only 31 percent of febrile children.

Parasitemia in children under five years of age has decreased: 24 percent of children under five years of age were positive for malaria using microscopy, a decline of 19 percentage points from 43 percent in 2010.

In general, women's knowledge about malaria has not changed and remained high over the past five years.

Figure 2: Coverage of Select Major Interventions and Parasite Prevalence by Region, 2017

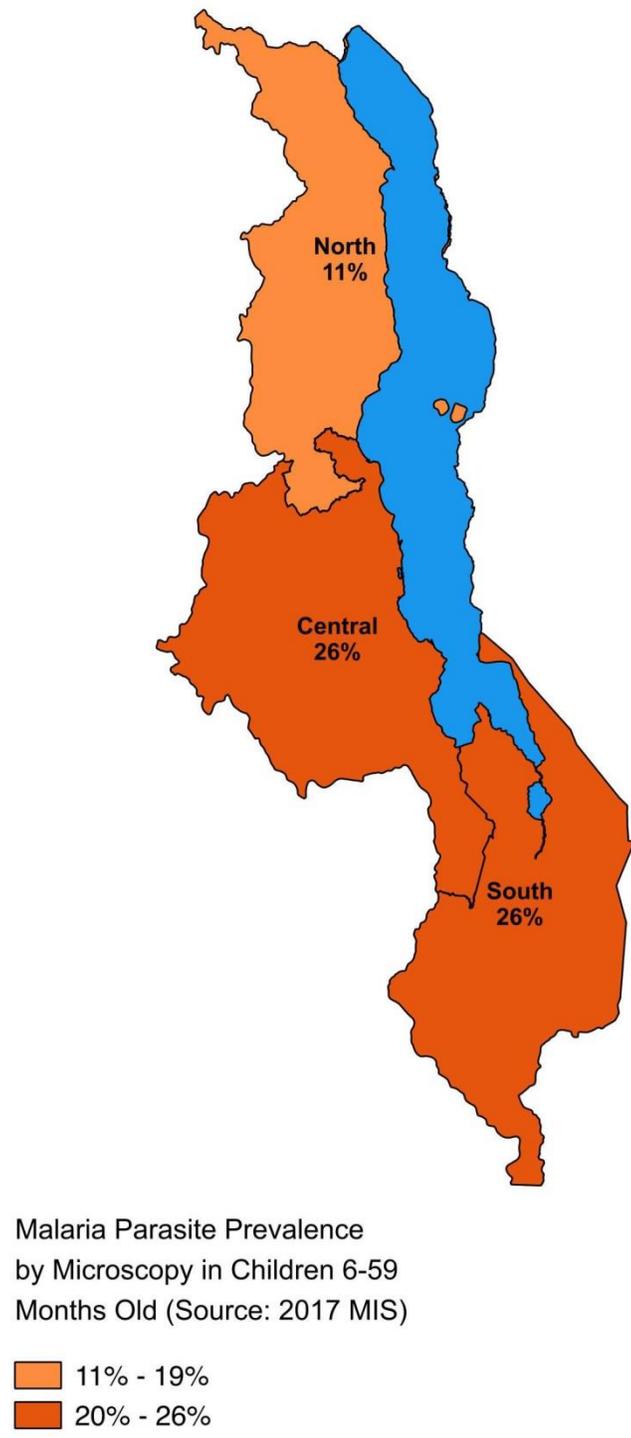


Table 1: Evolution of Key Survey-Based Malaria Indicators in Malawi from 2006 to 2017

Indicator	2006 MICS	2010 MIS*	2012 MIS	2014 MIS	2015-16 DHS**	2017 MIS
% Households with at least one ITN	38%	58%	55%	70%	57%	82%
% Population with access to an ITN	N/A	N/A	37%	52%	39%	63%
% Children under five who slept under an ITN the previous night	25%	55%	56%	67%	43%	68%
% Pregnant women who slept under an ITN the previous night	N/A	49%	51%	62%	44%	63%
% Population that slept under an ITN the previous night	N/A	N/A	41%	53%	34%	55%
% Children under five years old with fever in the last two weeks for whom advice or treatment was sought	N/A	26%*	50%	59%	67%	54%
% Children under five with fever in the last two weeks who had a finger or heel stick	N/A	7%	21%	32%	52%	38%
% Children receiving an Artemisinin-based combination therapy (ACT) among children under five years old with fever in the last two weeks who received any antimalarial drugs	N/A	N/A	91%	92%	92%	97%
% Women who received two or more doses of IPTp during their last pregnancy in the last two years	47%	60%	53%	63%	63%	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%	30%	41%
Under-five mortality rate per 1,000 live births	122	N/A	N/A	N/A	62	N/A
% children under five with parasitemia (by microscopy , if done)	N/A	43%	28%	33%	N/A	24%
% children under five with parasitemia (by rapid diagnostic test (RDT), if done)	N/A	N/A	43%	37%	N/A	36%

