

PMI

U.S. PRESIDENT'S MALARIA INITIATIVE

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This 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 funding available to support the plan outlined here is pending finalization of the FY 2020 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.

U.S. PRESIDENT’S MALARIA INITIATIVE

ZIMBABWE

Malaria Operational Plan FY 2020

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ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
ANC	Antenatal care
ASAQ	Artesunate-amodiaquine
BMGF	Bill and Melinda Gates Foundation
CCM	Community case management
CDC	Centers for Disease Control and Prevention
CHAI	Clinton Health Access Initiative
CM	Case management
CY	Calendar year
DHS	Demographic and Health Survey
DPS	Directorate of Pharmacy Services
eLMIS	Electronic logistics management information system
EQA	External quality assurance
EUV	End-use verification survey
FY	Fiscal year
GHI	Global Health Initiative
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HCC	Health center committee
IEC	Information, education, communication
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
MCS	Malaria Communication Strategy
MIP	Malaria in pregnancy
MIS	Malaria indicator survey
MoHCC	Ministry of Health and Child Care
MOP	Malaria Operational Plan
Natpharm	National Pharmaceutical Company of Zimbabwe
NIHR	National Institute for Health Research
NMCP	National Malaria Control Program
NMSP	2016-2020 National Malaria Strategic Plan
PMI	U.S. President's Malaria Initiative
RAS	Rectal artesunate suppository
RDT	Rapid diagnostic test
SBC	Social and behavior change
SHC	School Health Coordinator
SM&E	Surveillance, monitoring, and evaluation
SP	Sulfadoxine-pyrimethamine

UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VHW	Village Health Worker
WHO	World Health Organization
ZAPS	Zimbabwe Assisted Pull System
ZINQAP	Zimbabwe National Quality Assurance Program Trust

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 Zimbabwe to end malaria. PMI has been a proud partner of Zimbabwe since 2011, helping to decrease child death rates by 18 percent and reducing malaria incidence to 19 per 1,000 population through investments totaling almost \$131.5 million.

The proposed PMI fiscal year (FY) 2020 budget for Zimbabwe is \$14 million. This Malaria Operational Plan (MOP) outlines planned PMI activities in Zimbabwe for FY 2020. Developed in consultation with the National Malaria Control Program (NMCP) and key 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 Zimbabwe as well as other donors and partners.

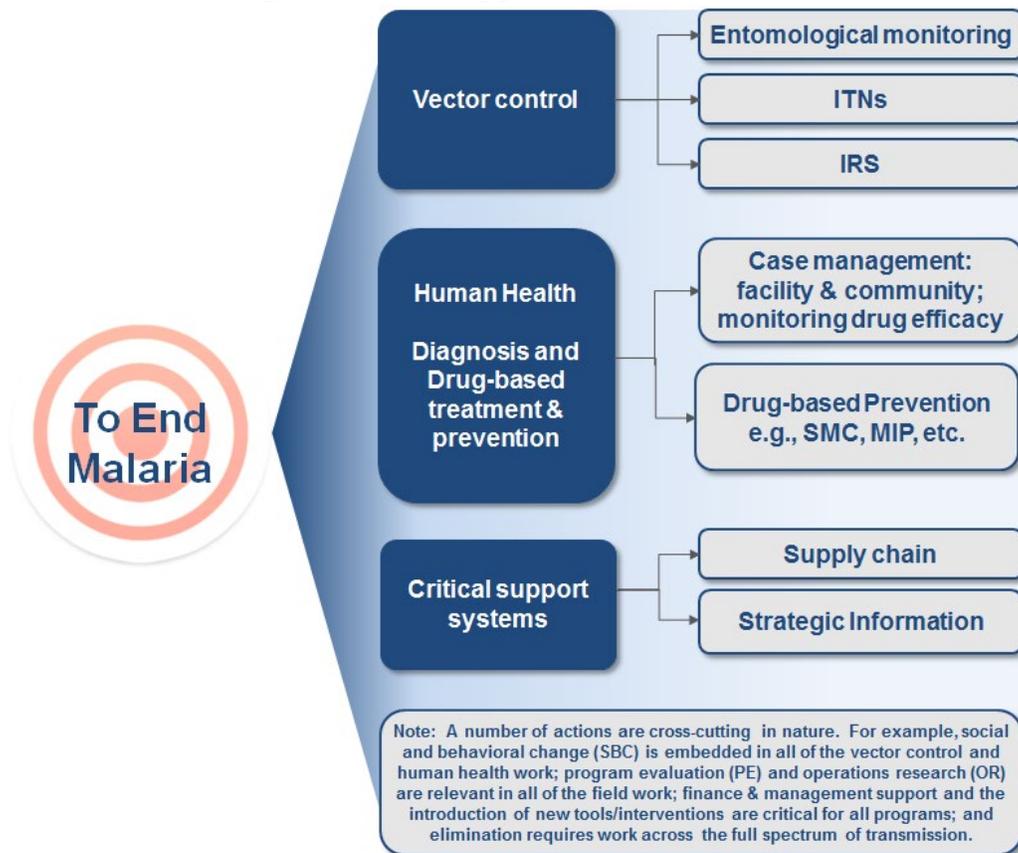
Zimbabwe at a glance

- **Geography:** Zimbabwe is a landlocked country in southern Africa and is bordered by Zambia to the north, Mozambique to the north and east, South Africa to the south, and Botswana to the west. Zimbabwe is divided by a central watershed lying higher than 1200 meters above sea level, which is flanked to the north and south by lower lying areas.
- **Climate:** Zimbabwe's climate is predominantly sub-tropical but varies by altitude. The rainy season typically occurs during the summer months, between November and April. This is followed by a cooler, dry season from May through August, with warmer, dry weather in September and October. Annual rainfall varies significantly by agro-ecological zones, ranging from 450mm to over 1000mm.
- **Population in 2019:** 14,100,758 (2012 Zimbabwe Census Projections)
- **Population at risk of malaria:** 7,050,379 (2016-2020 Zimbabwe *National Malaria Strategic Plan*)
- **Principal malaria parasites:** *Plasmodium falciparum* (2016-2020 Zimbabwe *National Malaria Strategic Plan*)
- **Principal malaria vectors:** *Anopholes funestus s.l.* and *Anopholes gambiae s.l.* (PMI-funded entomological monitoring)
- **Malaria incidence per 1000 population:** 19 (Zimbabwe DHIS2, 2018)
- **Under-five mortality rate:** 69 deaths per 1000 live births (2015 Zimbabwe DHS)
- **World Bank Income Classification & GDP:** Lower-middle income (World Bank 2019-2020 classification) & \$31.00 billion (World Bank 2018 data)
- **Political system:** Presidential Republic

- **Trafficking in Persons designations, 2016-2018:** Tier 2 (U.S. Department of State, 2018)
- **Malaria funding and program support partners include (but are not limited to):**
 - Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund)
 - U.S. President’s Malaria Initiative (PMI)
 - The World Health Organization (WHO)
 - Malaria Elimination 8
 - Bill and Melinda Gates Foundation
 - Isdell: Flowers Cross Border Malaria Initiative
 - United Methodist Church
- **PMI Support of National Malaria Control Strategy:** As one of two primary malaria donors in Zimbabwe, PMI coordinates closely with the NMCP and the Global Fund to ensure complementarity of support for implementation of the Zimbabwe 2016-2020 *National Malaria Strategic Plan*. PMI provides financial and technical support for the full range of PMI priority intervention areas. PMI’s provincial and district-level support has targeted higher burdened areas located in the northern and eastern parts of the country. However, Zimbabwe experiences the full spectrum of malaria transmission, including areas with very limited transmission in the central plateau and south-western portions of the country. Beginning in FY18, PMI initiated limited support for NMCP-driven elimination activities in these areas. If subsequent evaluation warrants, PMI may expand this support in the future. (See III. Overview of PMI’s support of Zimbabwe’s Malaria Control Strategy for additional details)
- **PMI Investments:** Zimbabwe began implementation as a PMI focus country in FY 2011. The proposed FY 2020 PMI budget for Zimbabwe is \$14 million; that brings the total PMI investment to nearly \$145.5 million.

PMI organizes its activities and planning levels around the activities in Figure 1, in line with the national malaria strategy.

Figure 1. PMI’s Approach to End Malaria



PMI’s approach is both consistent with and contributes to USAID’s Journey to Self-Reliance framework. Building and strengthening the capacity of Zimbabwe’s people and institutions – from the central level to communities – to effectively lead and implement evidence-based malaria control and elimination activities remains paramount to PMI. As denoted in Table 2 (the budget table), nearly all of PMI’s planned support for FY 2020 in the areas of vector control, human health, supply chain and strategic information contains elements of capacity building and system strengthening. PMI/Zimbabwe will continue to rely on and engage with local partners such as Africa University, encourage existing implementing partners to expand their work with local partners, and attempt to directly expand PMI/Zimbabwe’s local partner base with future procurement actions. Finally, PMI/Zimbabwe will explore opportunities for private sector partnerships. Historically, these opportunities have been limited, given the country’s focus on government leadership and implementation within the health sector, as well as the substantial economic roadblocks that have limited the development and sustainability of the private health care system. However, this is an area of increasing interest within Zimbabwe and PMI/Zimbabwe will continue to work with the NMCP and malaria stakeholders to increase the level of public/private partnership.

To accelerate the journey to self-reliance, PMI developed a programmatic inventory to assess the strengths and persistent challenges of Zimbabwe's program (see Annex B). The activities proposed in this MOP are tailored to draw on these strengths and address the weaknesses, which will be monitored to evaluate the effectiveness of capacity building efforts. In addition, while PMI is cognizant that it will take time before Zimbabwe is capable of fully financing its development priorities, PMI will work with other partners (e.g., the Global Fund) to jointly track Zimbabwe's funding commitments across the malaria portfolio.

In Zimbabwe, social, political, and economic hardships have increased over the past year and persist. The operating environment is extremely challenging for PMI, NMCP and implementing partners due to myriad economic and political changes and uncertainties. In January 2019, there was a transformation in government leadership that caused disruption of activities and subsequent social unrest and demonstrations. During the whole of this calendar year, hyperinflation has worsened. In June 2019, a new statutory instrument (SI 142) banned the use of the United States dollars for local payments. As a result of this change, PMI partners experienced difficulty adjusting to the policy, and could not implement field activities until after July 2019. There have been subsequent policies and statutory instruments issued by the government that have changed banking and vendor transactions. In addition, fuel is scarce and not available predictably. Implementing partners continue to cope and figure out how to pay vendors for project inputs. NMCP remains optimistic that the economic situation will improve and that malaria burden in the country will continue to shrink.

II. MALARIA SITUATION AND MALARIA CONTROL PROGRESS IN ZIMBABWE

Zimbabwe experiences a wide spectrum of malaria transmission intensity, with seasonal and geographic variation that corresponds closely with the country's rainfall patterns and topography. Although transmission is perennial in malarious areas, seasonal increases occur annually, with the majority of transmission occurring during or just after the November to April rainy season. Geographically, Zimbabwe is divided by a central watershed lying higher than 1,200 meters above sea level, which is flanked to the north and south by low-lying areas. This variability in elevation (and therefore temperature), combined with geographic variability in average annual rainfall, results in higher malaria transmission in the northern and eastern border regions, with more limited transmission in the central and south-western portions of the country. This pattern has remained consistent over recent years, with the three northern and eastern provinces of Mashonaland Central, Mashonaland North, and Manicaland accounting for approximately 80 percent of the reported annual malaria case load. At the national level, annual incidence (cases per 1,000 population) has decreased substantially over the last 15 years, from 153 in 2004 to 19 in 2018. However, much of this progress occurred prior to 2011. In the subsequent years, a pattern of cyclical increases and decreases in incidence has emerged (range: 19 to 40), which appears to be associated with annual variation in rainfall intensity (Zimbabwe DHIS2).

According to the 2016 MIS, parasite prevalence by microscopy was 0.2 percent for children under five years of age, 0.2 percent for children 5-14 years of age, and 0.3 percent for individuals older than 14 years of age. From 2012-2017, the percentage of total reported malaria cases that occurred among children less than 5 years of age ranged from 11-16 percent (Zimbabwe DHIS2). *Plasmodium falciparum* accounts for more than 98 percent of all reported malaria cases, with *Plasmodium ovale* and *Plasmodium malariae* accounting for the remainder. PMI-supported entomological monitoring has identified *Anopheles gambiae* s.l. and *Anopheles funestus* s.l. as the principal malaria vectors, with one or the other predominating, depending on the site monitored. *Anopheles gambiae* s.l. remains susceptible to most insecticides at most sites but there is resistance to DDT at selected sites. *Anopheles gambiae* s.l. was also susceptible to clothianidin. It has proven difficult to collect sufficient *Anopheles funestus* larvae to conduct insecticide resistance assays. However, testing of offspring of adult females revealed full susceptibility to DDT, the insecticide currently being used for IRS by the NMCP in the province where *Anopheles funestus* appears to be the predominant vector.

Figure 2 . Malaria Incidence (per 1000 population*) by District, 2017

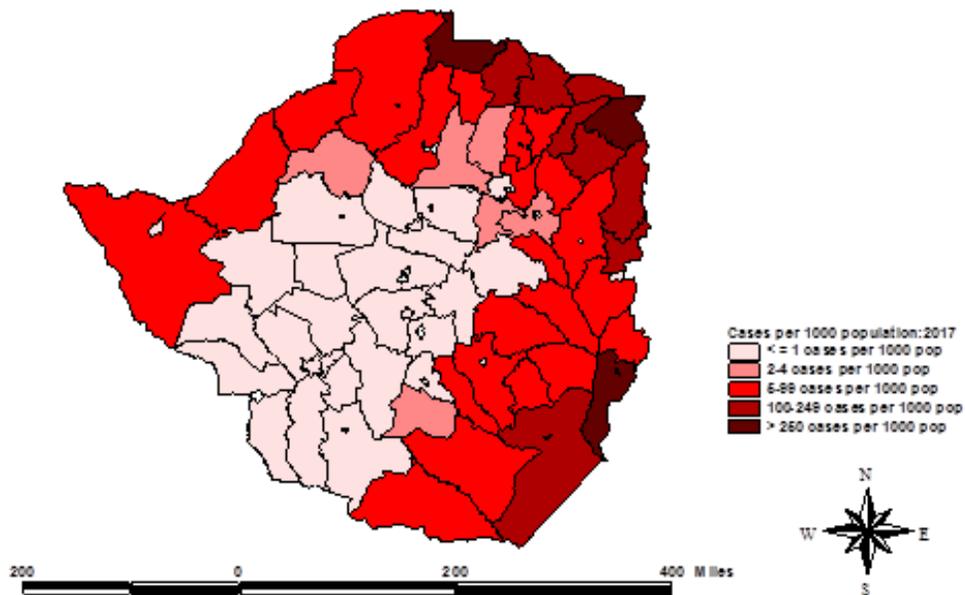


Figure 3. Malaria Incidence (per 1000 population*) by District, 2018

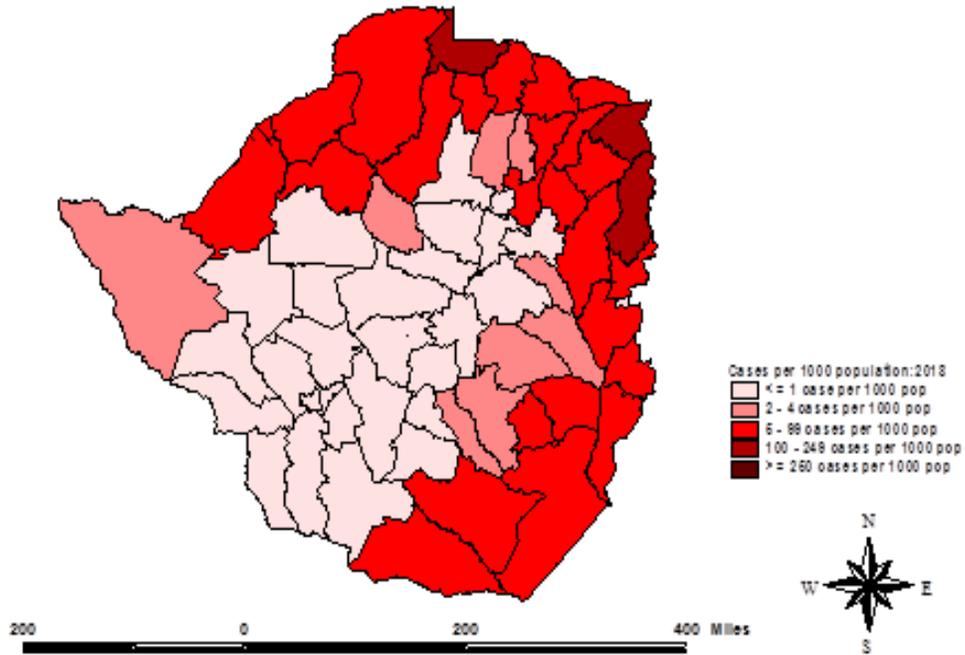


Figure 4. Trends in Malaria Prevalence , Percent of Children Under Five Who Tested Positive for Malaria by Microscopy and RDT

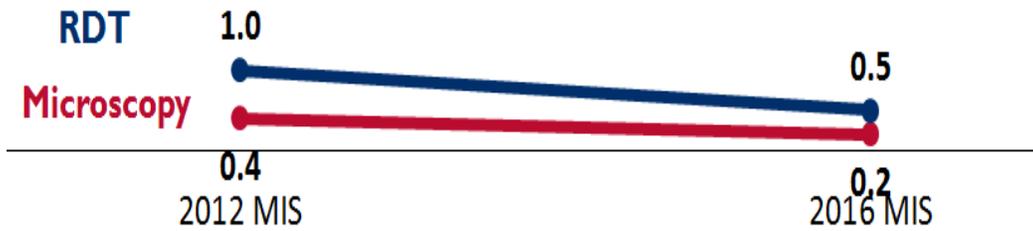


Figure 5. Trends in Prevalence of Low Hemoglobin , Percent of Children Age 6-59 Months with Moderate-to-Severe Anemia (Hemoglobin <8.0 g/dl)

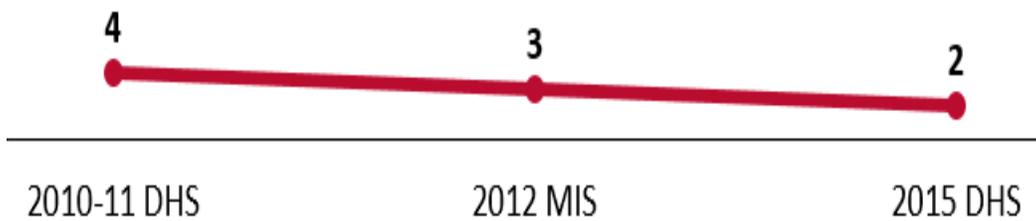


Figure 6. Key Indicators for Malaria Prevention and Treatment Coverage and Impact Indicators

Indicator	2010-11 DHS	2012 MIS	2014 MICS	2015 DHS	2016 MIS
% Households with at least one ITN	29	46	42	48	58
% Households with at least one ITN for every two people	12	n/a	21	26	51
% Population with access to an ITN ¹	22	n/a	34	43	42
% Population that slept under an ITN the previous night ¹	9	49	24	10	26
% Children under five years of age who slept under an ITN the previous night	10	58	27	9	33
% Pregnant women who slept under an ITN the previous night	10	n/a	26	6	25
% Children under five years old with fever in the last two weeks for whom advice or treatment was sought ²	43	n/a	47	51	65
% Children under five years of age with fever in the last two weeks who had a finger or heel stick	7	n/a	14	13	n/a
% Children receiving an ACT among children under five years old with fever in the last two weeks who received any antimalarial drugs	49	n/a	79	n/a	n/a
% Women who received two or more doses of IPTp during their last pregnancy in the last two years ³	8	35	13	n/a	36
% Women who received three or more doses of IPTp during their last pregnancy in the last two years ³	n/a	n/a	6	n/a	20
Under-five mortality rate per 1,000 live births	84	n/a	n/a	69	n/a
% Children under five years of age with parasitemia (by microscopy , if done)	n/a	0.4	n/a	n/a	0.2
% Children under five years of age with parasitemia (by RDT , if done)	n/a	1.0	n/a	n/a	0.5
% Children under five years of age with severe anemia (Hb<8gm/dl)	4	3	n/a	2	n/a

Source: Demographic Health Surveys (DHS) and Malaria Indicator Surveys (MIS) from 2011-2018.

*DHS/MICS surveys are generally fielded during the dry season, whereas MIS surveys are deliberately fielded during the high transmission season, which should be taken into consideration when interpreting these indicators. Additionally, the sampling frames and data analysis methodologies for the 2012 and 2016 MIS differed substantially and comparisons should be made with caution.

Footnotes:

¹Data presented from the 2010 DHS, 2015 DHS, and 2016 MIS for these two ITN indicators reflect the recalculated figures presented in the unpublished report A Secondary Analysis of the Zimbabwe Malaria Indicator Survey 2016 with Respect to ITN Ownership and Use completed with PMI support in coordination with the Zimbabwe NMCP. As a result, these figures may differ from those in the original publications.

²Note that this indicator has been recalculated according to the newest definition, care or treatment from any source excluding traditional practitioners, wherever possible.

³Note that this indicator has been recalculated according to the newest definition, at least the specified number of doses of SP/Fansidar from any source, wherever possible.

Figure 7. Evolution of Key Malaria Indicators Reported through Routine Surveillance Systems

Indicator	2014	2015	2016	2017	2018
# Suspect malaria cases ¹	1,477,287	1,405,368	1,245,217	1,583,047	1,325,711
# Patients receiving diagnostic test for malaria ²	1,454,640	1,385,195	1,227,131	1,536,353	1,291,530
Total # malaria cases ³ (confirmed and presumed)	540,866	384,109	280,842	468,759	264,752
# Confirmed cases ⁴	540,866	384,109	280,842	468,759	264,752
# Presumed cases ⁵	N/A	N/A	N/A	N/A	N/A
% Malaria cases confirmed ⁶	N/A	N/A	N/A	N/A	N/A
Test positivity rate (TPR) ⁷	37%	28%	23%	31%	21%
Total # <5 malaria cases ⁸	81,784	45,452	25,969	57,243	23,814
% Cases under 5 ⁹	15.1	11.8	9.2	12.2	8.9
Total # severe cases ¹⁰	N/A	N/A	N/A	N/A	N/A
Total # malaria deaths ¹¹	406	462	235	420	236
# Facilities reporting ¹²	1,758	1,758	1,758	1,758	1,758
Data form completeness (%) ¹³	91.5	93.5	94.9	95.6	97.2

Data sources and comments: N/A = not available

Definitions:

¹ Number of patients presenting with signs or symptoms considered to be possibly due to malaria, includes health facility and community levels.

² Number of patients receiving a diagnostic test for malaria (RDT or microscopy). All ages, outpatient, inpatient. Includes health facility and community levels.

³ Total # cases: Total number of reported malaria cases. All ages, outpatient, inpatient, confirmed and unconfirmed cases. Includes health facility and community levels.

⁴ # confirmed cases: n/a, see footnote 3. Breakdown of cases confirmed vs. presumed is not captured and normally, all cases are assumed to be “confirmed”.

⁵ # presumed cases: n/a, see footnote 4.

⁶ % Malaria Cases confirmed: n/a, see footnote 4.

⁷ Test Positivity Rate (TPR): Number of confirmed cases (#4 above)/Number of patients receiving a diagnostic test for malaria (RDT or microscopy) (#2 above)

⁸ Total #<5 cases: Total number of <5 cases. Outpatient, inpatient, confirmed, and unconfirmed. Includes only facility-level cases, as reporting system for community-level cases does not currently breakdown by age.

⁹ Total # <5 cases (#8 above) / Total # of cases (# 3 above)

¹⁰ Total number severe malaria cases: n/a, improving ability to report this data is a work in progress for NMCP and PMI.

¹¹ Total # Malaria Deaths Reported: All ages, outpatient, inpatient, confirmed, and unconfirmed.

¹² Total # of health facilities reporting data into the HMIS/DHIS2 system for that year.

¹³ Data completeness: Number of monthly reports received from health facilities/Number of health facility reports expected (i.e., number of facilities expected to report multiplied by the number of months considered).

III. OVERVIEW OF PMI’S SUPPORT OF ZIMBABWE’S MALARIA CONTROL STRATEGY

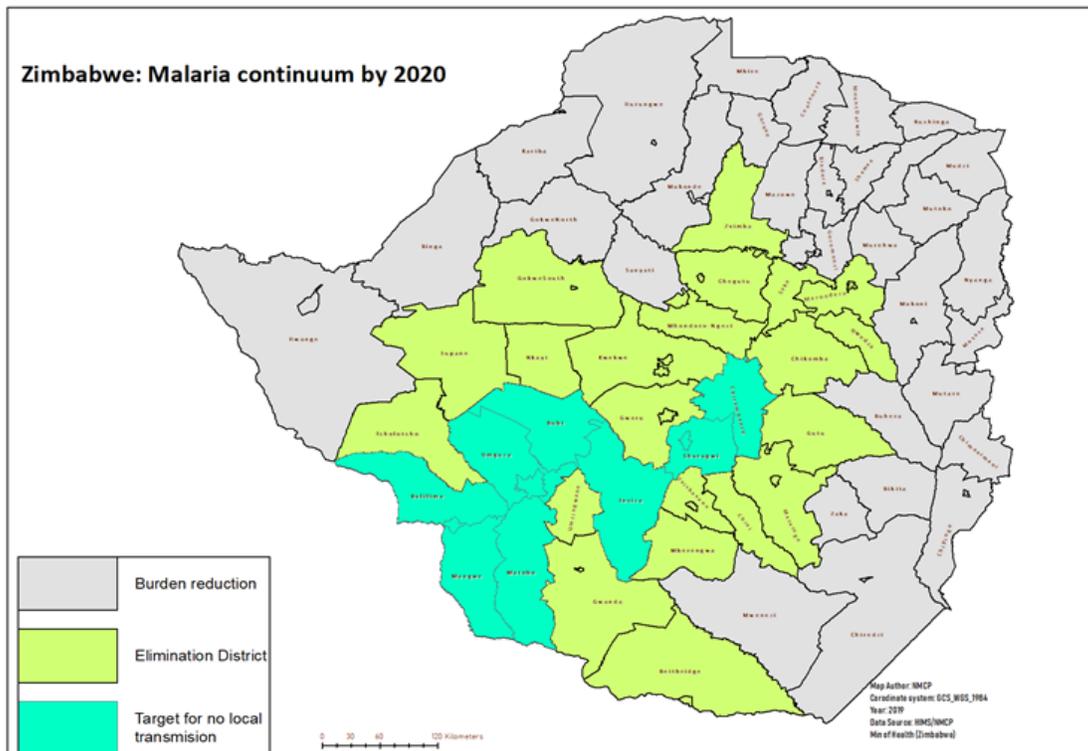
The vision of the Zimbabwe 2016-2020 *National Malaria Strategic Plan* (NMSP), which is currently under revision, is to achieve a malaria-free Zimbabwe, with the primary goal to “reduce malaria incidence to 5/1,000 and malaria deaths by at least 90 percent of the 2015 figure by 2020”. To achieve this, the Zimbabwe NMCP supports the following major intervention areas:

vector control; malaria case management; malaria in pregnancy (including IPTp); social and behavior change (SBC); surveillance, monitoring, and evaluation; malaria elimination; and malaria program management. Although categorized slightly differently, the strategies and activities implemented within these areas are closely aligned with those prioritized by PMI. Notable exceptions include the NMCP's promotion and implementation of larval source management and personal protection measures against malaria vectors outside of the malaria elimination context; and the national policy recommending pre-referral rectal artesunate for all age groups.

As one of two primary malaria donors in Zimbabwe, PMI coordinates closely with the NMCP and the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) to ensure complementarity of support for implementation of the Zimbabwe 2016-2020 *National Malaria Strategic Plan*. PMI provides financial and technical support for the full range of PMI priority intervention areas, as outlined in Figure 1. Portions of this support are directed to the central and national levels (e.g., technical assistance to central level MoHCC staff, laboratory capacity building, and procurement of malaria commodities for nationwide distribution), while other components are targeted directly to the provincial and district levels (e.g., malaria case management and IRS). Although there is substantial overlap between the general intervention areas funded by PMI and Global Fund, the targeting of specific activities is usually divided either geographically or by more detailed content area. For instance, PMI and Global Fund both support IRS, but in distinct geographical areas, and PMI's support for service delivery strengthening is targeted to only 15 high-burden districts, with the remainder receiving support through Global Fund. One notable exception is that both PMI and Global Fund procure and distribute malaria case management commodities through Zimbabwe's pooled supply chain management and distribution system.

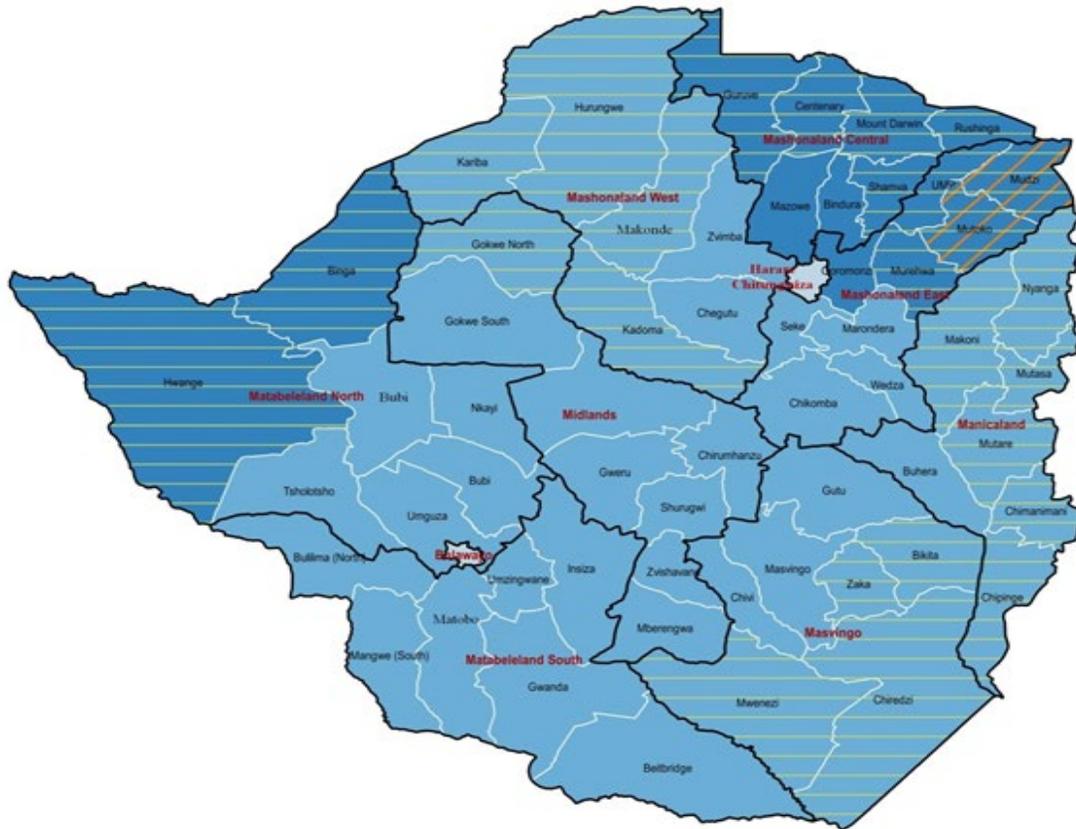
Historically, PMI's provincial and district-level support has targeted higher burdened areas located in the northern and eastern parts of the country (see Figure 7). Under the leadership of NMCP, this support has contributed greatly to the overall reduction in malaria burden and, as a result, PMI will continue to primarily direct resources to these high-burdened areas. However, Zimbabwe experiences the full spectrum of malaria epidemiology, including areas with very limited transmission in the central plateau and south-western portions of the country. In 2012, NMCP initiated elimination activities for seven low-burden districts, which was subsequently expanded to a total of 20 districts by 2015. Under the 2016-2020 *National Malaria Strategic Plan*, the NMCP set an objective of implementing a package of elimination activities in 29 districts and achieving malaria elimination in nine of these districts by 2020. As of 2019, 29 districts are implementing a package of elimination interventions (see Figure 6), three districts have recorded no local transmission for the last two years and an additional three have recorded no local transmission for the last one year. The package of elimination interventions includes the addition of low-dose primaquine for malaria case management, malaria case investigation and classification, and foci investigation and classification. A case-based surveillance system has been operationalized with support from CHAI in these districts.

Figure 8. Zimbabwe Districts Implementing Elimination Activities as of 2019 and Districts Targeted for Elimination According to the 2016-2020 *National Malaria Strategic Plan*.



In FY 2018, PMI provided initial funding to support NMCP’s malaria elimination efforts in Zimbabwe and additional support was included in the FY 2019 MOP. PMI has worked closely with the NMCP and the Clinton Health Access Initiative (CHAI) to identify areas of synergy and avoid duplication of effort. Currently, PMI is supporting Lupane District in Matabeleland North Province to enhance capacity of MoHCC staff to implement enhanced surveillance, foci response, foci mapping using geographic information system (GIS) and entomological investigation and response. If review of these efforts is favorable, PMI/Zimbabwe will consider expanding the geographic and technical scope of support for malaria elimination.

Figure 9. PMI Intervention Support Map



FY 2019 PMI-Supported Activities

- Nationwide support: Procure RDTs and ACTs, strengthen pharmaceutical management and entomological monitoring, and support SBCC and SM&E activities.
- Focused support: Above-listed activities + procure/distribute ITNs.
- Intense support: Focused support activities + strengthen malaria service delivery at the health and community level and enhanced support for routine surveillance.
- Procure SP for IPTp and (in a subset of districts) strengthen IPTp
- Indoor residual spraying
- Regional boundary (district-level boundaries are outlined in white)

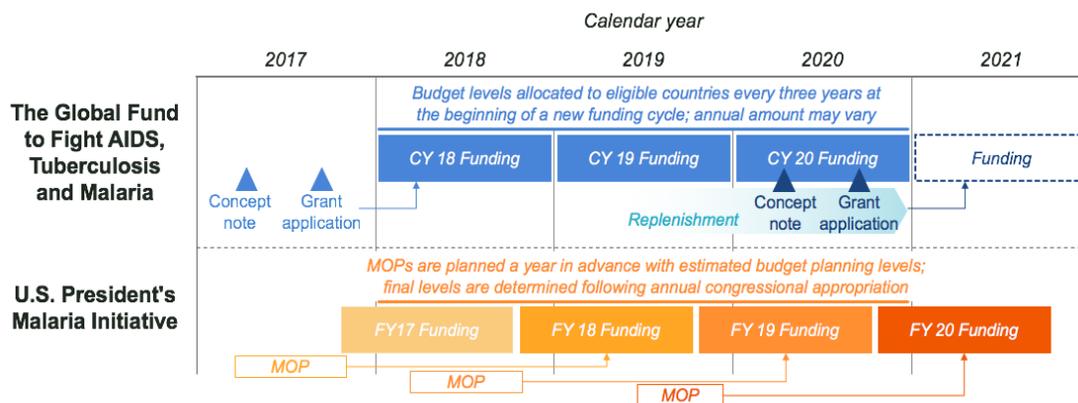
While not yet digitized, Gurube has been split into two districts: Gurube and Mbire.

IV. PARTNER FUNDING LANDSCAPE

PMI emphasizes the importance of partner alignment on malaria control. With the recognition that each of the agencies emphasizes complementary funding support for the national malaria control effort in a given country, over the last year, PMI, Global Fund, and the Bill and Melinda Gates Foundation (BMGF) set out to harmonize financial, supply chain, and programmatic data, and this effort remains ongoing as of the time of this MOP. A harmonized financial taxonomy has been developed for PMI and Global Fund (i.e. mapping cost categories across organizations).

The illustrative figure below visualizes the annual cycle of PMI funding and the MOP implementation year. As the figure illustrates, any given FY MOP funds activities that take place during the next FY. For example, a FY18 MOP funds implementation during FY19. Whereas Global Fund funding (and often, other partners and host country governments) is based on a three-year grant cycle on a calendar year (CY) timeframe during which activities were implemented. Annual PMI country budget allocations depend largely on the U.S. Congress' total overall malaria funding appropriation to USAID in a given fiscal year, as well as other considerations (e.g. previous funding levels, activity and program pipelines, other donor contributions, known commodity needs/gaps, progress on ongoing PMI-supported activities, clear evidence of continued government commitment to malaria control).

Figure 10: PMI and Global Fund Funding Cycle Alignment



Footnote: In some cases, Global Fund's funding may come in partway through the calendar year. Funding levels in "Section IV - Partner Funding Landscape" and commodity procurement amounts listed in "Annex A - Intervention Specific Data" may differ given the lag between the year that funding was planned and the year when procurement orders were placed. Differences may be a reflection of timing and/or based on changes in commodity consumption levels at country level, changes in commodity costs, or other donor orders.

The tables below summarize contributions by external partners and host country government in calendar years 2018-20, with the goal of highlighting total country investments. For Zimbabwe, data is available for PMI (FY 18) and Global Fund (CY 2018-20). As the Global Fund 2021-23 grant funding cycle is not yet underway at the time of this PMI FY 20 MOP development, Global Fund country investments for the 2021 implementation period and beyond are not yet known. Note that the host country government invests substantial funding into the national-to-local infrastructure and service delivery for malaria and many other programs. However, there has not been a standardized method for attributing those investments to malaria specifically. Thus, it may not yet be possible in the FY 2020 MOP cycle to attribute funding from the host country's government. There may be similar challenges for other partners.

Figure 11. Annual Budget by Level 1 Category

Year ¹	Funder	Vector Control	Case Management	Drug-Based prevention ²	Supply Chain ³	Monitoring, Evaluation & Research	Other Cross-Cutting and Health Systems Strengthening	Total
FY17/CY18	PMI	\$9.2M	\$1.6M	\$0.2M	\$1.4M	\$0.5M	\$2.1M	\$15.0M
	Global Fund	\$8.7M	\$2.5M	\$0.2M	\$0.2M	\$1.9M	\$3.5M	\$17.0M
	Total	\$17.9M	\$4.1M	\$0.4M	\$1.5M	\$2.4M	\$5.6M	\$32.0M
FY18/CY19	PMI	\$8.1M	\$2.7M	-	\$1.2M	\$1.1M	\$2.1M	\$15.0M
	Global Fund	\$16.8M	\$1.6M	\$0.1M	\$0.3M	\$0.5M	\$2.5M	\$21.8M
	Total	\$24.8M	\$4.3M	\$0.1M	\$1.5M	\$1.6M	\$4.5M	\$36.8M
FY19/CY20	PMI	\$7.3M	\$2.9M	-	\$1.1M	\$1.6M	\$2.1M	\$15.0M
	Global Fund	\$7.5M	\$1.2M	\$0.1M	\$0.2M	\$1.2M	\$2.7M	\$12.9M
	Total	\$14.8M	\$4.1M	\$0.1M	\$1.2M	\$2.8M	\$4.9M	\$27.9M

Footnotes:

¹ Each year's figures represent the FY for PMI and CY for GFATM that most closely align. Global Fund budget data accurate as of July 1, 2019. PMI budget data accurate as of Sept 1, 2019.

