

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 final funding available to support the plan outlined here is pending final FY 2015 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.



PRESIDENT'S MALARIA INITIATIVE



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Zimbabwe

Malaria Operational Plan FY 2015

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ACRONYMS AND ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
ANC	Antenatal care
AS/AQ	Artesunate-Amodiaquine
BCC	Behavior change communication
CDC	Centers for Disease Control and Prevention
CHW	Community-based health worker
DTTU	Delivery Team Topping Up
DOT	Directly observed treatment
EHO	Environmental Health Officer
EHT	Environmental Health Technicians
EPI	Expanded Program on Immunization
FELTP	Field epidemiology and laboratory training program
FY	Fiscal year
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GoZ	Government of Zimbabwe
HMIS	Health management information system
ICEMR	International Centers of Excellence for Malaria Research
iCCM	Integrated community case management
IPTp	Intermittent preventive treatment of pregnant women
IPTp2	Intermittent preventive treatment for pregnant women with two or more doses
IRS	Indoor residual spraying
ITN	Insecticide-treated net
LLIN	Long-lasting insecticide-treated net
MCAZ	Medicine Control Authority of Zimbabwe
MCH	Maternal and child health
MCM	Malaria Case Management
MCCM	Malaria Community Case Management
M&E	Monitoring and evaluation
MIP	Malaria in pregnancy
MOHCC	Ministry of Health and Child Care
MSP	Malaria Strategic Plan
NatPharm	National Pharmaceutical Company of Zimbabwe
NGO	Non-governmental organization
NIHR	National Institute of Health Research
NMCP	National Malaria Control Program
NMRL	National Microbiology Reference Laboratory
PHCP	Primary health care package
PMI	President's Malaria Initiative
PPE	Personal protective equipment
QA/QC	Quality control/quality assurance
RBM	Roll Back Malaria

RDT	Rapid diagnostic test
SADC	Southern African Development Community
SARN	Southern Africa Regional Network
SHMs	School Health Masters
SP	Sulfadoxine-pyrimethamine
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
VHWs	Village health worker
WDSS	Weekly Disease Surveillance System
WHO	World Health Organization
WHT	Ward Health Team
ZAPS	Zimbabwe Assisted Push System
ZEDAP	Zimbabwe Essential Drugs Action Program
ZiLaCoDS	Zimbabwe Laboratory Commodities Distribution System
ZINQAP	Zimbabwe National Quality Assurance Program
ZIPS	Zimbabwe Informed Push System

EXECUTIVE SUMMARY

Malaria prevention and control are major foreign assistance objectives of the U.S. Government (USG). In May 2009, President Barack Obama announced the Global Health Initiative (GHI), a six year, comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States will help partner countries improve health outcomes, with a particular focus on improving the health of women, newborns, and children.

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS and tuberculosis (TB) programs. PMI was launched in June 2005 as a five year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI was extended and, as part of the GHI, the goal of PMI was adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015.

In mid-2011, Zimbabwe was selected to join the initial 15 PMI countries. Malaria is a major health problem in Zimbabwe with 50% of the population at risk, although its epidemiology varies in the different regions of the country, ranging from year-round transmission in the lowland areas to epidemic-prone areas in the highlands. The WHO estimates that there are more than 400,000 malaria cases among all age groups each year. Zimbabwe's Malaria Strategic Plan does not call for the implementation of all interventions in all malarious districts; hence the targeted number of districts varies by intervention, as detailed below.

Zimbabwe has seen robust declines in transmission and disease burden. Today, malaria is the 5th leading cause of morbidity (compared to 2nd leading cause at the start of the implementation period). In 2013, incidence was reported at 29 per 1,000 (down from 58 per 1,000 in 2009); 351 malaria deaths were recorded (down from 375 deaths in 2009).

Zimbabwe's malaria program receives support from two major donors, the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) and PMI. The United States Agency for International Development (USAID) provided targeted support to Zimbabwe's National Malaria Control Program (NMCP) through an emergency round of indoor residual spraying (IRS) in 2009 and in 2011 with a procurement of malaria commodities. Prior to 2011, other malaria donors included the United Nations Children's Fund (UNICEF), the United Kingdom Department for International Development (DfID), and the European Commission. However, these European donors have shifted their funds to a new multi-donor fund designed to strengthen health systems in Zimbabwe, the Health Transition Fund. The Health Transition Fund is operating from 2011-2015 and aims to improve access to all types of quality health care for Zimbabweans and to harmonize donor support, practices, and requirements.