*The 2010 MIS collected data only on care-seeking within 24 hours of fever onset. Data reported here from subsequent surveys does not specify the period of care-seeking.

** For ITN indicators, it should be noted that data collection for the 2015-16 DHS was conducted from October 2015 – January 2016, several months prior to a mass ITN distribution campaign conducted from March 2016 to May 2016 in 19 of Malawi’s 29 districts. Additionally, given the DHS occurs during the low transmission period, while the MIS typically occurs near peak transmission season, some indicators are affected.

Table 2: Evolution of Key Malaria Indicators Reported through Routine Surveillance Systems in Malawi from 2012 to 2016

Indicator	2012	2013	2014	2015	2016
Total # Cases	2,960,617	4,415,153	6,402,715	6,239,378	6,423,422
Total # Confirmed Cases	796,236	1,408,783	2,951,841	3,862,199	5,478,323
Total # Clinical Cases*	2,164,381	3,006,370	3,450,874	2,377,179	945,099
Total # <5 Cases	2,088,868	2,465,927	3,614,983	3,469,283	3,231,445
Total # inpatient malaria deaths	7,174	6,656	10,510	14,092	18,875
Data Completeness** (%)					
HMIS-15 Form	72%	93%	97%	97%	91%
Village Clinic (VC) Form	52%	67%	78%	88%	88%
Malaria Facility Report (MFR) Form	46%	58%	73%	85%	93%
Test Positivity Rate (TPR)	46%	43%	52%	50%	54%