² Drug-based prevention, including SMC and MIP where relevant;

³ Covers management of in-country warehousing & distribution of malaria commodities, except for ITNs which are separately captured under "Vector Control"

Note: Categories shown reflect the harmonized financial taxonomy (Levels 1-3) developed by BMGF, Global Fund, and PMI in 2019, as part of a broader data harmonization initiative; potential for categories to continue to evolve through FY 2020 MOP process, as well as for additional donors and host country governments to adopt and reflect funding using the same categories.

Figure 12. Annual Budget by Level 3 Category, Detailed Breakdown for PMI and Global Fund

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund	PMI	Global Fund	PMI	Global Fund
Vector Control	Procure ITNs for Continuous Distribution	\$2.3M	-	\$2.1M	-	\$2.0M	-
	Distribute ITNs via Continuous Distribution	\$0.7M	\$0.3M	\$0.9M	\$0.2M	\$0.8M	-
	Procure ITNs for Mass Campaigns	-	-	-	\$2.9M	-	\$2.0M
	Distribute ITNs via Mass Campaigns	-	\$0.6M	-	\$0.8M	-	\$0.4M

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund	PMI	Global Fund	PMI	Global Fund
	Other ITN Implementation*	-	-	-	-	-	-
	IRS Implementation ⁴	\$5.5M	\$2.6M	\$4.5M	\$2.7M	\$4.0M	\$2.2M
	Procure IRS Insecticide ⁴	-	\$3.9M	-	\$7.6M	-	\$1.9M
	Other IRS*	\$0.03M	-	\$0.01M	-	\$0.03M	-
	Entomological Monitoring	\$0.6M	\$0.1M	\$0.6M	\$0.1M	\$0.5M	\$0.0M
	SBC for Vector Control ⁵	-	\$0.4M	-	\$0.1M	-	\$0.1M
	Other vector control measures	-	-	-	-	-	-
	Removing human rights- and gender-related barriers to vector control programs**	-	-	-	-	-	-
Case Management	Active Case Detection**	-	-	-	-	-	-
	Community-based case management	-	\$0.2M	-	\$0.2M	-	\$0.2M
	Facility-based case management	-	\$0.8M	-	\$0.6M	-	\$0.4M
	Private-sector case management	-	-	-	-	-	-
	Procure ACTs	-	\$0.1M	\$0.6M	\$0.0M	\$0.7M	\$0.0M
	Procure Drugs for Severe Malaria	-	\$0.2M	-	-	\$0.1M	\$0.1M
	Procure Other Diagnosis-Related Commodities	-	\$0.1M	-	\$0.03M	-	\$0.40M
	Procure Other Treatment-Related Commodities	-	\$0.1M	-	\$0.01M	-	\$0.01M
	Procure RDTs	\$0.1M	\$0.2M	\$0.6M	\$0.2M	\$0.5M	\$0.1M
	Therapeutic Efficacy	-	-	-	-	-	-
	SBC for Case Management ⁵	-	\$0.2M	-	\$0.1M	-	\$0.0M
	Other Case Management	\$1.6M	\$0.4M	\$1.5M	\$0.4M	\$1.6M	\$0.2M

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund	PMI	Global Fund	PMI	Global Fund
Drug-Based Prevention²	Procure SMC-Related Commodities	-	-	-	-	-	-
	SMC Implementation	-	-	-	-	-	-
	Prevention of Malaria in Pregnancy Implementation	-	-	-	-	-	-
	Procure IPTp-Related Commodities	\$0.2M	\$0.2M	-	\$0.1M	-	\$0.1M
	IPTi**	-	-	-	-	-	-
	SBC for Drug-Based Prevention ⁵	-	-	-	-	-	-
	Other Prevention**	-	-	-	-	-	-
Supply Chain³	In-Country Supply Chain ³	-	-	\$0.6M	-	\$0.3M	-
	Supply Chain Infrastructure	-	-	-	-	-	-
	Ensuring Quality	-	\$0.2M	-	\$0.3M	-	\$0.2M
	Pharmaceutical Management Systems Strengthening	\$1.4M	-	\$0.6M	-	\$0.8M	-
	Supply Chain System Strengthening	-	-	-	-	-	-
Monitoring, Evaluation & Research	Reporting, Monitoring, and Evaluation	\$0.5M	\$0.6M	\$1.0M	\$0.2M	\$0.4M	\$0.0M
	Program and data quality, analysis, and operations research	-	\$1.3M	-	\$0.4M	-	\$1.1M
	Surveys	-	-	\$0.0M	-	\$1.2M	-
	Other Data Sources**	-	-	-	-	-	-
	Support for FETP*	-	-	-	-	-	-

Level 1 Category	Level 3 Category	FY17/CY18 ¹		FY18/CY19 ¹		FY19/CY20 ¹	
		PMI	Global Fund	PMI	Global Fund	PMI	Global Fund
Other Cross-Cutting and Health Systems Strengthening	Integrated service delivery, quality improvement, and national health strategies**	-	-	-	-	-	-
	Financial management systems**	-	-	-	-	-	-
	Community responses and systems**	-	-	-	-	-	-
	Support for PCV and SPAs*	-	-	-	-	-	-
	Cross-Cutting Human Resources for Health**	-	-	-	-	-	-
	Central and Regional Program management ⁶	-	\$0.5M	-	\$0.4M	-	\$0.5M
	In-Country Staffing and Administration*	\$1.6M	-	\$1.5M	-	\$1.6M	-
	Other Program Management**	-	\$3.0M	-	\$2.0M	-	\$2.2M
	SBC Unspecified ⁵	\$0.5M	-	\$0.5M	-	\$0.5M	-
Total		\$15.0M	\$17.0M	\$15.0M	\$21.8M	\$15.0M	\$12.9M

Footnotes:

¹ Each year's figures represent the FY for PMI and CY for Global Fund that most closely align. Global Fund budget data accurate as of July 1, 2019. PMI budget data accurate as of Sept 1, 2019;

² Drug-based prevention, including SMC and MIP where relevant;

³ Covers management of in-country warehousing & distribution of malaria commodities, except for ITNs which are separately captured under "Vector Control";

⁴ May include the cost of IRS insecticides if full cost of IRS implementation including commodities was bundled within single line in prior year's Table 2;

⁵ SBC was not historically split in the PMI budget across intervention areas, hence the row "SBC (unspecified)" for the FY2020 MOP cycle. Going forward, SBC proposed activities will be categorized across vector control, case management, and prevention (new categories).

⁶ PMI Proposed Activity "National-level support for case management" rolls up under "Case Management" Level 1

Note: Categories shown reflect the harmonized financial taxonomy (Levels 1-3) developed by BMGF, Global Fund, and PMI in 2019, as part of a broader data harmonization initiative; potential for categories to continue to evolve through FY 2020 MOP process, as well as for additional donors and host country governments to adopt and reflect funding using the same categories.

* Category currently funded by PMI only

** Category currently funded by Global Fund only

Figure 13. Annual Budget, Breakdown by Commodity

Year ¹	Funder	ITNs for Continuous Distribution	ITNs for Mass Distribution	IRS Insecticide ⁴	ACTs	RDTs	Severe Malaria	SMC-Related	IPTp-related	Total
FY17/CY18	PMI ²	\$2.3M	-	-	-	\$0.1M	-	-	\$0.2M	\$2.4M
	Global Fund ³	-	-	\$3.9M	\$0.1M	\$0.2M	\$0.2M	-	\$0.2M	\$4.3M
	Total	\$2.3M	-	\$3.9M	\$0.1M	\$0.3M	\$0.2M	-	-	\$6.8M
FY18/CY19	PMI ²	\$2.1M	-	-	\$0.6M	\$0.6M	-	-	-	\$3.2M
	Global Fund ³	-	\$2.9M	\$7.6M	\$0.0M	\$0.2M	-	-	\$0.1M	\$10.7M
	Total	\$2.1M	\$2.9M	\$7.6M	\$0.6M	\$0.8M	-	-	-	\$14.0M
FY19/CY20	PMI ²	\$2.0M	-	-	\$0.7M	\$0.5M	\$0.1M	-	-	\$3.3M
	Global Fund ³	-	\$2.0M	\$1.9M	\$0.0M	\$0.1M	\$0.1M	-	\$0.1M	\$4.1M
	Total	\$2.0M	\$2.0M	\$1.9M	\$0.7M	\$0.6M	\$0.2M	-	-	\$7.4M

Footnotes:

¹ Each year's figures represent the FY for PMI and CY for Global Fund that most closely align. Global Fund budget data accurate as of July 1, 2019. PMI budget data accurate as of Sept 1, 2019 ;

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 in a given year. Additional costs, including quality control, freight, insurance, and customs totaled \$4.4 million over the CY2018-2020 period;

⁴ IRS insecticide; for PMI, IRS insecticide commodity costs may be inextricable from IRS implementation costs in historical data – field left blank where this is the case.

Note: Categories shown reflect the harmonized financial taxonomy (Levels 1-3) developed by BMGF, Global Fund, and PMI in 2019, as part of a broader data harmonization initiative; potential for categories to continue to evolve through FY 2020 MOP process, as well as for additional donors and host country governments to adopt and reflect funding using the same categories.

V. ACTIVITIES TO BE SUPPORTED WITH FY 2020 FUNDING

Please see the FY 2020 budget tables (Tables 1 and 2) for a detailed list of activities PMI proposes to support in Zimbabwe with FY 2020 funding. Please refer to www.pmi.gov/resource-library/mops for the latest tables. Key data used for decision-making can be found in Annex A.

ANNEX A: INTERVENTION-SPECIFIC DATA

1. VECTOR CONTROL

NMCP objective
<p>Zimbabwe has a long history of vector monitoring and control through IRS, dating back to 1949. Because of this history and continuous evidence of positive results, IRS has been a major intervention in the country. The current NMCP vector control strategy, as outlined in the 2016-2020 <i>National Malaria Strategic Plan</i>, combines IRS with the relatively recent addition of ITNs, circa 2008. NMCP policy is to deploy either IRS or ITNs in 530 malarious wards within 31 malarious districts, with a commitment to achieve and maintain universal coverage. No overlap of the two vector control measures is indicated, except under specific and limited circumstances (see below). Larval source management is also recommended for implementation in accordance with WHO guidance but there is limited application in the country.</p> <p>According to the <i>Surveillance, Monitoring and Evaluation plan for the Zimbabwe Malaria Control Strategic Plan 2016-2020</i> (revised, December 2018), the objective for vector control coverage is to protect the population at risk of malaria with an appropriate intervention, including ensuring:</p> <ul style="list-style-type: none">● Coverage of 95 percent of the population targeted for IRS.● Universal coverage with ITNs in targeted areas, defined as 85 percent of the households having at least one ITN per sleeping space.● At least 85 percent of the general population sleeps under an ITN every night.● Treatment of 95 percent of identified, active breeding sites with an appropriate larvicide.
NMCP approach
<p>According to the 2016-2020 <i>National Malaria Strategic Plan</i>, the country deploys IRS in areas with an annual parasite index (API) of 5 per 1,000 population or greater. In keeping with the 2016-2020 <i>Insecticide Resistance Monitoring and Management Plan for Malaria Vectors in Zimbabwe</i>, rotation of insecticides is indicated after two years of use and insecticides with different modes of action should be alternated, taking into consideration the available vector resistance data.</p> <p>ITNs are deployed in areas with an API of 2 - 4 per 1,000 population. In areas of decreasing transmission, IRS is scaled back and ITNs are implemented as the API reaches the ITN target range. Zimbabwe also recognizes the existence of special communities for which IRS may be indicated according to API but community members reside in un-sprayable structures or predominantly sleep outside. In such locations, both IRS and ITNs may be implemented within the same district or ward. The two maps below show how IRS is being replaced with ITNs in keeping with reductions in malaria transmission.</p>

Figure A1. IRS and LLINs Deployment, 2016-2017

Zimbabwe: Vector control interventions

IRS and LLINs deployment, 2016-17

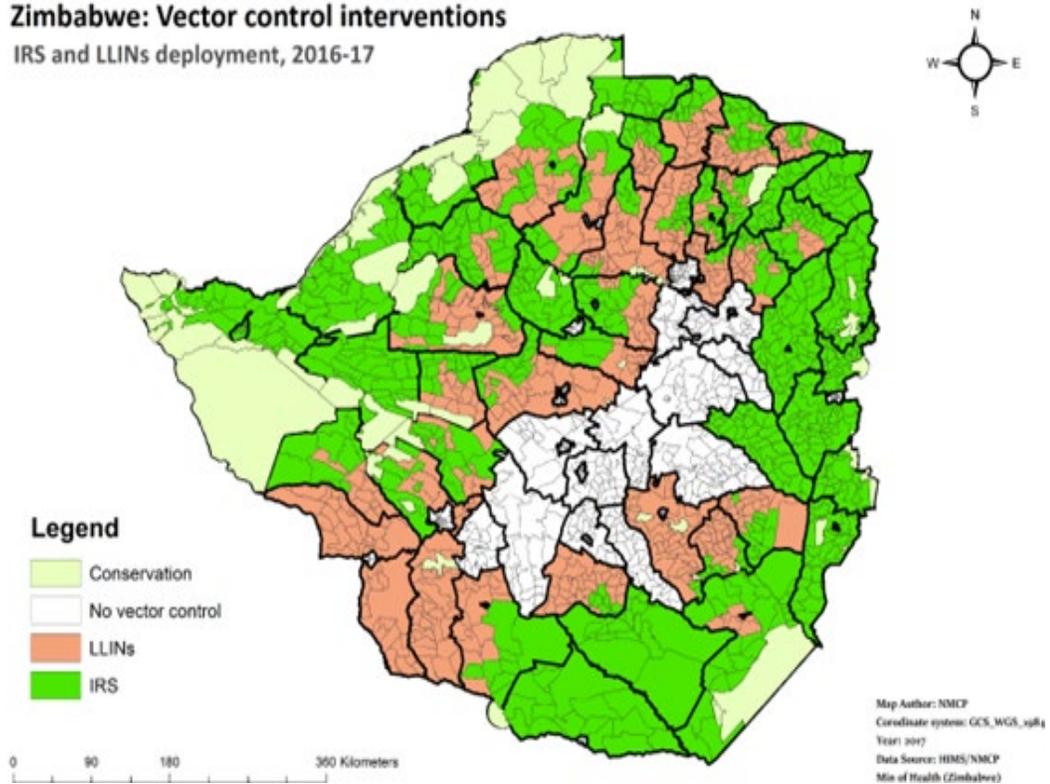
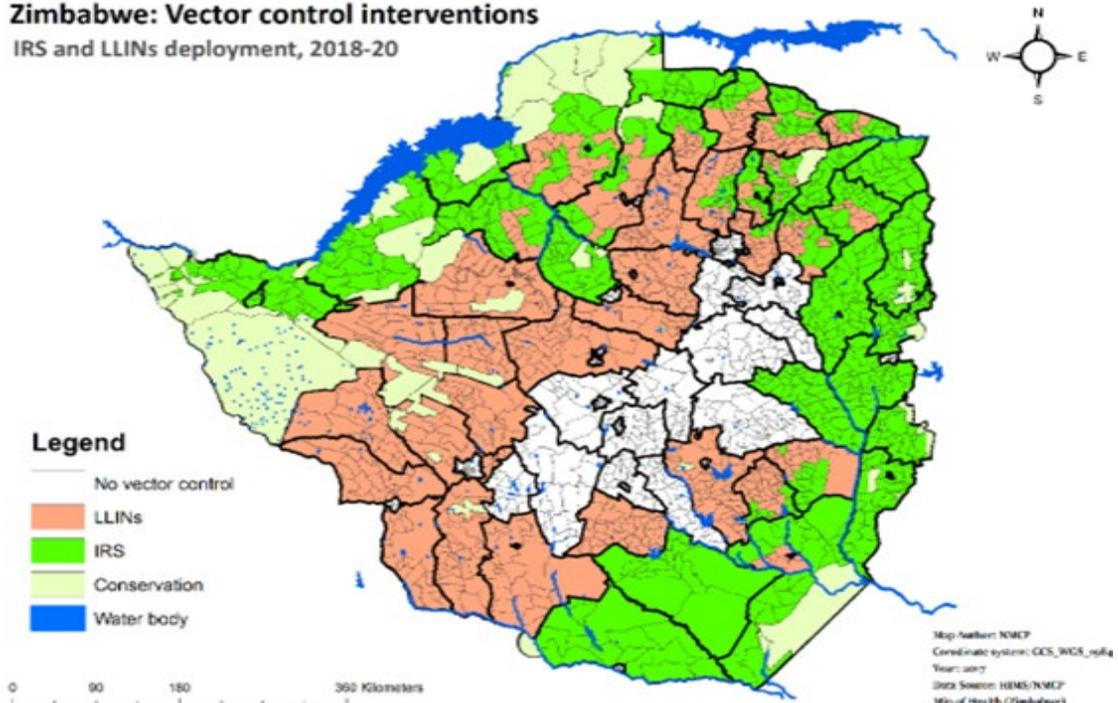


Figure A2. IRS and LLINs Deployment, 2018-2020

Zimbabwe: Vector control interventions

IRS and LLINs deployment, 2018-20



NMCP employs a mixed model of ITN distribution, including mass campaigns (every three years), which cover the wards targeted for ITNs and not the whole country, and routine distribution through public health facilities (ANC and EPI) and community channels. ITNs are also used in emergency situations and to control outbreaks, for example to protect survivors of last year's Cyclone Idai, which affected several districts on the eastern border. According to the current distribution policy, ITNs should not be distributed in areas with known pyrethroid resistance, as defined using the WHO standard (mortality of less than 90 percent).

With regard to larval source management, the NMCP recommends targeted larval source management in districts or wards with an API of less than 1 per 1000 population, large irrigation schemes, and urban areas where few, fixed and findable breeding sites can be identified.

This year (2019), the NMCP and partners have started to develop an integrated vector management (IVM) for the period 2020-2025. It is anticipated that, when finalized, policies and guidance for all vector control interventions applicable in Zimbabwe will be well aligned and articulated in a single document.

PMI objective, in support of NMCP

PMI/Zimbabwe supports nearly all aspects of the NMCP's vector control strategy, including entomologic surveillance, IRS, and mass and continuous distribution of ITNs. PMI/Zimbabwe does not support larval source management implementation. The PMI-supported entomological surveillance results have helped inform choice of IRS insecticides to NMCP and also help to inform where to distribute LLINs, taking into account pyrethroid resistance.

PMI-supported recent progress (past ~12-18 months)

- PMI/Zimbabwe provided support for implementation and strengthening of entomological monitoring, including:
 - Provision of technical and financial support for monthly, routine entomological surveillance activities at two sites in Manicaland Province and four sites in Mashonaland East Province. This included collecting data on malaria vector species composition and abundance, behavior, and insecticide susceptibility.
 - Coordinating with CHAI and the NMCP to support the training of health personnel in entomological monitoring approaches in Lupane District.
 - Supporting the development of an insectary at Africa University (AU) to increase the country's capacity to provide mosquitoes for cone bioassays and as control specimens for insecticide susceptibility tests.
 - Continued establishment of a molecular and immuno-diagnostic laboratory for analysis of entomological specimens at AU.
- PMI/Zimbabwe supported implementation and strengthening of IRS activities, including:

- Planning, implementing, and monitoring a comprehensive IRS campaign in two high-burden malaria districts in Mashonaland East Province. Through PMI's support, 112,805 structures were sprayed, achieving 90.1 percent coverage and protecting 276,343 people.
- Developing and implementing a transitional strategy for the withdrawal of PMI/Zimbabwe IRS support from four districts in Manicaland province over to government-supported IRS, including critical technical assistance around environmental compliance and planning.
- Conducting geo-mapping in the two PMI/Zimbabwe-supported IRS districts, which included using satellite and machine imagery to guide identification of eligible structures as part of a ground-truthing exercise.
- Procuring 54,794 bottles of Actellic CS OPs, which were added to the stock remaining from the previous season (7,933) and used for spraying the targeted two districts.
- Employing, training, and supervising more than 300 spray personnel.
- Distributing 20,000 IRS brochures and 1,100 IRS posters in the two PMI/Zimbabwe-supported districts.
- Conducting 115 sensitization meetings (provincial, district and ward-based) to enhance uptake of IRS by communities.
- An external assessment to evaluate the environmental compliance and management of PMI-funded IRS program was conducted in the two PMI-supported districts.
- PMI/Zimbabwe supported implementation and strengthening of ITN distribution activities, including:
 - Distribution of nearly 625,000 ITNs through mass distribution campaigns, covering a total of 223,270 households. Of the total ITNs distributed, three percent were for covering outside sleeping spaces. This was the first time that outside sleeping spaces were specifically earmarked for ITN distribution. The total population covered was 993,262 out of a target population of 967,141 (99.8 percent).
 - Training of 348 health workers and 1,632 VHWs to conduct mass distribution campaigns.
 - Conducting outreach to 28,592 community members through community sensitization meetings.
 - Finalization of the 36-month net durability study.
 - Over 101,000 rectangular ITNs were distributed through continuous distribution channels (EPI, ANC, and community).

- Challenges and bottlenecks that slowed or prevented progress included the deteriorating political and socio-economic environment, in which cash and fuel shortages and rapidly shifting monetary policies created substantial procurement and logistical challenges. These challenges resulted in delayed implementation of planned activities.

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

- Using MOP FY 2019 funds, PMI/Zimbabwe will continue to support the implementation and strengthening of entomological activities, including:
 - Implementing entomological surveillance, including insecticide susceptibility monitoring in sentinel sites in areas receiving PMI/Zimbabwe-supported IRS. Entomological surveillance activities will include assessments of vector density and behavior, wall bioassays, molecular analysis, and insecticide resistance testing.
 - Strengthening of foci investigation and response capacity in Lupane District in Matabeleland North and, if resources allow, selected areas in neighboring districts.
 - Building laboratory capacity for entomological surveillance by continuing to expand entomological laboratory and insectary capacity at National Institute for Health Research (NIHR) and AU.
- PMI/Zimbabwe will continue support for the strengthening and implementation of IRS operations, including:
 - Direct support for implementation of spray activities in the two districts in Mashonaland East province during 2019 spray season, using MOP FY 2018 funds. PMI/Zimbabwe will continue to provide direct support for spray operations during the 2020 spray season, likely in the same two districts, but exact targeting will depend upon upcoming planning discussions in-country.
- PMI/Zimbabwe will continue to support the procurement and distribution of ITNs through continuous and routine channels.

1.A. 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

Do you propose expanding, contracting, or changing any entomological monitoring activities? If so, why, and what data did you use to arrive at that conclusion?

The funding envelope for entomological monitoring within MOP FY 2020 will remain relatively consistent with recent years. However, PMI/Zimbabwe will work to improve the targeting of resources to maximize the quantity and quality of entomological surveillance data available for programmatic decision-making. This will include a partial shift in partners and enhanced collaboration with the NIHR and AU, including the provision of technical assistance and the procurement of laboratory and insectary supplies and equipment.

PMI has continued to advocate with the NMCP and NIHR regarding the need for a review and revision of the strategic approach to entomological monitoring nationwide, which is long overdue. However, coordination among the various institutions involved has been limited and no progress toward a revised, functional strategy has been realized. Recently, there has been a change in leadership at the NIHR, with a concomitant shift toward increased partner engagement and a desire to provide direction and ownership of entomological monitoring activities. PMI/Zimbabwe is optimistic that this will result in greater movement toward a coordinated and productive entomological monitoring system and will continue to work with the new NIHR leadership and NMCP on this aspect.

PMI/Zimbabwe will continue to support capacity building for entomological investigation and response in elimination areas. This will include continued capacity building and support for implementation in Lupane District in Matabeleland North, with possible expansion into neighboring districts as resources allow.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

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

Supporting Data

Figure A3. Entomological Surveillance and Insecticide Resistance Test Sites for August 2018 - August 2019

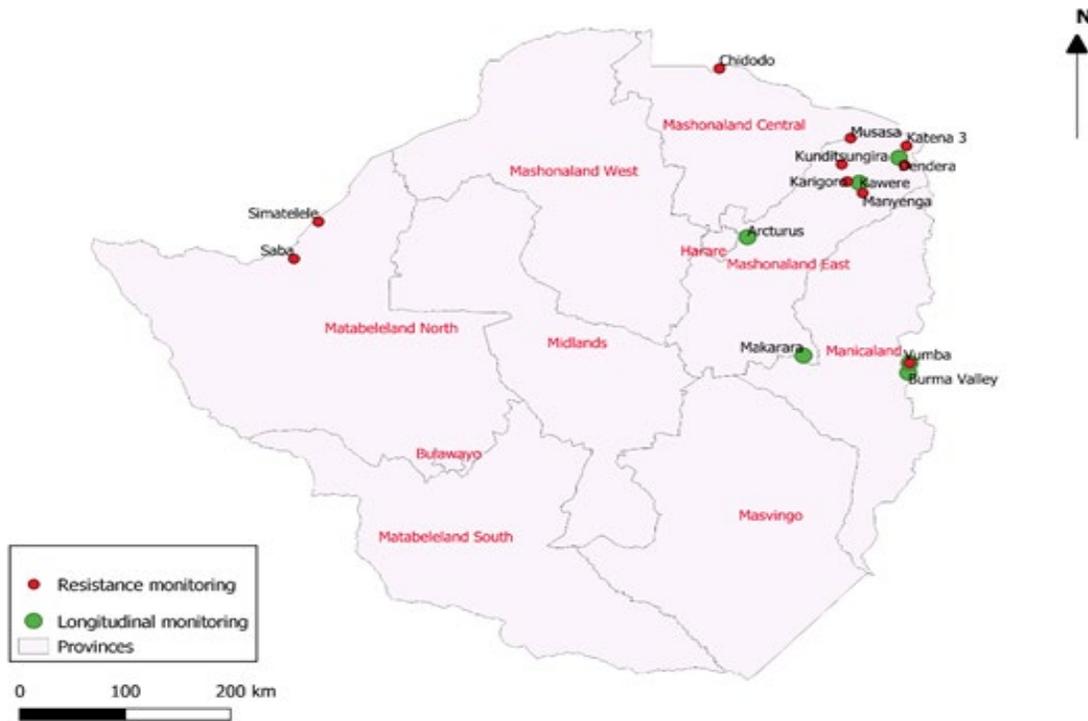


Figure A4. Entomological Activities from August 2018 - August 2019

Province	Total sentinel sites	Activities	Supported by
Manicaland	2 (Burma Valley, Vumba) 1 (Vumba)	Longitudinal monitoring (2) Resistance monitoring (1)	PMI
Mashonaland East	4 (Dendera, Kawere, Acturus, Makarara) 5 (Mafuta, Katena 3, Mayenga, Karigoro, Musasa, Kunditsungira)	Longitudinal monitoring (4) Resistance monitoring (6)	PMI
Mashonaland Central	1 (Chidodo)	Resistance Monitoring (1)	PMI
Matabeleland North	1 (Saba, Simatelele)	Resistance Monitoring (2)	PMI

Figure A5. Vector Distribution and Bionomics, Based on August 2018 - August 2019 Activities

Site	Major Vector	Minor Vector	Peak Abundance	Preferred Biting Location	Preferred Resting Location
Burma Valley	<i>An. funestus</i> s.l	--	N/A	<i>An. funestus</i> s.l (O)	<i>An. funestus</i> s.l (O)
Vumba (Non-IRS Site)	<i>An. funestus</i> s.l	--	<i>An. funestus</i> s.l (Jan-Apr)	<i>An. funestus</i> s.l (O)	<i>An. funestus</i> s.l (O)
Dendera	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l	N/A	<i>An. gambiae</i> s.l. (O) <i>An. funestus</i> s.l (Undetermined)	<i>An. funestus</i> s.l (O) <i>An. gambiae</i> s.l. (O)
Kawere	<i>An. funestus</i> s.l	<i>An. gambiae</i> s.l.	N/A	<i>An. funestus</i> s.l (Undetermined) <i>An. gambiae</i> s.l. (Undetermined)	<i>An. gambiae</i> s.l. (O)
Arcturus	<i>An. funestus</i> s.l	<i>An. gambiae</i> s.l	N/A	<i>An. funestus</i> s.l (Undetermined) <i>An. gambiae</i> s.l. (Undetermined)	<i>An. funestus</i> s.l (O) <i>An. gambiae</i> s.l. (O)
Makarara (Non-IRS site)	<i>An. funestus</i> s.l	<i>An. gambiae</i> s.l.	<i>An. funestus</i> s.l (Undetermined)	<i>An. funestus</i> s.l (O) <i>An. gambiae</i> s.l. (Undetermined)	<i>An. funestus</i> s.l (O) <i>An. gambiae</i> s.l. (O)

Note: Data unavailable for Preferred Host, Peak Sporozoite Rate, and Annual EIR

* Please denote specific months if it is not estimated for all 12 months of the year

Undetermined = mosquito densities were too low to reach a conclusion

I = Indoor; O = Outdoor

Laboratory processing for mosquito species identification, preferred host and sporozoite rate on going

Conclusion

Between August 2018 – August 2019, PMI longitudinal monitoring activities were conducted in two sites in Manicaland Province (Vumba, and Burma Valley) and four sites in Mashonaland East Province (Arcturus, Dendra, Kaere and Makarara). The NCMP carried out IRS in Burma Valley and Arcturus using DDT, while PMI supported IRS operations in Dendra and Kawere. Makarara and Vumba were non-IRS sites (control). Mosquito collections were carried out using light traps (LTs), LT set alongside a human bait as a proxy to human landing collections (HLC-Proxy), pyrethrum spray collections (PSCs) and pit traps (PTs).

Anopheles funestus s.l. was the predominant species at all the sites except for Dendra, where *An. gambiae* s.l. was predominant. Other *Anopheles* species collected were *An. pretoriensis*, *An.*

squamosis, *An. coustani* and *An. rufipes*. The role of these mosquitoes in malaria transmission has yet to be determined. Light trap collections indicated higher numbers of malaria vectors (both *An. funestus* s.l. and *An. gambiae* s.l.) outdoors versus indoors at all sites and might be indicative of the preference to feed outdoors. This could negatively impact the effectiveness of IRS and ITN vector control strategies. Molecular analysis of mosquito specimens for species, blood meal analysis and determination of malaria parasite infection rates by immunodiagnostic methods is currently ongoing at Africa University. The predominance of outdoor biting that was observed is a cause for concern. This could be the major contributor for residual malaria transmission that should be given due attention it deserves. If Zimbabwe is to suppress the malaria burden further at a faster pace, there is a need to find methods and tools for dealing with this outdoor biting behavior of mosquitoes.

Key Question 2

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

Supporting Data

Figure A6. Insecticide Resistance Testing, Using WHO Insecticide Resistance Assay and CDC Bottle Assay, on Adult *Anopheles gambiae* s.l. from Larval Collections and *An. funestus* s.l. to a Range of Insecticides at Respective Diagnostic Concentrations.

Province	District	Site	Anopheles species	DDT	Deltamethrin	Lambda-cyhalothrin	Permethrin	Chlorfenapyr	Priniphos-methyl	Clothianidin	
Manicaland	Mutare	Burma Valley	<i>An. funestus</i> s.l.	S							
Mataberland North	Binga	Saba	<i>An. gambiae</i> s.l.	S			S		S		
		Simatelele		S							
Mashonaland Central	Mbire	Chidodo		S	S	S			S		
Mashonaland East	Mudzi	Mafuta			S						S
		Katena 3						S			
	Mutoko	Manyenga			S						S
		Karigoro									S
	UMP	Musasa			S						S
		Kunditsungira									S
Mawanza									S		

Conclusion

Between 2018 -2019, *Anopheles gambiae* s.l. from larval collections in a total of 10 sites in four provinces (Manicaland, Matabeleland North, Mashonaland Central and Mashonaland East) were tested for insecticide resistance. The CDC bottle assay and the WHO insecticide resistance assay were used for testing. Following World Health Organization (WHO) guidelines for both the CDC bottle and WHO resistance assay, mortalities between 98-100 percent indicate that mosquitoes are susceptible, mortalities between 90-97 percent indicate possible resistance, while anything below 90 percent mortality indicates resistance.

An. gambiae s.l. adults were raised from larval collections for these assays. In Manicaland Province where PMI had previously conducted IRS, there is an increasing predominance of *An. funestus* as the main vector. It is difficult to collect sufficient *An. funestus* larvae to conduct insecticide resistance assays. Instead adult females collected in Burma Valley were used to raise the next generation of mosquitoes and these were then tested for resistance to DDT, the insecticide used by the NMCP for IRS in this province. The *An. funestus* from Burma Valley were fully susceptible to DDT. The *An. gambiae* s.l. tested in Matabeleland North, Mashonaland Central and Mashonaland East sites with deltamethrin, permethrin, lambda-cyhalothrin, DDT and Pirimiphos-methyl were all susceptible. As part of the development of insecticide resistance management strategy and future use of new approved insecticides, clothianidin and chlorfenapyr were tested in Mashonaland East sites. Mosquitoes tested in five sites were fully susceptible to clothianidin and mosquitoes tested at Katena 3, were also susceptible to chlorfenapyr.

Key Question 3

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

Supporting Data

Historically, PMI supported the revitalization of the entomology insectaries at NIHR in Harare and its satellite laboratory, De Beers, in Chiredzi District. Insectary and laboratory revitalization efforts included technical assistance, specific guidance on maximizing mosquito colonies, and support for equipment, reagents, and other consumable supplies.

PMI's support to the NIHR insectaries has helped to improve the supply of laboratory-reared mosquitoes for entomological surveillance needs in Zimbabwe. NIHR has also struggled to meet the demand for molecular and other laboratory analyses. Despite PMI's efforts, NIHR continued to struggle to provide services that meet the malaria program's needs. The reasons for this underperformance included, among others, managerial and negative attitude towards external support. This prompted PMI to look for other partners and expand options for laboratory services for entomology. With the recent change in leadership at NIHR, PMI/Zimbabwe is hopeful that the new leadership is willing to engage and accept external support so that investment at NIHR will be utilized to the fullest.

Conclusion

PMI, working with other partners such as NIHR and NMCP, will strive to ensure that entomological surveillance is strengthened as much as possible. New leadership at NIHR and the existence of other partners like Africa University, if coordinated very well, will improve the supply of mosquito samples for residual testing as well as insecticide resistance testing.

Improved supply of mosquito samples will enable conducting of resistance intensity testing to provide information for decision -making. It is also anticipated that the analyses of molecular and laboratory mosquito samples will improve, reduce backlog, and provide timely data to guide decisions. Currently data for ITN insecticide efficacy are limited in Zimbabwe. This is an area that needs strengthening, considering the fact that pyrethroid resistance has been observed in Zimbabwe.

1.B. INSECTICIDE-TREATED NETS (ITNs)

PMI Goal

Achieve high coverage and usage with effective ITNs in malaria endemic, PMI-supported areas (in the context of the current insecticide resistance situation) and maintain high coverage and use with consistent ITN distribution (via campaigns and/or continuous channels in a combination that is most effective given country context). Determine the geographic distribution, bionomics, and insecticide resistance profiles of the main malaria vectors in the country to inform decision-making regarding ITN deployment.

Do you propose expanding, contracting, or changing any ITN activities? If so, why and what data did you use to arrive at that conclusion?

Planned Changes from FY19 Programming:

During MOP20 implementation, PMI will shift to expand ITN procurement/distribution, and continue to cultivate a culture of net ownership and consistent use for all sleeping spaces year round in ITN-targeted areas. NMCP and PMI commitment to the cultivation of consistent ITN use, year round, was renewed after the 2016 Malaria Indicator Survey findings were released and followed-up by a qualitative net use survey in 2017.

In MOP FY 2020, PMI plans to procure an estimated 20 percent increase above the number of ITNs historically supported by PMI in Zimbabwe, using funding shifted from IRS support. Consistent with the NMSP, some of the PMI-purchased ITNs will be distributed in areas transitioning from IRS, where reduced incidence has been achieved. Populations in these new wards/districts will be prepared for the IRS-ITN transition in advance by raising awareness, knowledge, and comfort levels with ITN protection through community and individual outreach. The NMCP, provincial, and district malaria staff will monitor the malaria transmission levels in these areas closely and report any unexpected increases in transmission to the NMCP vector control team. As needed, rapid situational assessments

will be conducted to determine the likely causative factors for increased transmission and additional interventions (e.g., SBC or targeted IRS) may be implemented. Over the past five years, NMCP data included national quantification of ITN needs with the NMSP expectation of the IRS-ITN transition of a number of districts. PMI and NMCP expect this trend of transitioning from IRS to ITNs will continue.

As per the NMSP, PMI and partners will continue working to create more demand for ITNs nationwide in both indoor and outdoor sleeping spaces. This initiative supports NMCP's emphasis on providing ITNs for outdoor sleeping spaces. In addition, by the time PMI/Zimbabwe is preparing to implement this MOP, the team expects to have additional insecticide resistance data to inform decisions regarding the need for the next generation of ITNs. If entomological data indicates next-generation nets or PBO nets are necessary, the PMI/Zimbabwe team will consult with the relevant PMI technical groups and plan for this change. The recent conclusion of net durability study in Zimbabwe suggests that physical durability of ITNs is within an acceptable range. Therefore, PMI expects replacement campaigns to occur to replace aging nets every third year. See results in the response to Key Question 7 below.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding

Summary of activities within the last 12-18 months

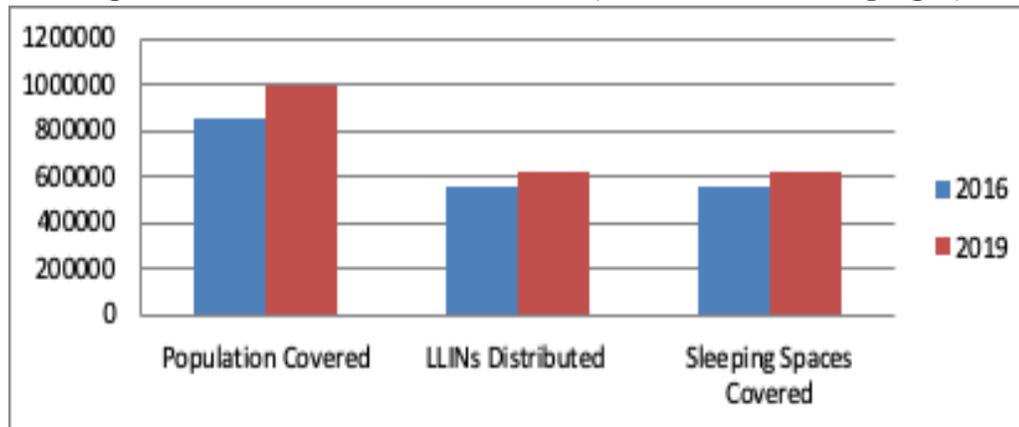
During the last 12-18 months, PMI supported the NMCP in conducting both mass and continuous distribution of ITNs under the theme "My Net, My Life". The following were some of the major achievements:

Mass Distribution

In 2019, PMI/Zimbabwe supported the implementation of a mass campaign in 10 districts. The broad objective for the ITN mass campaign was to increase ownership, access, correct and consistent utilization of ITNs and eventually reduce malaria transmission. Specific targets were to:

- Replace the ITNs distributed in 2016 by July 30, 2019
- Provide an ITN to every registered sleeping space in the targeted 144 wards in 10 districts by the 30th of July 2019

Figure A7. Mass Distribution of ITNs (2016 and 2019 Campaigns)



- A total of 348 health workers and 1,632 VHWs were trained on mass distribution
- A total of 993,262 people received ITNs. This figure represents a 16 percent increase compared to 2016.
- Sensitization activities reached 28,592 people, comprised of community leaders and ordinary community members, prior to conducting mass distribution activities
- A total of 624,458 blue (remaining stock) and white rectangular ITNs were distributed in 2019, which is an 11 percent increase compared to the 562,489 ITNs that were distributed in 2016. The increase between 2016 and 2019 may be due to the fact that in 2019 outside sleeping spaces were considered for ITNs distribution, which was not the case in 2016. Furthermore, the 2019 mass campaign included ten more wards than in 2016.