The FY 2015 Malaria Operational Plan was developed in collaboration with the NMCP and partners, including the Global Fund, and aligns well with the National Malaria Control Strategy. Planning for FY 2015 was carried out in Zimbabwe in April 2014 and included representatives from USAID and Centers for Disease Control and Prevention (CDC) staff based in Washington,

Atlanta, and Zimbabwe. The FY 2015 PMI proposed budget for Zimbabwe is \$14.5 million. The following major activities will be supported with FY 2015 funding:

Insecticide-treated nets (ITNs): PMI is supporting the Ministry of Health and Child Care's (MOHCC) goal of universal coverage with 880,000 (FY 2014) and 700,000 (FY 2015) long-lasting insecticide-treated nets (LLINs) in 47 districts with moderate to high transmission of malaria. With FY 2014 funding, PMI will support planning for free, routine distribution through antenatal care (ANC) and immunization clinics to pregnant women and children under one year of age, respectively, through a pilot program to be implemented in late 2014. With FY 2015 funding, PMI will procure approximately 700,000 LLINs for free routine distribution and continuous distribution channels.

Indoor residual spraying (IRS): Zimbabwe has a long history of IRS dating back to the 1950s. The NMCP IRS strategy focuses on 47 high-burden malaria districts throughout the country. With FY 2014 and FY 2015 funds, PMI will refocus its support for blanket IRS from a limited support in all pyrethroid districts in Zimbabwe to a comprehensive support of four high burden districts of Manicaland Province (a province that contributes about 51% of malaria cases in Zimbabwe) using organophosphate (OP) insecticides, covering approximately 159,387 structures, and protecting approximately 350,000 people in the targeted IRS districts. PMI's IRS partner will work with NMCP and partners to create a model spraying program in the four highest burden districts in Manicaland: Mutare, Chimanimani, Nyanga, and Mutasa. In addition, PMI will work with partners to support entomological monitoring to assure quality spraying and developments in insecticide effectiveness and resistance.

Malaria in pregnancy (MIP): Zimbabwe's malaria in pregnancy policy focuses on the high-burden malaria districts, and advocates for directly observed administration of three doses of sulfadoxine-pyrimethamine (SP) during scheduled antenatal care visits (ANC). PMI supports the NMCP to procure approximately 1.2 million tablets of SP for 2014 and 2015, respectively. Funding will also be used to improve quantification of antimalarial drugs including SP in an effort to minimize stockouts. In addition, PMI support will promote ITN use, early ANC visits and prompt malaria case management for pregnant women. Lastly, PMI and partners will work with the NMCP to introduce the newly approved WHO SP policy in Zimbabwe, which recommends giving IPTp at each scheduled antenatal care visit at least one month apart starting at the second trimester.

Case management: Since 2007, the first-line treatment for malaria has been the artemisinin-based combination (ACT) drug artemether-lumefantrine (AL). The NMCP policy requires that, where possible, all suspect cases of malaria undergo diagnostic confirmation by microscopy or a rapid diagnostic test (RDT). At the end of 2010, the pharmacy board and the laboratory regulatory council changed the policy to allow community-based health workers (CHWs) to perform diagnosis using RDTs and dispense ACTs for positive cases. Historically, CHWs have included Village Health Workers (VHWs) and School Health Masters (SHMs). Village Health Workers are trained in integrated community case management (iCCM) as well as more comprehensive malaria community case management (MCCM) to deliver integrated care. School Health Masters used to teach about malaria prevention and dispensed chloroquine to school children but have not been a functional group for case management in the past five years but VHWs remain an active group. The NMCP has discussed plans to revive the SHMs to diagnose

and dispense ACTs and possibly manage distribution of routine LLINs in the near future. In addition to supporting the drug management and distribution systems (Zimbabwe Informed Push System [ZIPS] and Zimbabwe Assisted Push System [ZAPS]), with FY 2015 funds: PMI will procure approximately 2 million RDTs and 450,000 ACT treatments for uncomplicated malaria and distribute them to primary health facilities and VHWs throughout the country. PMI will also support the recent NMCP adoption of the latest WHO-recommended guidelines for IPTp for control of malaria in pregnancy and use of ACTs for uncomplicated malaria and parenteral artemisinin products for the treatment of severe malaria. The support will include updating worker guidance materials and training of the workforce, (health workers and VHWs), and providing monitoring and supervision.

Monitoring and evaluation (M&E): Prior to PMI support in Zimbabwe, the NMCP, with the support of Global Fund and other partners, developed a National Malaria M&E Strategy and Plan. The plan covered 2008–2015, but in 2014 was extended to 2017 to be more in line with the WHO pre-elimination strategies, and describes, by program area, the type of data needed, the indicators, data collection and flow, analysis, reporting, feedback and stakeholders' responsibilities. PMI anticipates that two national level health surveys will take place during 2015–2016. The MOHCC and partners are planning a Demographic and Health Survey (DHS) and an AIDS indicator survey (AIS) in 2015, although the planning effort is currently experiencing a financial shortfall so the timing of the survey is uncertain. The sampling and timing of the DHS are not optimal for measuring malaria parasitemia (tentatively planned for June–December 2015 whereas malaria peak season in Zimbabwe is November–May); therefore, the NMCP has begun planning a Malaria Indicator Survey (MIS) to be conducted in 2016. In light of the findings of low national parasitemia from the 2012 MIS and in line with 2014 WHO recommendations on malaria diagnostics in low transmission settings, the collection of dried blood spots to be tested via polymerase chain reaction is being considered. PMI plans to support the planning and implementation of both the DHS and MIS with in-country partners.