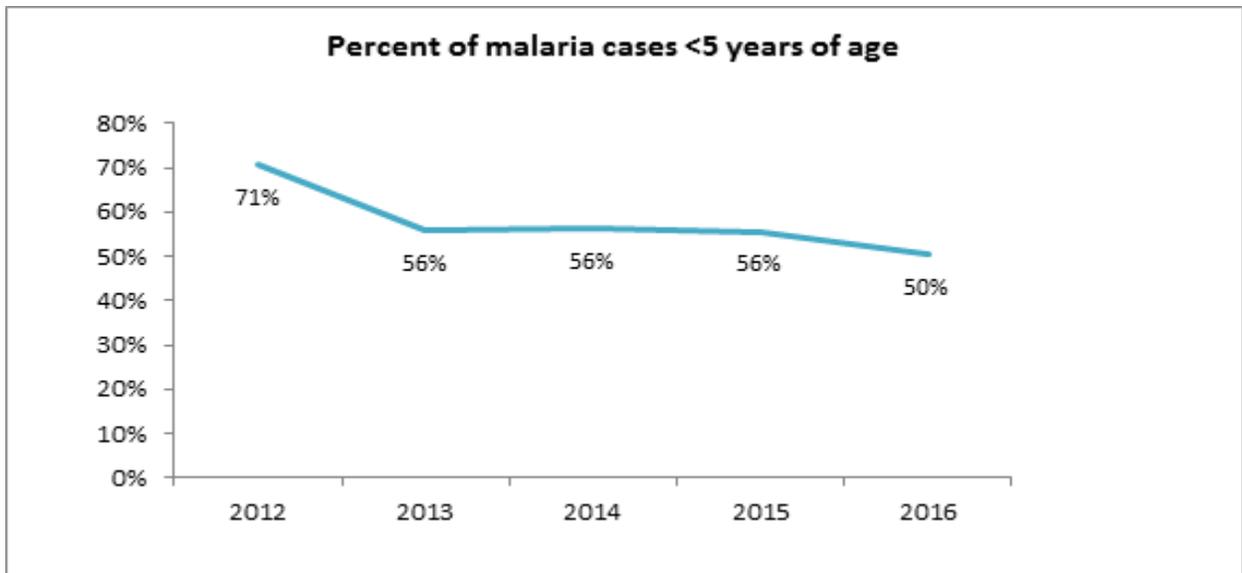
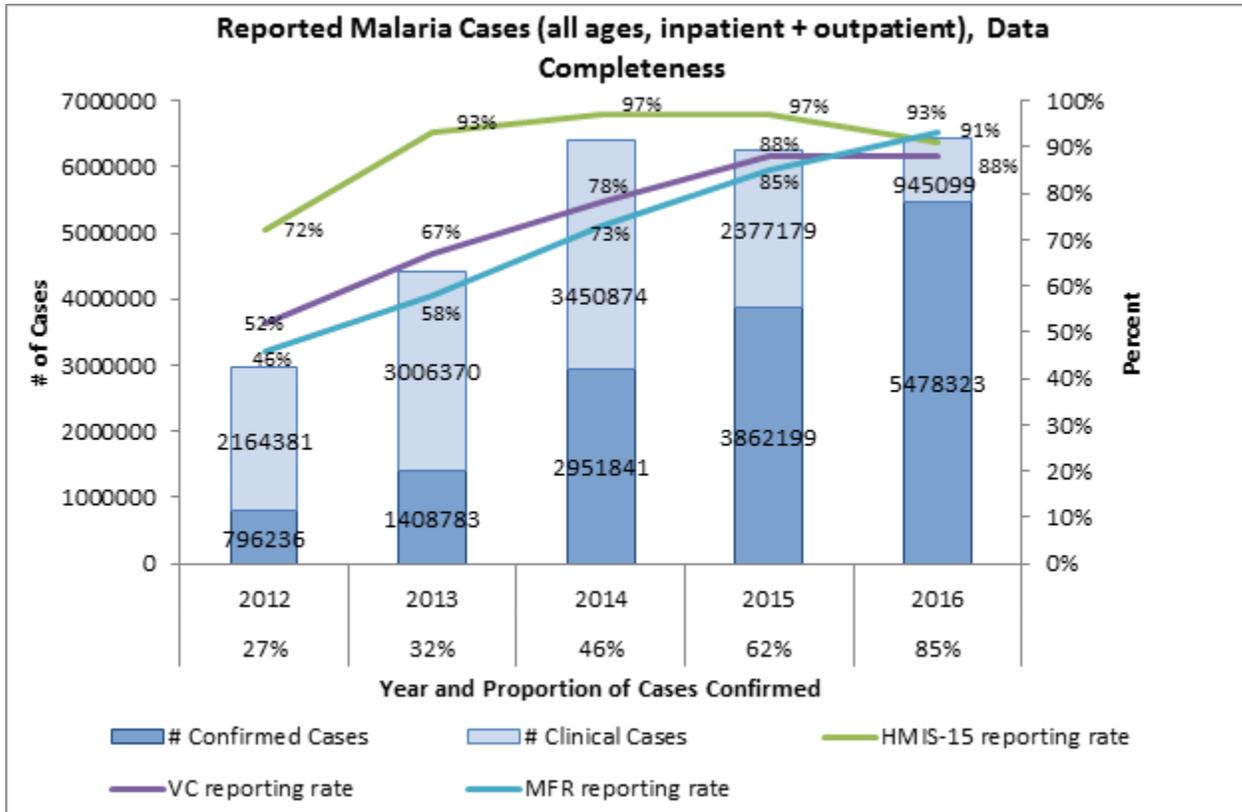
* Malaria case data in Malawi is submitted into the DHIS2 on three different forms:

1. The HMIS-15 form includes malaria cases (clinical and confirmed) and inpatient malaria deaths from facilities only; both disaggregated by under / over 5 years.
2. The malaria facility reporting form includes suspected cases tested, facility-level confirmed cases, and inpatient malaria deaths; disaggregated by under / over 5 years.
3. The village clinic reporting form includes under five malaria cases confirmed and unconfirmed.