Continuous Distribution

In the past 12-18 months, PMI continued to support the MOHCC/NMCP in implementing the continuous distribution activities in 11 districts.

- The districts are Bindura, Centenary, Guruve, Mazowe, Mbire, Mt Darwin, Rushinga and Shamva in Mashonaland Central Province. In Mashonaland East Province three districts, namely Goromonzi, Hwedza and Murewa, are supported.
- At total of 29 health workers and 100 VHWs were trained on continuous distribution of ITNs.
- Over 101,000 rectangular ITNs were distributed through continuous distribution channels (EPI, ANC, and community).

Other Activities

- Training of 62 Environmental Health Technicians who were involved in distributing ITNs to communities in Chimanimani and Chipinge District of Manicaland Province that were affected by Cyclone Idai

- Deployment of a transition guide from conical to rectangular-shaped ITNs
- Deployment of an ITN aeration guide

Key Question 1

How has net ownership evolved since the start of PMI in the country? Are households fully covered?

Supporting Data

Figure A8: Trends in ITN Ownership, Percent of Households

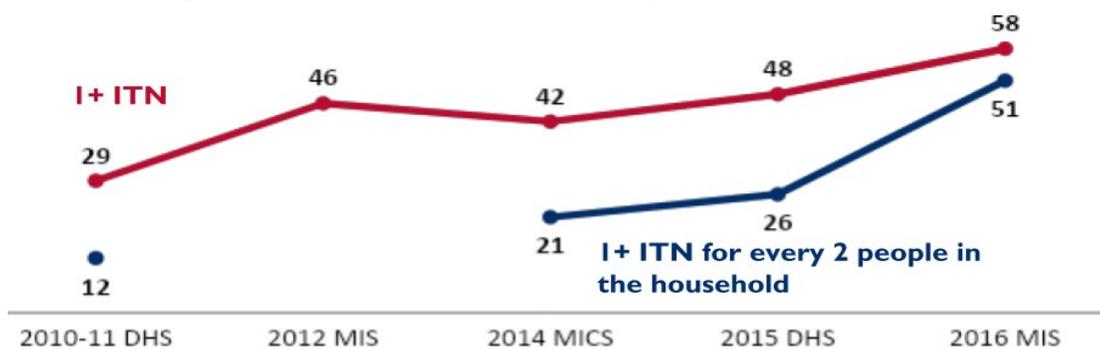


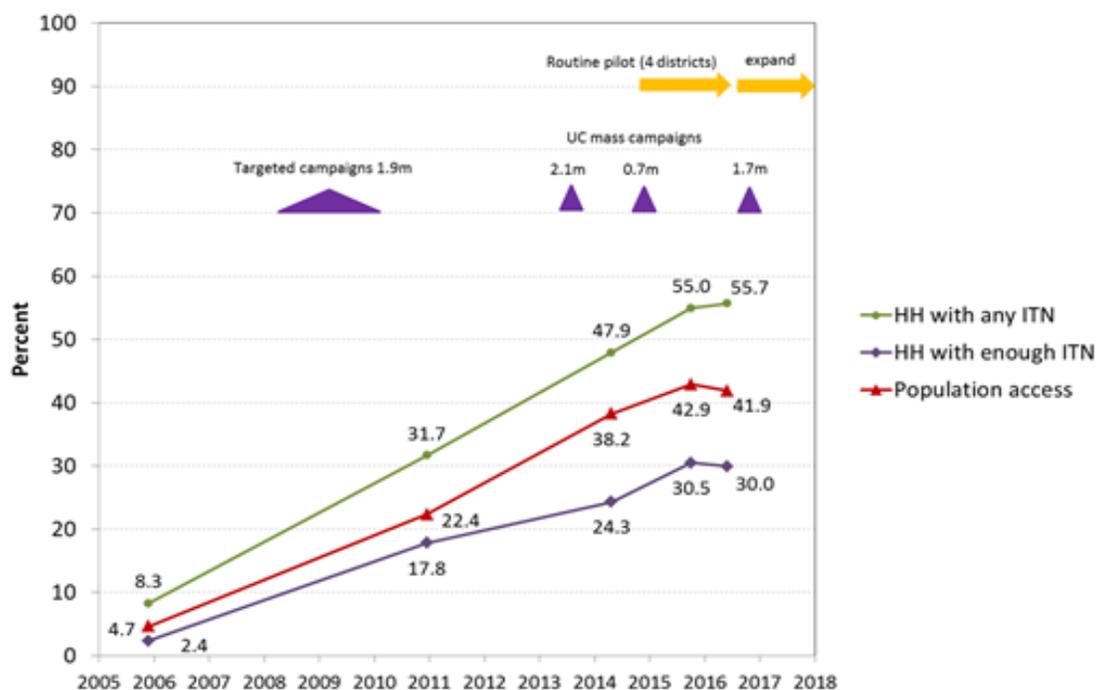
Figure A9. Secondary Analysis of Trends in ITN Ownership in Zimbabwe¹

Survey	HH with any ITN	HH with one ITN/ 2 people
DHS 2005	8.3% (6.9 – 9.9)	2.4% (1.9 – 3.0)
DHS 2010/11	31.7% (28.2 – 35.3)	17.8% (15.6 – 20.3)
MICS 2014/15	47.9% (45.2 – 50.6)	24.3% (22.4 – 26.4)
DHS 2015	55.0% (51.9 – 58.0)	30.5% (28.2 – 33.0)
MIS 2016	55.7% (51.1 – 60.2)	30.0% (26.0 – 34.3)

Source: Secondary Analysis of the Zimbabwe Malaria Indicator Survey 2016 with Respect to ITN Ownership and Use, Johns Hopkins Center for Communication Programs, Tropical Health, November 2017.

¹Denominators for calculated percentages in this secondary analysis include only areas targeted for ITN distribution.

Figure A10. Trends in Zimbabwe ITN Ownership Indicators 2005 to 2016 with Public Sector Distributions



“Enough” ITN refers to “at least 1 ITN for 2 people”, HH=household

Source: Secondary Analysis of the Zimbabwe Malaria Indicator Survey 2016 with Respect to ITN Ownership and Use, Johns Hopkins Center for Communication Programs, Tropical Health, November 2017.

Conclusion

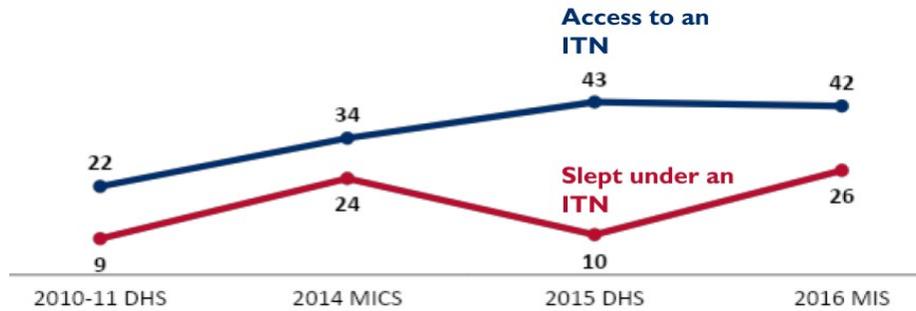
Historically, Zimbabwe NMCP vector control has depended primarily on IRS, since circa 1948. Only in the past decade has the country added ITNs as an equally valued and widely distributed vector control mechanism. However, today NMCP embraces both IRS and ITN coverage as equally important for malaria prevention. In 2005, ITN ownership was almost non-existent with 8 percent of households in the moderate- and high-transmission areas owning any ITN and 5 percent of the population with access to an ITN. As shown in the table and second figure above, ITN ownership increased dramatically in the following years due to the targeted distributions during 2008-10 and universal coverage mass campaigns of 2014-15, peaking at 55 percent of households with any ITN, 43 percent population access and 31 percent of households with enough ITN for all members (i.e., at least 1 ITN for 2 people) in 2016. The MIS 2016 results are similar to the DHS 2015 even though the data collection methodologies differ (in timing and geography). The MIS 2016 was done in April 2016, prior to a mass campaign done later in 2016. Campaigns and the introduction of continuous distribution have continued in subsequent years but ownership and use has not been measured in a national-level survey since 2016. The next survey is scheduled for 2020. PMI/Zimbabwe plans to support the MIS and potentially another secondary analysis of ITN data. The MIS/DHS in 2020 will help PMI/Zimbabwe and NMCP to understand progress and the determine the programmatic focus for ITN ownership, access, and consistent use.

Key Question 2

What proportion of the population has access to an ITN? In contrast, what proportion of the population reports using an ITN? What is the ratio between access and use? Does it vary geographically?

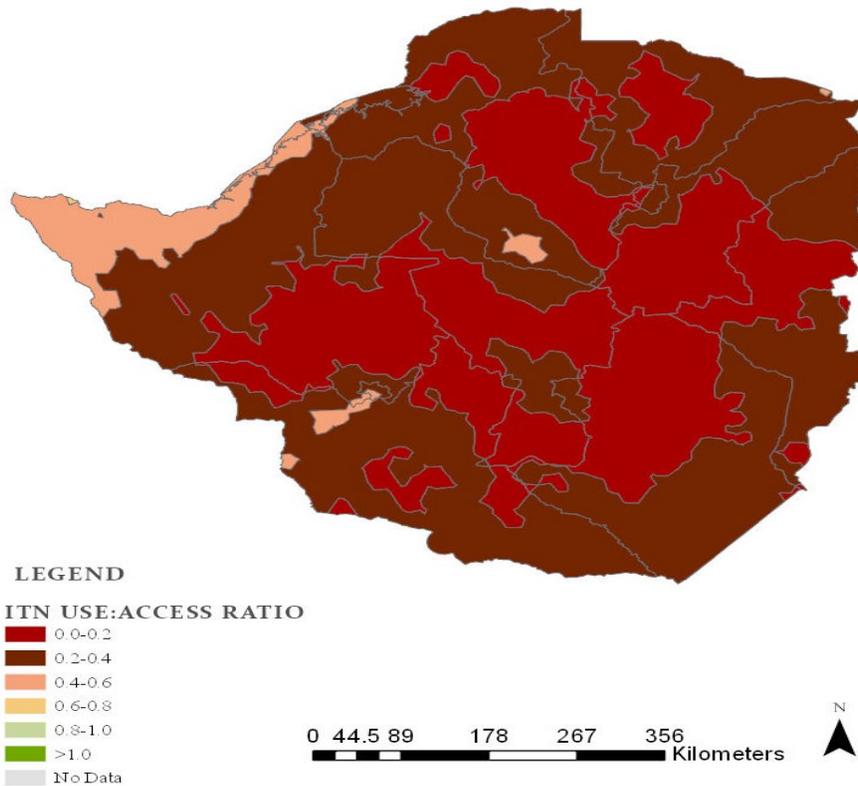
Supporting Data

Figure:A11: Trends in ITN Access and Use, Percent of Household Population with Access to an ITN with Access to an ITN and Who Slept Under an ITN the Night Before the Survey



Note: DHS and MICS surveys are generally fielded during the dry season, as opposed to MIS surveys, which are deliberately fielded during the high-transmission season, which should be taken into consideration when interpreting the ITN use indicator

Figure A12: Zimbabwe ITN Use and Access Ratio



Source: DHS 2015

Figure A13: Trends in Zimbabwe Population Access to ITNs, by Province¹

Province	DHS 2005	DHS 2010	MICS 2014	DHS 2015	MIS 2016
Manicaland	5.1%	35.1%	51.4%	45.9%	36.1%
Mashonaland Central	6.8%	24.6%	41.2%	34.5%	33.9%
Mashonaland East*	3.1%	18.0%	34.8%	43.1%	54.1%
Mashonaland West	5.7%	15.0%	38.5%	52.5%	37.1%
Matabeleland North	4.1%	29.2%	62.2%	57.7%	52.8%
Matabeleland South*	3.0%	3.5%	5.9%	32.2%	74.0%
Midlands*	6.6%	23.1%	28.1%	37.6%	25.0%
Masvingo*	1.6%	21.8%	40.2%	40.0%	29.7%

Source: Secondary Analysis of the Zimbabwe Malaria Indicator Survey 2016 with Respect to ITN Ownership and Use, Johns Hopkins Center for Communication Programs, Tropical Health, November 2017.

¹Denominators for calculated percentages in this secondary analysis include only areas targeted for ITN distribution.

Figure A14: Secondary Analysis of Trends in Zimbabwe Population ITN Use the Previous Night¹

Survey	Population using ITN last night	Population using ITN if access
DHS 2005	2.2% (1.7 – 2.8)	44.6% (39.9 – 50.4)
DHS 2010	9.4% (7.9 – 11.0)	40.6% (37.2 – 44.1)
MICS 2014	26.6% (24.6 – 28.6)	65.4% (63.5 – 67.2)
DHS 2015	9.7% (8.5 – 11.0)	22.2% (19.9 – 24.7)
MIS 2016	25.9% (23.3 – 28.7)	54.8% (51.2 – 58.4)

Source: Secondary Analysis of the Zimbabwe Malaria Indicator Survey 2016 with Respect to ITN Ownership and Use, Johns Hopkins Center for Communication Programs, Tropical Health, November 2017.

¹Denominators for calculated percentages in this secondary analysis include only areas targeted for ITN distribution.

Analysis of population access to ITNs by province shows demonstrated considerable geographic variation in this indicator across the national-level surveys. Even though the indicator ‘Population using ITN last night’ has been low historically in Zimbabwe’s national-level surveys, the column labeled ‘Population using ITN if Access’ illustrates ITN use among those the previous night who had an ITN available. ITN use if access was much higher than ITN use overall but still varied between 22.2 percent in the DHS 2015 and a maximum of 65.4 percent in the MICS 2014. Results for the MIS 2016 were 54.8 percent and the second highest observed for

Zimbabwe in a national survey so far. (Note: Variation between surveys is most likely driven by the timing of the survey data collection and the rainy season and the geographic sampling including non-malarious and non-ITN designated areas.)

Conclusion

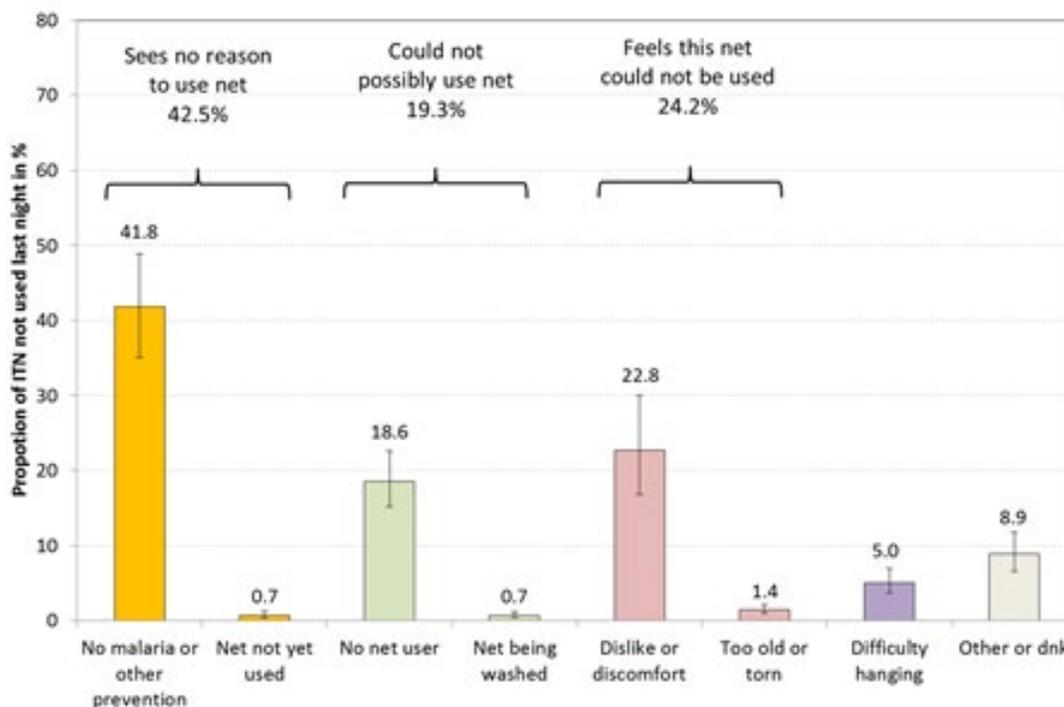
Overall, these results during the first half of the 2000's on ITN use suggest that the net use culture in Zimbabwe is less than optimal. Since analysis of this data in 2016, NMCP, PMI and partners have been working on increasing net ownership, access within the household and use by addressing the most identified barrier to use - low risk perception. The next national level survey to measure ITN improvement is planned in 2020.

Key Question 3

In areas where ITN access is high but use is low, what is known about the key barriers and facilitators to use?

Supporting Data

Figure A15: Why ITN Was Not Used the Previous Night



Source: Secondary Analysis of the Zimbabwe Malaria Indicator Survey 2016 with Respect to ITN Ownership and Use, Johns Hopkins Center for Communication Programs, Tropical Health, November 2017.

The MIS 2016 ITN secondary analysis highlights the most common reason (42.5 percent of all nets not used) for not using an ITN was that *households did not feel there was a reason to use a net mainly because they thought there was no malaria* and to a small degree that they were already using other, alternative, preventive measures (mainly coils). The NMCP follow-up ITN

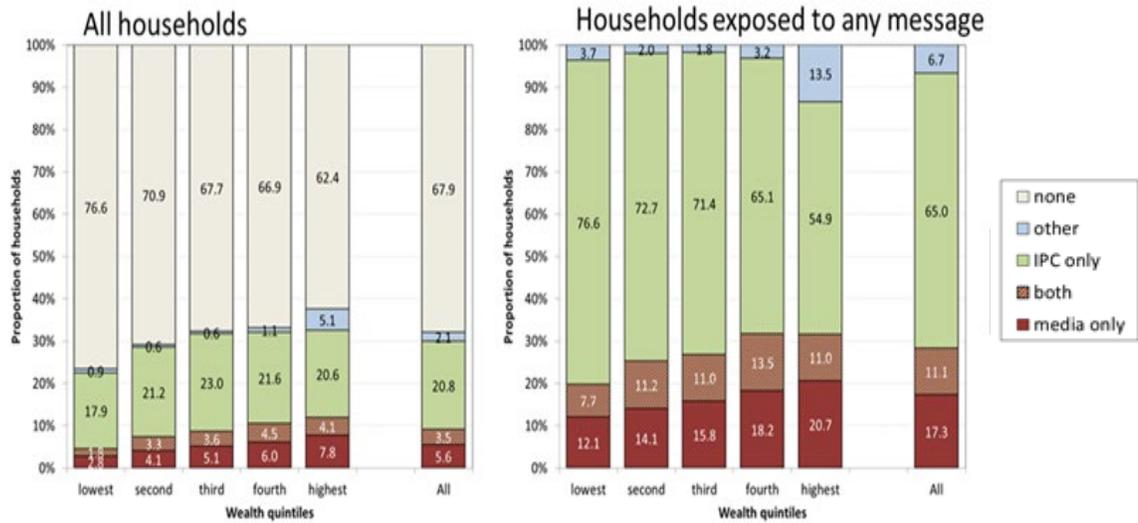
Knowledge Attitudes and Practices (KAP) Study, which collected extensive qualitative data, corroborates this important barrier on risk perception. The NMCP KAP study found that most respondents in all districts perceived that malaria was seasonal and, therefore, risk was not always present. High risk was perceived during the rainy season, only. Furthermore, the existence of mosquitoes, as evidenced by their sounds in the evening or at night, was also perceived to be associated with high risk of malaria. Therefore, if no mosquitoes were perceived to be present based on their sounds, then ITN usage would not be necessary. The twin, dominant ITN use barriers of low perceived risk outside of the rainy season and/or when mosquito sounds are absent is something NMCP acknowledged that it must address. (Source: *Understanding Long Lasting Insecticidal Net Utilization Amongst Households in Malaria Transmission Districts of Zimbabwe*, NMCP, December 2017.)

The second most common reason for not using a net in the MIS 2016 (24.2 percent) was that people felt that the net could not be used for reasons of discomfort or dislike (mainly “too hot” and “itching”) or that it was too old and torn. Almost one in five nets (19.3 percent) were not used because the net user was not around, the net was extra or it was being washed, i.e., it could objectively not have been used. Reported difficulty in hanging the net was a minor problem, applying to 5.0 percent of the unused nets. Among the 8.9 percent of nets not used for other reasons, explanations included “forgot”, “was too lazy” or occasionally “was drunk”.

Another potential barrier to ITN use is that overall exposure to messages about malaria was low, as shown in the graphic below from the ITN secondary analysis, only 32.1 percent (95 percent CI 30.5-33.7) of household respondents having been exposed in the last six months. Further, recall of malaria messages and knowledge of malaria transmission increased with increasing exposure to messages and this had a moderate but statistically significant positive effect on ITN use. These findings came as a great concern to NMCP and they have been working to correct it for subsequent years and consistently advocating for more SBC funds from all donors.

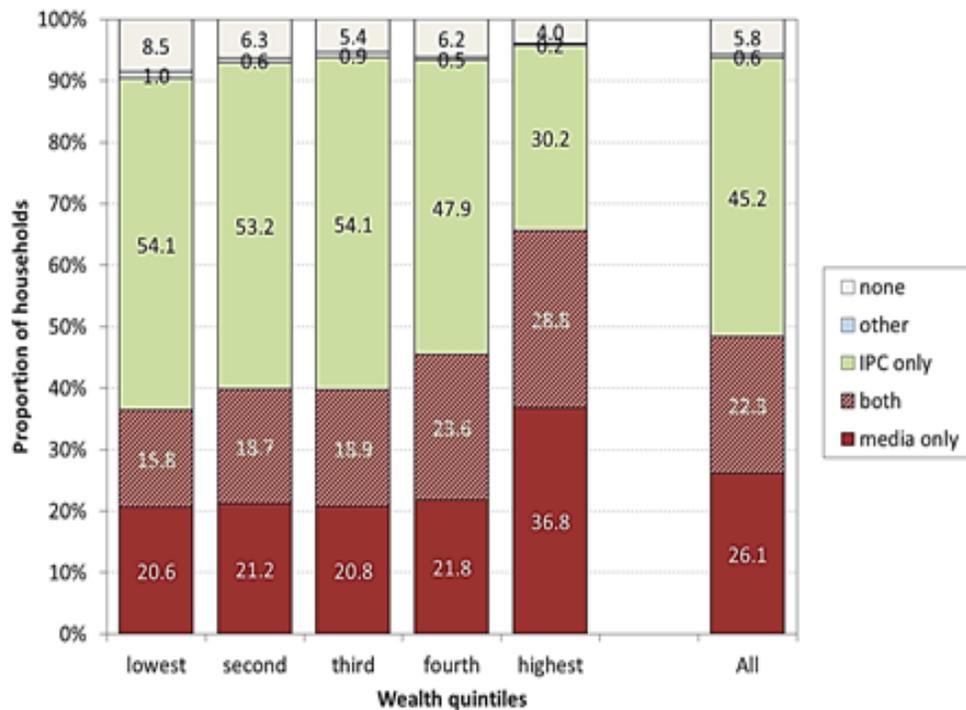
Exposure to messages increased significantly with increasing wealth ($p < 0.0001$) as shown in the left panel (Figure A16), but also the type of BCC channel differed by wealth quintile (right panel) with media (mainly radio and pamphlets) being more common in the higher quintiles and interpersonal communication (mainly facility and community health workers) more common among the poorer quintiles. This pattern matched the preference in BCC channels expressed by the households with the only difference that media preference was higher than the actual exposure.

Figure A16: Exposure to Malaria Related SBC Messages by Communication Channel



Correct knowledge of malaria transmission was higher among those exposed to any messages [78.7 percent vs. 72.8 percent ($p=0.0002$)], and increased with increasing number of information sources, reaching 83.0 percent for those with four or more information sources ($p=0.01$), but did not vary with the type of BCC channel (media vs. IPC).

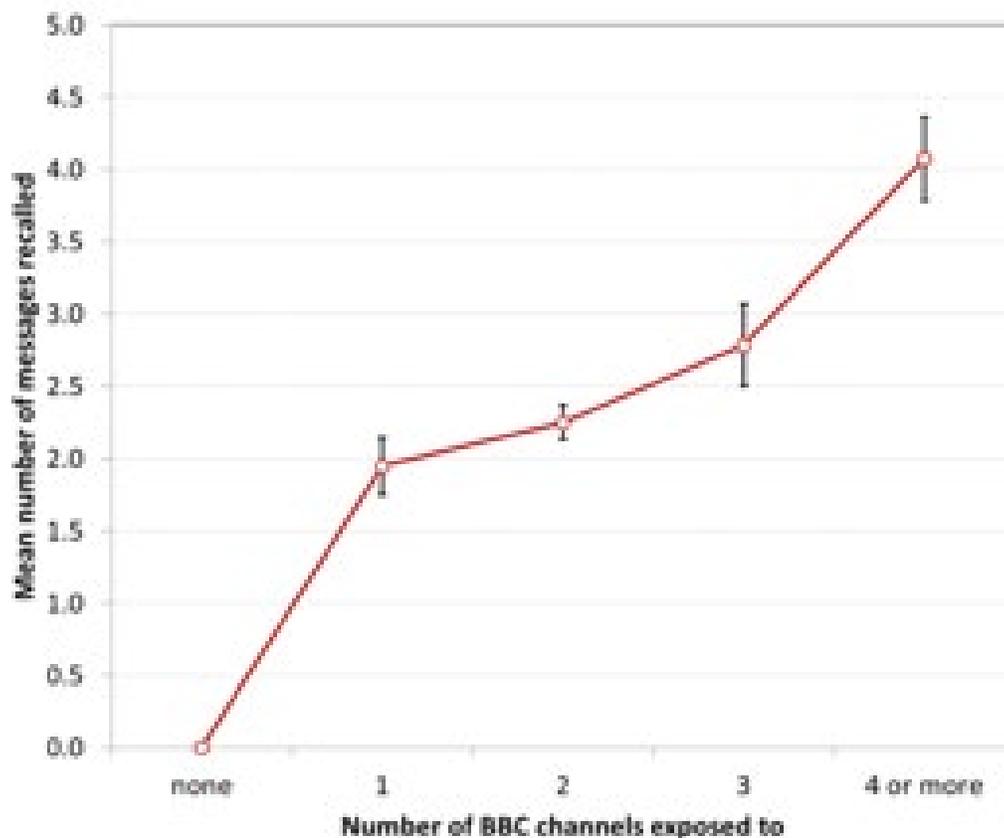
Figure A17: Household Preferred Communication Channels for Malaria Information by Wealth Quintiles, Zimbabwe



Source: Secondary Analysis of the Zimbabwe Malaria Indicator Survey 2016 with Respect to ITN Ownership and Use, Johns Hopkins Center for Communication Programs, Tropical Health, November 2017.

Recall of messages also significantly ($p < 0.0001$) increased with the number of SBC channels to which individuals were exposed, as shown below. Among those recalling any messages, general messages on malaria and its dangers were most frequently recalled (65.1 percent), followed by messages on malaria prevention (57.1 percent). Recall of specific messages on mosquito nets was reported by 37.9 percent of those with any recall in ITN-targeted areas and IRS-related messages were mentioned by 14.7 percent in IRS-targeted areas.

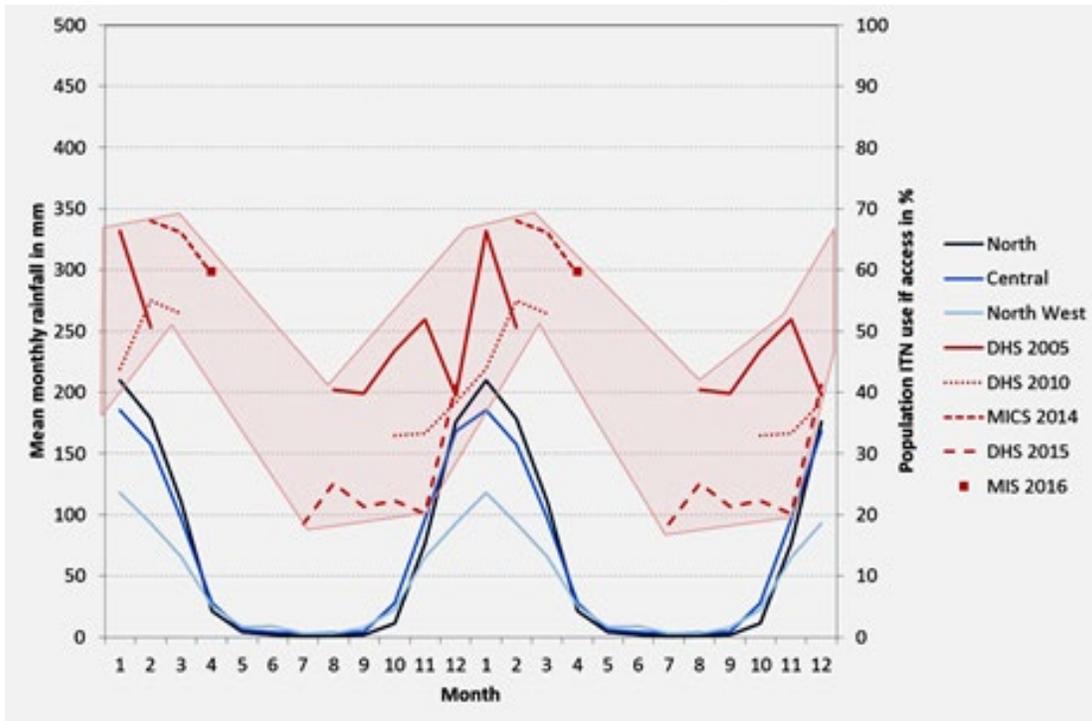
Figure A18: Relationship of Mean Number of Malaria Messages Recalled by Responded as a Function of Number of BCC Channel Exposures



Source: Secondary Analysis of the Zimbabwe Malaria Indicator Survey 2016 with Respect to ITN Ownership and Use, Johns Hopkins Center for Communication Programs, Tropical Health, November 2017.

Using logistic regression models on ITN use given access for the BCC exposure variables and adjusting for other potential confounders such as Province, wealth quintile, urban residence and intra-household ITN supply showed a moderate effect: any exposure to BCC messages on malaria increased ITN use – all other things being equal – about 1.3-fold (OR 1.29 95 percent CI 1.13 – 1.48, $p < 0.0001$), and there was an increasing effect with exposure to increasing numbers of BCC channels (OR 1.13 per each additional channel up to four, $p = 0.01$). The increasing effect of BCC exposure on ITN use was slightly better for IPC (OR 1.35 compared to no exposure at all) than for media (OR 1.12), but this difference was not statistically significant. Correct knowledge of malaria only had a marginal effect on ITN use (OR 1.16, 95 percent CI 0.85-1.40, $p = 0.1$).

Figure A19: Zimbabwe Rain Pattern and Monthly ITN Use, 2005 to 2016.



Source: Rainfall data obtained from: Willmott, C.J., Matsuura, K., Legates, D.R. Terrestrial Precipitation: 1900-2014 Gridded Monthly Time Series v2.01. Delaware: University of Delaware

Note: Highlighted area marks range of data points for % population using ITNs, given access

Previous analysis suggested that, in Zimbabwe, ITN use varies significantly with the seasons. This was further explored by analysis of ITN use given access by the month of data collection from all five available national survey data sets and plotting it against ten-year average monthly rainfall at different latitudes of the country. In order to allow a better visualization of any seasonal pattern, Figure A19 presents the results over a period of 24 months. In addition, the data range is highlighted, showing some variation from year to year, possibly due to variations in the actual rains, but also a significant pattern of higher ITN use as the rains start and a peak of ITN use right after the peak of the rains.

Figure A20. Key Barriers and Facilitators to ITN Use

Facilitator	Type of Factor	Data Source	Evidence
ITN ownership and adequate access within the household	Social/Environmental	MICS 2014 DHS 2015 MIS 2016	ITN use if access (55.8%) was much higher than ITN use overall, but varied between 22.5% in the DHS 2015 and a maximum of 65.4% in the MICS 2014

Barrier	Type of Factor	Data Source	Evidence
Low risk perception due to equation of malaria risk with rainy season and audible mosquito sounds	Internal/Environmental	MIS 2016 ITN Secondary Analysis	MIS 2016 24.2% identified this as the reason nets were not used ITN use markedly varied with the rains, showing peaks of use directly following the peaks of the rains
Itchiness and discomfort of using ITN or too old and torn	Internal/Environmental	Terrestrial Precipitation: 1900-2014 Gridded Monthly Time Series v2.01. Delaware: University of Delaware	MIS 2016 24.2% identified this as the reason nets were not used
Religious group discomfort accepting ITNs from health facilities	Internal/Social	NMCP ITN Use KAP Study	NMCP KAP study identified religious beliefs by Apostolic sect members not to accept LLINs from people other than their own members

Conclusion

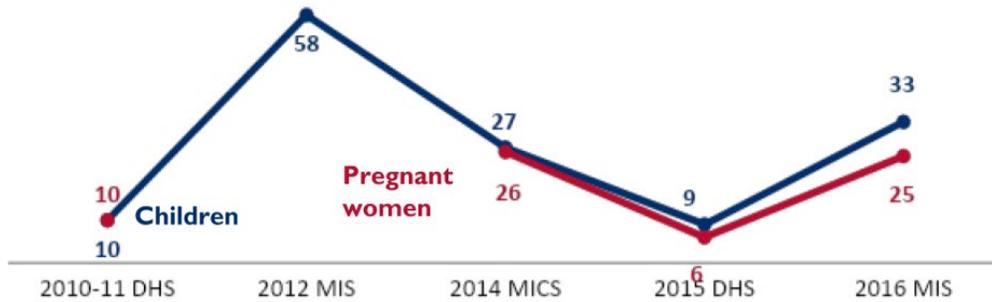
PMI and Global Fund have supported qualitative and quantitative data collection and analysis in order to understand progress in ITN coverage in Zimbabwe and to document how ITNs have been accepted and used by Zimbabweans. Since the last national survey, 2016 MIS, NMCP and partners have used that evidence to address barriers and facilitators to ITN ownership, access, and consistent use. The major facilitator identified is that use will more likely increase if ITN access in the household is sufficient. The most important barrier is perception of malaria risk is low due to malaria seasonality in Zimbabwe with no mosquitoes visible and audible. Other barriers include ITN itchiness and general discomfort. And, finally, one of the special populations in Zimbabwe, religious objectors called Apostolics, do not always accept nets from outside their trusted group. Therefore, NMCP and partners have been working to increase ITN coverage for every sleeping space in the household as well as outdoor sleeping spaces. SBC activities are focusing on changing malaria risk perceptions and using ITNs year round even when mosquitoes cannot be seen or heard. Also, PMI partners developed special messages on how to avoid itchiness as well as an aeration guide, which is discussed at every ITN distribution training. Finally, one of the priorities for NMCP, as per the SBC strategy, is to work to better protect special groups that may be extraordinarily exposed to malaria. NMCP and partners have worked to recruit Apostolics to be VHWs and trained them to distribute ITNs.

Key Question 4

What percent of pregnant women and children under 5 report sleeping under an ITN?

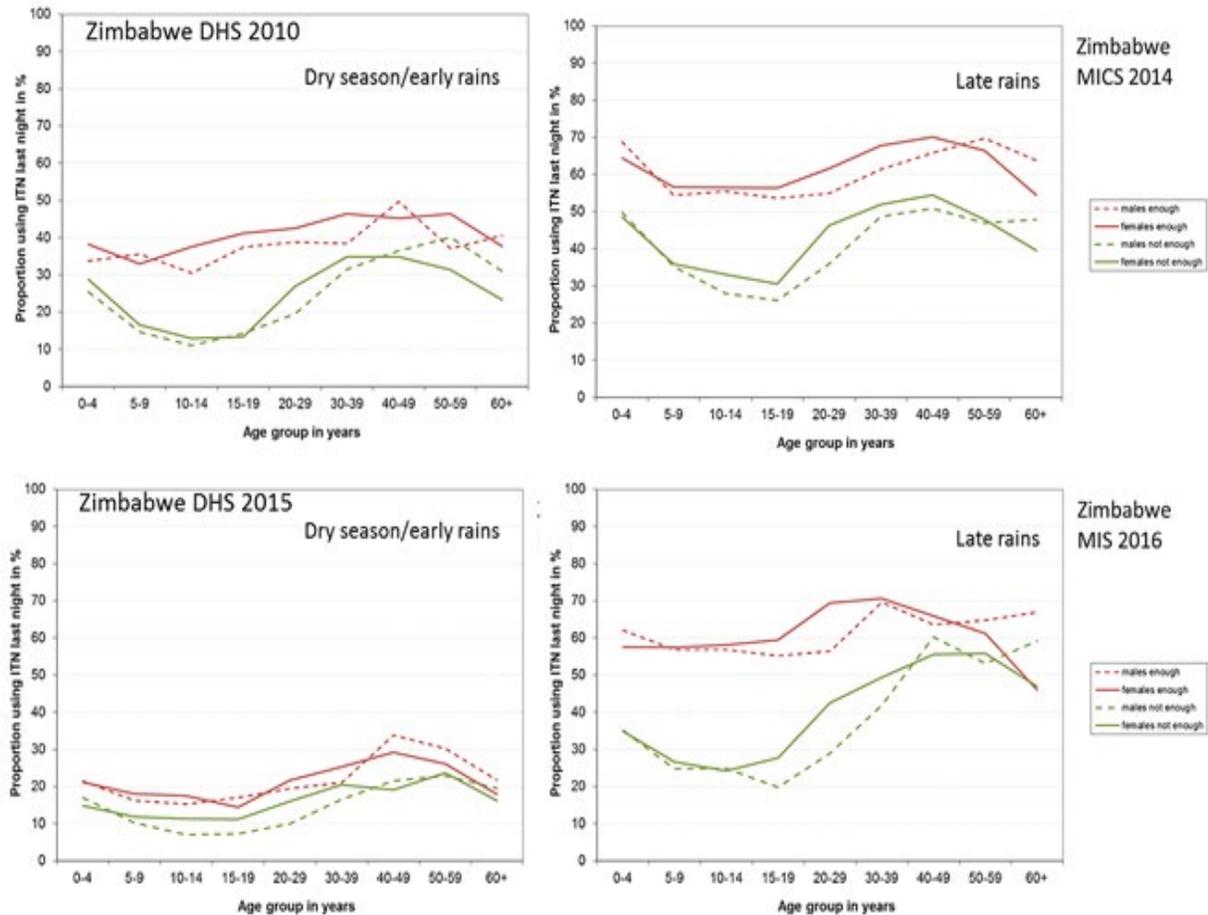
Supporting Data

Figure A21. ITN Use Among Children and Pregnant Women , Percent of Children Under Five Years of Age and Pregnant Women Age 15-49 Who Slept Under an ITN the Night Before the Survey



Note: DHS and MICS surveys are generally fielded during the dry season, as opposed to MIS surveys, which are deliberately fielded during the high transmission season, which should be taken into consideration when interpreting these indicators.