With FY 2015 funding, PMI will continue to support malaria surveillance and national survey activities, M&E trainings at all levels including VHWs, as well as supervisory and district health facility trainings. In addition, PMI support will facilitate quarterly meetings for district-, provincial- and national-level representatives to meet and discuss surveillance and M&E related issues. PMI will continue to support four therapeutic efficacy monitoring sites every other year. PMI will continue supporting LLIN durability monitoring following the LLINs that were distributed in a mass campaign in 2014. PMI will provide very limited support to the 2015 DHS and significant support to the MIS, expected in 2016.

Operations research (OR): In FY2015, PMI will support two operational research activities. One will assess the seasonal population movements, health care access, and malaria disease burden in Manicaland Province on the border with Mozambique. This two-phase activity will seek to better understand the changing burden and risk of malaria in this province and to understand the driving forces behind persistently high incidence levels and re-occurring outbreaks. Phase 1 will be conducted with FY 2014 funds and FY 2015 funds will provide a continuation of the research. The second OR activity will support collection and testing of dried blood spots in order to more precisely quantify national parasitemia levels using a more sensitive test. This activity is consistent with the 2014 WHO recommendation that the use of nucleic acid amplification (NAA) methods by malaria programs should be considered for

epidemiological research and surveys aimed at mapping submicroscopic infections at low transmission intensity.

Behavior change communication (BCC): Zimbabwe's 2008-2015 National Malaria Communication Strategy and Implementation Guidelines documents utilize advocacy, social mobilization, and BCC for malaria prevention and control through traditional and religious leaders and community volunteers organized into ward health teams (WHTs). The NMCP uses WHTs and community malaria committees to promote IRS campaigns and raise awareness about LLIN distribution and consistent use. During the last quarter of 2013, PMI supported extending the National Malaria Communication Strategy from 2013 to 2015 in line with the National Malaria Control Strategy, as well as development of Implementation Guidelines for partners. With funds from the FY 2014 MOP, a review of current BCC activities will be carried out and will inform plans for activities to be implemented with FY 2015 funds. With FY 2015 funds, PMI will work with the NMCP and partners to strengthen BCC activities for malaria prevention and treatment, particularly working with VHWs at the community level.

Capacity building: PMI will support capacity building by contributing to the Field Epidemiology and Laboratory Training Program (FELTP), a successful, 21 year-old program in Zimbabwe, which is designed to train leaders in applied epidemiology while providing epidemiologic services to national and sub-national health care workers and supervisors. PMI's support will provide for a malaria-focused educational experience for selected participants to further enhance the workforce capacity in malaria control and prevention.

STRATEGY

1. Introduction

Global Health Initiative

Malaria prevention and control is a major foreign assistance objective of the U.S. Government (USG). In May 2009, President Barack Obama announced the Global Health Initiative (GHI) to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States will help partner countries improve health outcomes, with a particular focus on improving the health of women, newborns and children. The GHI is a global commitment to invest in healthy and productive lives, building upon and expanding the USG's successes in addressing specific diseases and issues.

The GHI aims to maximize the impact the United States achieves for every health dollar it invests, in a sustainable way. The GHI's business model is based on: implementing a woman- and girl-centered approach; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; encouraging country ownership and investing in country-led plans and health systems; improving metrics, monitoring and evaluation; and promoting research and innovation. The GHI will build on the USG's accomplishments in global health, accelerating progress in health delivery and investing in a more lasting and shared approach through the strengthening of health systems.