The clinical case numbers shown here have been generated manipulating data from the three sources, which have different reporting and completeness rates, and thus do not reflect an accurate estimate of clinical malaria cases. For example, if a facility only submits the HMIS-15 form, which includes all cases, but not the malaria facility report, which includes confirmed cases, all cases from that facility would be counted as clinical here. Similarly, if a facility only submits the malaria facility report form, but an incomplete HMIS-15 form, that facility could have no clinical cases for that month.

**Percentage of health facilities reporting each month.

Figures 3 and 4: Trends in Key Malaria Indicators Reported in Routine Surveillance Systems



V. NEW OR EXPANDED ACTIVITIES AND KEY CHANGES

1. Vector control

a. Entomologic monitoring and insecticide resistance management

PMI will continue to support entomological monitoring at 11 sites across 5 targeted districts. In each district, PMI continues to support insecticide resistance monitoring, including measurement of resistance intensity and synergist assays once per year, as well as monthly measurements of species distribution, and abundance. Mosquito behavior will be assessed in human landing catches quarterly in four sites. Data on pyrethroid resistance from multiple districts in Malawi including intensity data from two districts (Nkhotakota and Chikwawa) indicate 10X resistance to alphacypermethrin, deltamethrin, and permethrin in *An. funestus*. Piperonyl butoxide (PBO) pre-exposure completely restores susceptibility to these insecticides. Other data includes PBO pre-exposures from Machinga and Balaka districts and molecular data from other researchers indicating that pyrethroid resistance in *An. funestus* is largely due to elevated oxidase enzymes.

In FY 2018, PMI will stop supporting entomological monitoring in Balaka and Ntcheu Districts and start monitoring in Nkhata Bay and Salima Districts, which are adjacent to Nkhotakota. The sites in these two districts will serve as a comparison to the IRS district. The four non-IRS districts included in entomological monitoring activities will receive either standard ITNs or PBO ITNs. Monitoring activities will provide monthly data on the impact of PBO nets on entomological indices and will provide information on net ownership and use of the different types of nets. Entomological monitoring in each site covers 15 houses each month; thus, for 11 sites, 165 households are visited each month. At each visit, household owners will be asked about net ownership and use. Although this is not a large number of houses, it will provide some information on net ownership and use between the 2019 Multiple Indicator Cluster Survey (MICS) and the 2020-2021 Demographic and Health Survey (DHS). In addition, annual monitoring of insecticide resistance in districts that receive IRS, PBO ITNs, or standard ITNs will inform the NMCP and PMI on the best strategy for mitigating and managing insecticide resistance. In Nkhotakota District, where IRS is to be implemented, PMI will conduct monthly wall bioassays in beginning in 2018, one month after spraying and will continue into 2019. Table 5 below shows the sites in each district and the method of samples collections at each site.

Table 3: Districts, Sites and Activities for Entomological Monitoring

District	Site**	HLC	CDC Light Traps (LTs)	Pyrethrum Spray Catches (PSCs)	Wall Bioassay	Insecticide Susceptibility **
Nkhotakota (IRS District)	Vwawa	X	X	X	X	X
	Chimkwende	X	X	X	X	
	Ngalauka		X	X	X	
	Selemani *				X	
Salima†	Cholokoto	X	X	X		X
	Chilungo		X	X		
Nkhata Bay ‡	Sanga	X	X	X		X
	Kande		X	X		
Chikwawa ‡	Ntwana		X	X		X
	Nyamphota		X	X		
Karonga †	Mwakanyamale		X	X		X
	Mwenimambwe		X	X		

† Indicates district that will receive PBO ITNs.

‡ Indicates district that will receive standard ITNs

b. Insecticide-treated nets

The NMCP, with technical assistance from PMI and financial support from the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) and Against Malaria Foundation (AMF), will conduct a nationwide mass ITN distribution in all 29 districts in the country from September to November 2018. It is estimated that nearly 11 million nets will be distributed during this campaign, 2 million of which will be PBO nets procured by the Global Fund. During the mass campaign, either PBO or standard nets will be distributed to fully cover respective districts; standard nets distributed via routine channels will account for a relatively small proportion of nets in PBO districts. Leveraging routinely collected data, PMI will monitor the effectiveness of PBO nets in Malawi using entomological data from entomological monitoring sites and epidemiological data from routine health facility reporting.