Figure A22. Trends in ITN Use by Age, Gender and Household ITN Supply, 2010 to 2016



Source: Secondary Analysis of the Zimbabwe Malaria Indicator Survey 2016 with Respect to ITN Ownership and Use, Johns Hopkins Center for Communication Programs, Tropical Health, November 2017.

Conclusion

In the final graph, ITN use is presented by age groups disaggregated by gender and by households with enough ITNs for all members (at least 1 ITN for 2 people) and those with any but not enough ITNs. Results demonstrate that there was some preference for use among children under five, lower ITN use in older children and adolescents but also a preference of women in reproductive age over men, especially if there are not enough ITNs in the household. Clearly, the patterns in ITN use in Zimbabwe are not optimal, with some reluctance of older children and adolescents to use ITNs and maximum use levels not exceeding 70 percent in the late rains, and much less in the dry season.

Key Question 5

What channels are used to distribute ITNs?

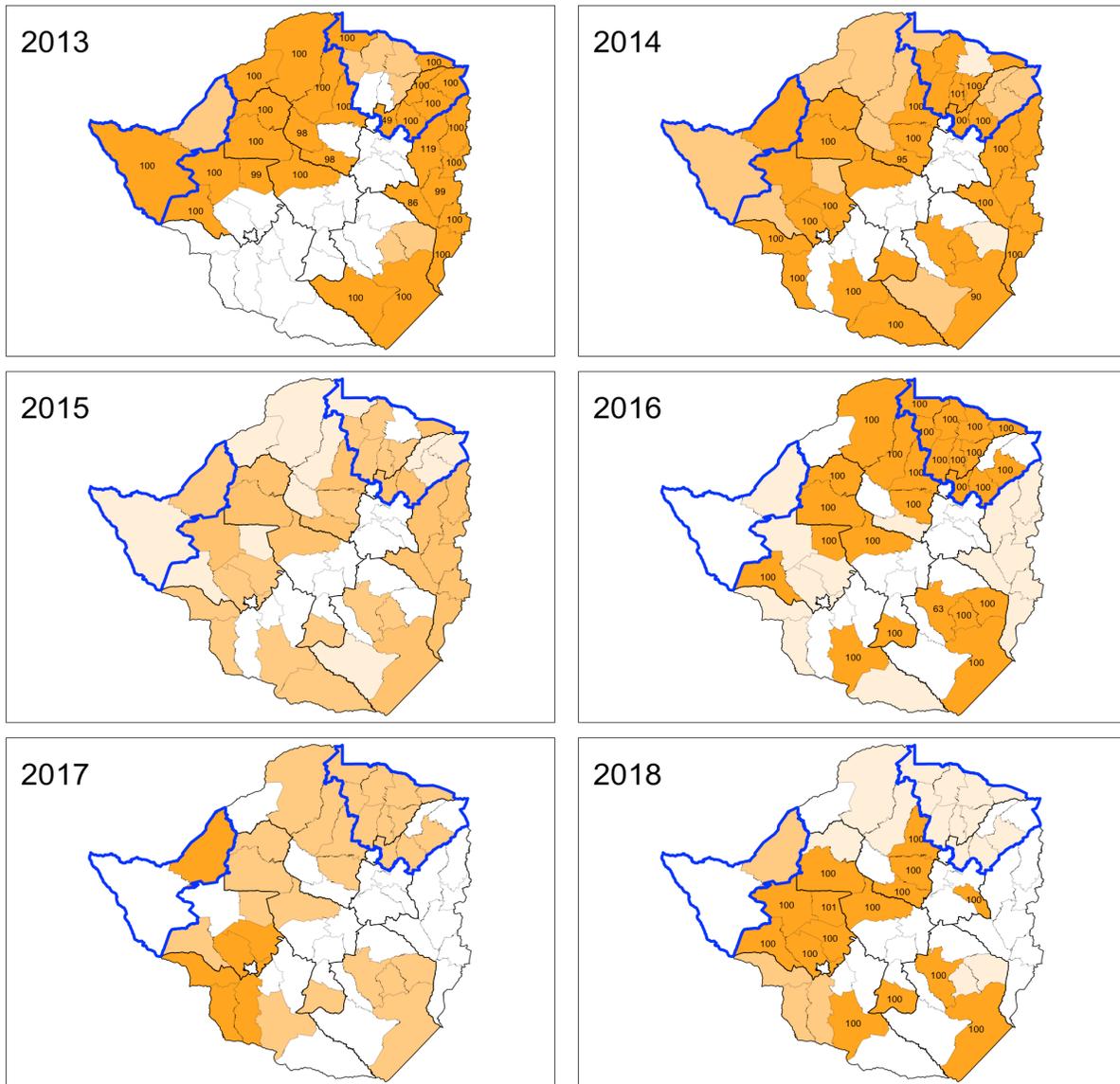
Supporting Data

ITNs in Zimbabwe are distributed via large and medium-sized campaigns and continuous distributions through EPI, ANC, and community channels. There was one school distribution (3rd and 6th graders) in 2015 in association with the net durability study. ITNs are also distributed in small campaigns in response to a natural disaster (cyclone) or sudden influx of refugees.

ITN: Mass Distribution

Dark orange indicates that the most recent distribution occurred that year. Medium orange indicates that the most recent distribution occurred one year prior. Light orange indicates that the most recent distribution occurred two years prior. White indicates no distribution for three years or more. The numbers displayed in the districts represent the coverage of nets for that year's distribution, if known (distributed/targeted).

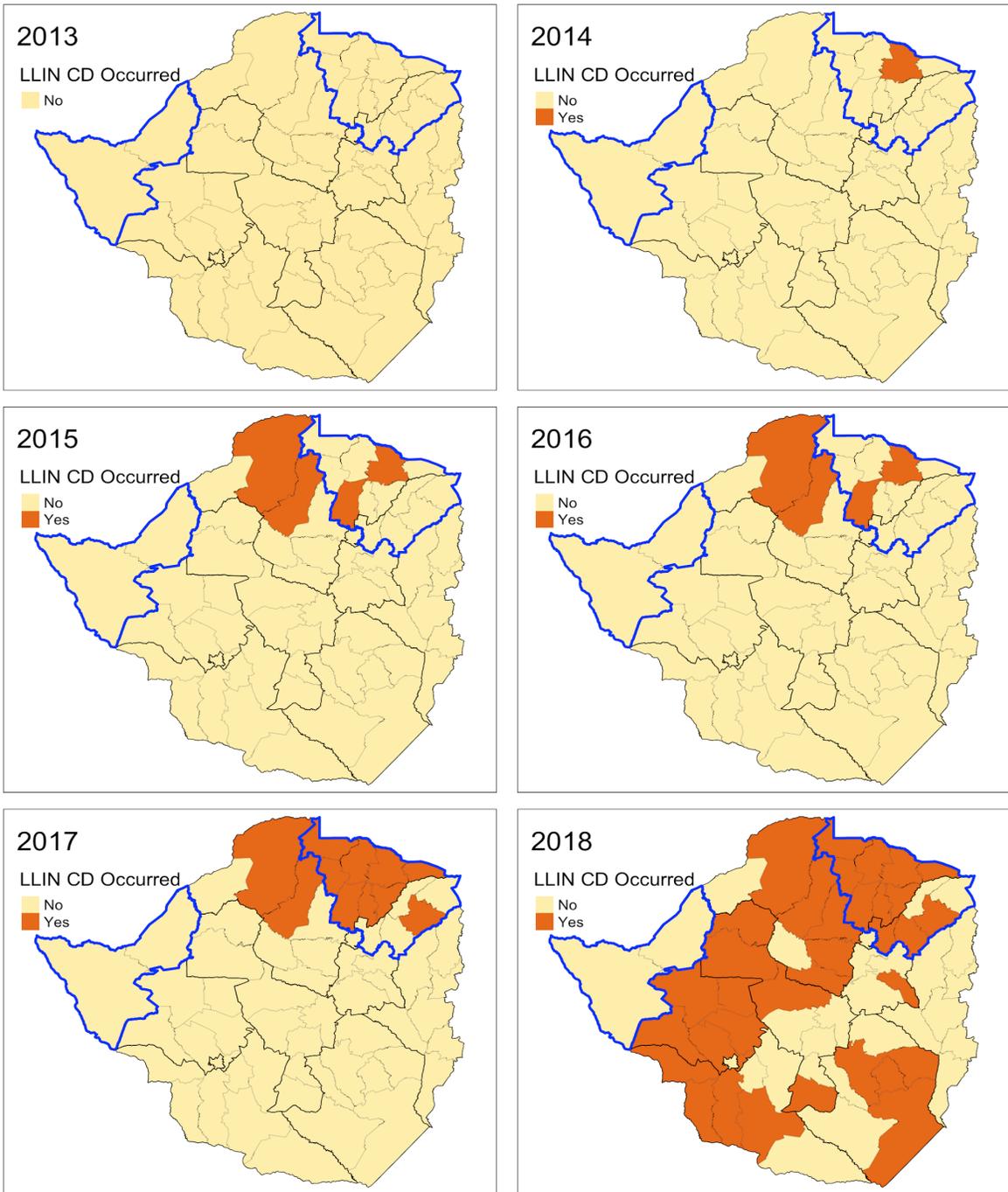
Figure A23: ITN Mass Distribution



Source: 2019 ZAPIM end-of-project evaluation

Notes: Dark orange indicates that the most recent distribution occurred that year. Medium orange indicates that the most recent distribution occurred one year prior. Light orange indicates that the most recent distribution occurred two years prior. White indicates no distribution for 3 years or more. The numbers displayed in the districts represent the coverage of nets for that year's distribution, if known (distributed/targeted). Blue lines represent PMI implementing partner ITN mass distribution targeted districts.

Figure A24. ITN Continuous Distribution



Source: 2019 ZAPIM end-of-project evaluation

Note: Blue lines represent PMI implementing partner ITN continuous distribution targeted districts.

Figure A25. Channels Used to Distribute ITNs in Zimbabwe

Channel	2015	2016	2017	2018	2019	2020 Projected	2021 Projected
EPI	15,721	23,461	4,053	25,065	15,142	152,414	154,091
ANC	14,268	33,816	6,916	33,041	19,703	169,349	171,212
Schools	147,447	0	0	0	0	0	0
Community	29,599	85,731	8,338	113,002	76,008	346,149	407,295
Other Emergency, Outbreak Response			15,900	4,000	186,000		
Mass Campaign	0	562,489		379,253	936,561	132,088	197,403

Source: NMCP, Plan and ZAPIM program records and reports

Conclusion

NMCP distributes ITNs via campaign and continuous distribution with continuous distribution increasing in more districts in recent years.

Key Question 6

What was the estimated need for ITNs during calendar year 2019? What are the estimated ITN needs over calendar years 2020 and 2021? What volume of ITNs are available from partners and the public sector for the next three calendar years?

Supporting Data

Figure A26. Gap Analysis Table for ITNs

Calendar Year	2019	2020	2021
Total Targeted Population ¹	7,127,934	7,206,341	7,285,610
Population Targeted for LLINs ²	3,350,129	3,386,980	3,424,237
Continuous Distribution Needs			
Channel #1: ANC ³	167,506	169,349	171,212
Channel #2: EPI ⁴	150,756	152,414	154,091
Channel #3: Community ⁵	77,879	346,149	407,295
<i>Estimated Total Need for Continuous Channels</i>	<i>396,141</i>	<i>667,912</i>	<i>732,597</i>
Mass Campaign Distribution Needs			
2019/2020/2021 mass distribution campaigns ⁶	1,730,746	1,070,844	1,266,312
<i>Estimated Total Need for Campaigns</i>	<i>1,730,746</i>	<i>1,070,844</i>	<i>1,266,312</i>

Calendar Year	2019	2020	2021
Total ITN Need: Routine and Campaign	2,126,887	1,738,756	1,998,909
Partner Contributions			
ITNs carried over from previous year (PMI)	168,200	70,151	0
ITNs from MOH	0	0	0
ITNs from Global Fund	1,316,688	405,838	TBD
ITNs from other donors	0	0	0
ITNs planned with PMI funding	712,150	800,000	930,000
Total ITNs Available	2,197,038	1,275,989	930,000
Total ITN Surplus (Gap)	70,151	-462,767	-1,068,909

¹ Target population is those considered to be at risk of malaria, or 50% of the total estimated Zimbabwe population.

² Target for LLINs distribution is estimated to be 47% of the population at risk of malaria, or the population of wards targeted for LLIN distribution according to the national vector control intervention stratification.

³ ANC distribution targets all pregnant women, estimated at 5% of the total population at risk.

⁴ EPI distribution targets all children receiving measles vaccine at nine months of age, estimated at 4.5% of the total population at risk.

⁵ Community distribution aims to replace attrited or torn nets and to cover new sleeping spaces identified between mass campaigns. This is estimated to be 20% of the LLINs distributed by the second year following mass distribution.

⁶ For 2021, more wards are expected to be targeted for LLIN distribution as the country scales back IRS per the National Malaria Strategic Plan. Again in 2020 and 2021, there will be a mass campaigns to replace nets distributed during the 2017 and 2018 mass campaigns.

Conclusion

In FY 19, there was a modest surplus of ITNs. For FY 20, PMI has maintained the customary allocation commitment to ITNs, purchasing approximately 800,000 and filling most of the calculated ITN gap that year. If commodity savings or pipeline are available, PMI will purchase an extra tranche of ITNs mid-year to fill the identified gap of about 400,000 ITNs.

As mentioned above, for FY21, PMI will expand the allocation amount for ITNs more than in previous years in order to expand coverage and/or purchase more expensive, next-generation nets, if needed. PMI plans to collect additional entomological data to inform any necessary switch to next-generation nets. If next-generation nets are indicated, PMI will work with the PMI technical working groups to plan deployment for these new ITNs. Because the NMCP GF grant will come to an end in 2020 and any new grant procurements may be delayed, PMI will completely cover ITNs for routine distribution that year and add a modest amount toward the ITN campaign (200,000). If PMI commodity pipeline is available, additional ITNs will be procured to decrease the campaign gap. In addition, PMI will be on the NMCP GF grant development team and will advocate for appropriate ITN coverage.

Key Question 7

What is the current status of durability monitoring?

Supporting Data

Figure A27. Status of Durability Monitoring Sites and Brands

Campaign Date	Sites	Brands ¹	Baseline ²	18-month ³	24-month	36-month
September 2015	Kariba, Hurungwe, Makonde, Mbire, Guruve, Zvimba, Mazowe, Centenary, Mt. Darwin, Rushinga, Shamva, Bindura	DawaPlus 2.0 & DuraNet	X	X	X	X

¹ The original cohort of 2,000 LLINs (1,000 DawaPlus 2.0 and 1,000 DuraNet) was distributed across the 12 districts, with each district receiving both brands.

² Baseline assessment was conducted six months after distribution.

³ According to the protocol, assessments were scheduled for months 6, 12, 24, and 26. However, the month 12 assessment was postponed until month 18 due to significant logistical issues and implementing partner turnover.

For the full report, please visit <https://www.pmi.gov/how-we-work/technical-areas/insecticide-treated-mosquito-nets-itns-pmi>.

Figure A28. Status of Durability Monitoring Key results

Brand	Survey and time since distribution (months)	All cause attrition (%) ¹	Remaining nets in serviceable condition (%)	Remaining campaign nets hanging over sleeping space (%) ²	Optimal insecticidal effectiveness in WHO cone bioassay ³ (%)	Optimal Chemical content (%) ⁴
DawaPlus 2.0	18m:	19.5	83.0	69.2	51.0	12.0
	24m:	29.3	76.3	62.2	42.2	6.4
	36m:	42.9	68.3	60.9	4.0	10.0
DuraNet	18m:	23.7	78.6	69.2	98.1	37.5
	24m:	33.7	73.4	62.2	88.5	33.3
	36m:	46.8	60.7	60.9	85.1	12.8

¹All-cause attrition: defined as the proportion of LLINs destroyed, discarded, or repurposed, as well as those lost for any reason including those given away, used elsewhere, or stolen. Attrition specifically due to wear and tear was not presented by brand. For all study nets, attrition due to wear and tear was 3.1% at month 18, 5.1% at month 24, and 10.0% at month 36.

²The percentage of remaining campaign LLINs hanging was not disaggregated by brand. The cumulative figures are reported for both brands. This proportion includes nets hanging over both indoor and outdoor sleeping spaces, folded or loose.

³Optimal effectiveness was defined as mortality greater than or equal to 80% using WHO cone bioassay methodology.

⁴Optimal chemical content was defined as meeting the minimum value for the WHO-specified target dose range: DawaPlus 2.0 (active ingredient: deltamethrin 2.0g/kg), range 1.5-2.5g/kg; DuraNet (active ingredient: alpha-cypermethrin 5.8g/kg), range 4.4-7.3g/kg.

Conclusion

The proportion of nets in serviceable condition remained above 60 percent for both DawaPlus 2.0 and DuraNet at month 36. This is above the recommended “normal” threshold of 50 percent at month 36. The estimated median survival (a calculated estimate of the length of time to reach 50 percent survivorship) at the end of the 3-year study was 4.7 years for DawaPlus 2.0 and 3.8 years for DuraNet. The optimal effectiveness (proportion of LLINs with bioassay mortality rates \geq 80 percent at 24 hours) decreased for both net brands, with DawaPlus 2.0 showing a greater

loss of effectiveness than DuraNet. DawaPlus 2.0 also showed earlier reductions in chemical content than DuraNet. The proportion of DawaPlus 2.0 with the required minimum target dose was 46 percent at month 6 and decreased to 10 percent at month 36, compared with 78 percent and 13 percent for DuraNet, respectively. The investigators concluded that re-assessment of the distribution-replacement cycle in Zimbabwe should consider these results, and proper net handling, care, and consistent use should be encouraged through routine malaria SBC messaging.

Key Question 8

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

Supporting Data

As mentioned above, NMCP SBC strategy includes language about consideration for special populations and their extraordinary malaria risk. One example of a special population can be found in Angwa Ward, Mashonaland Central Province, investigated by a PMI partner to understand the barriers and drivers of malaria transmission. Angwa Ward has conventional malaria prevention activities in place but inadequate access to health care services for testing and treating malaria in a timely manner. In addition, there is a receptive environment for mosquitoes and community members that engage regularly in outdoor activities, unprotected and during peak mosquito biting times.

Practices identified in Angwa that increased the risk of exposure to mosquito bites outdoors during peak biting times were all-night prayer vigils, guarding fields at night, and staying/sleeping outdoors in the evening due to high temperatures. Community members (65 percent to 71 percent) were unprotected and vulnerable to mosquito bites while engaging in these common outdoor activities, during which strategies and tools such as IRS and ITNs, which are intended mainly for indoor biting prevention, are not protective. In addition, the typical housing structures in the community were characterized as having visible openings in multiple places (for example, open eaves, uncovered windows and openings, and no roofs on the simplest of structures).

Conclusion

NMCP is concerned about malaria protection for special populations who sleep outdoors for long periods during the year. Continued efforts to improve the coverage and quality of malaria prevention and control interventions already being implemented in Angwa Ward, including identifying and implementing additional prevention interventions designed to limit exposure during outdoor activities. NMCP has distributed and will monitor the use of ITNs in Angwa Ward for outdoor sleeping spaces and/or in covering structures without a roof or sprayable walls. Where applicable, they may be considered for replication in other areas with similar entomological and socio-epidemiological characteristics.

1.C. INDOOR RESIDUAL SPRAYING (IRS)

Key Goal

Ensure high spray coverage, with an appropriate insecticide, in targeted endemic PMI-supported areas

Do you propose expanding, contracting, or changing any IRS activities? If so, why and what data did you use to arrive at that conclusion?

From 2011 to 2013, PMI provided a limited package of support (environmental compliance, training, monitoring and evaluation, operational logistics, and procurement of insecticides and equipment) for the NMCP's implementation of IRS in districts using pyrethroid insecticides. The decision to provide this limited package rather than comprehensive support for IRS operations in selected districts was predicated on the fact that Zimbabwe had a long-standing history of implementing a successful IRS program. However, after a request from the NMCP for PMI/Zimbabwe to directly demonstrate the most current IRS best practices and to address increasing incidence in Manicaland Province, PMI/Zimbabwe shifted to providing a full package of direct support for IRS operations in 2014. This support was implemented in four high-burden districts in Manicaland Province through the 2017 spray season. In 2018, in response to a desire by NMCP to rotate insecticides from organophosphates to DDT in those four Manicaland Districts (according to the established insecticide rotation plan), PMI/Zimbabwe shifted its package of comprehensive IRS support to two high-burden districts in Mashonaland East Province. Although PMI would like to have covered the equivalent number of districts (four) in Mashonaland East, increasing costs for IRS operations limited the number of structures, and hence districts, that could be sprayed with the available funding envelope. This comprehensive support for IRS operations in Mashonaland East will be maintained through FY 2019 (2020 spray season).

By FY 2020, PMI/Zimbabwe will have rendered comprehensive IRS support and demonstration of IRS best practices for a full seven years. However, the level of incorporation of these best practices by the NMCP in Global Fund-supported districts has been limited by planning, financial and implementation challenges. In addition, the economic challenges in Zimbabwe have resulted in increased costs for PMI-funded IRS operations, which have limited the number of households that PMI can cover with the existing IRS envelope. Although these economic challenges also affect campaigns in NMCP-led districts, the GoZ is still able to cover more structures than PMI, using an equivalent amount of donor resources. Taking these factors into consideration, PMI/Zimbabwe plans to shift a substantial portion of the funding targeted to IRS in recent years towards the procurement/distribution of additional ITNs and the promotion of their use, in line with the overall direction of the NMCP vector control strategy. PMI will direct an additional portion of the historical IRS funding to improve the quality of malaria case management, particularly at the community level.

In MOP FY 2020, PMI will not fund direct and comprehensive support for the implementation of a spray campaign in selected districts. Rather, PMI will maintain sufficient IRS funds (approximately

half of the MOP FY 2019 funding level) to provide broad technical and financial support for the NMCP IRS program during the 2021 spray season. The overall objective will be to help the NMCP overcome the financial and operational challenges that prohibit the implementation of IRS best practices nationwide. The exact nature of the support will depend upon an assessment of the overall IRS program needs but will likely include:

- Provision of technical assistance to ensure the uptake and implementation of IRS best practices
- Provision of specialized training (e.g. environmental compliance, entomological monitoring, medical management of insecticide poisoning)
- Targeted procurement of insecticides, equipment, and PPE
- Targeted support for operational logistics

This shift in support has been discussed with NMCP and in-country partners during the FY 2020 MOP development process and the NMCP supports the change. The timing of this shift is in-line with the beginning of the next Global Fund grant. This will afford the NMCP the opportunity to appropriately estimate the required IRS funding levels, taking into account this shift in the PMI/Zimbabwe strategy for the need to incorporate the best practices that have been demonstrated by PMI/Zimbabwe over the past seven years. As always, PMI/Zimbabwe will provide substantial technical support to the NMCP during the Global Fund grant writing process. PMI has also begun the process of communicating this change with the Zimbabwe Global Fund country team and will work with Global Fund staff to ensure the most cost-effective planning and implementation of the entire malaria program budget in Zimbabwe.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

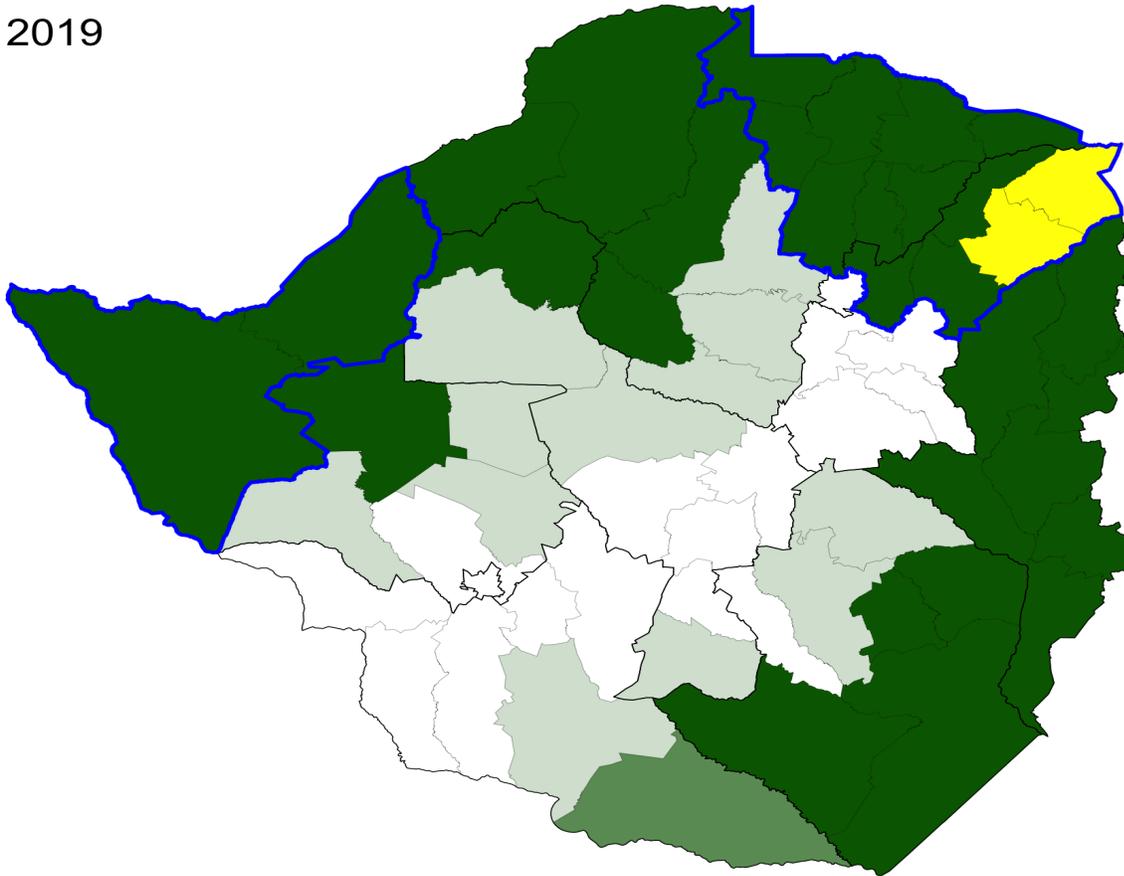
What areas are targeted for IRS and why?

Supporting Data

The Zimbabwe NMCP's vector control policy is to achieve and maintain universal vector control coverage in targeted malarious wards with either ITNs or IRS – with no overlap of either of these two vector control measures. In 2019, the NMCP plans to spray 31 districts, of which two (Mutoko and Mudzi Districts) will be covered by PMI. The map below shows the districts that are targeted for IRS in 2019. The same map also shows the districts that were covered by IRS during the previous years.

Figure A29: Districts Targeted for IRS in 2019 and Previous Years.

2019



Notes: Dark green indicates the districts targeted for IRS by NMCP under the auspices of the Global Fund in 2019. Yellow highlighted districts are those targeted for IRS under PMI in 2019. Medium green indicates that the most recent spraying occurred one year prior i.e. in 2018. Light green indicates that the most recent spraying occurred two years prior (2017). White indicates no spraying for 3 years or more.

Conclusion

As more and more districts graduate from malaria control to pre-elimination status, the IRS map is shrinking because the NMCP policy states that IRS should be implemented in the wards where the API is 5 and above. Conversely, the ITN map is expanding because the number of districts with API that is less than five is increasing. As outlined in the previous section, PMI plans to respond to these changes strategically with a shift in vector control resources from IRS to ITNs. PMI will also work with the NMCP and partners to monitor the distribution and intensity of pyrethroid resistance in Zimbabwe to inform where to distribute ITNs and the type of nets that should be distributed in a given area.

Key Question 2

In PMI-supported areas, what spray coverage rates have been achieved in the past 5 years?

Supporting Data

Figure A30: Spray Coverage Rates Achieved in the Past 5 Years

Calendar Year	Number of Districts Sprayed	District Names**	Number of Structures Sprayed	Coverage Rate	Population Protected
2016	4	Chimanimani, Mutare, Mutasa, Nyanga	229,377	95.6%	550,475
2017	4	Chimanimani, Mutare, Mutasa, Nyanga	209,055	96.4%	517,374
2018	2	Mudzi, Mutoko	112,805	90.1%	276,343
2019*	2	Mudzi, Mutoko	150,335	85%	276,343
2020*	2	Mudzi, Mutoko	150,335	85%	276,343

*Denotes targets

**If more than 15 districts, list regions/provinces.

Conclusion

From 2014 to 2017, PMI/Zimbabwe-supported IRS achieved high spray coverage with Pirimiphos-methyl in four districts (Chimanimani, Mutare, Mutasa, and Nyanga) in Manicaland Province. In 2018, PMI support for IRS was shifted to two other high-burden malaria districts (Mudzi and Mutoko) in Mashonaland East Province following the NMCP decision to implement IRS with DDT (which PMI does not procure or deploy) in Manicaland Province, as outlined in the Zimbabwe Insecticide Resistance Management Plan (IRMP). However, PMI/Zimbabwe continued to provide technical assistance, particularly around environmental compliance, and limited material support for GoZ IRS operations in Manicaland in 2018, as part of its exit strategy. The level of support for the transition from Manicaland will decline even further in 2019, with only limited technical assistance and support for specialized training planned.

In 2018, PMI achieved adequate spray coverage in Mudzi and Mutoko (90 percent).

PMI/Zimbabwe will continue to support a comprehensive IRS package for these two districts in 2019 and will use the results from the 2018 geo-mapping exercise to expand the number of structures targeted. Additional efforts will be made to increase the proportion of targeted structures sprayed, based on experiences from 2018, which was the first year of PMI-supported operations in these districts.

2020 will be the final year for PMI/Zimbabwe to support IRS with a full package, and though the exact targeting of districts is to be determined, the expectation is that PMI will continue to support operations in Mudzi and Mutoko. In both 2019 and 2020, PMI will work with provincial and district health officials to allow for a phased transition of support to NMCP management of spray operations in Mashonaland East Province.

Key Question 3

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

Supporting Data

Figure A31: Residual Efficacy of Insecticides Used for IRS in PMI-Supported Areas

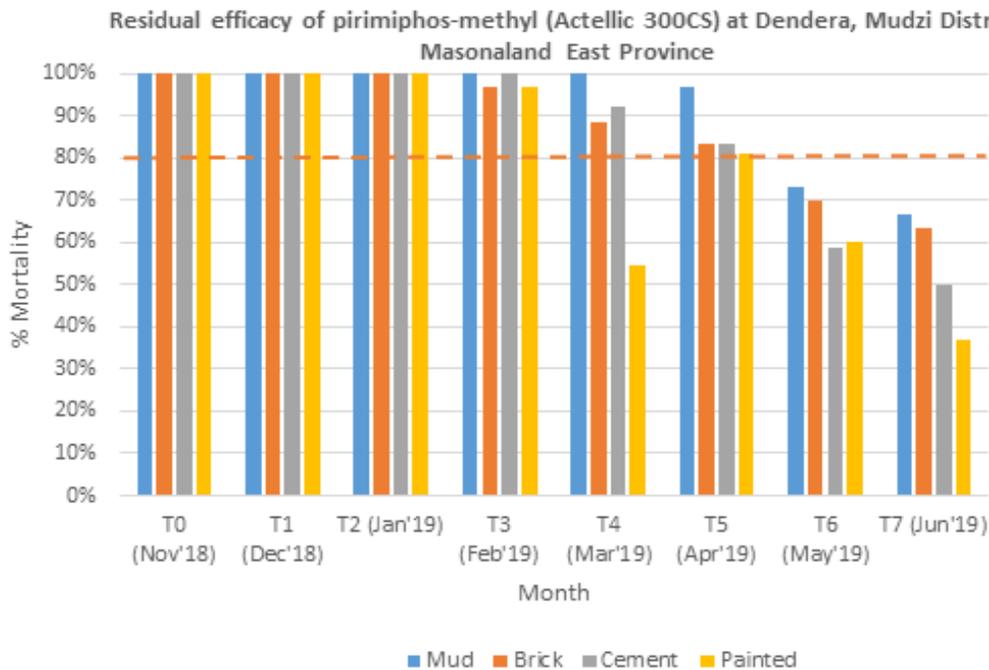


Figure A32. Residual Efficacy of Pirimiphos-Methyl (Actellic 300CS) at Kawere, Mutoko District Mashonaland East Province

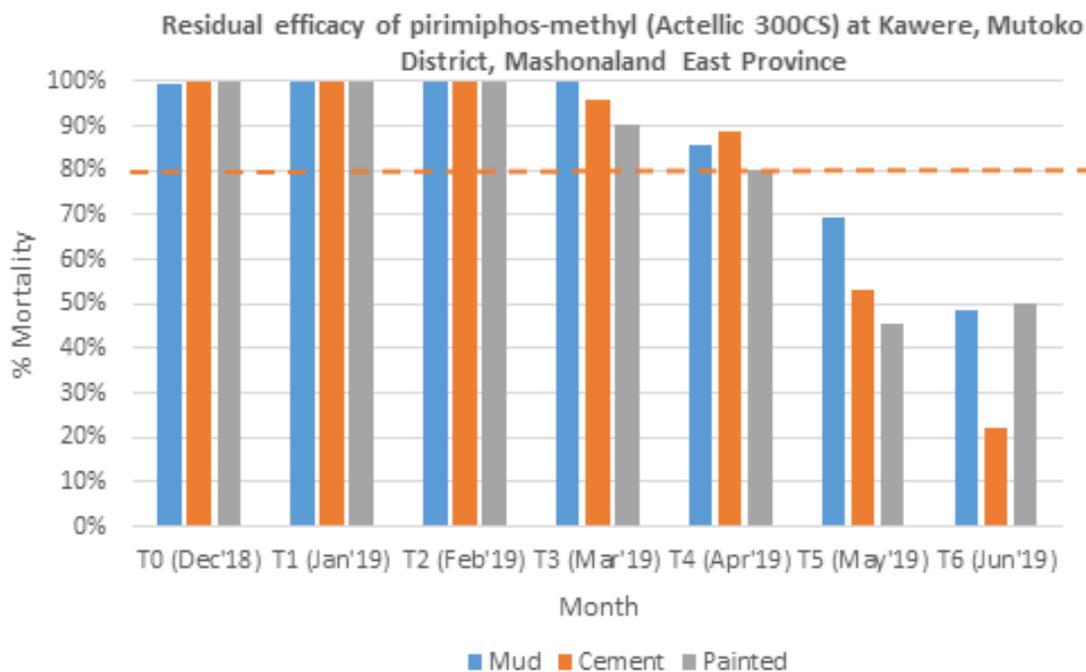
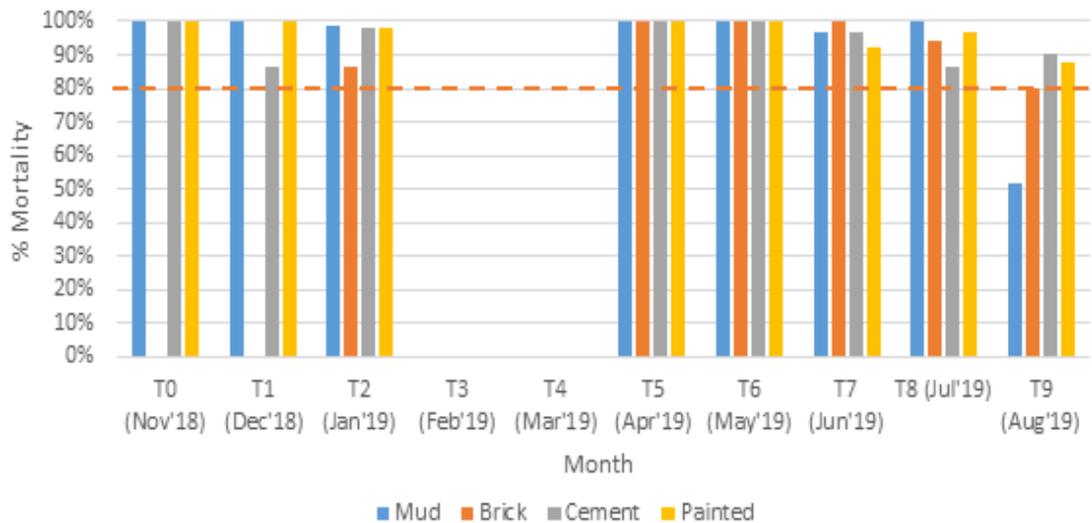


Figure A33. Residual Efficacy of DDT in PMI-Supported Areas

Residual efficacy of DDT at Burma Valley, Mutare District, Manicaland Province



Conclusion

Data collected after the 2018 IRS campaigns indicate that the residual efficacy of Pirimiphos-methyl on sprayed surfaces (mud, brick, cement, and painted) in PMI-supported spray districts in Mashonaland East is generally around five months, after which mosquito mortality consistently drops below 80 percent each month in wall cone bioassays. The residual life of DDT extends to nine months, across all wall surfaces with the exception of mud, in Manicaland Province.

Key Question 4

What is the plan for insecticide rotation? What insecticide will be used next in PMI-supported areas?

Supporting Data

Figure A34. Insecticide Rotation Plan

District	2017	2018	2019	2020*
Chimanimani	Organophosphate (Pirimiphos-methyl)	Organochlorine (DDT)**	Organochlorine (DDT)**	Organochlorine (DDT)**
Mutare	Organophosphate (Pirimiphos-methyl)	Organochlorine (DDT)**	Organochlorine (DDT)**	Organochlorine (DDT)**
Mutasa	Organophosphate (Pirimiphos-methyl)	Organochlorine (DDT)**	Organochlorine (DDT)**	Organochlorine (DDT)**

District	2017	2018	2019	2020*
Nyanga	Organophosphate (Pirimiphos-methyl)	Organochlorine (DDT)**	Organochlorine (DDT)**	Organochlorine (DDT)**
Mudzi	Organophosphate (Pirimiphos-methyl) and Organochlorine (DDT)**	Organophosphate (Pirimiphos-methyl)	Neonicotinoid/Pyrethroid Combination (clothianidin/deltamethrin)	Neonicotinoid/Pyrethroid Combination (clothianidin/deltamethrin)
Mutoko	Organophosphate (Pirimiphos-methyl) and Organochlorine (DDT)**	Organophosphate (Pirimiphos-methyl)	Organophosphate (Pirimiphos-methyl) and Neonicotinoid/Pyrethroid Combination (clothianidin/deltamethrin)	Neonicotinoid/Pyrethroid Combination (clothianidin/deltamethrin)

*Denotes planned insecticide classes

** GoZ IRS campaigns

Conclusion

In 2019, Zimbabwe will use Fludora Fusion (Neonicotinoid/Pyrethroid Combination (clothianidin/deltamethrin) for the first time in the two PMI-supported districts. PMI/Zimbabwe will monitor the residual effect of this insecticide and the results will help inform future choice and use of insecticides by the NMCP and partners.