President's Malaria Initiative

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS, and tuberculosis. PMI was launched in June 2005 as a 5-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI was extended and, as part of the GHI, the goal of PMI was adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. This will be achieved by continuing to scale up coverage of the most vulnerable groups - children under five years of age (under five) and pregnant women - with proven preventive and therapeutic interventions, including prompt and effective case management for confirmed malaria cases using artemisinin-based combination therapies (ACTs), insecticide-treated nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

Zimbabwe was selected as a PMI country in FY 2011, but USAID has previously provided limited malaria support, including funding and technical assistance to conduct emergency IRS in 2009, and an emergency procurement of ACTs in early 2011. Funding for Zimbabwe has been as follows:

- FY 2011, \$12 million
- FY 2012, \$14 million
- FY 2013, \$15 million
- FY 2014, \$15 million
- FY 2015, \$14.5 million (planning figure)

This FY 2015 Malaria Operational Plan (MOP) presents a detailed implementation plan for Zimbabwe, based on the National Malaria Control Program's (NMCP's) Malaria Strategic Plan (MSP) (2013-2015) and its affiliated addendum which extends the strategy to 2017. The activities PMI is proposing to support align with the current MSP, and build upon past PMI investments in Zimbabwe as well as investments and/or proposed ones made by other partners, especially the Global Fund to Fight AIDS, TB and Malaria (Global Fund), to improve and expand malaria-related services.

Zimbabwe's MOP for FY 2015: 1) briefly reviews the current status of malaria control policies and interventions; 2) identifies gaps, challenges, opportunities and threats that pose barriers to achieving the targets of the NMCP and PMI; and 3) provides a description of planned FY 2015-funded activities.

2. Malaria Situation in Zimbabwe

Zimbabwe has seasonal and geographic variation in malaria transmission that corresponds closely with the country's rainfall pattern (see Figure 1).

In general, the major malaria transmission season occurs during the rainy season between November and April, with the average temperature ranging between 18 and 30 degrees Celsius. The annual rainfall varies from less than 700 mm in the Matabeleland to more than 1,500 mm in Manicaland. Malaria transmission is lower in the low rainfall areas and higher in the high rainfall provinces.

Geographically, Zimbabwe is divided by a central watershed lying higher than 1,200 meters above sea level and flanked north and south by low lying areas. In 1986, the country was divided into three malaria epidemiological areas: areas below 900 meters to the north and below 600 meters in the south have perennial transmission; areas between 900–1,200 meters north and 600–900 meters south have seasonal transmission and are prone to epidemics; areas above 1,200 meters north and 900 meters in the south normally do not experience malaria transmission.¹

¹ National Malaria Control Programme, Ministry of Health and Child Welfare Zimbabwe.

East and Mashonaland Central, with 51% of all cases and 35% of all deaths coming from Manicaland. (Tables 1 and 2)

Table 1: Malaria Morbidity data, 2013, Zimbabwe

Province	Malaria Cases*	% Contribution
Manicaland	192,730	51.0
Mashonaland East	60,968	16.1
Mashonaland Central	70,749	18.7
Subtotal (3 provinces)	324,447	85.9
Other Provinces	53,425	14.1
National	377,872	100

*Diagnostically confirmed

Table 2: Malaria Mortality data, 2013, Zimbabwe

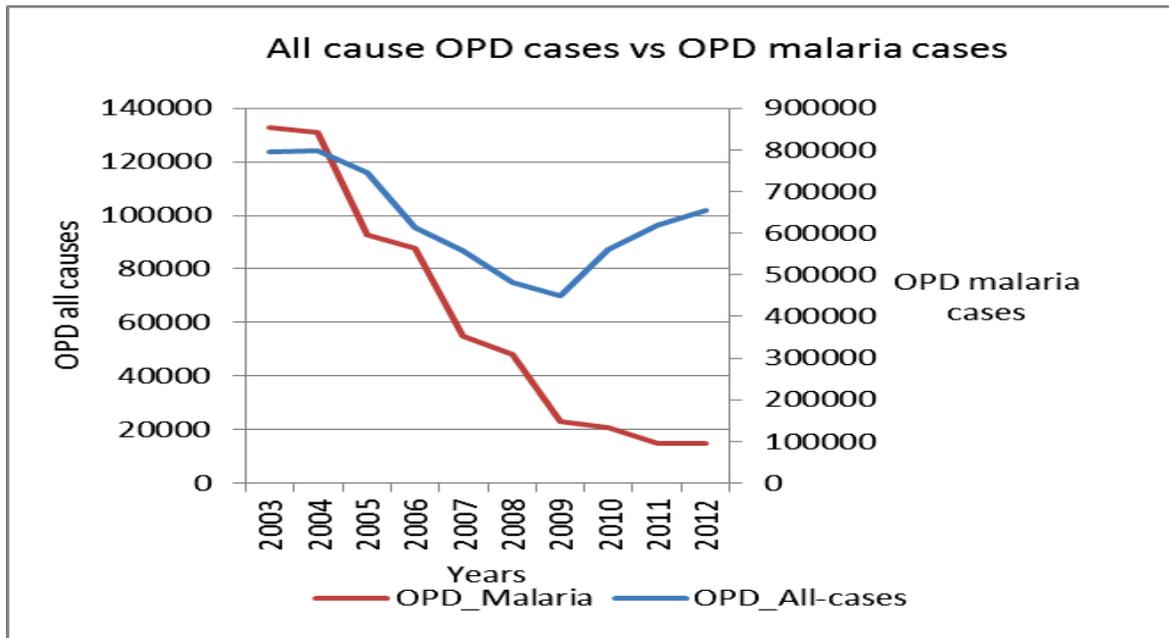
Province	Malaria Deaths	% Contribution
Manicaland	121	34.5
Mashonaland East	48	13.7
Mashonaland Central	41	11.7
Subtotal (3 provinces)	210	59.8
Other Provinces	141	40.2
National	351	100