c. Indoor residual spraying

In FY 2019, PMI will support a third year of IRS in Nkhotakota District. Nkhotakota was selected based on the following criteria: high malaria burden, demonstrated pyrethroid resistance, and a dense, non-urban population to minimize operational costs per household. Furthermore, Nkhotakota is one of the ten PMI focus districts in which PMI provides support for improving case management and routine monitoring and evaluation (M&E) systems. Thus, higher quality data is available to track the impact of IRS. In addition, PMI has been supporting entomological monitoring in Nkhotakota since 2007, so 11 years of historical data and baseline entomological data are available. Given the high levels of pyrethroid resistance in *An. funestus* in Malawi, including Nkhotakota, organophosphates will be used. With support from PMI, Malawi is developing an insecticide resistance management plan in FY 2018, and technical considerations for the 2020 IRS campaign will be based on that document; the planned insecticide will be rotated accordingly.

2. Malaria in pregnancy

No new activities or significant changes are proposed.

3. Case management

The private sector in Malawi plays a small but growing role in the delivery of health care services: According to the 2017 MIS, among children with fever for whom advice was sought, roughly 25 percent sought care at private sector sources; in 2014, the percentage was less than 20 percent. With FY 2019 funding, PMI will engage the private sector in district implementation planning processes, and support capacity building through mentorship and oversight, data collection, and reporting. The targeted private sector facilities are mostly clinics and small hospitals. Private facilities and providers are officially under the oversight of the District Health Offices and the MoH, though to date, district officials have not provided extensive oversight. Through current PMI support, districts and NMCP are engaging private providers in supportive supervision, data collection (e.g., reporting malaria cases), and limited trainings; strategies to support the private sector will be continually monitored and adapted as appropriate.

PMI will ensure private sector facilities receive updates to service delivery guidelines and protocols to enable quality and systems improvements down to the community level. This enhanced engagement is expected to strengthen health management information systems (HMIS)/ District Health Information System 2 (DHIS2) reporting and accountability to district health authorities and to improve availability and use of appropriate commodities and supplies.

4. Cross-cutting and other health systems strengthening

a. Pharmaceutical management

No new activities or significant changes are proposed. The PMI-supported parallel supply chain is anticipated to continue through 2020. In 2017, a multi-stakeholder group agreed on a refined Integration Roadmap with detailed activities to strengthen the national supply chain, Central Medical Stores Trust (CMST). Should all benchmarks be achieved according to this revised timeline, integration would commence in 2021.

b. Social and behavior change communication

No new activities or significant changes are proposed. Activity implementation will continue with a greater focus on addressing behavioral factors (attitude, self-efficacy, risk perception, response-efficacy) to improve adoption of positive health behaviors as opposed to solely increasing knowledge. While the

2017 MIS demonstrated high levels of knowledge on malaria symptoms (71%) and prevention (87%), care seeking within 24 hours of onset of symptoms remains low (31%) and net utilization among children under five years of age has stagnated.

c. Surveillance, monitoring, and evaluation

No new activities or significant changes are proposed.

Table 4. Surveillance, Monitoring, and Evaluation Data Sources

Data Source	Survey Activities	Year								
		2012	2013	2014	2015	2016	2017	2018	2019	2020
Household surveys	Demographic Health Survey (DHS)				X					
	Malaria Indicator Survey (MIS)	X		X¶			X			
	Multiple Indicator Cluster Survey (MICS)			X*					X	
	Micronutrient Survey				X					
Health Facility surveys	Service Provision Assessment (SPA)			X						
	Service Availability Readiness Assessment (SARA) survey							X		
Routine System Support	Support to HMIS	X	X	X	X	X	X	X	X	X
Other Surveys	End use verification (EUV)	X	X	X	X	X	X			
	In vivo efficacy testing	X*		X		X*			X	
	ITN durability					X	X	X	X	
	Malaria impact evaluation		X							

*Not PMI funded

¶ 2014 MIS supported by the Global Fund with technical assistance provided by PMI and ICF-MACRO.

d. Operational research

No new activities or significant changes are proposed.

e. Other health systems strengthening

No new activities or significant changes are proposed.

5. Staffing and administration

PMI Malawi supports staffing and administration that follow PMI policy, as articulated in the FY 2018 MOP.