Key Question 5

Are the NMCP and PMI considering withdrawing IRS from any PMI-supported area? If so, what programs are in place to cover anticipated increases in malaria cases and promote consistent net use and care-seeking behaviors?

Supporting Data

In the 2019 spraying season, the NMCP dropped one district (Beitbridge District) from the 32 districts that were sprayed in 2018. Beitbridge District has now been added to the growing list of ITN targeted districts for Zimbabwe. It is anticipated that the number of IRS targeted districts will remain at 31 in 2020.

As stated above, PMI/Zimbabwe will continue comprehensive support for spraying in Mudzi and Mutoko Districts in 2019 and 2020, while preparing Mashonaland East provincial and district officials to take full responsibility for IRS in these two districts beginning in 2021. From discussions with NMCP, the expectation is that NMCP will fund spray operations in Mudzi and Mutoko with Global Fund support and PMI/Zimbabwe will work with the NMCP during the upcoming grant writing process to ensure that this gap is noted and filled. PMI will shift to the provision of broader technical assistance as described above, which will include support to Mudzi and Mutoko as needed. PMI/Zimbabwe will also work with the NMCP to monitor malaria

trends, particularly in the previous PMI-supported districts to ensure any increases in malaria cases are detected early and appropriate actions are implemented early so that the gains noted in reducing malaria cases are not reversed.

Conclusion

Withdrawal of comprehensive support by PMI should not be interpreted to mean reduction of overall IRS support in Zimbabwe. PMI will work with the NMCP and Global Fund to ensure vector control strategies from the two donors are complementary and the shift of PMI resources to ITNs, case management and SBC should allow for a corresponding shift in Global Fund resources to IRS. This may allow for the most cost-effective use of the overall donor resource envelope in Zimbabwe.

Key Question 5

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

Supporting Data

The IRS funding category under PMI/Zimbabwe is going to be reduced significantly under MOP FY2020. As stated above, reduced IRS funding levels should not be misconstrued as reducing vector control support in Zimbabwe because most of the financial savings that are going to be realized from IRS will be used to procure more ITNs and fund associated SBC, thereby protecting the same population. The coverage levels may become different if the country decides to purchase dual active ingredient and/or PBO nets because of possibly growing pyrethroid resistance. These nets are more costly when compared to the single-pyrethroid ITNs that are currently in use in Zimbabwe.

Conclusion

See above.

2. HUMAN HEALTH

2.A CASE MANAGEMENT -Health Facilities and Communities

NMCP objective
<p>Ensuring access to prompt and appropriate management of all malaria cases within 24 hours of onset of symptoms is a key objective of the 2016-2020 <i>National Malaria Strategic Plan</i>. To achieve this objective, the NMCP focuses its efforts in the following areas:</p> <ol style="list-style-type: none"> 1. Strengthening quality assurance of diagnostics (RDTs and microscopy) 2. Maintaining quality-assured treatment of all uncomplicated malaria cases 3. Capacitating health facilities to effectively manage severe malaria

4. Strengthening case management for special groups (mobile migrant populations, miners, refugees, agriculture workers, religious groups, gatherings, etc.)
5. Ensuring quality-assured supply chain management

NMCP approach

Diagnostic testing

In the most recent (2015) version of the *Guidelines for the Management of Malaria in Zimbabwe*, the NMCP recommends parasitological diagnosis of all suspected malaria cases prior to treatment. While microscopy is still recognized as the gold standard for parasitological confirmation, its use is primarily reserved for: 1) follow-up of admitted malaria patients; 2) confirmation of suspected treatment failure; and 3) confirmation of co-infections or infections with non-*falciparum* malaria species. Rapid diagnostic tests are endorsed for VHWs, rural clinics, district hospitals, provincial hospitals, emergency departments in central hospitals, and private health institutions. Mono-species (*P. falciparum*) RDTs are used in higher-transmission regions, with multispecies RDTs used in pre-elimination areas. Multispecies RDTs are procured by Global Fund and, in some instances, the Government of Zimbabwe.

Treatment of uncomplicated malaria

The 2015 *Guidelines for the Management of Malaria in Zimbabwe* recommend oral artemether-lumefantrine (AL) as the first-line treatment and artesunate-amodiaquine (ASAQ) as the second-line treatment for uncomplicated malaria. Oral quinine was recommended as the first-line treatment in children less than five kilograms body weight. However, to be consistent with updated WHO guidance, this recommendation was amended in an August 2018 circular from the Secretary for Health and Child Care. The updated guidance recommends that children weighing two kilograms to less than five kilograms should receive AL for uncomplicated malaria. Children less than two kilograms body weight should be treated as having severe disease (see below for further details on severe malaria treatment recommendations). Oral quinine with either doxycycline or clindamycin is listed as an alternative second-line treatment to ASAQ or as the first-line regimen for pregnant women in the first trimester.

Treatment of uncomplicated malaria in elimination areas

In low-transmission areas implementing elimination interventions, the 2015 *Guidelines for the Management of Malaria in Zimbabwe* recommend the addition of low-dose primaquine (for its gametocytocidal effect) to the usual treatment course for uncomplicated malaria. To date, the Global Fund has supported the procurement of this medication.

Treatment of severe malaria

Zimbabwe's 2015 *Guidelines for the Management of Malaria in Zimbabwe* recommend intravenous artesunate as the first-line treatment for severe malaria and as a pre-referral treatment at the health facility level. Parenteral quinine was recommended as the first-line treatment for severe malaria for

women in the first trimester of pregnancy and for children weighing less than five kilograms. However, to be consistent with updated WHO guidance, the recommendation for these groups was shifted to parenteral artesunate in an August 2018 circular from the Secretary for Health and Child Care. Parenteral quinine is now recommended only as an alternative treatment when parenteral artesunate is unavailable or contraindicated.

Pre-referral treatment with rectal artesunate suppositories (RAS)

The 2015 *Guidelines for the Management of Malaria in Zimbabwe* recommend the use of rectal artesunate suppositories (RAS) for pre-referral treatment of severe malaria at the community level for all age groups, a difference from the WHO recommendation that RAS be used only for children under six years old. Of note, rectal artesunate suppository uptake has been slower than predicted since introduction, with relatively low and inconsistent consumption patterns noted.

Quality assurance of diagnostic testing

Zimbabwe implements a quality control and quality assurance system for both laboratory and pharmaceutical supplies. RDTs are procured by the Government of Zimbabwe and donors, which are then pooled and distributed by the National Pharmaceutical Company (NatPharm). The RDTs procured by PMI are lot tested before shipment to Zimbabwe. In country, the National Medical Reference Laboratory lot tests all RDTs before they are distributed to public sector facilities.

External quality assurance (EQA) for malaria microscopy has been offered since 2011 by Zimbabwe National Quality Assurance Program Trust (ZINQAP). However, the program has historically been underfunded and the number of participating sites has been limited. ZINQAP is currently a sub-recipient under the 2018-2020 Zimbabwe Global Fund grant and currently provides EQA for both microscopy and RDTs. However, the program still faces funding delays and procurement challenges that prevent consistent, full-scale implementation at all 1,700 RDT sites. However, the program was able to distribute testing panels to all of the 170 targeted microscopy sites in the first two quarters of 2019. Moving forward, ZINQAP will attempt to implement on-site training and supportive supervision as well, pending reprogramming approval, to ensure corrections based on the findings of the EQA.

The MoHCC has also initiated a results-based financing system that has created an incentive system for quality implementation among health workers. Please see Other Health Systems Strengthening section for more details.

Community-based health worker (CBHW) role

Two community-based cadres are routinely engaged in malaria activities, VHWs and School Health Coordinators (SHCs). According to the Directorate of Nursing Services, there are approximately 17,400 VHWs, each serving approximately 100-120 households. By MoHCC policy, VHWs and SHCs working in malaria control areas are mandated to conduct malaria community-case management, including administering RDTs, treating positive cases with ACTs, and administering RAS as pre-referral treatment of severe malaria at community level. However, VHWs and SHCs

working in lower-transmission, elimination settings are trained only to administer RDTs and refer to the nearest health facility, given the stock management issues in low-transmission settings and the need for active case investigation. In 2018, approximately 30 percent of all malaria cases in Zimbabwe were reported by VHWs and SHCs.

VHWs receive a quarterly stipend of 42 USD, which is paid using other donor resources. In Zimbabwe's current economic climate, this is not a substantial sum. Other incentives provided primarily with donor funding include:

- uniforms (though these are not always available);
- promotional materials and clothing and,
- in limited cases, bicycles, medicine cabinets, and smartphones.
- As part of the Zimbabwe Results Based Financing Program, some VHWs receive a small payment for cases that they refer to the clinic.

Private sector

According to the 2015 Zimbabwe DHS, 10 percent of all caregivers of children less than five years of age with fever sought care in the private sector. Among those children with fever for whom advice or treatment was sought, 19 percent sought care in the private sector. National policy recommends malaria treatment and testing in the private sector consistent with the *National Guidelines for the Management of Malaria*, including the use of AL as the first-line agent, as well as the use of RDTs. The NMCP has attempted to engage with the private sector to ensure appropriate malaria case management, including conducting training of private sector professionals, either through inclusion in public sector trainings or by outreach through existing channels, such as continuing education sessions. However, the available resources for such activities are limited, given the substantial gaps remaining within the public sector. PMI/Zimbabwe is not aware of a recent formal assessment of malaria treatments available in the private sector. Anecdotal evidence suggests that AL and ASAQ are available as are quinine and clindamycin tablets.

Target for national scale

To achieve national-level scale, Zimbabwe would need to train and supervise all of the approximately 18,000 facility-based health workers and the majority of the estimated 17,000 community-based health workers. Historically, the tracking of case management training has been a decentralized process and it has been difficult for PMI/Zimbabwe to estimate the complete, national training need. In response, PMI/Zimbabwe has supported the implementation of the TrainSMART system to track trainings conducted in PMI-supported provinces, including trainings funded by other donors. This system, combined with detailed discussions with provincial and district leadership regarding training gaps and resources, has enabled PMI to more completely estimate the training need and coverage. In the three primary PMI-supported provinces, there are approximately 3,097 facility-based workers targeted for training, of whom 85 percent have received training. Among the nearly 3,400 VHWs in the same three PMI-supported districts, approximately 72 percent have

received community case management training since late 2015. Further clarity is needed regarding the training needs within non-PMI supported areas.

PMI objective, in support of NMCP

- PMI/Zimbabwe and Global Fund procure nearly all of the malaria commodities (e.g. ACTs, RDTs, SP, parenteral artesunate, RAS), with limited inputs from the GoZ. PMI works with the NMCP, the Directorate of Pharmacy Services (DPS), and Global Fund staff to ensure timely product availability, according to current needs. As a result, PMI/Zimbabwe does not necessarily procure all commodity types each year. By policy, PMI does not currently procure rectal artesunate suppositories (RAS), as the Zimbabwe policy includes provision of RAS to all age groups, in contrast with WHO recommendations. PMI/Zimbabwe commodities are contributed to a pooled commodity management system and distributed nationwide.
- PMI/Zimbabwe provides support for case management service delivery strengthening in selected districts within four of Zimbabwe’s highest malaria burden provinces. This includes provision of technical assistance, as well as support for training, supportive supervision, mentoring, death audits, policy and guideline revision, and other activities (see below for more details). PMI/Zimbabwe’s support is targeted to all levels of the health system and emphasizes both facility and community-based service provision.

PMI-supported recent progress (past ~12-18 months)

- PMI/Zimbabwe worked with Global Fund and in-country partners to coordinate procurement and delivery schedules to ensure appropriate central-level stocks of malaria commodities were available. In the past year, PMI procured approximately 810,000 ACTs and 1,000,000 RDTs.
- PMI/Zimbabwe supported report finalization and dissemination for an assessment to determine the contributing factors for the observed disparity between recorded malaria cases and consumption of first-line ACT in Zimbabwe.
- In the four high-burden provinces, PMI/Zimbabwe supported:
 - Final implementation of a now fully-functional training database (TrainSMART).
 - Training of over 900 health workers in malaria CM and MIP, including approximately 200 VHWS and 38 VHW peer supervisors.
 - Orientation of 23 facility-based health workers on CM supportive supervision tools and processes.

- Nine rounds of supportive supervision visits, covering a total of 134 facility-based health workers.
- Implementation of a pilot CM mentorship program in five districts, including a recent stakeholder meeting to evaluate program outcomes to date.
- Two provincial-level death audit meetings.
- Post-training follow-up for 169 VHWs and potential VHW peer supervisors.
- Three VHW review meetings, integrating CM, ITN, and SBC issues.
- Procurement of medicine boxes for 300 VHWs in hard-to-reach, high burden districts.
- Peer-to-peer supervision to enhance community case management.
- Although significant progress was made, dramatic shifts in economic/monetary policies by the GoZ and limited fuel availability affected implementation of PMI-supported CM activities.

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

Currently, the majority of PMI-supported CM activities (not including procurement and distribution of commodities) have been on hold since September 2019, due to late USAID funding this fiscal year. As a result, implementation of some of the activities below will be delayed until that funding is available.

Over the next 12-18 months, PMI/Zimbabwe will continue to support the procurement and distribution of malaria commodities and case management service delivery strengthening, including:

- Procurement and distribution of approximately 1,000,000 RDTs, 730,000 ACT courses, and 38,000 vials of parenteral artesunate, using MOP FY 2019 funds.
- Continued support for malaria case management strengthening within the same four provinces using MOP FY 2019 funds, including:
 - Supporting the review and revision of the existing malaria case management guidelines if an agreement can be reached in-country on the need to do so.
 - Continued implementation of the TrainSMART database.
 - Initial training for 36 case management trainers
 - Refresher training for an additional 24 case management trainers
 - Training of approximately 500 facility-based health workers in malaria CM, which represents nearly 60 percent of the existing training gap.
 - Continued implementation and possible expansion of the malaria clinical mentoring program, including training of facility-based peer mentors.

- Hosting three provincial malaria death audit meetings.
- Conducting supported supervision visits in selected high-burden districts.
- Development, printing, and dissemination of community case management (CCM) training materials and job aids.
- Training and post-training follow-up for approximately 440 VHWs in CCM, which represents approximately half of the current training gap.
- Training of approximately 300 SHCs in CCM
- Orientation of 25 facility-based health workers to the VHW supportive supervision processes and tools.
- Conducting biannual supportive supervision visits for 440 VHWs.
- Hosting eight VHW review meetings.
- Procurement of additional medicine boxes for VHWs in selected districts.
- Case management activities will also be conducted in elimination areas, specifically Lupane District, Matabeleland North, with possible expansion to areas in neighboring districts if resources allow. Health facility-level training will be tailored to the needs of the elimination setting, including an emphasis on malaria microscopic slide preparation, appropriate use of primaquine, and active surveillance for primaquine side effects. VHW training will highlight the appropriate skills to test and refer, how to conduct advocacy for early treatment seeking, and methods for active case finding and testing during case investigations. Job aids specific to the elimination setting will also be created.

PMI Goal

Improve access to and utilization 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 be able to provide high quality, effective care.

Do you propose expanding, contracting, or changing any Case Management activities? If so, why and what data did you use to arrive at that conclusion?

After careful review of the current PMI portfolio and progress, PMI/Zimbabwe plans to expand support for case management activities, with an enhanced emphasis on strengthening community-based interventions. This proportional increase in funding is made possible by the shift in vector control support to targeted technical and procurement assistance for IRS, as opposed to continued support for direct spraying in selected high-burden districts.

In 2018, approximately 30 percent of malaria cases were reported from the community level (DHIS2). However, key CCM deficiencies are evident and the roll-out of community case

management, including training and supervision of VHWs, is still not complete in some areas. For example, in a 2017 PMI-funded assessment of 72 facilities in three high-burden provinces, a total of 1016 VHWs were designated to either test and treat for malaria or test and refer, per NMCP policy. Of these, only 472 had received training in malaria case management and 172 were actively engaged in malaria case management. PMI/Zimbabwe will prioritize implementation of CCM in PMI-supported areas to ensure prompt access to care and appropriate case management in hard-to-reach areas.

Deficiencies in service delivery also persist at the health-facility levels in PMI-supported areas, including substantial training and supportive supervision gaps. Additionally, funding constraints have limited the scale-up of other potentially beneficial activities, such as clinical case mentoring, malaria death audits, and peer-to-peer supportive supervision. The modest shift in funding proposed for MOP FY 2020 will not be sufficient to fully meet the programming needs, but will allow for more flexibility in scaling up activities and, potentially, allow for an increase in the geographic scope for PMI-supported activities.

Of note, PMI/Zimbabwe's primary service delivery implementing partner will be coming to a close in 2020/2021. The PMI/Zimbabwe team will collaborate with the USAID Mission, NMCP, Global Fund and other malaria partners to further refine the geographic scope and specific activities of the future support in the coming months.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

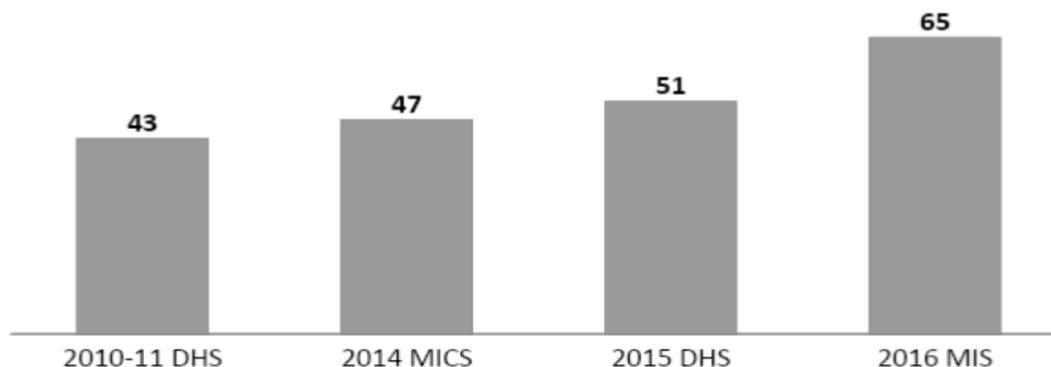
Key Question 1

What is the status of care-seeking?

Supporting Data

Figure A35. Trends in Care Seeking for Fever

*Among children under 5 with fever in the 2 weeks before the survey for whom advice or treatment was sought**



*Note: Where possible, this indicator has been recalculated according to the newest definition, care, or treatment from any source, excluding traditional practitioners

Conclusion

Although a positive temporal trend is noted in care seeking behavior, overall levels remain suboptimal. PMI/Zimbabwe will address key barriers and facilitators to care seeking with MOP FY 2019 and 2020 funding. Please see Key Question 2 below for more details.

Key Question 2

What is known about the major barriers and facilitators to care-seeking?

Supporting Data

Figure A36. Key Barriers and Facilitators to Care Seeking

Facilitator	Type of Factor	Data Source	Evidence
Malaria recognized as a major health problem	Internal - knowledge	2016 MIS	Approximately 67% of surveyed heads of household listed malaria as the primary health problem in their area.
VHWs recognized as a source of care by patients in hard-to-reach areas	Internal - knowledge	2018 Assessment of Drivers of Continuing Malaria Transmission in Angwa Ward, Mbire District	Survey respondents reported heavy reliance on VHWs for family members with fever (though they were not always able to access the care needed).

Barrier	Type of Factor	Data Source	Evidence
Current economic context leading to staff shortages and restricted ability for patients to seek care (see context description below)	Social - economic	Media sources and direct observation	The evidence is primarily observational. However, it seems clear that substantial changes in the ability of the public health system to provide services, and the ability of patients to seek care have occurred.
Limited knowledge among patients and care-givers of the signs and symptoms of malaria.	Internal - knowledge	2016 MIS; 2018 Assessment of Drivers of Continuing Malaria Transmission in Angwa Ward, Mbire District	MIS: Only 36% of household heads surveyed identified fever as a sign of malaria Angawa assessment: 59% of respondents knew at least two signs and symptoms of malaria, but only 8% recognized fever as a sign of malaria in adults, and only 20% knew two danger signs of malaria in children.
Long distances to nearest health facility	Environmental	2016 MIS	Nearly 47% of households reported the distance to the nearest health facility was greater than five kilometers, with over 19% reporting a distance greater than 10 kilometers.
Need to ask permission to seek care for child with fever	Social	2016 MIS	Approximately 12% of women aged 15-49 years of age reported the need to ask permission to seek care for a child less than five with fever.
Religious objection to care seeking	Social	2016 MIS	Members of a particular Apostolic sect, which makes up approximately 3% of the population surveyed, were substantially less likely to seek care in the public or private sector than other religious groups (8% for members of this sect vs 58% for all care seekers)

Conclusion

Context: It is important to note that Zimbabwe is currently facing an economic crisis that is severely affecting the functioning of the health sector and, likely, the ability of malaria patients to seek services. Currently, health facility staff are working limited hours due to restricted pay and inability to travel, intermittent physician strikes have been implemented, and service delivery is often being implemented by lower-level cadres. All indications are that staff morale is low. These changes have likely affected the availability and quality of services at public health

facilities, with a subsequent reliance on the private sector for patients that can afford to pay. However, with dramatic inflation of food and necessity costs, household financial resources are stretched for many Zimbabweans. Fuel availability is limited and substantial increases in fuel prices and, subsequently, transport costs, have occurred.

Although malaria is recognized as a major health problem in Zimbabwe, knowledge of the specific signs and symptoms, particularly fever, remains suboptimal. In addition to this limited knowledge, specific social and environmental barriers to care-seeking exist, as highlighted above. PMI/Zimbabwe has been supporting efforts to address these and other barriers, including strengthening facility-based CM services to provide greater incentive for care-seeking, completing the roll-out of CCM in PMI-supported areas to ensure access to care for those living in hard-to-reach areas, enhancing Zimbabwe’s ability to provide targeted and effective SBC messaging, and ensuring the availability of commodities at service delivery points. With the additional resources targeted for CM in the FY 2020 MOP, PMI/Zimbabwe will expand support for facility and community-based service delivery strengthening, while also providing additional funding for SBC compared to previous years. However, as noted above, the current operating environment in Zimbabwe is particularly challenging. To be successful, PMI will have to coordinate closely with the NMCP, Global Fund and other malaria partners to ensure PMI’s resources are targeted effectively and leverage other efforts.

Key Question 3

How have malaria testing and treatment practices evolved over time?

Supporting Data

Figure A37. Trend in Diagnosis and Treatment of Children with Fever

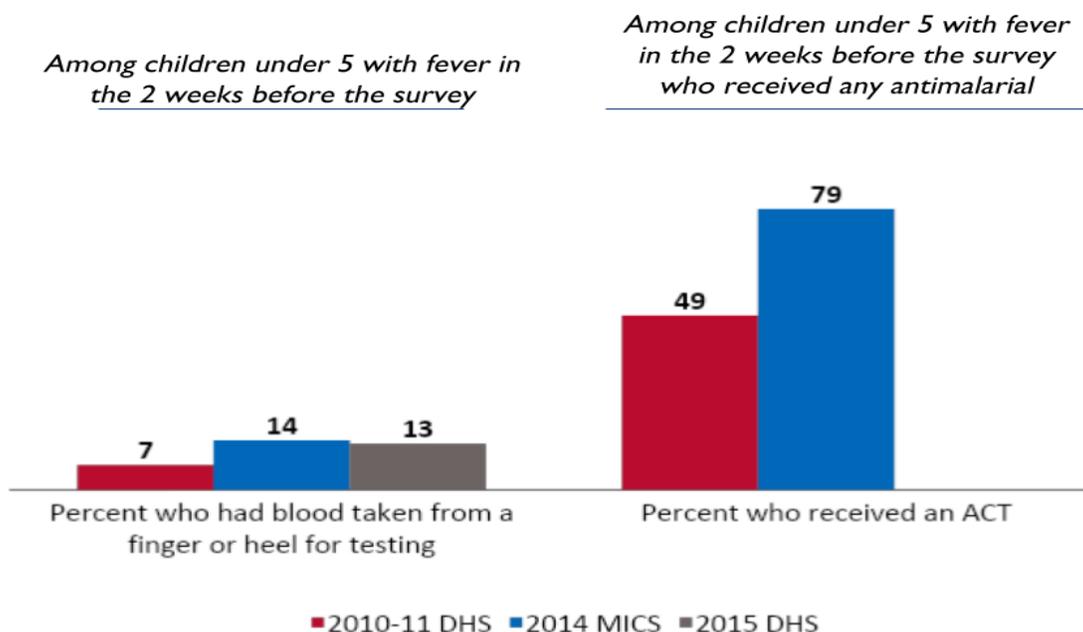
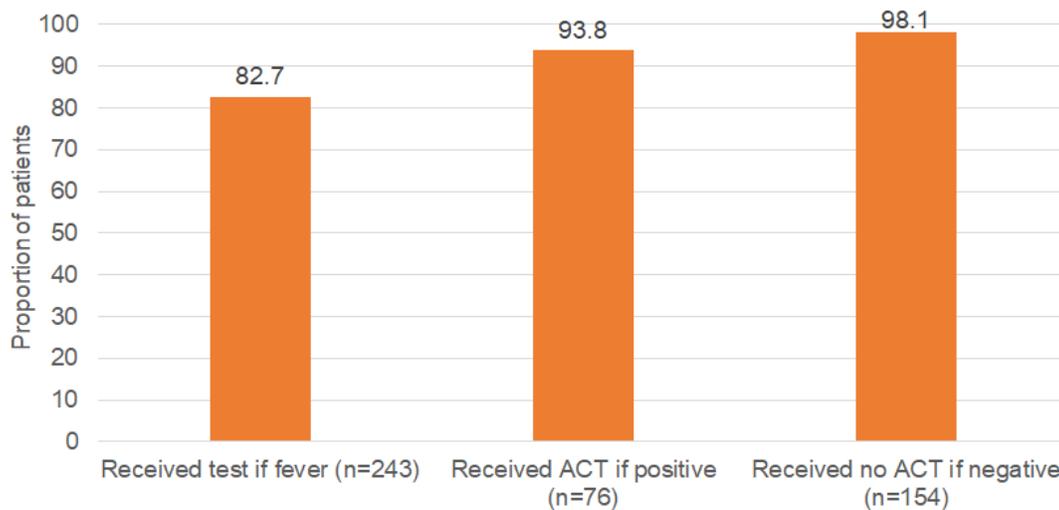


Figure A38: Proportion of Patients Who Received Correct Malaria Case Management



Source: 2019 ZAPIM End-of-Project Evaluation

Conclusion

The data presented in Figure A38 above suggest that use of parasitological diagnosis is quite limited in Zimbabwe. However, it should be noted that Zimbabwe began implementation of universal parasitological diagnosis with RDTs in 2009 but the roll-out was not immediately completed at the facility level and use of RDTs to the community level did not begin in earnest until 2014. Additionally, malaria transmission is quite heterogeneous in Zimbabwe, with substantial portions of the country experiencing little to no transmission. As a result, provider suspicion for malaria may be quite low in some areas, potentially diluting the results in a nationwide survey. Preliminary results from the 2019 independent assessment of a PMI partner project found that adherence to malaria case management practices in high-burden areas is substantially better than what is suggested by the DHS and MICS data. As illustrated in Figure A39 above, review of patient records at 70 health facilities in three high-burden provinces revealed that 83 percent (n=243) of patients with fever received a parasitological test, 94 percent of those patients who tested positive received an ACT, and 98 percent of those patients that tested negative did not receive an ACT.

The 2017 PMI-funded assessment of the discrepancy between reported cases and ACT consumption also assessed limited aspects of VHW adherence to case management guidelines. Record review of case management practices among 209 VHWs across 72 districts revealed that ACTs were administered to 87 percent of confirmed cases seen at the community level.

Key Question 4

What is known about provider behavior in relation to testing and treatment practices?

Supporting Data

Figure A39. Key Barriers and Facilitators to Appropriate Testing and Treatment Practices

Facilitator	Type of Factor	Data Source	Evidence
Substantial proportion of staff trained in malaria case management in PMI-supported areas	Environmental - provision of training	ZAPIM quarterly and annual reports; 2019 ZAPIM end of project evaluation	In the three high-burden provinces support by PMI through the ZAPIM project, 72% of facility-based staff and 73% of VHWs have received case management training between 2016 and present. Ninety-seven percent of facilities surveyed in the ZAPIM end of project evaluation reported having at least one health worker trained in malaria CM.
Availability of malaria diagnostic and treatment commodities at service delivery points	Environmental - commodity availability	LMIS and EUV data	In general, stockout rates for RDTs and ACTs remain relatively low according to LMIS data, particularly for at least one AL presentation at the facility level (See Section 3.A). According to the most recent EUV, stock outs for three or more days in the last three months were 12% for AL and 8% for RDTs across the 72 facilities visited. On the day of the EUV visit, all facilities had at least one AL formulation available.
Availability of malaria diagnosis and treatment guidelines	Environmental - guideline availability	2019 ZAPIM end of project evaluation	Malaria treatment guidelines were available in 97% of facilities surveyed.
Relatively high adherence to diagnosis and treatment guidelines by health care workers at the facility and community level	Internal/Social - provider behavior	2019 ZAPIM end of project evaluation and 2017 assessment of the discrepancy between reported cases and ACT consumption	In 70 facilities in PMI-supported areas, 83% (n=243) of patients with fever received a parasitological test, 94% of those patients who tested positive received an ACT, and 98% of those patients that tested negative did not receive an ACT. Among 209 VHWs in 72 districts, 87% of confirmed malaria cases received an ACT.
Barrier	Type of Factor	Data Source	Evidence
Current economic context leading to staff shortages, strikes and low morale	Social -economic	Media sources and direct observation	The evidence is primarily observational. However, it seems clear that substantial changes in the ability of the public health system to provide services, and the ability of patients to seek care have occurred.

Conclusion

Overall, the evidence for determining barriers and facilitators for provider adherence to recommended case management practices is limited and mixed. The last case management audit was conducted in 2015. A repeat audit was conducted in mid-2019 but results have yet to be disseminated. PMI/Zimbabwe plans to review those results as soon as they are available and will use those data to inform CM programmatic decision-making in FY 2019 and FY 2020.

Commodity availability is listed as a facilitator above, as the overall stock out rates are relatively low; however, stock out rates for particular facilities are higher and the availability of commodities likely limits the provision of care to some degree. As a result, this could serve as both a facilitator or a barrier, depending on the circumstances. As described above, the current economic context in Zimbabwe is likely affecting the ability and willingness of providers to deliver care.

Key Question 5

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

Supporting Data

Please see “Section III: Overview of PMI’s Support of Zimbabwe’s Malaria Control Strategy, Figure 7” for a geographical representation of PMI’s current support for case management at the health facility level.

Currently, financial contributions to the malaria program by the Government of Zimbabwe are limited and, as noted in “Section V: Partner Funding Landscape,” Global Fund investments for the PMI FY 2020 implementation period and beyond are not yet known. Thus, it is not yet possible to attribute funding from these institutions nor determine the geographic or programmatic targeting of any potential Government of Zimbabwe or Global Fund case management investments. With regard to PMI/Zimbabwe activities in FY 2020, the geographic distribution of case management support is under discussion at this time and PMI/Zimbabwe will strive to ensure alignment of donor and GoZ support. PMI/Zimbabwe in-country staff will also serve as members of the writing team for the next Global Fund grant, targeted to start in January 2021, and will work with NMCP, GF and other stakeholders to help ensure resource alignment.

Conclusion

As noted earlier, PMI/Zimbabwe plans to shift additional financial resources to support facility- and community-based care, with an increased emphasis on ensuring effective implementation of CCM in PMI-supported areas.

Key Question 6

What was the estimated need for RDTs during calendar year 2019? What are the estimated RDT needs over calendar years 2020 and 2021?

Supporting Data

Figure A40. Gap Analysis Table of RDTs

Calendar Year	2019	2020	2021
RDT Needs			
Total country population	14,255,867	14,412,681	14,571,220
Population at risk for malaria ¹	7,127,934	7,206,341	7,285,610
PMI-targeted at-risk population	7,127,934	7,206,341	7,285,610
Total number of projected fever cases ²	1,578,792	1,578,792	1,578,792
Percent of fever cases tested with an RDT ²	98%	98%	98%
Total RDT Needs ³	2,418,399	2,418,399	2,418,399
Partner Contributions (to PMI target population if not entire area at risk)*			
RDTs carried over from previous year	1,828,002	1,964,778	836,154
RDTs from Government	0	0	0
RDTs from Global Fund	1,555,175	289,775	TBD
RDTs from other donors	0	0	0
RDTs planned with PMI funding	1,000,000	1,000,000	1,408,000
Total RDTs Available	4,383,177	3,254,553	2,244,154
Total RDT Surplus (Gap)	1,964,778	836,154	-174,245
Gap including stock required to end the year at the desired (max) stock level⁴	N/A	-1,582,245	-2,592,644

¹ Assumes 50% of the population is at risk of contracting malaria.

² Projected number of fever cases and percent of fever cases tested with an RDT are based on 2018 actual data reported in DHIS2, flatlined for 2019, 2020, and 2021.

³ Total forecasted need is based upon historical consumption for Pf-only RDTs, excluding requirements to fill up the pipeline to desired stock levels (see footnote 4).

⁴ Gap calculation assumes the desired maximum stock level of 12 months is met at the end of 2020 and 2021 calendar years.

Conclusion

Biannual national quantification exercises are conducted by DPS, in coordination with the NMCP and malaria stakeholders. The PMI/Zimbabwe RDT gap analysis table was developed in collaboration with PMI's supply chain partner and the NMCP using information from the most recent quantification exercise, conducted in August 2019. The gap analysis table estimates the total gap for calendar year 2021 to be approximately 175,000 RDTs. However, this figure does not take into consideration the need to ensure appropriate stock within the in-country pipeline. The total need to ensure the maximum desired 12-month pipeline is approximately 2,500,000 additional RDTs. Given PMI budget constraints and the likelihood of continued support for RDT procurement in the next Zimbabwe Global Fund grant, PMI/Zimbabwe will procure 1,408,000 RDTs, with the expectation that additional Global Fund resources will be made available to

cover the remaining need. PMI/Zimbabwe will continue to monitor the RDT supply status and work with Global Fund, the NMCP, and DPS to ensure that Zimbabwe's commodity needs are fully covered for 2021. This includes participating as members of the Global Fund grant writing team.

Key Question 7

What was the estimated need for ACTs during calendar year 2019? What is the estimated need for ACTs over calendar years 2020 and 2021?

Supporting Data

Figure A41. Gap Analysis Table of ACTs Needs

Calendar Year	2019	2020	2021
ACT Needs			
Total country population	14,255,867	14,412,681	14,571,220
Population at risk for malaria	7,127,934	7,206,341	7,285,610
PMI-targeted at-risk population ¹	7,127,934	7,206,341	7,285,610
Total projected number of malaria cases ²	289,866	260,879	260,879
Total ACT Needs ³	1,518,780	1,366,902	1,366,902
Partner Contributions (to PMI target population if not entire area at risk)¹			
ACTs carried over from previous year	1,477,147	1,508,605	1,281,213
ACTs from Government	0	0	0
ACTs from Global Fund	314,657	409,510	TBD
ACTs from other donors	0	0	0
ACTs planned with PMI funding	1,235,581	730,000	722,000
Total ACTs Available	3,027,385	2,648,115	2,003,213
Total ACT Surplus (Gap)	1,508,605	1,281,213	636,311
Gap including stock required to end the year at the desired (max) stock level⁴	N/A	-85,689	-730,591

¹ Assumes 50% of the population is at risk of contracting malaria

² Projected number of cases in NMCP strategic plan ending 2020 are 194,107 (2018); 140,034 (2019); 70,717 (2020). However, based on actual 2018 DHIS case data (263,515 cases), new projections in the revised performance framework are 289,866 (10% reduction) in 2019, with a further 10% reduction to 260,879 in 2020. 2021 cases (260,879) were flatlined from 2020, pending development of the 2021-2025 strategic plan.

³ Total forecasted need is based on historical consumption and represents the combined need for 1st line (AL) and 2nd line (ASAQ) ACTs, excluding requirements to fill up the pipeline to desired stock levels. 97% of total cases are assumed to be uncomplicated. 100% of uncomplicated cases required 1st line (AL) treatment, of these, 3% will fail 1st line treatment and will require 2nd line (ASAQ) treatment.

⁴ Gap calculation assumes the desired maximum stock level of 12 months is met at the end of 2020 and 2021 calendar years.

Conclusion

Biannual national quantification exercises are conducted by DPS, in coordination with the NMCP and malaria stakeholders. The PMI/Zimbabwe ACT gap analysis table was developed in collaboration with PMI's supply chain partner and the NMCP using information from the most recent quantification exercise, conducted in August 2019. The gap analysis table estimates the total gap for calendar year 2021 to be filled, taking into account PMI's proposed number of treatments to procure. However, this figure does not take into consideration the need to ensure appropriate stock within the in-country pipeline. The total need to ensure the maximum desired 12-month pipeline is approximately an additional 1,300,000 ACT treatments. Given PMI budget constraints and the likelihood of continued support for ACT procurement in the next Zimbabwe Global Fund grant, PMI/Zimbabwe will procure 722,000 ACT courses, with the expectation that additional Global Fund resources will be made available to cover the remaining need.

PMI/Zimbabwe will continue to monitor the ACT supply status and work with Global Fund, the NMCP, and DPS to ensure that Zimbabwe's commodity needs are fully covered for 2021. This includes participating as members of the Global Fund grant writing team.

Key Question 8

What was the estimated need for severe malaria treatment and any other treatments as applicable during calendar year 2019? What is the estimated need for calendar years 2020 and 2021?

Supporting Data

Figure A42. Gap Analysis Table for Injectable Artesunate

Calendar Year	2019	2020	2021
Injectable Artesunate Needs			
Projected Number of Severe Cases ¹	8,696	7,826	7,826
Projected # of severe cases among children	3,478	3,131	3,131
Projected # of severe cases among adults	5,218	4,696	4,696
Total Injectable Artesunate vials Needs²	19,411	17,673	17,674
Partner Contributions			
Injectable artesunate vials carried over from previous year	72,079	248,335	339,818
Injectable artesunate vials from Government	0	0	0
Injectable artesunate vials from Global Fund	107,123	53,783	TBD
Injectable artesunate vials from other donors	0	0	0
Injectable artesunate vials planned with PMI funding	69,133	37,700	0
Total Injectable Artesunate vials Available	248,335	339,818	339,818
Total Injectable Artesunate vials Surplus (Gap)	228,924	322,145	322,144

¹ Assumes 3% of all malaria cases are severe cases

² Total forecasted need is based on historical consumption, excluding requirements to fill up the pipeline to desired stock levels. Average number of vials needed per case is 5 and 16 vials for children and adults, respectively. Most (99.9%) complicated cases are expected to be treated with injectable artesunate except for pregnant women in the first trimester - pending revision of case management guidelines.