Malaria burden

Overall, malaria incidence in Zimbabwe appears to be decreasing even though it remains a major challenge in certain provinces, districts, and wards. According to the NMCP's latest figures malaria cases decreased from 1.8 million in 2006 to 377,872 cases in 2013.² Outpatient department malaria cases have decreased from about 1.53 million in 2005 to 659,262 in 2013 (Figure 2 below); inpatient malaria cases declined from 53,000 in 2005 to 26,000 in 2013 with the case fatality rate for the same period oscillating from 4.0% in 2005 to 1.4% in 2013.

² Zimbabwe Malaria Program Review (draft), Ministry of Health and Child Welfare (2012)

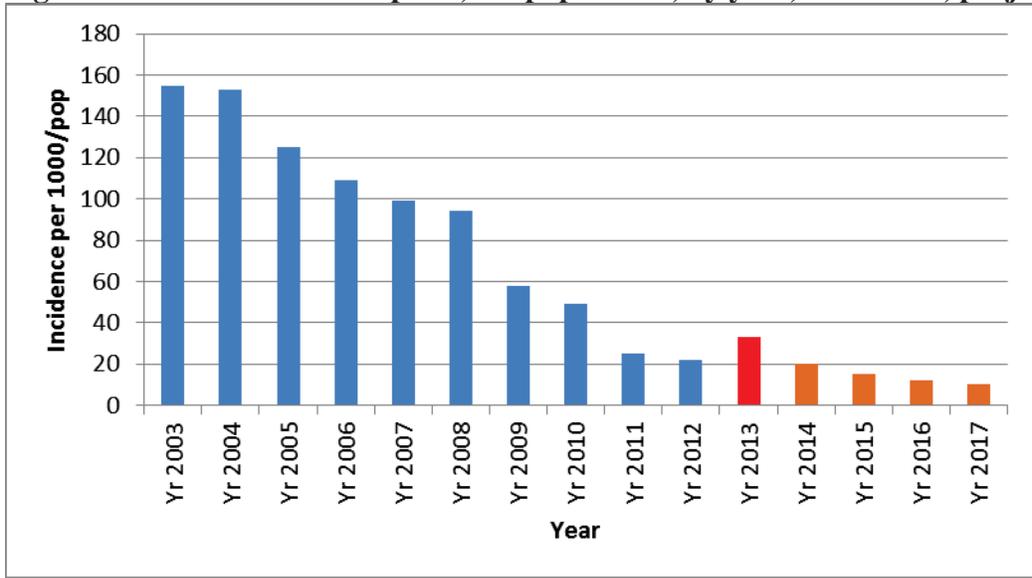
Figure 2: All cause Outpatient Department (OPD) cases versus OPD malaria cases, 2003-2012, Zimbabwe



As of December 2013, Zimbabwe’s reported malaria incidence rate was 29 cases per 1,000, indicating a decline of approximately 80% from the 2003 data – however also marking a 7% increase from 2012’s low of 22 cases per 1,000 (Figure 3). It is difficult to know how much of the reduction in incidence is due to migration, changing weather patterns, oscillations in data quality, or if this represents a true reduction due to effective malaria control interventions. The NMCP and WHO collaborated on a rapid impact assessment exercise in 2013 to determine the impact of the scaled up interventions on transmission trends, as well as on disease burden and mortality. They concluded that the decline in malaria inpatient admissions and deaths was seen after the shift from chloroquine to its combination with SP, and the introduction of ITNs. In addition, a more dramatic decline resulted after the mass distribution of LLINs to the general population, as well as the introduction of ACTs in the public sector in 2008.³ Figure 2 highlights the declining contribution of malaria to all-cause outpatient mortality; today, malaria is the 5th leading cause of morbidity (compared to 2nd leading cause in 2008).³ Declines in malaria admissions and deaths were much greater in high transmission areas rather than in the low transmission areas. Sustaining these gains which Zimbabwe has achieved is dependent on sustained coverage of control interventions and strengthened surveillance.