Figure A43. Gap Analysis Table for RAS

Calendar Year	2019	2020	2021
Artesunate Suppository Needs			
Number of severe cases expected to require pre-referral dose at community level ¹	2,609	2,348	2,348
Total Artesunate Suppository Needs, 50mg and 100mg (Each)²	18,730	16,857	16,857
Partner Contributions			
Artesunate suppositories carried over from previous year	17,143	25,413	8,556
Artesunate suppositories from Government	27,000	0	0
Artesunate suppositories from Global Fund	0	0	0
Artesunate suppositories from other donors	0	0	0
Artesunate suppositories planned with PMI funding	0	0	0
Total Artesunate Suppositories Available	44,143	25,413	8,556
Total Artesunate Suppositories Surplus (Gap)	25,413	8,556	-8,301
Gap including stock required to fill up pipeline to end the year at the desired (max) stock level³	N/A	-8,301	-25,158

¹ Assumes 3% of total cases will be severe malaria cases. 30% of severe cases will be seen for community level pre-referral treatment

² Historical consumption based forecast, excluding requirements to fill up the pipeline to maximum desired stock levels.

³ Gap calculation assumes the desired maximum stock level of 12 months is met at the end of 2020 and 2021 calendar years.

Conclusion

Biannual national quantification exercises are conducted by the DPS, in coordination with the NMCP and malaria stakeholders. The PMI/Zimbabwe parenteral artesunate gap analysis table was developed in collaboration with PMI's supply chain partner and the NMCP using information from the most recent quantification exercise, conducted in August 2019. The table above estimates that there will be no gap for calendar year 2021. PMI/Zimbabwe will continue to monitor the parenteral artesunate supply status and work with Global Fund, the NMCP, and DPS to ensure that Zimbabwe's commodity needs are fully covered for 2021. This includes participating as members of the Global Fund grant writing team.

Note that PMI/Zimbabwe does not procure RAS given the current NMCP policy to administer suppositories for pre-referral treatment to all age groups. This contrasts with current WHO guidance, which recommends administering suppositories only to children under six years of age. Also, note that for calendar year 2020, the full need for primaquine will be met using Global Fund resources. The expectation is that calendar year 2021 primaquine needs will be included in the next Global Fund grant application. PMI will monitor the situation and adjust if required.

Key Question 9

Are the first-line ACTs effective and monitored regularly?

Supporting Data

Figure A44. Recently Completed and Ongoing Antimalarial Therapeutic Efficacy Studies

Year	Sites	Treatment arms	PCR-corrected ACPR>90%?	Where molecular resistance work was completed or the plan, if any, for molecular resistance work
2014 ¹	Chitulipasi, Dindi, Dotito, Hauna, Nyamhunga, Simatelele	AL	Yes	Not done
2017-2018 ²	Chitulipasi, Dindi, Dotito, Hauna, Nyamhunga, Simatelele	AL	Yes (preliminary, uncorrected results)	Not done

Sources:

¹Mutambu, et al. Efficacy And Safety Of A Fixed Combination Of Artemether And Lumefantrine (Coartemether) For The Treatment Of Uncomplicated *Plasmodium falciparum* Malaria Using The Sentinel Surveillance System In Zimbabwe. 2015, study report.

²Preliminary Report, Therapeutic Efficacy Test 2017-2018.

Footnotes - ACPR: adequate clinical and parasitological response

Conclusion

The two studies cited above suggest no evidence of substantial resistance to the first-line ACT treatment (AL) in Zimbabwe. However, PMI/Zimbabwe has considerable concerns regarding the methodologies and quality of implementation for these studies. As a result, PMI has actively engaged with the new leadership of NIHR, the responsible institution for TES in Zimbabwe, and the NMCP to explore possible PMI support for the next TES. Discussions are still underway to determine the type and level of support that PMI will provide, as well as the timing of the next TES. However, PMI/Zimbabwe has set aside funding in MOP FY2020 for this support and intends to engage as fully as possible to ensure that reliable and accurate ACT resistance data is collected in Zimbabwe.

Key Question 10

Are there other key items, such as lab strengthening, private sector support, etc. that should be considered?

Supporting Data

As highlighted earlier in this Annex, private sector care seeking 10 percent of all caregivers of children less than five years of age seek care in the private sector (2015 DHS). However, there is limited data regarding the adherence of private sector providers to the recommended case management practices and efforts to engage with the private sector have been limited to date.

Conclusion

PMI/Zimbabwe and the NMCP have a mutual interest in providing outreach and educational opportunities to the private sector and have agreed that initial steps should be taken. As a result, PMI/Zimbabwe will target limited FY 2020 funds toward efforts to engage the private sector.

Discussions regarding the best use of these resources are still ongoing in-country. However, the most likely first step will be to conduct an assessment of the private sector provider practices to identify and quantify programmatic needs.

Key Question 11

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

Supporting Data

N/A

Conclusion

N/A

2.B. DRUG-BASED PREVENTION

NMCP objective
<ul style="list-style-type: none"> ● Ensuring prompt and appropriate malaria in pregnancy services, including case management and the provision of IPTp and ITNs to pregnant women, is a key objective of the 2016-2020 Zimbabwe Malaria Strategic Plan. Zimbabwe’s policy specifically supports : <ul style="list-style-type: none"> ○ Implementation of IPTp in 26 high-burden districts, with a target of 90 percent of pregnant women receiving at least three doses of SP during pregnancy by 2020. ○ Distribution of ITNs to pregnant women as early as possible in pregnancy, and promotion of their use, with a target of 85 percent of pregnant women sleeping under ITNs by 2020. ○ Early and effective diagnosis and treatment of malaria with the appropriate medications for gestational age, as laid out in the 2015 Guidelines for the Management of Malaria.
NMCP approach
<p>Zimbabwe implements drug-based prevention (IPTp with SP) in 26 targeted high-burden districts, as shown in the map below.</p>

geographic area of focus covers the majority of districts targeted for IPTp by the NMCP.

- Provision of SBC to improve uptake of IPTp (see Annex 3.C)

PMI-supported recent progress (past ~12-18 months)

- PMI/Zimbabwe worked with Global Fund and in-country partners to coordinate procurement and delivery schedules to ensure appropriate stock levels of SP at service delivery points. In the past year, PMI procured approximately 530,000 SP courses for distribution to the 26 targeted IPTp districts.
- In four high-burden provinces, PMI/Zimbabwe supported:
 - Final implementation of a now fully-functional training database (TrainSMART).
 - Training of over 900 health workers in malaria CM and MIP/IPTp, including approximately 200 VHWs and 38 VHW peer supervisors.
 - Orientation of 23 facility-based health workers on CM and MIP/IPTp supportive supervision tools and processes.
 - Nine rounds of supportive supervision visits, covering a total of 134 facility-based health workers.

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

Currently, the majority of PMI-supported MiP activities (not including procurement and distribution of commodities) have been on hold since September 2019, due to late USAID funding this fiscal year. As a result, implementation of some of the activities below will be delayed until that funding is available.

- PMI/Zimbabwe will continue to work with Global Fund and in-country partners to coordinate procurement and delivery schedules to ensure appropriate stock levels of SP at service delivery points. Given the current pipeline in-country, PMI will not support procurement of SP using FY 2019 MOP funds however a supply funded from a FY 2018 MOP procurement will arrive in country in 2020.
- Continued support for malaria case management strengthening in the same four high-burden provinces using MOP FY 2019 funds, including:
 - Continued implementation of the TrainSMART database.
 - Initial training for 36 CM and MIP/IPTp trainers
 - Refresher training for an additional 24 CM and MIP/IPTp trainers

- Training of approximately 500 facility-based health workers in malaria CM and MIP/IPTp.
- Conducting supportive supervision visits for CM and MIP/IPTp in selected high-burden districts.

2.B.i MALARIA PREVENTION IN PREGNANCY (MIP)

PMI Goal

Support the national strategy for MIP, which includes provision of ITNs at first antenatal care (ANC) visit, intermittent preventive treatment for pregnant women (IPTp) to all pregnant women in malaria endemic area starting at 13 weeks gestational age, for a minimum of three doses, and effective case management of malaria, in accordance with the WHO recommendations.

Do you propose expanding, contracting, or changing any MIP activities? If so, why and what data did you use to arrive at that conclusion?

Activities designed to strengthen delivery of MIP are, in many cases, linked with CM interventions (e.g., training, supportive supervision, and mentoring of facility and community-based health workers). As a consequence, the increased funding toward CM service delivery strengthening described in Annex 2.A will enable PMI to expand the scale and geographic scope of MIP interventions as well.

As for malaria CM, deficiencies in MIP service delivery persist at the health-facility levels, including substantial gaps in training and supportive supervision. Additionally, funding constraints have limited the scale-up of other potentially beneficial activities. The modest shift in funding proposed for MOP FY 2020 CM and MIP service delivery strengthening will not be sufficient to fully meet the programming needs, but will allow for more flexibility in scaling up activities and, potentially, allow for an increase in the geographic scope for PMI-supported activities.

PMI/Zimbabwe's primary service delivery implementing partner will be coming to a close in 2020/2021. The PMI/Zimbabwe team is currently further refining the geographic scope and specific activities of future PMI support. In addition, PMI/Zimbabwe will review the results of a planned NMCP pilot for delivery of the first dose of IPTp in the community (to be implemented with Global Fund resources), and the results of studies of community-based IPTp distribution in Burkina Faso and Malawi, to guide future programming in this area.

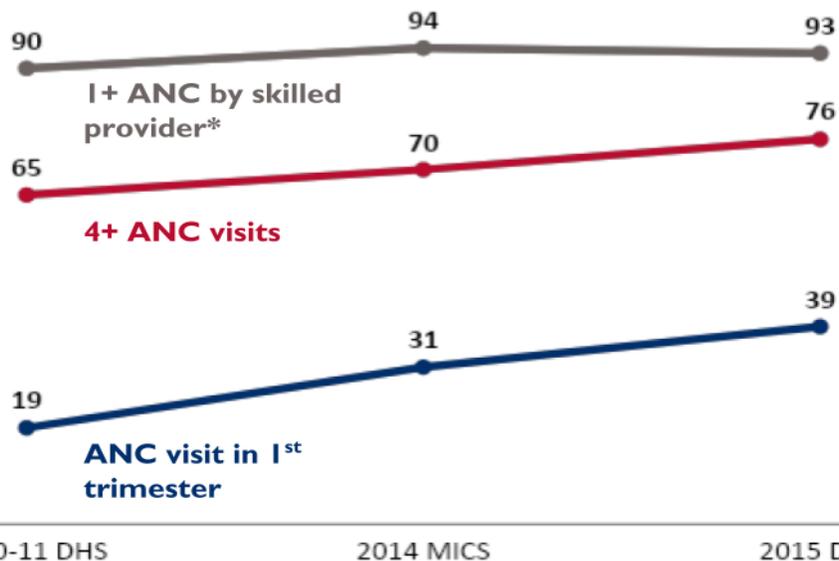
Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

What proportion of pregnant women are receiving ANC early and frequently during their pregnancy?

Figure A46. Trends in ANC Coverage

Percent of women age 15-49 with a live birth in the 5 years before the survey for most recent birth



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

Figure A47. Key Barriers and Facilitators to ANC Attendance

Facilitator	Type of Factor	Data Source	Evidence
Positive perceptions of ANC staff attitudes among beneficiaries	Social	2017 MCHIP Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts	The vast majority of mothers surveyed expressed positive comments in reference to the attitudes of ANC staff at the nearest health facility.
High ANC beneficiary satisfaction levels	Social	2017 MCHIP Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts	72% of ANC beneficiaries surveyed reported their service delivery experience was “very satisfactory”, with an additional 25% reporting a “satisfactory” experience.

Barrier	Type of Factor	Data Source	Evidence
Restricted ANC service availability at health facilities	Environmental	2017 MCHIP Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts	Almost 41% of mothers surveyed reported that ANC services at their nearest health facility were only offered on specific days of the week. 92% reported that regularity of service influenced their decision to attend ANC visits as scheduled.
Long distances to nearest health facility	Environmental	2016 MIS; 2017 MCHIP Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts	MIS: Nearly 47% of households reported the distance to the nearest health facility was greater than five kilometers, with over 19% reporting a distance greater than 10 kilometers. MCHIP assessment: Mothers residing > 10 km from the HF had a 70% reduced odds of receiving IPTp3+ compared with mothers living within five km of the nearest facility.
Cultural practices that encourage concealment of pregnancies	Social - norms	2017 MCHIP Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts	Focus group discussion members reported fear of being bewitched and shyness as substantial barriers to early ANC care-seeking.

Conclusion

The percentage of pregnant women attending four or more ANC visits is relatively high, suggesting that the majority of women have opportunities to receive the recommended minimum of three IPTp doses. However, there is still a need to increase the number of ANC visits by each pregnant woman and to improve early antenatal care-seeking to minimize missed opportunities for IPTp administration. According to the 2015 DHS, the average gestational age at first ANC was 4.4. months, with 35 percent of pregnant women making the first visit at four to five months and 17 percent delaying until the sixth or seventh month. There are several possible drivers for this behavior, including the cultural norms regarding concealment of pregnancy described above. PMI will focus SBC efforts to help address these issues.

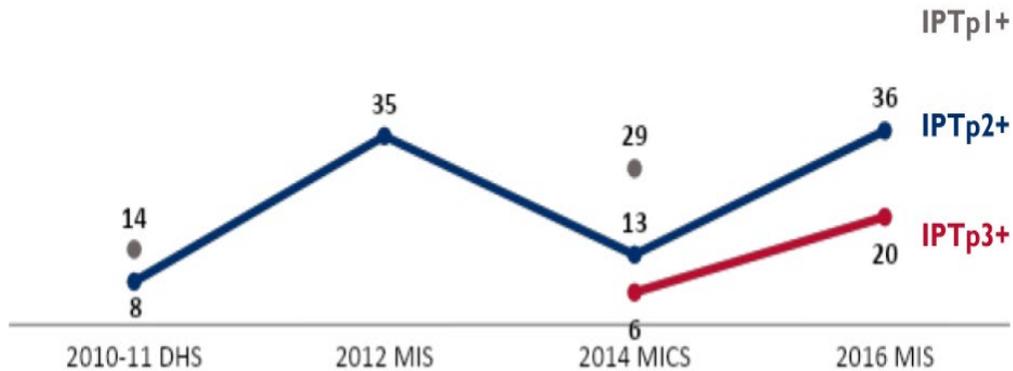
To help ensure early and regular ANC attendance, the MoHCC has adopted the revised 2016 ANC schedule and has rolled this approach out to facilities. However, there are concerns in-country regarding the administration of IPTp early in the second trimester for those women who attend the first ANC visit in the first trimester (approximately 39 percent of pregnant women, according to the 2015 DHS). In an effort to address this, the NMCP will be piloting community distribution of the first dose of IPTp at the community level using Global Fund resources.

Key Question 2

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

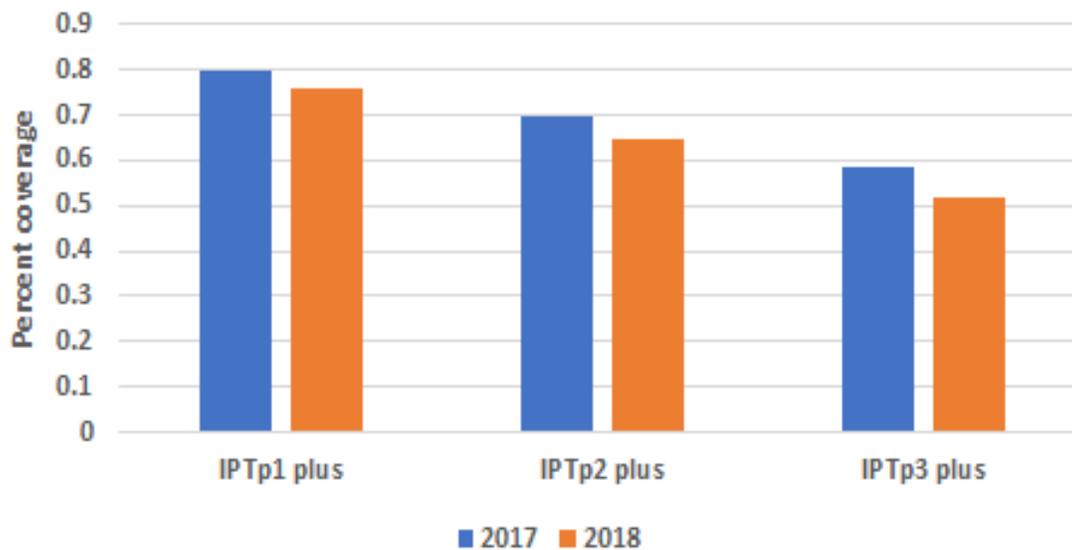
Supporting Data

Figure A48. Trends in IPTp, Percent of Women Age 15-49 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: Where possible, this indicator has been recalculated to coverage in subnational areas where the program is targeted.

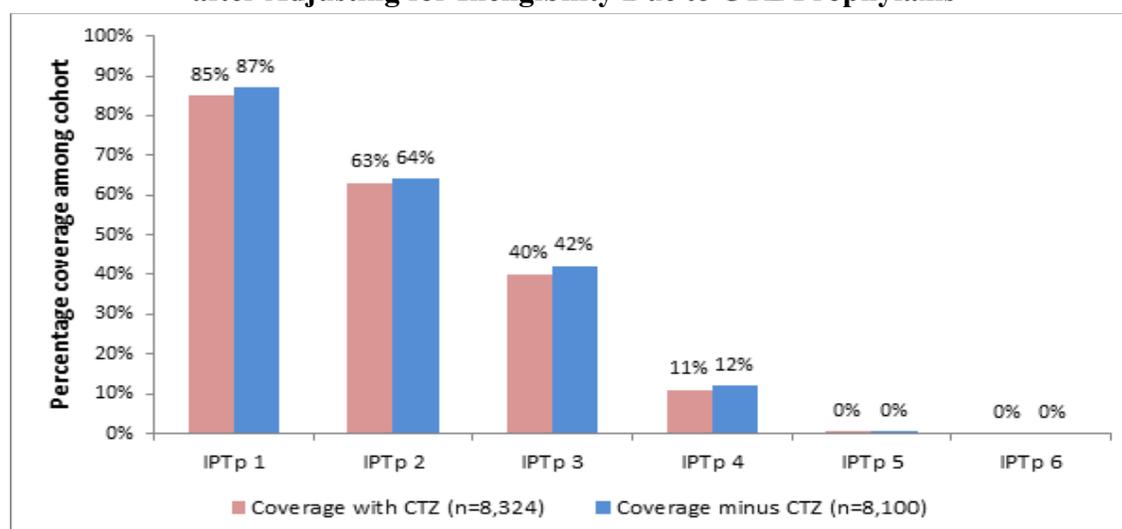
Figure A49. IPTp Coverage among Pregnant Women with at Least One ANC Visit *



Source: DHIS2 data, 2017 and 2018

*IPTp coverage calculated as the number of pregnant women receiving the specified number of IPTp doses divided by the number of pregnant women attending at least one ANC visit, as reported in DHIS2.

Figure A50. Facility-Based IPTp Coverage in a Cohort of 8,324 Women with First ANC Visit from January to June 2016, at 56 Health Facilities in Chipinge and Mutare Districts after Adjusting for Ineligibility Due to CTZ Prophylaxis



Note: IPTp coverage figures in this figure represent the minimum number of doses received, i.e. IPTp1 = one or more doses, IPTp2 = 2 or more doses, etc.

Conclusion

As measured by national-level household surveys (Figure A48), IPTp coverage in Zimbabwe appears to be relatively low, with the highest coverage estimate for IPTp2+ at only 36 percent (2016 MIS). However, as described earlier, IPTp is a targeted intervention in Zimbabwe, with implementation in only 26 of 62 districts. Given the methodology of these surveys and potential denominator issues in the calculation of IPTp coverage, PMI/Zimbabwe believes that these national household surveys underestimate the actual coverage in IPTp-targeted districts. Data from DHIS2 for the 26 targeted districts suggest that IPTp coverage is substantially higher. As Figure A49 illustrates, IPTp2+ coverage, calculated as the number of pregnant women receiving at least two doses of IPTp divided by the number of pregnant women attending at least one ANC visit in 2018, was 65 percent and IPTp3+ coverage was 52 percent. These coverage figures represent a slight decrease from 2017 levels. It should be noted that the HMIS data collection system does not allow for the capture of additional doses beyond IPTp3+, but revisions are currently being made to the system.

Although more limited in geographic scope, data from the PMI-funded 2017 *Assessment of drivers and barriers for achieving targeted IPTp coverage in Chipinge and Mutare District, Manicaland Province, Zimbabwe* also indicate higher IPTp coverage than reported in the national household surveys using a different, and likely more accurate, data collection methodology. In this assessment, coverage for IPTp doses were calculated for a cohort of approximately 8,500 pregnant women who attended first ANC from January to June 2016 in 56 health facilities in two high-burden, IPTp-target districts in Manicaland Province. Doses for each member of the cohort were manually counted and tallied from the ANC register. Figure A50

presents a summary of the findings. IPTp coverage levels were high, with 87 percent of cohort members receiving one or more IPTp doses, 64 percent receiving two or more IPTp doses, and 42 percent receiving three or more IPTp doses, after correction for cotrimoxazole prophylaxis.

Although the DHIS2 and 2017 Manicaland assessment data are reassuring, there is still considerable need to strengthen IPTp service delivery if the national target of 90 percent coverage with at least three IPTp doses is eventually to be reached.

Key Question 3

What is the gap between ANC attendance and IPTp uptake? What barriers and facilitators exist, especially among providers?

Supporting Data

Figure A51. Missed Opportunities for IPTp

Percent of women age 15-49

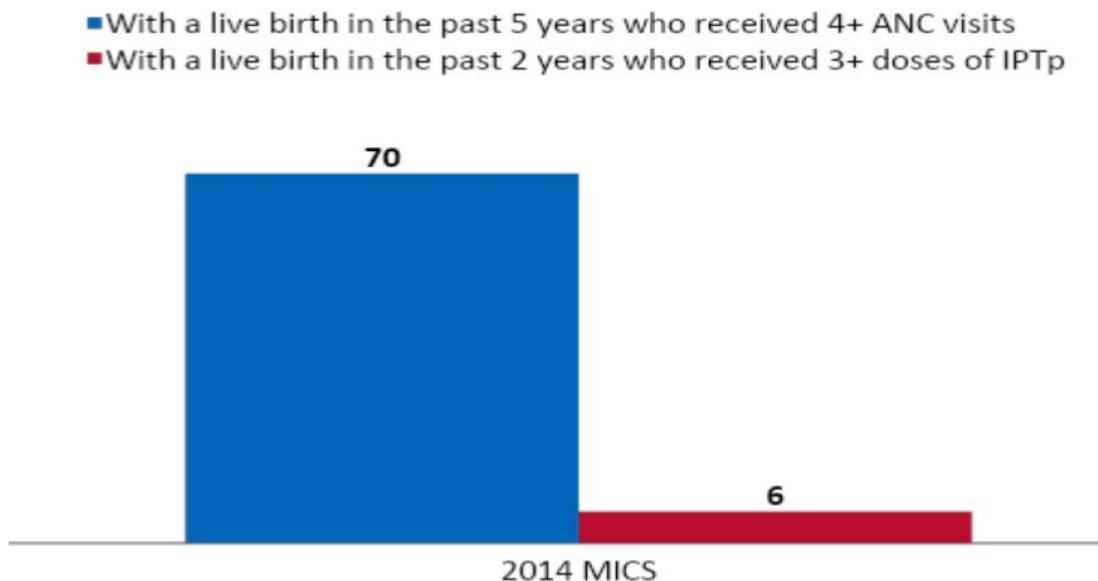


Figure A52. Key Barriers and Facilitators to IPTp Administration at ANC Visits

Facilitator	Type of Factor	Data Source	Evidence
Substantial proportion of staff trained in malaria in pregnancy in PMI-supported areas	Internal - knowledge	ZAPIM quarterly and annual reports; 2019 ZAPIM end of project evaluation; 2017 MCHIP Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts	In the three high-burden provinces supported by PMI through the ZAPIM project, 72% of facility-based staff and 73% of VHWs have received CM/MIP training between 2016 and present. Approximately 97% of facilities surveyed in the ZAPIM end-of-project evaluation reported having at least one health worker trained in malaria CM/MIP. High training coverage was also found in the 2017 MCHIP assessment.
Willingness among pregnant mothers to take SP.	Social - behavioral	2017 MCHIP Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts	99% of nearly 800 women offered SP during their last ANC visit reported that they had agreed to take the medication.
Barrier	Type of Factor	Data Source	Evidence
Availability of adequate SP stocks at central and facility level.	Environmental - commodity availability	LMIS and EUV data	15% of facilities (n=34) experienced a stock out of three days or more during the last three months.
Substantial gaps in knowledge of current IPTp guidelines among recently trained nurses and VHWs	Internal - knowledge	2017 MCHIP Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts	These knowledge gaps were associated with non-adherence to SP DOT in a substantial proportion of consultations and a high proportion of invalid IPTp doses and missed opportunities.
Limited IPTp content during ANC supportive supervision visits	Internal - knowledge	2017 MCHIP Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts	Although resources were generally available for supportive supervision and visits were taking place, the level of reinforcement of IPTp concepts during visits was limited.

Conclusion

The data from the 2014 MICS suggest that the vast majority of women attending four ANC visits do not receive at least three doses of IPTp. However, as described earlier, there are questions regarding the accuracy of IPTp3+ calculations in these surveys given the targeted nature of IPTp administration in Zimbabwe and data from other sources suggest considerably higher IPTp3+ coverage is the norm. That said, there are undoubtedly many missed opportunities for IPTp administration, even among those pregnant women with four ANC visits, given that even the

highest estimates for IPTp3+ are near 50 percent. This is corroborated by data from the 2017 *Assessment of drivers and barriers for achieving targeted IPTp coverage in Chipinge and Mutare District, Manicaland Province, Zimbabwe*. A review of ANC register records for over 8,500 women conducted as part of that assessment indicated that IPTp was not given at 19 percent of client encounters when it was due and no contraindications existed. The primary reason cited for not administering the dose was stockout of SP. The information regarding facilitators and barriers suggests a willingness among pregnant women to take SP when offered, but that ability to travel for ANC visits, SP availability, and provider knowledge (despite relatively high levels of training), may be limiting factors. PMI/Zimbabwe will focus service delivery, supply chain strengthening interventions and SBC efforts to help address these issues.

Key Question 4

What proportion of pregnant women with fever and malaria infection are getting diagnosed and treated?

Supporting Data

Given the current capabilities of the HMIS, it is not possible to capture this data.

Conclusion

Discussions regarding the changes to the HMIS required to enable collection of this data occurred in-country during a recent review of HMIS tools and registers. However, to PMI/Zimbabwe's knowledge, the necessary changes were not fully agreed upon or implemented. PMI will continue to advocate for the appropriate modifications.

Key Question 5

What was the estimated need for IPTp commodities during calendar year 2019? What is the estimated need for IPTp commodities over calendar years 2020 and 2021?

Supporting Data

Figure A53. Gap Analysis Table of SP Needs

Calendar Year	2019	2020	2021
Total Population at Risk	7,127,934	7,206,341	7,285,746
SP Needs			
Total number of pregnant women ¹	320,757	324,285	327,859
Total SP Need (in treatments)²	662,870	662,870	662,870

Calendar Year	2019	2020	2021
Partner Contributions			
SP carried over from previous years	1,032,197	612,827	490,802
SP from Government	0	0	0
SP from Global Fund	0	248,645	TBD
SP from Other Donors	0	0	0
SP planned with PMI funding	243,500	292,200	300,000
Total SP Available	1,275,697	1,153,672	790,802
Total SP Surplus (Gap)	612,827	490,802	127,932
Gap including stock required to end the year at the desired (max) stock level³		-172,068	-534,938

¹ Total number of pregnant women calculated as 4.5% of the total at-risk population.

² Total forecasted need is based on historical consumption, excluding requirements to fill up the pipeline to desired stock levels.

³ Gap calculation assumes the desired maximum stock level of 12 months is met at the end of 2020 and 2021 calendar years.

Conclusion

Biannual national quantification exercises are conducted by DPS, in coordination with the NMCP and malaria stakeholders. The PMI/Zimbabwe SP gap analysis table was developed in collaboration with PMI's supply chain partner and the NMCP using information from the most recent quantification exercise, conducted in August 2019. The gap analysis table estimates the total gap for calendar year 2021 to be approximately 172,000 SP treatments. However, this figure does not take into consideration the need to ensure appropriate stock within the in-country pipeline. The total need to ensure the maximum desired 12-month pipeline is approximately 830,000 treatments. Given PMI budget constraints and the likelihood of continued support for SP procurement in the next Zimbabwe Global Fund grant, PMI/Zimbabwe will procure 300,000 SP treatments, with the expectation that additional Global Fund resources will be made available to cover the remaining need. PMI/Zimbabwe will continue to monitor the SP supply status and work with Global Fund, the NMCP, and DPS to ensure that Zimbabwe's commodity needs are fully covered for 2021. This includes participating as members of the Global Fund grant writing team.

Key Question 6

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

Supporting Data

N/A

Conclusion

N/A

3. CROSS-CUTTING AND OTHER HEALTH SYSTEMS

3.A. SUPPLY CHAIN

NMCP objective
The availability of medicines is one of the key performance indicators for the MoHCC. Over the past ten years, MoHCC has developed and implemented a number of supply chain systems in order to ensure the availability of health commodities at the facility level.
NMCP approach
In an effort to prepare the MoHCC to provide a larger role in supporting public health supply chain management systems, stakeholders, with DPS leadership, created a vision to bring the management of all health commodities under a single unified commodities system for all primary care facilities and to have TB, malaria, and preventive commodities distributed via one system to all levels. This led to the Zimbabwe Assisted Pull System (ZAPS), which includes the management of all health commodities under a harmonized system of assisted ordering to create cost-efficiency without losing any of the availability of data and maintaining the low stockout rates realized under one of the previous systems called Zimbabwe Informed Push System. After a successful pilot that began in 2014, roll-out of ZAPS completed at the end of 2016 so that now much of the focus is on creating end-to-end data visibility from the health facility to the national level to continue to decrease stockouts.
PMI objective, in support of NMCP
In alignment with the MoHCC, PMI's main objective is to support availability of commodities and increased data visibility and quality. PMI contributes through the procurement and distribution of commodities as well as direct operational and logistical support for procurement and supply management, including the logistics reporting and ordering systems. Historically, PMI also supported the integration from the multiple systems to ZAPS and continues to support strengthening the functionality of the integrated system.
PMI-supported recent progress (past ~12-18 months)
<ul style="list-style-type: none"> ● PMI supported the assessment of the discrepancy between commodity consumption reported and reported malaria cases (refer to key question 3 below for data discrepancy). The assessment found multiple factors contributing to the issue, with a large component being the resupply system for VHWs and how their consumption is reported. Therefore, PMI supported a redesign of this system, including holding a workshop with stakeholders across the system to provide inputs to define feasible solutions. ● PMI provided support for a warehouse optimization exercise with key recommendations on how to improve the warehouse workflow due to challenges with the central-level warehouse. However, due to a misunderstanding of commodity availability issues from Zimbabwe

political leadership, the central-level warehouse (Natpharm) received a mandate to push all commodities out of the warehouse to lower levels, without using any current data system to inform where those commodities were needed. This led to stock imbalances across facilities as well as requiring additional support to Natpharm in order to resume normal operations.

- Global Fund included support to procure and implement an electronic Logistic Management System (eLMIS) in their last funding grant. PMI contributed to the technical requirements gathered to assist in informing the appropriate system for the country context and implementation is currently underway with the pilot launched in eight sites.
- PMI continued its operations support to the ZAPS quarterly reporting and distribution system, a semi-annual end-user verification survey (EUV), and support to the national quantification exercises with semi-annual updates.

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

- PMI will pilot the revised VHW resupply system. This will include gathering data at baseline and endline to inform if the system should be rolled out at a larger scale and how to improve it.
- In coordination with Global Fund, PMI will offer technical assistance in rolling out the eLMIS, including integrating the current ordering and reporting system while also upgrading this system to factor in the seasonality of malaria in Zimbabwe to address consistent stock imbalances seen across health facilities. In addition, to build off the previous work supported by PMI, Global Fund will support a warehousing consultant, which PMI will work with in order to improve Natpharm operations and distribution of commodities throughout the country.
- PMI will also continue to support the quantification of commodities as well as ZAPS ordering and delivery, including the fuel and trucks required in support of the system, to ensure commodity availability while monitoring commodity availability through the semi-annual EUV.

PMI Goal

To support efforts to 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.

Do you propose expanding, contracting, or changing any supply chain activities? If so, why and what data did you use to arrive at that conclusion?

The team is proposing to maintain consistent support for supply chain activities. Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

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

Supporting Data

Figure A54. Central Stock Levels for AL

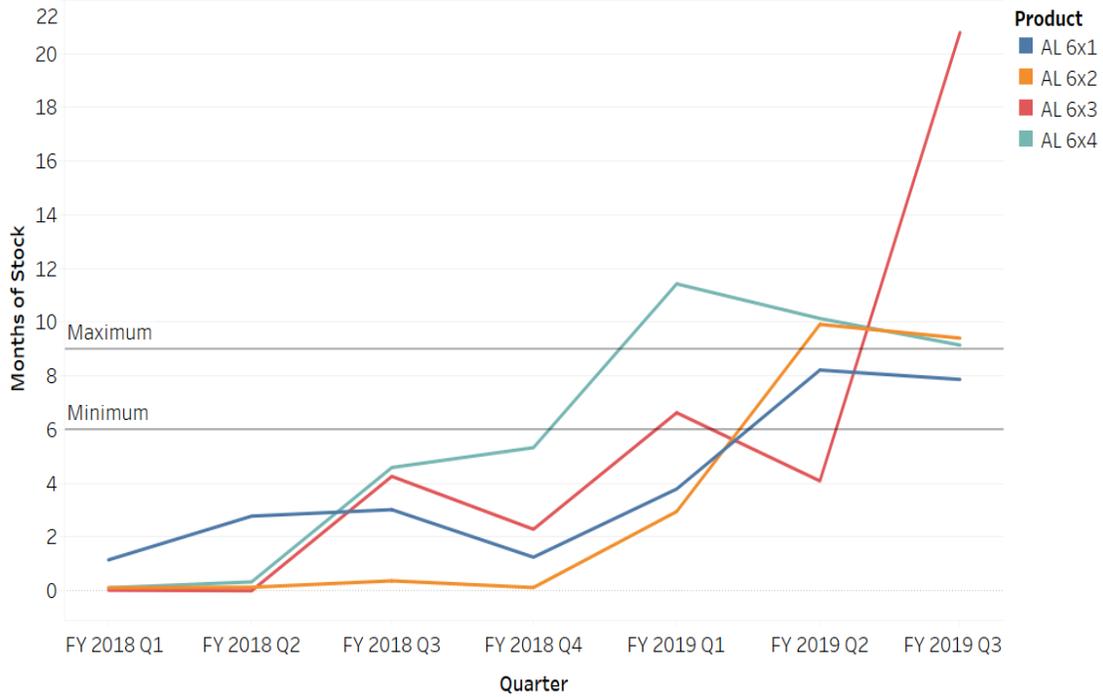
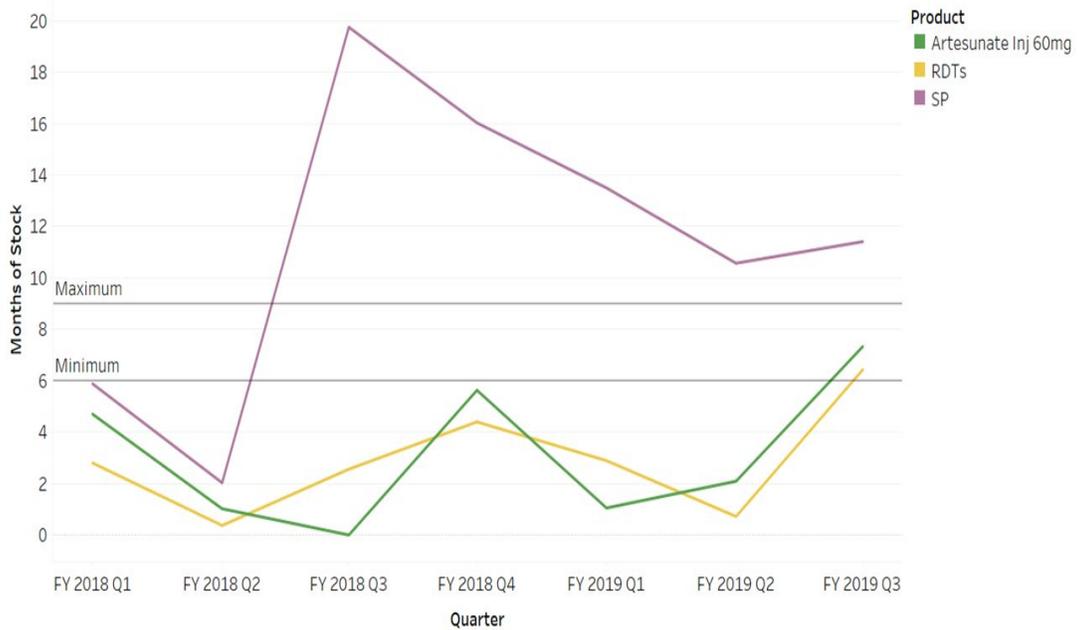


Figure A55. Central Stock Levels for RDTs, SP, and Injectable Artesunate, 60mg



Conclusion

Due to the high seasonality and known funding gaps for procurement, the country struggles to maintain appropriate stock at the central-level to ensure optimal response to changes in demand as the country is often understocked across commodities at the central level, with the exception of SP. However, around quarter three or four of the fiscal year, stock levels increase a bit as this shows the end of malaria season, before consumption increases again one to two quarters later and the majority of stock is pushed to health facilities. PMI uses this trend to time the arrival of orders as much as possible and consistently monitors these stock levels to place additional emergency orders as needed if funding is available. In addition, to improve anticipating these changes in seasonality, PMI is supporting the integration of a seasonality index into the current ordering system.

Key Question 2

What are the trends in facility- and community health worker-level stock out rates for ACTs, RDTs, and SP over the last year? Is there a seasonal or geographic difference in stock out rates?

Supporting Data

Figure A56. AL Stockout Rates

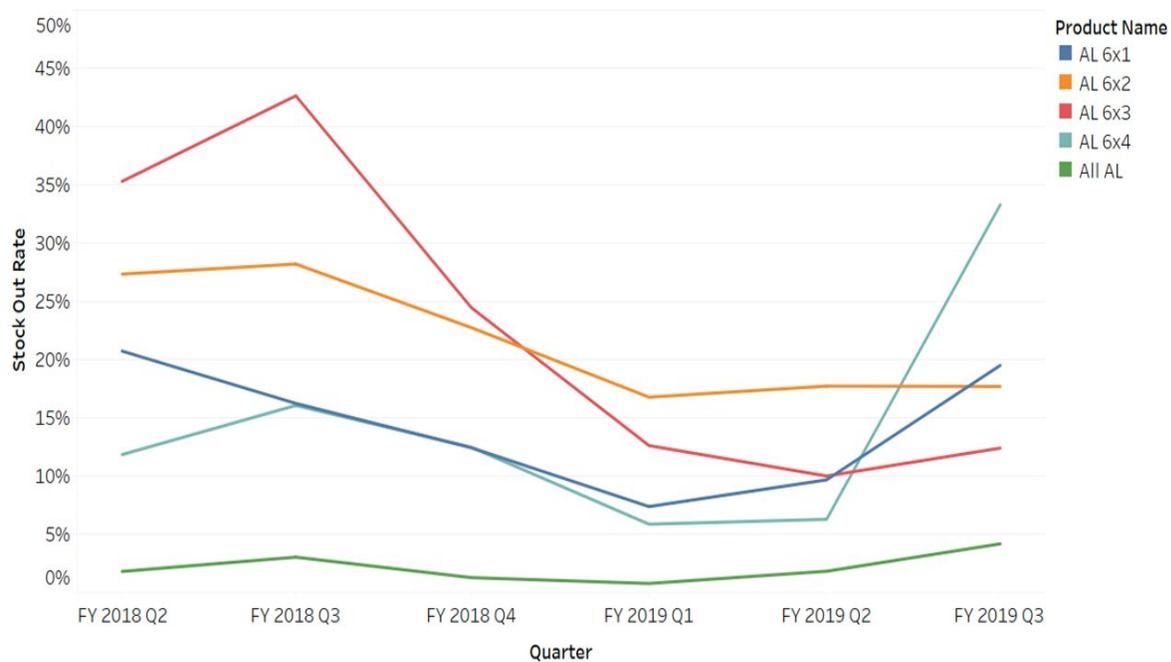


Figure A57. SP and RDT Stockout Rates



Conclusion

While stockouts of individual presentations of AL can be high, stockouts across all four AL presentations consistently remain low so facilities are generally able to treat cases by cutting or combining packs. RDT stockout rates also peaked last malaria season due to low availability in the country resulting from a policy disagreement that has since been resolved. SP stock levels are continuously a challenge as it is not used in areas with low malaria transmission, which can cause confusion on the ordering side even though SP is available at the central level. It can also cause confusion on which facilities should be reporting on SP stock and which should not. As orders also only occur once per quarter, SP might not always be prioritized over other commodities. Overall appropriate stock levels across facilities is a major focus of the team as while some facilities report stockouts, more facilities report overstocks. The EUV collected in May, at the end of the malaria season, reported over 50 percent of facilities with overstock across the 4 AL presentations, 31 percent in RDTs and 46 percent for SP. Therefore, stock is available in the country but not necessarily where needed. PMI continues to focus on this with follow-up actions after the EUV as well as by working to include seasonality into the ordering system to better inform facilities how to resupply appropriately.

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?

Supporting Data

Figure A58. Reported ACT Consumption Compared to Reported Malaria Cases

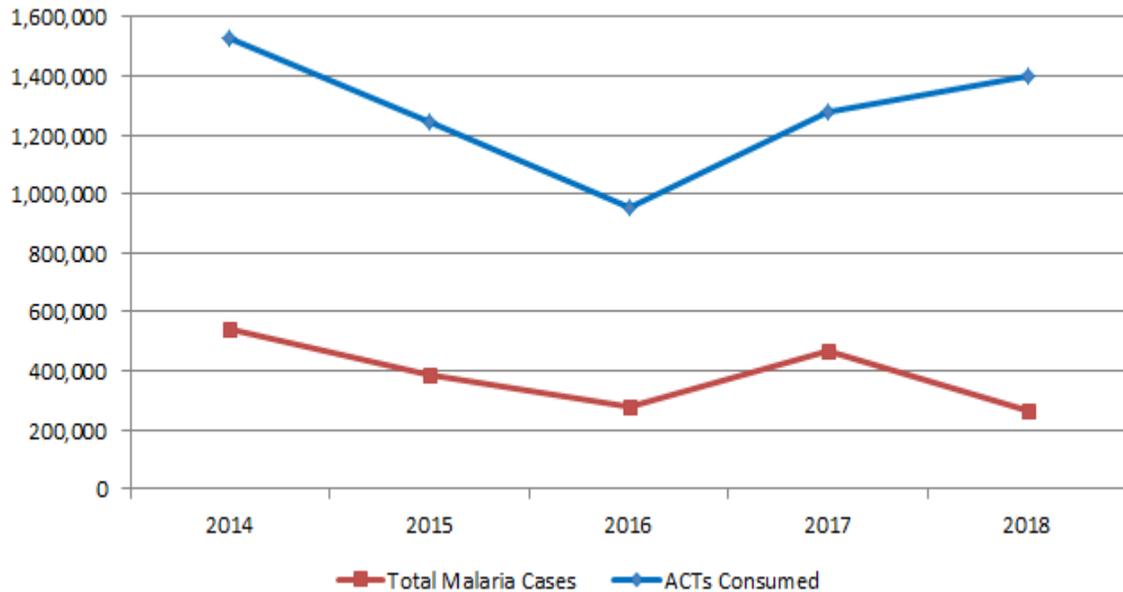
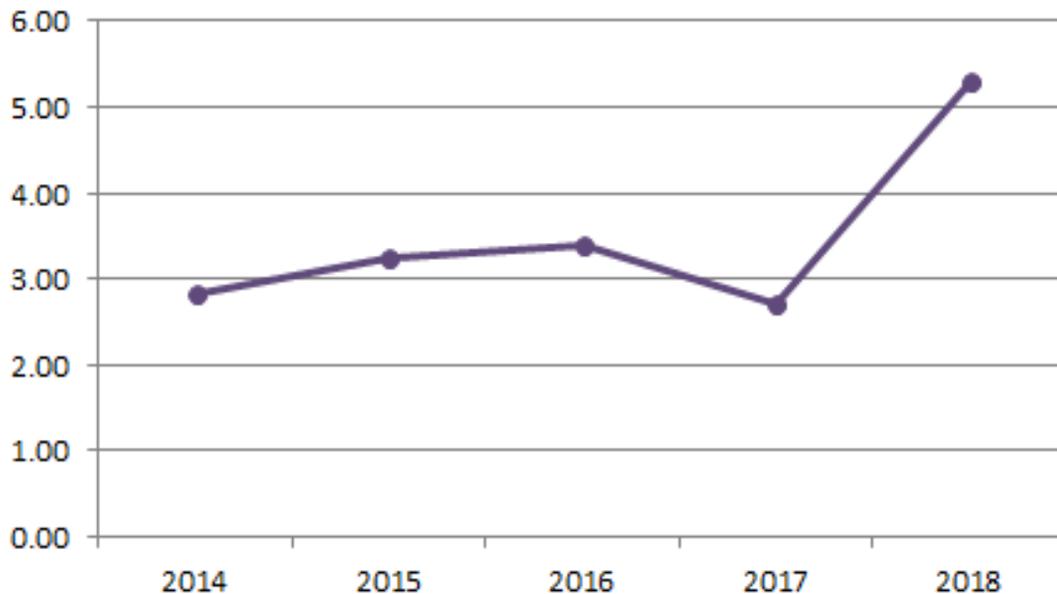


Figure A59. Ratio of ACTs Consumed to Malaria Cases



Conclusion

Zimbabwe consistently reports a significantly higher consumption of ACTs compared to the number of malaria cases reported with the ratio historically averaging approximately three, and with an even higher discrepancy in 2018. Due to this, PMI supported an assessment to identify possible causes and implemented activities to hopefully improve reporting. The assessment identified gaps and inconsistencies with the tracking of commodities at the VHW/community

level (such as double counting commodities as consumed when they are picked up by the VHW at the health facility then again when the VHW returns to the health facility to restock) leading to likely overestimations of malaria commodities consumed, attributing this as a potential major contributor for these discrepancies.

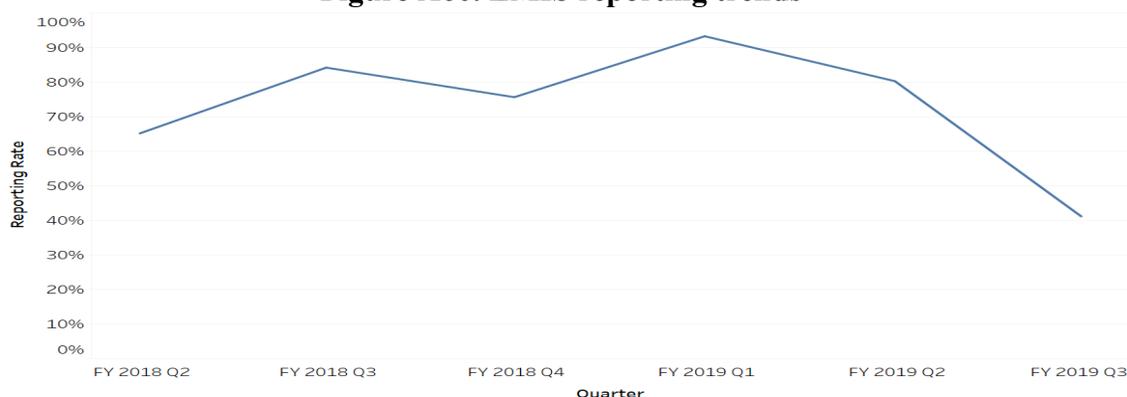
PMI is piloting a revised reporting system for VHWs over the course of the next year and will be providing technical assistance to the rollout of the Global Fund- supported eLMIS to provide more real-time data. In addition, due to the high overstock rates reported in the EUV, PMI is routinely monitoring expiration reporting trends in an attempt to identify any possible mistakes in reporting expired product as consumed in addition to performing regular data quality assessments. PMI is collecting expiry data in the EUV, to assess how this data is being reported. The addition of a seasonality index in the ordering system may also address the major stock imbalances seen across the country and in turn may address some of the major fluctuations. This is considered to be a long-term effort requiring adjustments at multiple levels of the system.

Key Question 4

What are the trends in LMIS reporting rates?

Supporting Data

Figure A60. LMIS reporting trends



Conclusion

Reporting in ZAPS occurs with DPS order teams traveling to each facility and entering order information into the system. This is a highly manual process that is prone to delays and can result in late receipt of orders at the central level, which could result in missed or delayed shipments and affect higher level quantification. Additionally, in quarter three of FY 19, ZAPS experienced significant delays and disruptions in their processes due to the mandated accelerated push, when NatPharm was forced to distribute commodities simply to clear the shelves of the warehouse instead of collecting orders and sending commodities to health facilities experiencing gaps in supply. Forced distribution not based on facility-level needs and lack of reporting disrupts multiple functions in the supply chain, including the ability to quantify appropriate need in-

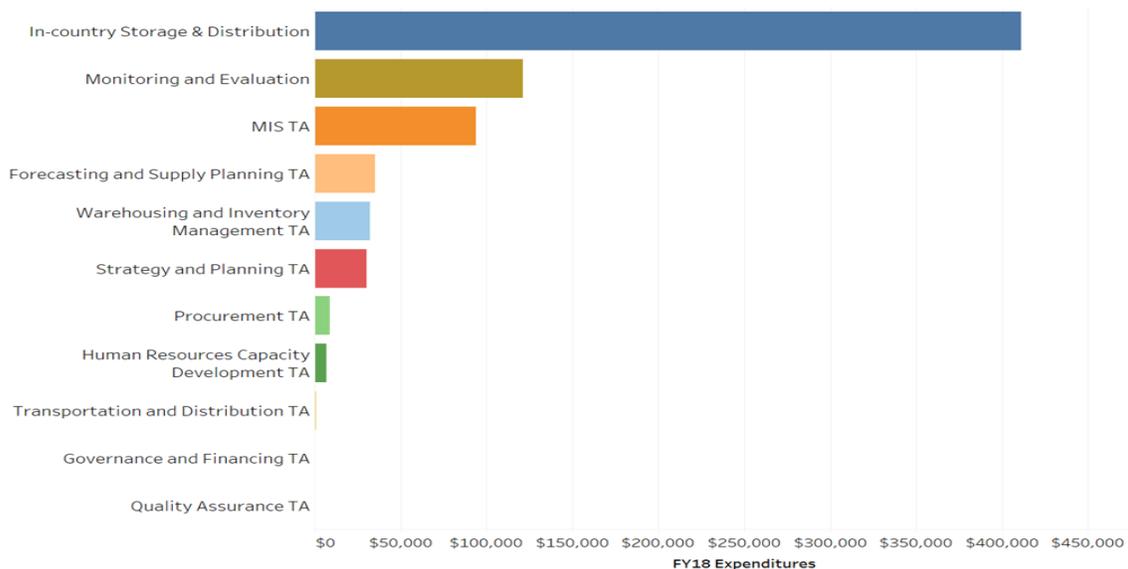
country. Supporting the rollout of an eLMIS will assist in lowering the burden of the current manual ordering process to increase consistent data visibility moving forward.

Key Question 5

What are the main supply chain functions supported by PMI? For areas that are not as strong is there additional investment that PMI should make? In areas performing well, is it dependent on PMI/donor funding and so should be maintained?

Supporting Data

Figure A61. FY 18 Supply Chain Investments



Conclusion

As mentioned earlier, a large portion of PMI funding contributes directly to the operations of ZAPs, ensuring the direct warehousing and delivery of commodities to health facilities. Due to the current economic situation in Zimbabwe, this support will continue in collaboration with other donors, including PEPFAR. The second two areas of greatest support are in M&E and management information systems (MIS) to both monitor the availability of commodities and increase data visibility at all levels of the supply chain. As Zimbabwe continues to move closer towards elimination throughout the country, this visibility will be important to ensure commodities are where they are needed when they are needed. PMI is moving forward with some of these improvements such as the VHW resupply redesign and including the seasonality index in the ordering system, as mentioned above. Support to continue improving the warehousing systems in country and regular forecasting and supply planning will also be critical moving forward to improve the system, although this requires lower levels of funding than these other areas.

Key Question 6

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

Supporting Data

N/A

Conclusion

N/A

3.B. SURVEILLANCE, MONITORING & EVALUATION (SM&E)

NMCP objective
<ul style="list-style-type: none">● In 2018, with PMI/Zimbabwe support, the NMCP updated the <i>Surveillance Monitoring and Evaluation Plan for the Zimbabwe Malaria Control Strategic Plan 2016-2020</i>. The overall SM&E objective is to provide a comprehensive tracking system that enables transparent and effective management of information on malaria prevention and control activities. The specific objectives of the SM&E plan are to:<ul style="list-style-type: none">○ Ensure collection, collation, processing, analysis, reporting, dissemination, and use of malaria data at all levels○ Harmonize data collection based on standardized reporting tools and indicators○ Facilitate and coordinate linkages between malaria control activities and information with other programs and partners to eliminate duplication○ Provide information for evidence-based decision making at all levels○ Provide a platform for evaluation of the outcomes and impact of malaria interventions
NMCP approach
<ul style="list-style-type: none">● <i>The Surveillance Monitoring and Evaluation Plan for the Zimbabwe Malaria Control Strategic Plan 2016-2020</i> outlines the following strategies to achieve the objectives above:<ul style="list-style-type: none">○ Improve routine data collection○ Strengthen surveillance at entomological sentinel sites○ Implement continuous data quality improvement○ Conduct and strengthen review meetings at all levels○ Improve monitoring of malaria medicines and other commodities○ Strengthen the reporting system for malaria elimination--the country has developed and adopted foci management guidelines following the WHO recommendations and the case and foci investigations are tracked through a separate module in DHIS2

- Strengthen supportive supervision at all levels
- Strengthen surveillance and M&E collaboration
- The NMCP works with PMI, Global Fund, the Clinton Health Access Initiative (CHAI) and other donors and partners to implement the activities falling under each of these strategic areas.
- The *Surveillance Monitoring and Evaluation Plan for the Zimbabwe Malaria Control Strategic Plan 2016-2020* also includes a performance indicator matrix, which the NMCP uses to track progress toward the achievement of the malaria prevention and control objectives outlined in the strategic plan.

PMI objective, in support of NMCP

- In coordination with other donors and malaria partners, PMI/Zimbabwe supports multiple aspects of the NMCP's SM&E efforts. This support spans all levels of the health system and all malaria prevention and control intervention areas. Note: Some aspects of PMI/Zimbabwe monitoring and evaluation support (e.g., entomological monitoring and tracking of vector control interventions) are described in other sections of this document.
- At the central level, PMI supports the NMCP and the broader MoHCC to review and adjust policies, as well as to plan, coordinate and implement broader SM&E strengthening initiatives. This includes support for population-based surveys to measure progress on key malaria indicators.
- At the provincial, district and health-facility levels, PMI/Zimbabwe SM&E activities are focused on strengthening routine malaria surveillance and epidemic preparedness and response in four high-burden provinces. Activities targeting the remaining provinces are implemented by NMCP with support from Global Fund.
- PMI/Zimbabwe also supports SM&E-strengthening efforts in areas implementing malaria elimination activities, particularly in Lupane District in Matabeleland North.

PMI-supported recent progress (past ~12-18 months)

- PMI/Zimbabwe provided financial and technical support for the revision of the Surveillance Monitoring and Evaluation Plan for the Zimbabwe Malaria Control Strategic Plan 2016-2020 and the 2018 Malaria Epidemic Preparedness and Response guidelines. Both documents have been finalized, printed, and disseminated. PMI/Zimbabwe is currently supporting the revision of the SM&E facilitator and participant training manuals.
- In the four targeted high-burden provinces, PMI/Zimbabwe supported:
 - Three DQA exercises, covering 32 facilities across five districts.
 - Three provincial- and district-level planning and review meetings.

- Training of 24 health workers in Lupane District in enhanced surveillance procedures for malaria elimination areas.
- Training of 25 health workers in Lupane District in GIS mapping techniques for support of enhanced surveillance in malaria elimination areas.
- Development of a pilot program for weekly mobile reporting by VHWs in a hard-to-reach area in Mbire district, including training of 186 VHWs and 26 health facility staff.
- Printing and distribution of 1,160 RDT registers for VHWs in selected districts.
- Implementation of peer-to-peer supervision to enhance disease reporting at the health-facility and community level.

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

Currently, the majority of PMI-supported SM&E activities have been on hold since September 2019, due to late USAID funding this fiscal year. As a result, implementation of some of the activities below will be delayed until that funding is availed.

- PMI/Zimbabwe will support the finalization, printing and dissemination of the SM&E facilitator and participant training manuals and biannual SM&E TWG Sub-Committee meetings.
- In the four high-burden provinces, PMI will support:
 - Training for 150 health workers in malaria SM&E, using the revised training manuals.
 - Training for 56 rapid-response team members in malaria epidemic preparedness and response.
 - Seven DQA exercises, to be conducted bi-annually in three provinces, with a special elimination-focused exercise for Lupane District.
 - Three provincial- and district-level annual review meetings.
 - Completion of the currently ongoing pilot program for weekly mobile reporting by VHWs in a hard-to-reach area in Mbire district.
 - Implementation of peer-to-peer supervision to enhance disease reporting at the health-facility and community level in selected districts.
- In elimination areas in Matabeleland North province, PMI will support:
 - Training and logistics for the DHIS2 tracker system used for surveillance in malaria elimination areas.

- Updating the malaria elimination foci database.
- Updating, printing and dissemination of malaria elimination reporting tools.

PMI 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.

Do you propose expanding, contracting, or changing any SM&E activities? If so, why and what data did you use to arrive at that conclusion?

In FY 2020, PMI/Zimbabwe will target additional resources to strengthening routine malaria SM&E systems. In FY 2018 and FY 2019, PMI has assisted the NMCP with the revision of Zimbabwe's SM&E guidelines and training manuals and has initiated training of health care workers using these tools. However, resources have not been sufficient for the full scale-up of these trainings and of other critical activities, such as DQAs and data review meetings. The modest shift in funding proposed for MOP FY 2020 will not fully meet the programming needs, but will allow for more flexibility in scaling up activities and, potentially, allow for an increase in the geographic scope for PMI-supported activities. It should also be mentioned that PMI/Zimbabwe will be supporting the development of a malaria module in the pilot EHR system (funding is included under the Other Health Systems Strengthening section).

PMI/Zimbabwe will continue to support the NMCP's efforts to improve preparedness and response for the seasonal malaria epidemic at the same funding level. With the revision of the *Malaria Epidemic and Response Guidelines* completed, these resources will be targeted to ensure training on and implementation of the activities outlined.

Finally, PMI/Zimbabwe will continue to provide support for malaria elimination activities in selected geographic areas, with a particular emphasis on strengthening case and foci-based surveillance. Of note, PMI/Zimbabwe's primary service delivery implementing partner will be coming to a close in 2020/2021. The PMI/Zimbabwe team will further refine the geographic scope and specific activities of the follow-on project in the coming months.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

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

Supporting Data

Figure A62. Summary of Zimbabwe Data Collection Activities

Data Source	Data Collection Activities	Year								
		2015	2016	2017	2018	2019	2020	2021	2022	2023
Household Surveys	Demographic Health Survey (DHS)*	X					(X)			
	Malaria Indicator Survey (MIS)		X							
	Multiple Indicator Cluster Survey* (MICS)					X				
	EPI survey									
Health Facility Surveys	Service Provision Assessment (SPA)									
	Service Availability Readiness Assessment (SARA) survey									
	Case Management Audit*					X				
Other Surveys	EUUV	X	X	X	X	X	(X)	(X)	(X)	
	School-based Malaria Survey									
	Other (Knowledge, Attitudes and Practices Survey, Malaria Behavior Survey)									
	Other (Malaria Impact Evaluation)									
Malaria Surveillance and Routine System Support	Support to Parallel Malaria Surveillance System									
	Support to HMIS	X	X	X	X	X	(X)	(X)	(X)	
	Support to Integrated Disease Surveillance and Response (IDSR)*	X	X	X	X	X	(X)	(X)		
	Other (Logistics Management Information System (LMIS)	X	X	X	X	X	(X)	(X)	(X)	
	Other (Malaria Rapid Reporting System)*	X	X	X	X	X	(X)	(X)	(X)	

*Asterisk denotes non-PMI funded activities; x denotes completed activities and (x) denotes planned activities.

Conclusion

In recent years, PMI/Zimbabwe has prioritized support for national-level surveys, EUV, and HMIS/LMIS implementation and strengthening. PMI will continue to support these activities in FY 2019 and FY 2020, including the implementation of a 2020 DHS, if in-country and PMI funding are sufficient for implementation. However, given the delays in securing funding, it is possible that this survey will need to be postponed until 2021, pending the outcome of stakeholder discussions in the near future.

Although not listed here, PMI/Zimbabwe has also supported program evaluations to assess particular issues that are affecting progress in malaria prevention and control. These include the 2018 *Assessment to determine the factors that contribute to the observed disparity between recorded malaria cases and first-line ACT consumption on Zimbabwe*, the 2018 *Assessment of the drivers of continuing malaria transmission in Angwa Ward, Mbire District, Mashonaland Central Province* (report finalization imminent), and the 2019 ZAPIM end-of-project evaluation (preliminary results now available). Each of these assessments included surveys of facilities and/or facility-based staff that have provided valuable information for PMI/Zimbabwe and NMCP.

Key Question 2

What HMIS activities have been supported in your country? What current priorities will be supported with this MOP funding?

Supporting Data

Figure A63. HMIS-Supported Activities

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
Central Level					
Register, tools (e.g. checklists, indicator glossary), job aids (design, indicators, definition of data elements, data dictionary, system support)	X	X	X		
Data quality assessments (separate from supervision – funding for travel to lower levels)	X	X	X		
Program monitoring and technical assistance (funding for travel to lower levels)	X	X	X		

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
Training (funding for central level to conduct training at lower levels, capacity building, i.e. on the job training for central level staff)					
Human Resources (secondment of person in NMCP for SM&E, office/team for SM&E)			X		
Data Use (analysis, interpretation, visualization (dashboards, bulletins, dissemination/feedback to lower levels, decision-making)			X		
Policy guidelines and coordination (updating policies, guidelines, supporting sub-committee meetings, supporting participation in sub-committee meetings)	X	X	X		
External relations/Communications/Outreach (support travel to international meetings and publications)					
Support to annual operational plans for national malaria program	X	X	X		
Desk review to catch “logic errors system” (provide TA to catch logic errors)					
Admin 1 Level (Province). PMI supports activities in 4 provinces while Global Fund supports activities in the remaining 6 provinces.					
Registers (warehousing, printing, distribution)					
Data quality assessments (separate from supervision – funding for travel to lower levels)	X	X	X		
Program monitoring and technical assistance (funding for travel to lower levels)	X	X	X		
Training (funding for provincial staff to conduct training at lower levels, capacity building, i.e. on the job training for provincial level staff)	X		X		
Human Resources (secondment of person for malaria SM&E, office/team for SM&E)					

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
Data Use (analysis, interpretation, visualization (dashboards, bulletins), dissemination/feedback to lower levels, decision-making)	X	X	X		
Adaptation of national policy guidelines and coordination (adapting policies, guidelines, supporting sub-committee meetings, supporting participation in sub-committee meetings)	X	X	X		
Adaptation of checklists and job-aides	X	X	X		
Participation in national meetings (support for travel costs)	X		X		
Support to Annual Operational Plans for Provincial Malaria Program	X	X	X		
Admin 2 Level (District)					
Data entry, summary, and transmission (training, re-training, computers, internet, tools)	X	X	X		
Supervision (training, traveling, supervision tools/checklists, create/design system for organized/methodical supervision)	X	X	X		
Data validation (data validation activities before monthly data submission - organize health facilities)	X	X	X		
Monthly/Quarterly/Biannual data quality review meetings (venue, meeting support)	X	X	X		
Data Use (analysis, interpretation, visualization (i.e. dashboards), dissemination/feedback to facilities, decision-making)	X	X	X		
Human Resources (secondment of person for malaria SM&E, office/team for SM&E)					
Annual planning with province (support travel)	X	X	X		
Facility Level					
Data collection/entry, summary, and transmission (training, re-training, computers, internet, tools)	X	X	X		

Intervention	PMI-Funded? (X)			Does Global Fund plan to fund this? (X)	Does another donor plan to fund this? (X)
	FY 18	FY 19	FY 20		
Supervision of CHWs (training, traveling, administering supervision tools/checklists of community health workers)	X	X	X		
Data use (analysis, interpretation, visualization (dashboards), dissemination/feedback to CHWs, decision-making)	X	X	X		
Monthly/Quarterly data quality review meetings(support for travel)	X	X	X		
Community Level					
Data collection/entry and transmission (training, re-training, tools)	X	X	X		
Data use (analysis, interpretation, decision-making)	X	X	X		
Monthly/quarterly data quality review meetings (support for travel)	X	X	X		

Conclusion

The current Global Fund grant ends in December 2020, and it is not possible at the time writing, to confirm Global Fund commitments for HMIS strengthening in FY 2020. PMI/Zimbabwe will be heavily engaged in the grant writing process for the follow-on grant, slated to begin implementation in January 2021, and will work to ensure alignment of PMI/Zimbabwe and Global Fund resources and activities. CHAI also provides support for HMIS strengthening, primarily in elimination areas. However, the current BMFG grant funding this work is coming to an end prior to FY 2020 implementation. PMI/Zimbabwe will be collaborating with CHAI to ensure alignment of resources and activities if a follow-on grant is made.

Key Question 3

What are the outcomes of HMIS strengthening efforts?

Supporting Data

Figure A64. HMIS Outcome Summary

		2017	2018
Timeliness ¹	% of reports received on time	80.4%	75.4%

		2017	2018
Completeness	“Confirmed malaria cases for children under 5 years of age” was reported in X% of facility-months	N/A	N/A
Accuracy ²	Populate with most recent DQA data	2017 National RDQA Report identified 25% under-reporting and 4% over-reporting for confirmed malaria cases. PMI-supported DQA in four districts over a period of six months identified 3% over-reporting of confirmed malaria cases and 8% under-reporting for patients given ACTs	PMI-supported DQA in three districts over a period of three months identified 2% under-reporting for confirmed malaria cases and 14% over-reporting for patients given ACTs

¹Source: Zimbabwe DHIS2

²The 2017 National RDQA Report was implemented by MoHCC with support from Global Fund.

Conclusion

Approximately three-quarters of the T5 HMIS OPD reports that include the key malaria disease surveillance indicators were received on time in 2018. As reported in Figure 7, *Evolution of key malaria indicators reported through routine surveillance systems* (See Introduction), the overall submission rate for T5 reports was above 97 percent. Although there is still room for improvement, this suggests that relatively efficient and timely submission is the norm. However, information regarding the completeness of individual data elements within these reports is more limited. Currently, there is no templated reporting tool within DHIS2 for retrieving reporting rate information on individual lines included within the T5 report. PMI/Zimbabwe attempted to pull this information manually (i.e., for the “confirmed malaria cases for children under 5 years of age”) but the system does not differentiate between non-reporting and zero reporting for individual line items. The team will work with partners to determine a way forward to retrieve this data in the future.

The DQA data supported by the NMCP and PMI/Zimbabwe identified discrepancies in data reporting between the original registers and the final figures in DHIS2. Similar discrepancies were also noted in the 2018 *Assessment to determine the factors that contribute to the observed disparity between recorded malaria cases and first-line ACT consumption on Zimbabwe*. Record review of 72 facilities conducted as part of this assessment identified considerable discordance between the data recorded in source register, compared with the data in the T5 form and DHIS2 (the latter two sources were generally comparable). Similar to the DQA exercises, the discordance was inconsistent in direction and magnitude across the two indicators of interest, confirmed cases and confirmed cases given an ACT. The overall tendency was to over-report the

number of confirmed cases. These findings are not surprising given some of the issues identified through these assessments, which include a near total lack of formal adult OPD registers, inconsistent use of RDT registers, and unclear guidance regarding the official source documents for data collection at the facility level. PMI/Zimbabwe has been working with NMCP and other MoHCC SM&E colleagues to address these issues, but there is still considerable progress that needs to be made. Of note, no National DQA exercise was conducted in 2018. The MoHCC intends to implement the next DQA exercise in November 2019.

Key Question 4

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

Supporting Data

N/A

Conclusion

N/A

3.C. SOCIAL AND BEHAVIORAL CHANGE (SBC)

NMCP Objective
<p>Zimbabwe Malaria Communication Strategy Vision Statement:</p> <ul style="list-style-type: none"> To have a malaria-free Zimbabwe through empowered communities who have the knowledge and skills to protect themselves from malaria. <p>Zimbabwe Malaria Communication Goal (also NMSP Objective 5):</p> <ul style="list-style-type: none"> Increase utilization of all malaria interventions to at least 85 percent by 2020.
NMCP Approach
<p>Zimbabwe has a Malaria Communications Strategy (MCS), which was designed to support the NMSP 2016-2020. Like the NMSP, the communications strategy recognizes the heterogeneous malaria transmission within the country and distinguishes between SBC needs for both high and low transmission areas. High and low transmission areas have different approaches and protocols to manage malaria. Therefore, the SBC messages, desired behaviors, target groups/individuals and challenges are different. Most of the MCS strategies (strategies 2-5) include a sub-section for low-transmission areas.</p> <p>The MCS is organized by seven Strategy Areas:</p> <ul style="list-style-type: none"> Strategy 1: Advocacy Strategy 2: Vector Control Strategy 3: Case Management

- Strategy 4: Surveillance
- Strategy 5: Cross-border Initiatives
- Strategy 6: Special Populations
- Strategy 7: Branding

Guiding Principles of MCS 2016-2020

1. Evidence-based information gathering and dissemination. Systematic inquiry and use of resulting data on the determinants of behavior is the basis for health communication interventions. In order to develop strategies that result in behavior change, the knowledge levels, beliefs, cultural values, and structures of the target groups need to be identified. Formative research and rapid assessments will also assist in the segmentation of the target groups and development of specific and key messages.
2. Epidemiological evidence. Use of epidemiological data will greatly assist SBC efforts by ensuring malaria is defined in terms of place, time, and the population at risk.
3. Multi-sectoral collaboration. In order for malaria prevention and control to be successful, joint efforts are needed among all sectors, from the community to the national level. Collaboration and coordination of key partners and stakeholders will be crucial in mobilizing financial and human resources.
4. Community ownership, empowerment, initiative, involvement, and participation. Zimbabwean communities should be convinced that they remain at risk of contracting malaria all year round. Their ownership and participation in malaria control and prevention activities will make malaria elimination possible. Community participation will ensure that the approaches developed to address barriers to their health in their unique context are sustainable and effective.
5. Use of multiple, reinforcing channels. Use of multiple channels to reach target audiences has proved to be very effective in SBC. Due to the stratified nature of malaria risk in the country, this is an important component of this strategy. Some of the communication channels this strategy highlights include interpersonal communication, community mobilization and mass media.

Conceptual Framework

The MCS is guided by theory-based models of behavior change. The socio-ecological model (Figure A65) highlights how behavior influences (and is influenced by) individual, social and structural factors. Based on the Ecological Systems Theory, the socio-ecological model is the basis for decisions to focus on advocacy as an important part of this strategy.

Green and Kreuter's PRECEDE-PROCEED planning framework (see Figure A66) provides a roadmap for the design of SBC programs.

The Precede-Proceed Model is evidence based. Data derived from the MIS, HMIS, ZDHS and MICS were used to come up with epidemiological, behavioral, predisposing, reinforcing, and enabling factors. Thus, the SBC interventions in this MCS are focused on addressing problems highlighted in nationally representative household survey data.

Figure A65. The Socio-Ecological Model

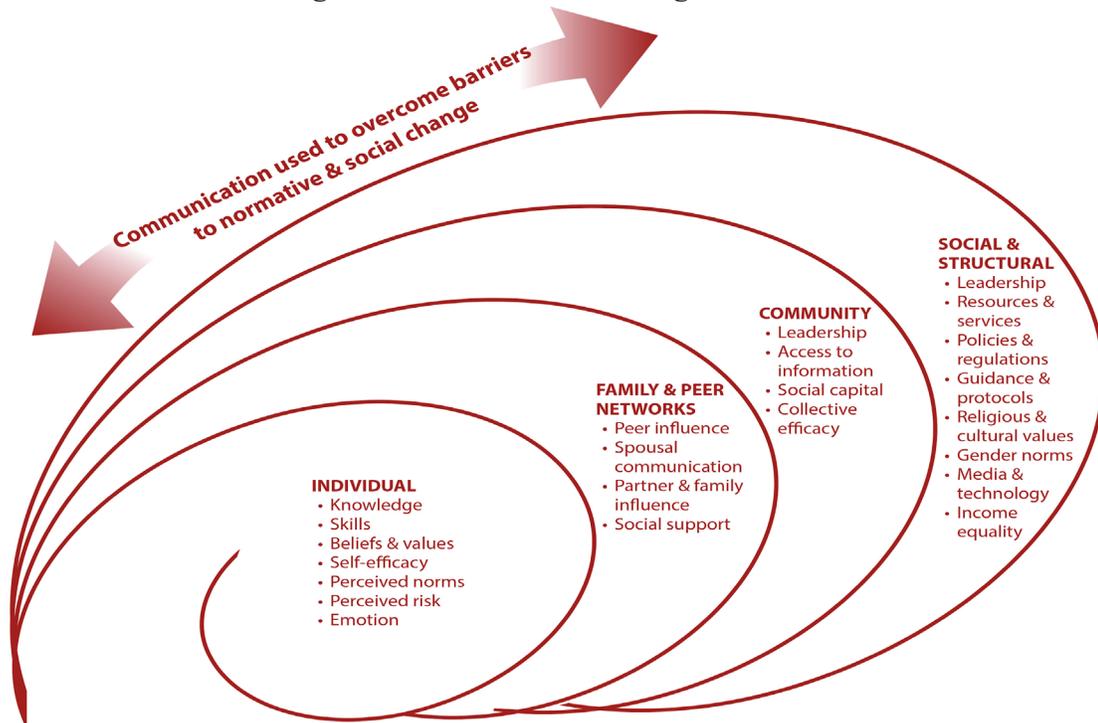
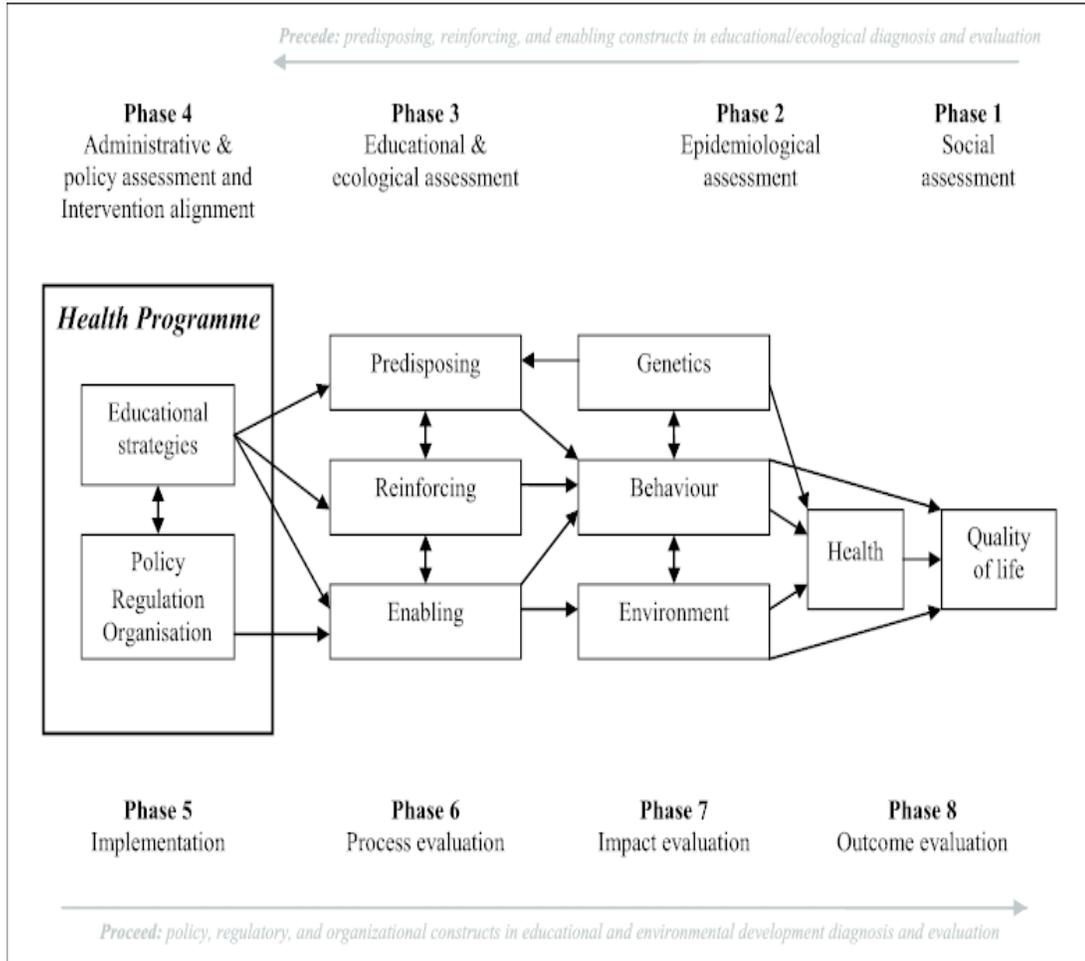


Figure A66. The Precede-Proceed Model



There is an active NMCP SBC technical sub-committee meeting that occurs at the national level quarterly and includes representatives from each provincial office. The chair of the SBC technical sub-committee is from a PMI-supported partner organization, and the NMCP SBC Officer plays the secretariat role. The purpose of the sub-committee is to provide technical guidance, policy formulation, oversight and monitoring of quality implementation, motivation, and a forum for discussion for SBC nationwide.

PMI and Global Fund, as the major malaria donors in the country, provide a similar package of support to NMCP across all the major malaria implementation areas (IRS, ITN, IPTp, case management, MIP, and elimination). Together, these two major pieces of support are combined across all geographic areas and are supplemented by smaller donors including: Isdell Flowers, Wild4Life, and the United Methodist Church. However, some gaps still exist as SBC funding is not sufficient. NMCP plays the coordinating role of all donors and partners to ensure adequate SBC coverage as much as possible with no duplication.