³ World Health Organization (WHO), 2013. Rapid Impact Assessment: Antimalarial Interventions and Trends of Malaria Cases and Deaths in Hospitals, 2003-2012

Figure 3: Malaria incidence per 1,000/population, by year, 2003-2013, projected to 2017

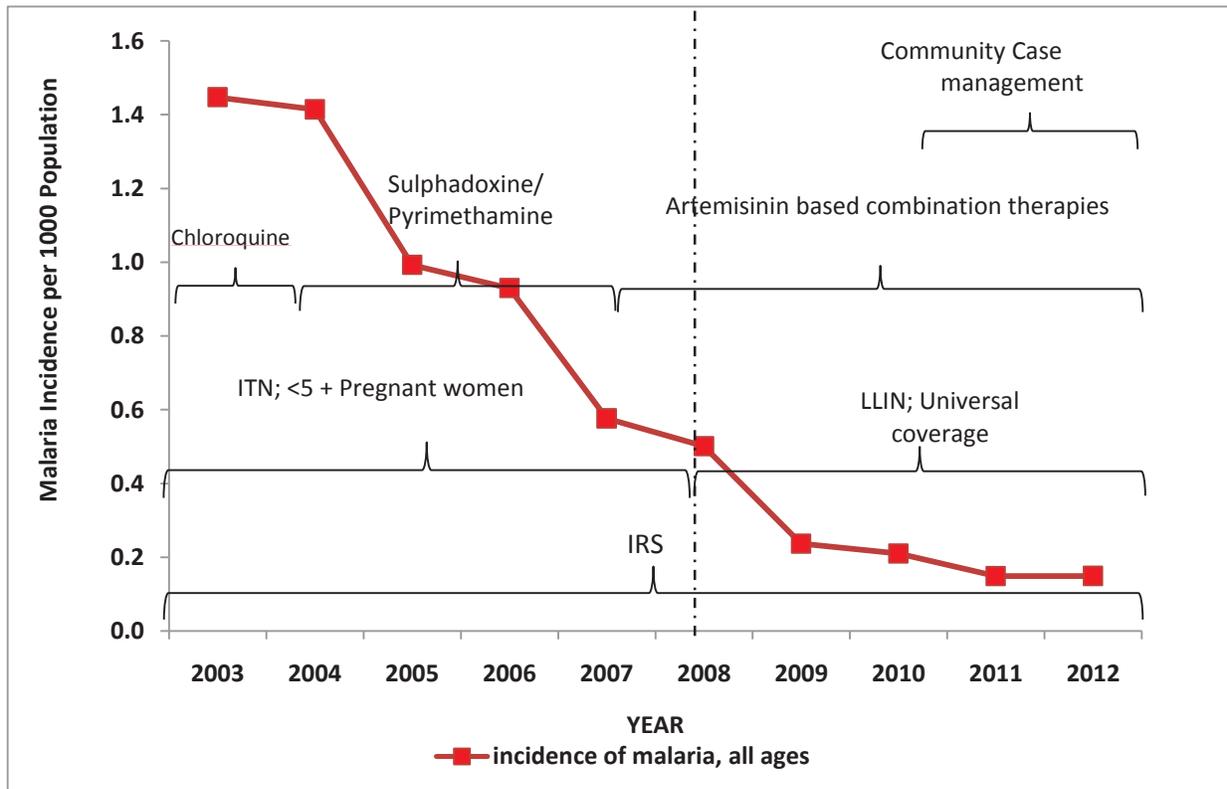


Blue and Red - confirmed data

Orange – projected data

Source: Zimbabwe Health Information System (HIS)

Figure 4: Incidence of malaria in relation to timing of malaria intervention, 2003-2013, Zimbabwe



National malaria prevalence is 0.4% slide positivity rate and 1.0% RDT positivity rate among children aged 6-59 months (2012 MIS). Most slide-positive cases occurred in districts or areas of high-moderate seasonal malaria transmission.

Plasmodium falciparum accounts for 98% of all reported malaria cases; *P. ovale* and *P. malariae* account for the remaining 2%. The Centers for Disease Control and Prevention (CDC) light traps and pyrethrum spray catches conducted at PMI-supported sentinel sites in 2013-14 showed the major malaria vector to be *Anopheles (An.) gambiae s.l.* in most parts of the country. *Anopheles funestus* was found to be prevalent in Mutasa and Mutare Districts of Manicaland Province. Other vectors such as *An. pretoriensis*, and *An. rufipes* are also present in low numbers (Source: Africa Indoor Residual Spraying (AIRS) Project Data, 2013). *Anopheles quadriannulatus*, a member of the *An. gambiae complex*, is commonly found in Zimbabwe, but is zoophilic and therefore not a malaria vector. A fourth member of the complex, *An. merus*, which is a vector in coastal areas of Eastern Africa, has also been reported in Zimbabwe; however, its role in malaria transmission is unclear.