PMI Objective in Support of NMCP

PMI's SBC support is fully aligned with the NMSP and the MCS. PMI's objective is to support NMCP's NMSP by extending SBC funds as far as possible. Inevitably, PMI funds will not cover every area of need, even with GF support. Therefore, PMI prioritizes the most urgent SBC priorities in control areas.

At the national level PMI supports NMCP to articulate SBC policies and themes, produce guiding documents, etc. In addition, NMCP has assigned PMI implementing partners specific districts in which to provide a comprehensive package of malaria prevention and treatment support including important cross-cutting areas such as SBC and SM&E. Two PMI partners cover the districts in the three highest-burdened provinces (Manicaland, Mashonaland East and Mashonaland Central) currently responsible for approximately 80 percent of malaria transmission in-country. PMI also is working with NMCP and partners to define and refine the SBC elimination approach and tools which are deployed in two provinces (Matabeleland South and Matabeleland North). PMI has one partner that is working in Matabeleland North. The NMCP GF grant covers the SBC work in the remaining malarious provinces (Midlands, Masvingo, and Mashonaland West).

PMI plays a leading technical role in support of NMCP to coordinate, plan, and technically dialogue mainly through the NMCP SBC Subcommittee. One of PMI's partners plays the role of chair on the sub-committee and also frequently supports logistics for the meetings. NMCP plays the secretariat role.

PMI-Supported Recent Progress (Past 12-18 Months)

PMI/Zimbabwe supported activities within the past 12-18 months included:

- Broad stakeholder meeting to help NMCP develop their new branding concept and creation of branding process concept note and planning documents
- Development and printing materials promoting the "My net, My life" concept to promote the mass distribution of ITNs
- Reprinting of the *Communication Guide for the Introduction of Rectangular Nets* for distribution in Manicaland in response to Cyclone Idai.
- Development of radio spots to promote ITN ownership and consistent use for every sleeping space and acceptance and participation in IRS
 - ITN messages raised awareness of ITNs as a malaria intervention for use indoors and outdoors, encouraged correct and consistent use of ITNs and gave tips on correct care of the net to avoid adverse effects. The spots went on three radio stations: National FM (27 slots), Radio Zimbabwe (30 slots) and Diamond FM (24 slots). Broadcasts will continue through malaria season November-December 2019 and will continue through April-May 2020 as soon as new funds arrive.

- IRS radio spots are aimed to sensitize IRS-targeted communities activities from mid-October to November 2019 in advance of the spraying season. The overall message is to encourage uptake of IRS services by communities and include content on: announcing the spraying season is approaching and that the program is conducted free of charge, encouraging participation in IRS by allowing spray operators to spray homes, prepare homes in advance (remove belongings) and provide a rationale and explanation for chemical rotation. PMI supported a 60-second radio advertisement using three voices (artists) which was aired on one national radio station (National FM -11 slots) and one provincial radio (Diamond FM -22 slots) aimed to reach over eighty percent of the population targeted by ITNs nationwide.
- Through the health center committees (HCCs), PMI supported training through the community action cycle (60 HCCs in two high burdened provinces) on Explore Health Issues and Setting Priorities and Planning Together and Act Together phases. Other HCCs already trained in community action cycle have reached out to 18,239 community members through village meetings. In addition, HCCs have participated actively in supporting VHWs in their work by accompanying them on home visits, conducting village inspections and creating health and hygiene clubs. HCCs have become active in community lobbying for early ANC booking and early seeking of care for suspected malaria, community surveillance for ITN abuse and IRS refusal, and periodic assessment of disease levels in the community.
- Follow-up on the Chikunda-speaking ward of Chapoto District and their use and community discussion of the malaria control talking book, *Dipa la Malaria*.
- Development and production of SBC materials in an elimination setting focused on creating a sense of urgency and action required by health facilities, VHWs and community members (HCCs)
 - flow chart job tool for health facility workers
 - flip chart for VHWs to use with community members
 - wall painting designs in public locations (schools, sundry stores, bottle stores, etc.)
 - leaflet for community members
- 2019 World Malaria Day Commemorations support by providing technical assistance to the NMCP to publish malaria advertisements in the local newspapers and support for advocacy events in the three districts representing three high-burden provinces in Shamva, Binga and Hwedza Districts.

Unfortunately, no new SBC data has been collected since 2016/2017. A MICS was conducted at the beginning of 2019, but the data are still being processed at this time. The Zimbabwe SBC stakeholders are looking forward to the planned MIS/DHS 2020 results to help review SBC progress and help inform a new MCS with some refined indicators, targets, target individuals/groups,

messages, etc. In the future, PMI/Zimbabwe plans to include funding for surveys every 2-3 years to regularly measure SBC progress.

Many of the challenges inhibiting desired progress on malaria SBC implementation are due to serious, social/political, and economic problems in the country that affect daily life for citizens and groups trying to accomplish basic tasks (e.g., to travel, to meet, to eat). In addition, there are financial challenges related to less than adequate funds for SBC habitually over time and difficulty in managing finances within Zimbabwe's hyperinflation context (administrative, banking/cash crisis, payment transactions). Here is a list of challenges that have prevented SBC implementation in Zimbabwe, identified during the NMCP Mid-term Review, November 2019:

- Social and political upheaval within the country prevents and delays some activities
- Economic hardship within the country prevents and delays activities
- Difficulty in sourcing fuel and water prevents and delays activities
- Late USAID funding prevents and delays activities for several months at a time
- Inadequate funding for SBC habitually, over the years
- Limited funds for measuring SBC progress on indicators between national level surveys
- Ineffective payment modalities for community activities (funds for community volunteers)
- Lower SBC coverage than desired
- Inadequate SBC materials production
- Absence of SBC personnel at ward level (sub-district, administrative level)
- Limited capacity to document best practice and lessons learned

PMI-Supported Planned Activities (*Next 12-18 Months Supported by Currently Available Funds*)

Current SBC activities have been on hold since September 2019 due to late USAID funding this fiscal year. The PMI/Zimbabwe team and partners are making the best possible use of this time to work on 'desk activities' that can be done without spending additional funds, such as designing new SBC materials and approaches and engaging in technical discussion.

However, activities that are planned to be implemented this fiscal year, once funds arrive, include SBC interventions expected to contribute to NMSP Objective 5, which aims to increase the use of all malaria interventions to least 85 percent of the population by 2020, and to the national goals of reducing malaria incidence to 5/1,000 and reducing malaria deaths by 90 percent by 2020. To assist NMCP in achievement of these goals, PMI partners will implement activities detailed below:

- Support NMCP efforts to continue with the re-branding process by establishing the new brand to effectively guide NMCP communication activities and SBC interventions around

improvement of ITN uptake and utilization, enhancing malaria messaging through interpersonal communication, multimedia, campaigns, and commemorations

- Continue to support and expand community-based approaches such as the community action cycle as targeted communities reach the implementation phases of the cycle to ensure that malaria community action plans are responsive to community needs and intensified in close collaboration with the NMCP national, provincial, and district levels as well as the NMCP SBC technical subcommittee. Develop, print, and disseminate malaria SBC materials and communication facilitation tools
- Develop and air multimedia malaria communications spots (radio) with emphasis on the three major desired behaviors listed above and below
- Monitor and document community-based approaches for malaria behavior change-oriented actions
- Support advocacy and communications for malaria elimination
- Build SBC technical skills for partner personnel through membership to peer forums and attendance at Roll Back Malaria-sponsored annual general meetings and SBC summits and conferences

PMI Goal

Through the use of social and behavior change 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 morbidity and mortality.

Do you propose expanding, contracting, or changing any SBC activities? If so, why and what data did you use to arrive at that conclusion?

For FY 2020, PMI plans to add additional funds to SBC. The total SBC funds amount to \$600,000 total which is approximately \$100,000-\$150,000 more than has been allocated in past years. PMI and NMCP recognize that SBC is critical to support the success of all major malaria interventions. During this MOP consultation process, NMCP specifically requested additional funds for SBC. PMI will work with NMCP and partners to make the best use of these additional funds to better understand and address findings from MIS/DHS 2020. PMI expects to commission a secondary analysis in several key areas, for example ITNs, which was extremely helpful to drive programming after the 2016 MIS. In addition, there will be a new NMSP and MCS that will need to be developed since the current ones expire in 2020. PMI will support a workshop and SBC specialist(s) to assist with this exercise. Finally, PMI will continue focusing on SBC support for both control and elimination settings with an

emphasis on CHWs and communities for both prevention and treatment activities. Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

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

Supporting Data Zimbabwe

As mentioned above, PMI proposes six key, desired behaviors, which were established after the last national-level survey in 2016 and are endorsed by NMCP:

- Encouraging caregivers to seek early treatment for fever in children under five years old
- Increasing use of ITNs among all populations with ITN access
- Increasing uptake of IPTp among pregnant women
- Maintaining high rates of IRS acceptance
- Increasing health facility and VHW/community awareness of their roles in attaining malaria elimination
- Advocating for local leadership and facility and community participants to support and sustain malaria control and elimination in their communities

In addition, the underlying perception that: **that one is at low risk of getting malaria outside of malaria season and if mosquitoes are not seen/heard** is of particular concern.

The most important items on this list are in bold, as found in the 2016 MIS and ITN secondary analysis and the 2017 MCHIP *Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts*.

Figure A67 presents key data illustrating why these three priority areas are the PMI focus for SBC moving forward.

For ITN use in particular, it is important to note that malaria is seasonal in Zimbabwe. Malaria risk perception is low when inhabitants determine that it is not malaria season based upon the presence of rain and/or the presence of mosquitoes seen and/or heard in the environment. For more information about ITN use, IPTp uptake and malaria care-seeking behavior, please see the ITN, MIP and Case Management Sections above.

Also note that during FY 2020, PMI will support a MIS/DHS which will produce much-anticipated findings on SBC progress. PMI will arrange for secondary analysis of malaria findings, especially related to ITNs, to better understand the ownership, use and access data.

Figure A67: Showing Trends in Care-Seeking for Fever in Zimbabwe
*Among children under 5 with fever in the 2 weeks before the survey for whom advice or treatment was sought**

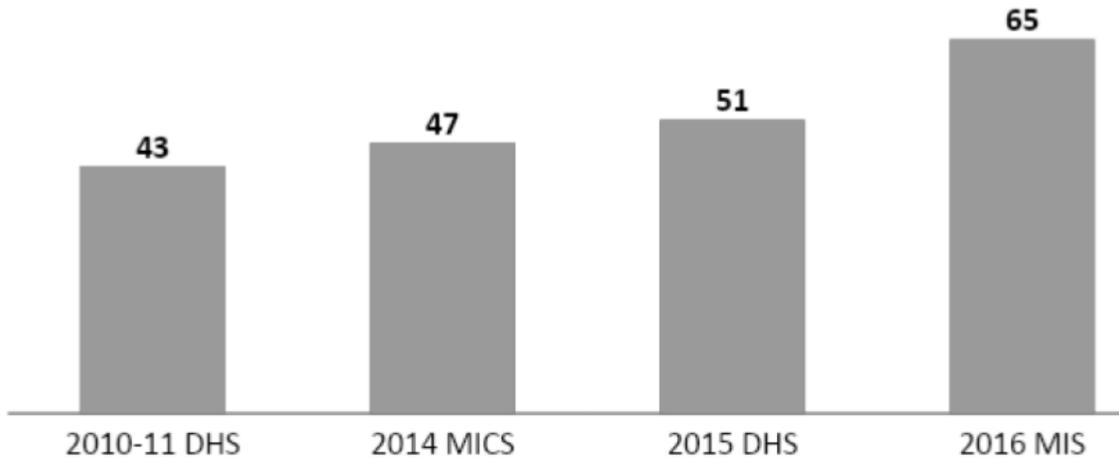
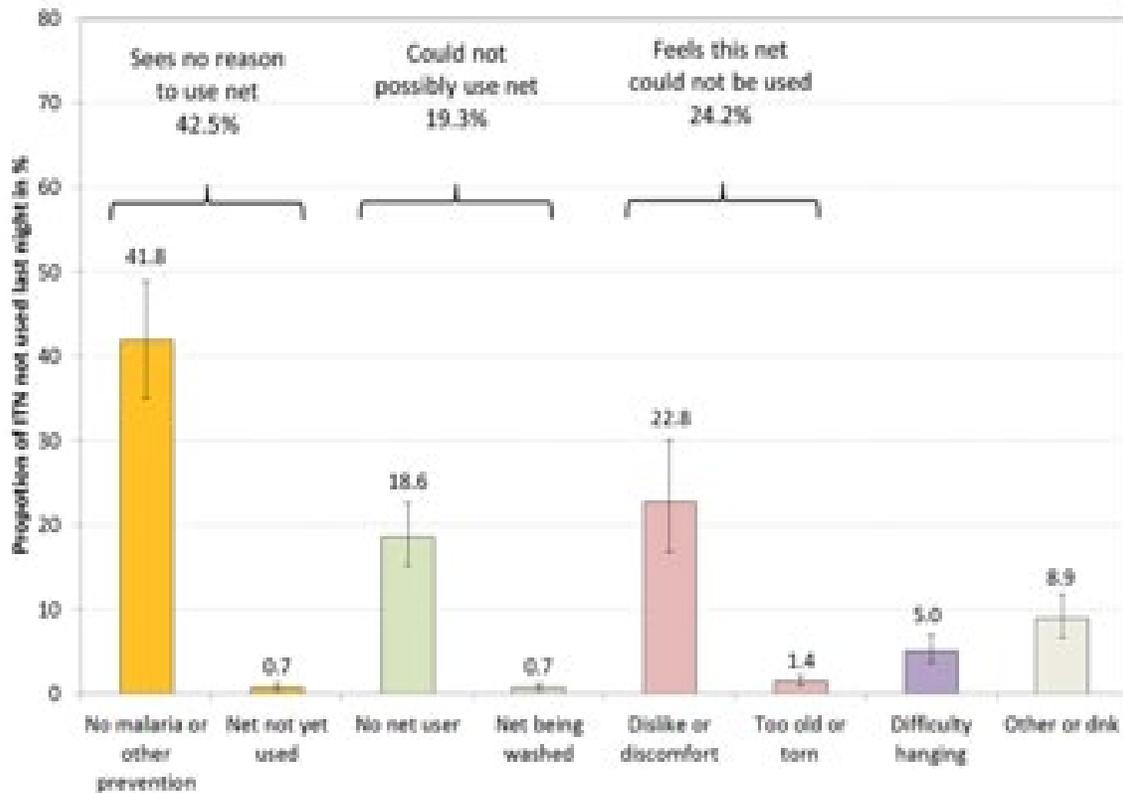
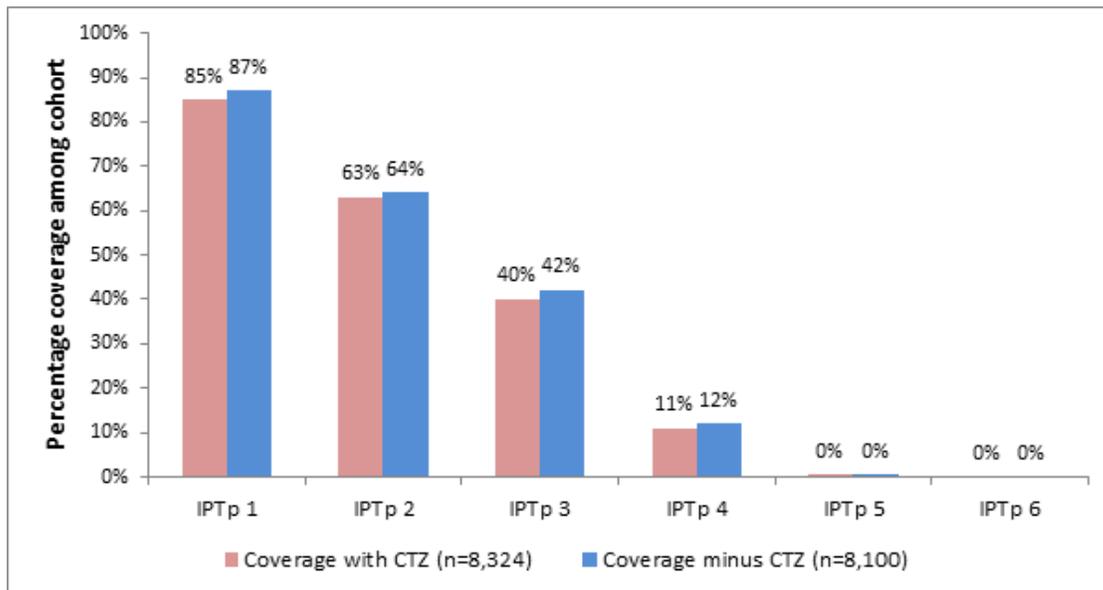


Figure A68: Grouped Reasons Why ITNs Were Not Used The Previous Night, MIS 2016.



Source: Secondary Analysis of the Zimbabwe Malaria Indicator Survey 2016 with Respect to ITN Ownership and Use, Johns Hopkins Center for Communication Programs, Tropical Health, November 2017.

Figure A69: IPTp Coverage among cohorts in Chipinge and Mutasa Districts, Manicaland, Zimbabwe



Note: IPTp coverage figures in this figure represent the minimum number of doses received, i.e. IPTp1 = one or more doses, IPTp2 = 2 or more doses, etc.

Conclusion

The MCS (2016-2020) identifies the following Behavior Priority Objectives which are linked to the six key desired behaviors mentioned above.

- Increase the proportion of the population sleeping under ITNs to 85 percent by 2020
- Maintain the proportion of households who accept to have their houses sprayed above 90 percent by 2020
- Increase the proportion of women who have knowledge about the importance of IPTp during pregnancy to 85 percent by 2020
- Increase the proportion of the population who utilize malaria prevention and control interventions to 85 percent by 2020

NMCP and partners are currently focusing on the behaviors in bold below.

Figure A70. Prioritized Behaviors with FY2020 Funds

Behavior	Target Population	Geographic Focus	Justification
ITN consistent use	3,386,980 All populations in 27 districts targeted for ITN distribution	27 targeted districts	Widespread misconception regarding malaria risk in Zimbabwe. 42% of respondents said the main reason they will not sleep under a net is because they perceive no malaria is currently present. It is not perceived to be the rainy season and they hear/see no mosquitoes. ¹
IRS acceptance	3,799,230 All populations in 31 districts	31 targeted districts	Although IRS in Zimbabwe has general acceptance, PMI partner end-of-spray reports record a consistent, yet low percentage of refusals of 10% and below over the years. Sometimes these refusals occur in community clusters around religious objection or other reasons. If these grouped structures cannot be sprayed then malaria transmission may persist in that micro area. NMCP wants to closely monitor the situation. Specific concerns from tobacco farmers were raised during IRS preparations and community outreach during the 2018/2019 spraying season as NMCP switched to DDT.
IPTp uptake by pregnant women	243,935 pregnant women in 26 IPTp targeted districts	26 targeted districts	The percentage of pregnant women attending four or more ANC visits is relatively high, suggesting that the majority of women have opportunities to receive the recommended minimum of three IPTp doses. However, there is still a need to increase the number of ANC visits by each pregnant woman and to improve early antenatal care-seeking to minimize missed opportunities for IPTp administration. According to the 2015 DHS, the average gestational age at first ANC was 4.4 months, with 35% of pregnant women making the first visit at four to five months and 17% delaying until the sixth or seventh month. There are several possible drivers for this behavior, including the cultural norms regarding concealment of pregnancy. ²

Behavior	Target Population	Geographic Focus	Justification
Caregivers seek early treatment for fever in children under five years old	7,206,341 persons residing in areas at risk for malaria	47 targeted districts	a positive temporal trend in care-seeking behavior, yet overall levels remain suboptimal, the highest at 65% in the MIS 2016. There are many, varied barriers to seeking treatment including economic hardships, distance to facility, and recognition of malaria signs/symptoms. ³
Increase health facility and VHW/community awareness of their roles in attaining malaria elimination	4,700,000 persons residing in elimination areas	28 targeted districts	With the advent of this NMSP, NMCP began a drive toward elimination in 7 districts in the southern part of the country. Over the past 4 years, the drive has continued with now 28 designated being in pre-elimination mode. This change in status and malaria management policies requires changing roles in health facilities and communities. Each of the 28 districts underwent a capacity assessment which revealed minimal understanding of the new roles and performance expectations in a pre-elimination district.
Advocate for local leadership and facility and community participants to support and sustain malaria control and elimination in their communities	7,206,341 persons residing in areas at risk for malaria	malarious areas = 50% of the total population	Malaria was cited as the main health problem in the survey area (67%), only about a third of respondents reported ever seeing a message or information about malaria in the previous 12 months. NMCP seeks to create greater malaria awareness and advocate for malaria within local leadership to sustain malaria control gains and move forward with increasing elimination districts. ⁴

Footnotes:

1. 2016 MIS ITN secondary analysis
2. 2015 DHS, 2016 MIS and the 2017 MCHIP Assessment of drivers and barriers for achieving target IPTp coverage in Chipinge and Mutare Districts.
3. DHS 2010-2011, MICS 2014, DHS 2015 and MIS 2016
4. MIS 2016

Key Question 2

Given the priority behaviors identified, what data are available to better understand the factors influencing low uptake? What are the behavioral determinants of the prioritized behaviors? Are there gaps in understanding the barriers to uptake?

Supporting Data

Figure A71. Summary of Determinants and Gaps for FY2020 Prioritized Behaviors

Behavior	Key Facilitators	Key Barriers	Knowledge Gaps
ITN consistent use	ITN ownership and access within the household	<p>Low risk perception due to equation of malaria risk with rainy season and audible mosquito sounds</p> <p>Itchiness and discomfort of using ITN or too old and torn</p> <p>Religious group discomfort accepting ITNs from health facilities</p>	<p>Need new national- level survey to measure important SBC behaviors and facilitators and barriers and intermittent SBC surveys commissioned in-between national surveys</p>
IRS acceptance	<p>Better knowledge and comfort level of IRS chemicals effectiveness and safety</p> <p>Reassurance of IRS safety around farming areas (specifically tobacco)</p> <p>Acceptable schedule and notification of households to expect and prepare for IRS</p>	<p>Concern about chemicals being too strong or too weak</p> <p>Fear of chemicals damaging farming areas, especially tobacco</p> <p>Skin irritations/itchiness</p> <p>Causes dirty walls</p> <p>Involves labor to pack and unpack in some households</p> <p>Late notifications by spray teams</p>	<p>Need new national level survey to measure important SBC behaviors and facilitators and barriers and intermittent SBC surveys commissioned in-between national surveys</p>
IPTp uptake by pregnant women	<p>Positive perceptions of ANC staff attitudes among beneficiaries</p> <p>High ANC beneficiary satisfaction levels</p>	<p>Restricted ANC service availability at health facilities</p> <p>Long distances to nearest health facility</p> <p>Cultural practices that encourage concealment of pregnancies</p>	<p>Need new national level survey to measure important SBC behaviors and facilitators and barriers and intermittent SBC surveys commissioned in-between national surveys</p>

Behavior	Key Facilitators	Key Barriers	Knowledge Gaps
<p>Caregivers seek early treatment for fever in children under five years old</p>	<p>Malaria recognized as a major health problem</p> <p>VHWs recognized as a source of care by patients in hard-to-reach areas</p>	<p>Current economic context leading to staff shortages and restricted ability for patients to seek care</p> <p>Limited knowledge among patients and caregivers of the signs and symptoms of malaria</p> <p>Long distances to nearest health facility</p> <p>Need to ask permission to seek care for child with fever</p> <p>Religious objection to care seeking</p>	<p>Need new national- level survey to measure important SBC behaviors and facilitators and barriers and intermittent SBC surveys commissioned in-between national surveys</p>
<p>Adhere to appropriate testing and treatment practices</p>	<p>Substantial proportion of staff trained in malaria case management in PMI-supported areas</p> <p>Availability of malaria diagnostic and treatment commodities at service delivery points</p> <p>Availability of malaria diagnosis and treatment guidelines</p> <p>Relatively high adherence to diagnosis and treatment guidelines by health care workers at the facility and community level</p>	<p>Current economic context leading to staff shortages, strikes and low morale</p>	<p>Need new national- level survey to measure important SBC behaviors and facilitators and barriers and intermittent SBC surveys commissioned in-between national surveys</p>

Behavior	Key Facilitators	Key Barriers	Knowledge Gaps
Increase health facility and VHW/community awareness of their roles in attaining malaria elimination	Education and understanding of malaria elimination policies and procedures Understanding of their elimination roles of facility health workers, VHWs and community members	Unidentified at this time in this new area of work	Need survey to measure important SBC behaviors and facilitators and barriers in elimination areas
Advocate for local leadership and facility and community participants to support and sustain malaria control and elimination in their communities	Empowerment by provincial- and district-level malaria teams	lack of community cohesion overwhelmed with social/political/economic hardships and conflicting priorities	Need new national- level survey to measure important SBC behaviors and facilitators and barriers and intermittent SBC surveys commissioned in-between national surveys

Conclusion

NMCP has been using SBC resources as efficiently as possible to address issues revealed by the latest national survey, MIS 2016. NMCP, PMI and partners are all looking forward to new national-level survey data expected soon (the MIS/DHS 2020). New data will provide insight into progress on SBC and pinpoint new areas of concern. In addition, moving forward, NMCP has requested that PMI support surveys focused on SBC progress, barriers, and facilitators in-between national-level surveys. Interim data are important to help guide SBC programs and provide more in-depth and frequent updates on what drives behaviors and how interventions can be adapted accordingly. Interim surveys should be established as a routine practice, even as NMCP may consider discontinuing MIS/DHS-type surveys in favor of alternate survey models and/or focus on routine SM&E systems.

Key Question 3

What activities are needed to bolster the country’s capacity for SBC? Are these activities needed at the national or sub-national level?

Supporting Data

As described above, NMCP commitment and capacity for SBC activities is evident in national-level staff commitment, theoretical understanding of SBC, existence of a strategy, knowledge of desired key behaviors, and existence of other key SBC documents in the major malaria implementation areas. The major challenges include the current difficult operating environment and insufficient funding for SBC.

Throughout this section, the MIS/DHS 2020 is mentioned as a forthcoming exercise that will benefit malaria SBC immensely. In addition, the introduction of intermittent SBC surveys is an activity PMI hopes to support in the future. These additional data will bolster the country's capacity for SBC.

Another NMCP proposal to bolster the country's capacity for SBC includes introduction of SBC staff at the ward level (an administrative level lower than district level), which would provide more human resources to carry out SBC. Ward SBC staff would be managed at the district level and would engage VHWs and community groups such as HCCs. Introduction of a new cadre at the ward level may be beyond the resources of PMI, but PMI/Zimbabwe will continue discussing alternate proposals for ward/village-level SBC staff or volunteers.

Finally, NMCP is also interested in using a re-branding of the malaria program, now underway, to achieve commitment of the President, Ministers, Parliament, and the private sector. The goal is to create high-level malaria advocates and champions with resources or ability to influence resource mobilization to rally around the malaria program.

Conclusion

NMCP SBC capacity is high, but funding is insufficient. NMCP continues to voice its SBC priorities to PMI and GF but financial gaps remain. However, NMCP, PMI and implementing partners look forward to the following activities aimed to support SBC in Zimbabwe:

- MIS/DHS 2020
- Intermittent SBC surveys, in-between national level surveys
- Lower-level SBC cadre
- Malaria advocates at high political levels and within the private sector

Key Question 4

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

Supporting Data

No additional considerations at this time.

Conclusion

N/A

3.D. PROGRAM EVALUATION AND OPERATIONAL RESEARCH

NMCP objective
The revised 2016-2020 <i>National Malaria Strategic Plan</i> highlights the importance of conducting operational research (OR) to generate and maintain evidence for informed malaria programming, as part of a broader objective to strengthen surveillance, monitoring, and evaluation.
NMCP approach
<ul style="list-style-type: none"> ● Currently, no structured process exists for reviewing current studies and no prioritized operational research agenda has been established. ● Within the 2016-2020 <i>National Malaria Strategic Plan</i>, the NMCP prioritized the development and dissemination of a malaria OR agenda in collaboration with potential research partners and malaria stakeholders. The 2018 <i>Surveillance Monitoring and Evaluation Plan</i> reiterated the importance of developing a structured review process and agenda. However, to date, no process has been defined and no agenda has been developed despite advocacy and interest within malaria stakeholders in-country. ● It should be noted that NIHR is the primary agency responsible for the development and implementation of operational research for the MoHCC, including the malaria program. However, in recent years, restricted resources and other challenges have hampered NIHR’s ability to effectively drive the development of a research agenda and implement malaria-specific research. Quite recently, there has been a change in leadership with a concurrent focus on partner engagement, resource mobilization, and a strong desire to prioritize possible malaria operational research.
PMI objective, in support of NMCP
<ul style="list-style-type: none"> ● Historically, PMI/Zimbabwe has not provided substantial support for PMI-funded OR activities. However, PMI/Zimbabwe has provided financial and technical support for multiple NMCP-led program evaluation activities to provide critical, targeted evidence for programmatic decision making (examples are given in the next section). ● PMI has continued to engage with NMCP and NIHR to encourage the development of a structured process for the review and prioritization of malaria OR. The new leadership at NIHR now intends to develop a malaria OR agenda, as part of a broader health research agenda. The NMCP is supportive and plans to engage in this effort. The process will begin in earnest in January 2020, with completion expected by December 2020.
PMI-supported recent progress (past ~12-18 months)
<ul style="list-style-type: none"> ● PMI provided technical and financial support for the development and implementation of the following program evaluation activities:

- *Assessment of drivers and barriers for achieving targeted IPTp coverage in Chipinge and Mutare District, Manicaland Province, Zimbabwe, completed in December 2017.*
- *Assessment to determine the factors that contribute to the observed disparity between recorded malaria cases and first-line ACT consumption on Zimbabwe, completed in December 2018.*
- *Assessment of the drivers of continuing malaria transmission in Angwa Ward, Mbire District, Mashonaland Central Province, report finalization imminent.*

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

- PMI/Zimbabwe plans to provide technical and financial support for the development of a malaria OR agenda, in collaboration with the NIHR, NMCP, malaria researchers, and other relevant stakeholders.
- No OR studies or PE activities are currently planned, pending the development of the OR agenda.

PMI Goal

PMI will conduct OR/PE that helps to evaluate coverage of population at-risk, quality of intervention(s), and efficiency in intervention delivery, or study reducing remaining malaria transmission and disease burden, test effectiveness of new or evolved priority interventions and strategies, or explore new metrics and mechanisms to assess the impact of interventions. Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Do you propose expanding, contracting, or changing any program evaluation and operational research activities? If so, why and what data did you use to arrive at that conclusion?

PMI/Zimbabwe does not intend to fund any OR or PE activities using MOP FY 2020, pending the development of the OR agenda.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

Have technical challenges or operational bottlenecks that require operations research or program evaluation been identified in consultation with the NMCP? How have they been prioritized?

Supporting Data

As outlined above, PMI/Zimbabwe has historically strategized directly with the NMCP and malaria partners to identify areas of strategic interest for which information for programmatic decision-making was lacking. For example, PMI, Global Fund, NMCP and other malaria

stakeholders were concerned about the substantial discrepancy between the number of malaria cases reported through the HMIS and the consumption of ACTs reported through the LMIS. This concern led to the development of the PMI-supported PE activity to assess the situation and identify possible solutions. In this instance, the results of the program evaluation suggested several areas for improvement that are currently being addressed programmatically with support from both PMI and GF. A similar, informal process drove the development of the other PMI-funded PE activities listed above.

Although this process has resulted in the development of multiple activities that have provided valuable and actionable results, there is no formal mechanism in Zimbabwe for prioritizing malaria operational research, identifying interested researchers, and ensuring review and use of results of OR/PE activities. As a result, PMI is prioritizing support for the development of a malaria OR agenda and will also advocate for the development of a governing body responsible for malaria OR/PE prioritization and review (or the incorporation of those responsibilities into an existing governing structure).

Figure A72. PE/OR Currently Conducted in Country with USG, GF, Multilaterals or Other Major Donors.

Source of Funding	Implementing institution	Research Question/Topic	Current status/timeline
Global Environment Facility through the United Nations Environment Program	WHO	Evaluation of house screening and other non-insecticide driven interventions	Implementation pending, with screening of study houses from August to November 2019.
ICEMR	Johns Hopkins University, Zimbabwe Biomedical Research and Training Institute, Zimbabwe National Institute of Health Research, Africa University	Malaria Transmission and the Impact of Control Efforts in Southern and Central Africa, Mutasa District, Manicaland Province. Entomological monitoring and evaluation.	Ongoing

Conclusion

No OR/PE activities are being proposed using FY 2020 funds, pending the development of a malaria OR agenda.

Key Question 2

In the technical areas covered above, are there specific issues in any of the intervention areas that merit further exploration, in anticipation of establishing intervention strategies that are or could become available in the future that could be applied?

Supporting Data

PMI/Zimbabwe will coordinate with the NIHR, NMCP, and other malaria stakeholders during the development of the malaria OR agenda to review existing data and publications and prioritize areas meriting further exploration. Areas of particular interest for the PMI/Zimbabwe team, and which have been discussed with NMCP, include further evaluation of interventions or approaches to address outdoor biting, evaluation of the effectiveness of PBO and/or dual active ingredient ITNs vs. traditional single-pyrethroid ITNs vs. IRS in various transmission settings within Zimbabwe, and piloting or evaluation of cross-border and regional initiatives.

Conclusion

See above.

Key Question 3

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

Supporting Data

N/A

Conclusion

N/A

3.E. OTHER HEALTH SYSTEMS STRENGTHENING

NMCP objective
Providing effective leadership and an enabling environment for optimal program management and coordination at all levels of the health system is a key objective of the 2016-2020 <i>National Malaria Strategic Plan</i> .
NMCP approach
The NMCP outlines the following specific strategies for achieving this objective: <ul style="list-style-type: none">● Strengthening program management and coordination at all levels of the health system by ensuring that:<ul style="list-style-type: none">○ The appropriate staff are equipped with the program management, planning, and technical skills required to support malaria interventions○ Strong annual plans are developed and reviewed on a routine basis○ Supportive supervision is conducted to ensure implementation of the plan○ Advocating for high-level commitment, support, and resources for malaria both within the GoZ and among malaria donors and partners

- Strengthening of cross-border and inter-district collaboration for malaria control and elimination
- Strengthening the procurement and supply chain management system

PMI objective, in support of NMCP Infrastructure

PMI/Zimbabwe strives to support NMCP’s efforts to develop strong leadership and an enabling environment at all levels of the health system to the extent possible, given the substantial needs, ongoing deterioration of the health system within in Zimbabwe, and restrictions regarding direct government-to-government support. This support includes training, supportive supervision, mentoring, smaller infrastructure support, and other activities already described in the previous Annexes. Additional activities not already mentioned are described in the next section.

PMI-supported recent progress (past ~12-18 months)

The vast majority of PMI/Zimbabwe’s HSS efforts are already listed in the previous annexes and the funding is included under the relevant line items for those areas. A few additional efforts that were not previously listed (but funded under other technical area line items) include support for:

- Secondment of two technical officers to DPS to ensure strong coordination and effective implementation of the pooled malaria commodity warehousing and distribution system.
- Secondment of an entomologist to the NMCP to assist with coordination and implementation of entomological activities conducted in collaboration with the NIHR, Africa University, Provincial, and District-level staff.
- Minor infrastructure improvements to the NIHR facility in Harare, including the refurbishment of a meeting space and support for internet services.
- Placement of Malaria Provincial Coordinators (PMI implementing partner staff) in PMI-supported provinces to ensure service delivery strengthening and IRS activities were successfully implemented and coordinated with Global Fund and other donor-funded activities. These officers also provided support for strategic planning by the provinces and districts.
- Assistance to provincial- and district-level MoHCC staff to devise a systematic approach for documenting and reviewing training gaps for CM, CCM and SM&E thematic areas.
- Procurement and distribution of 175,000 ITNs to areas affected by Cyclone Idai.

PMI-supported planned activities (next ~12-18 months, supported by currently available funds)

PMI will continue the secondment of the two technical officers to DPS and will continue to support the Provincial Coordinators in PMI areas.

PMI Goal

Please see PMI objective described above.

Do you propose expanding, contracting, or changing any health system strengthening? If so, why and what data did you use to arrive at that conclusion?

PMI/Zimbabwe intends to provide limited support to the Zimbabwe electronic health record (EHR) system to ensure the incorporation of a robust malaria module and the capacity to harness appropriate malaria data from the system. The system was piloted in one district in Mashonaland East Province, with recent expansion to a second district in Mashonaland East and multiple facilities within Harare Province. The current plan is to expand the EHR to over 400 facilities with current- year PEPFAR funds. Although it will be challenging for Zimbabwe to fully implement this system nationwide in the near future (given the concomitant infrastructure improvements that will be needed), the expansion of this EHR system is a key priority of the MoHCC and PMI/Zimbabwe's relatively small investment will be leveraged by much more substantial PEPFAR support.

Please see Table 2 for a detailed list of proposed activities with FY 2020 funding.

Key Question 1

What other capacity building activities are ongoing in Zimbabwe?

Supporting Data

In addition to the EHR system, there are several other capacity-building activities ongoing in Zimbabwe that, although not directly supported by PMI/Zimbabwe, are creating a more conducive environment for the implementation of PMI-supported interventions, or have the potential to do so. For example:

- Zimbabwe's involvement in the Malaria Elimination 8 consortium has helped to strengthen NMCP's partnerships with border countries and helped to unlock additional Global Fund resources through the associated E8 grant. This has resulted in some infrastructure improvements in Zimbabwe, including the construction and initial operational support for five malaria border posts, and the implementation of targeted activities designed to strengthen epidemic response and entomology in country.
- The MoHCC has initiated a results-based financing system that has created an incentive system for better performance among health workers. In light of the current economic situation and resulting issues faced by health workers at the facility level, this provides opportunities for filling resource gaps and improving staff morale.
- CHAI continues to work to strengthen NMCP's capacity to implement elimination areas and may expand their footprint of support to include control areas as well.

Conclusion

PMI/Zimbabwe will continue to partner with the NMCP, Global Fund, CHAI, and other malaria partners to leverage the activities listed above to improve the implementation of PMI-supported interventions.

Key Question 2

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

Supporting Data

The deteriorating political and socio-economic environment poses a significant risk to Zimbabwe's health system and infrastructure. Cash and fuel shortages and rapidly shifting monetary policies have created substantial procurement and logistical challenges. Doctors have been on strike for an extended period of time and nurses in most rural clinics work on three-days shifts because of delayed salary payments. These challenges resulted in delayed implementation of planned malaria activities.

USAID/Zimbabwe is designing an activity to enable rapid deployment of resources in areas prone to health emergencies and needing humanitarian assistance. This would require coordination and some PMI contribution. For example, in 2019, ITNs were used in emergency situations to protect survivors of last year's Cyclone Idai, which affected Zimbabwe's eastern border.

Conclusion

PMI, through its malaria flagship project and integrated projects, intends to support NMCP to improve coordination functioning of community health workers and other line agencies such as NIHR in annual operational plan development and program reviews.