3. National Malaria Control Program: Plan and Strategy

The MOHCC has three main divisions: Policy Planning, Monitoring, and Evaluation; Curative Services; and Preventive Services, plus the Provincial Medical Directorates. Under the Preventive Services directorate is the Epidemiology and Disease Control Department and the NMCP is located within this department. The NMCP is led by a program manager, supported by a team of senior officers responsible for: case management, monitoring and evaluation (M&E), vector control, behavioral change communication (BCC), and finance and administration.

At the provincial level, the Provincial Medical Director is responsible for all health activities, including malaria control, and has a team of managers responsible for epidemiology and disease control, nursing services, environmental health, administration, nutrition, health promotion and pharmacy. The Provincial Epidemiology and Disease Control Officer (PEDCO) also serve as the provincial focal person for malaria. The structure at the district level mirrors the province with a District Health Management Team (DHMT). The DHMT is led by the District Medical Officer (DMO), who is responsible for all health delivery services in the district including malaria. The DHMT works with ward health teams (WHTs) to coordinate and implement health programs. The District Environmental Health Officer (DEHO) manages IRS activities whereas the District Nursing Officer is responsible for case management related issues.

The primary health facility level is staffed by two or three nurses, one or two Environmental Health Technicians (EHTs), and nurse aides. There are approximately 1,500 primary health facilities in Zimbabwe and each primary health facility is linked to a WHT comprised of community members such as village health workers (VHWs), school health teachers, headmen, chiefs, and religious leaders. The health facility staff is responsible for overseeing program implementation at ward level in conjunction with the WHT. The WHT members are volunteers, although trained community-based health volunteers receive an incentive of \$14/month from the Global Fund grant for health system strengthening. An additional \$1/month per VHW goes to the Department of Nursing in the MOHCC to support the VHWs program.

The NMCP collaborates with diverse partners and has linkages with the following parastatal organizations:

- National Pharmaceutical Company of Zimbabwe (NatPharm), which is responsible for the procurement, storage, and distribution of all health pharmaceutical commodities, including malaria medicines;
- Medicine Control Authority of Zimbabwe (MCAZ), which is responsible for registration of all medicines in the country;
- National Microbiology Reference Laboratory (NMRL), which is responsible for internal quality assurance; and
- Zimbabwe National Quality Assurance Program (ZINQAP), which is responsible for external quality assurance for laboratories.

The NMCP has ten national level staff and eight Provincial Malaria Focal Persons; all currently supported by the Global Fund malaria grant. In addition, there is one national level, local consultant supporting vector control as well as an MPH student attached to the NMCP. At the national level, the NMCP develops policy, national guidelines, and training materials. The national level also oversees program implementation, monitoring and evaluation, resource mobilization and coordinates partnerships. Due to Zimbabwe's economic collapse in 2008-09, all of the NMCP positions in Harare are supported by the Global Fund. The position of the Provincial Malaria Focal Person is also supported by the Global Fund while the other workers receive allowances from the Zimbabwe Health Worker Retention Scheme. A Malaria Logistics Focal Person who is funded by PMI sits at the MOHCC under the pharmacy directorate and spearheads malaria supply chain activities at MOHCC headquarters and coordinates with the NMCP. An IRS Technical Officer, funded by PMI, is based at the NMCP 40% of his time when most IRS activities take place, September-February.

The Government of Zimbabwe (GoZ) and partners fund the malaria program. The budget is planned annually, based upon district annual plans which are consolidated at the provincial and later at the national levels.

Table 3: Malaria funding, 2008-2015, Zimbabwe

Partners	2008	2009	2010	2011	2012	2013	2014	2015
GoZ	850,000	1,400,000	1,200,000	1,000,000	902,850	1,200,000	1,000,000	1,000,000
Global Fund	2,100,000	11,320,000	24,500,000	2,600,000	19,069,239	7,460,006	17,576,833	*
WHO (CERF)**	-	1,200,000	79,000	-	-	150,000	150,000	150,000
UNICEF~	320,000	450,000	25,000	18,250	42,500			
PMI	-	200,000	1,000,000	12,000,000	14,000,000	14,100,000	15,000,000	14,500,000
DfID≈	-	300,000	-	-	-	-	-	-
Private Sector	47,250	60,000	20,000	12,500	-	-	-	-
Total	\$3,317,250	\$14,930,000	\$26,824,000	\$15,630,750	\$34,014,589	\$22,910,006	\$33,726,833	\$15,650,000

Note: The GoZ line items reflect activities funded in foreign currency only. This figure does not include human resource and infrastructure maintenance related costs which are currently covered by the Global Fund.

** Data forthcoming*

***Central Emergency Response Fund*

~ United Nations Children's Fund

≈ United Kingdom Department for International Development

In addition to the above financial assistance, other local and international non-governmental organizations (NGOs), support malaria control activities.

The vision of the NMCP's 2008-2015 extended MSP is a malaria-free Zimbabwe with the goal to "reduce malaria incidence from 95/1,000 in 2007 to 10/1,000 by 2015 and reduce malaria deaths to near zero by 2015." The advent of the addendum (2016-17) to the strategic plan resulted in the revision of the goal and reads as follows: "To reduce malaria incidence from 22/1000 in 2012 to 10/1000 by 2017 and malaria deaths to near zero by 2017."

The five key approaches of the MSP include:

- Universal access to malaria prevention and personal protection with: 90% of the population at risk covered by IRS and ITNs, and 85% coverage of monthly recommended dose of intermittent preventive treatment for pregnant women (IPTp2) attending antenatal care in medium-high transmission areas
- Improve diagnosis and treatment of both uncomplicated and severe malaria
- Improve detection and timely control of malaria epidemics, by detecting at least 100 % of malaria epidemics within two weeks of onset
- Expand districts implementing pre-elimination activities
- Increase utilization of correct malaria prevention and control measures to at least 80% of the population at risk
- Strengthen monitoring and improve evaluation of malaria activities at all levels
- Expand and maintain strong multi-sectoral partnerships for effective program management and coordination.

The Zimbabwe NMCP participates in a number of sub-regional and cross-border initiatives, a priority for the program. The NMCP is an active partner of the Roll Back Malaria (RBM)

Southern Africa Regional Network (SARN) and with the Southern African Development Community (SADC) malaria network.

The NMCP is a member of the Malaria Elimination (E8) countries comprised of four front line countries: Botswana, Namibia, South Africa, and Swaziland and four second line countries: Angola, Mozambique, Zambia, and Zimbabwe. Inaugurated in 2009, the E8 countries have a collective goal to eliminate malaria.

The program is also a member of the Trans-Zambezi Malaria Initiative (TZMI) with Zimbabwe, Zambia, Namibia, Botswana, and Angola. The TZMI is a convergence of five countries on the narrow Caprivi Strip with a total of 16 districts and a combined population of 1.5 million people at risk of malaria. Its vision is to eliminate malaria in the Trans-Zambezi communities with social and economic prosperity by 2020.

The MOZIZA is a cross-border malaria initiative with Mozambique, Zimbabwe, and South Africa which began in 2003 and submitted an unsuccessful proposal to the Global Fund in 2010. The remote border area shared by Mozambique, Zimbabwe, and South Africa contains a catchment population of over 2.3 million people within nine districts – referred to as the MOZIZA region – of which 100% of the population is at risk for malaria.

Recently, on World Malaria Day 2013 in Victoria Falls, Zambia and Zimbabwe announced the Zam-Zim Cross Border Initiative along with a planning and coordination workshop.

4. Goals and Targets of the President's Malaria Initiative

The goal of PMI is to reduce malaria-associated mortality by 50% compared to pre-initiative levels in the 15 original PMI countries. By the end of 2016, PMI will assist Zimbabwe to achieve the following targets in populations at risk for malaria:

- >90% of households with a pregnant woman and/or children under five will own at least one ITN
- 85% of children under five will have slept under an ITN the previous night
- 85% of pregnant women will have slept under an ITN the previous night
- 85% of houses in geographic areas targeted for IRS will have been sprayed
- 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been sprayed with IRS in the last six months
- 85% of women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy
- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria
- 85% of children under five with suspected malaria will have received treatment with ACTs within 24 hours of onset of their symptoms.

5. Current Status of Malaria Indicators

As in many African countries, PMI and the NMCP rely on nationally representative health surveys to track progress in coverage of malaria control interventions in Zimbabwe. There have been five such surveys since 2005. The most recent three surveys have been a Multiple Indicator Monitoring Survey (MIMS) conducted by UNICEF from August 2009 to October 2009, the Demographic Health Survey (DHS) carried out from September 2010 to March 2011, and an MIS conducted from February 2012 to April 2012. The latter was conducted by NMCP with support from the Global Fund and PMI. Data from the 2012 MIS will provide baseline for key PMI indicators. The next DHS is planned for 2015 with data collection scheduled for June-December. And, the next MIS is expected to be conducted in 2016.

Zimbabwe has achieved steady gains in many key malaria indicators. Between 2005 and 2012, ITN ownership and use and the uptake of IPTp2 increased significantly (Table 4). These data are encouraging but also suggest that efforts to scale up interventions must continue for Zimbabwe to achieve the RBM, PMI, and national targets.

The 2010 DHS shows national ITN ownership of one or more ITNs averaged 29% for the country compared to 9% in 2005, and the 2012 MIS found a higher proportion of ITN ownership (46%) in the 51 malaria endemic districts that were sampled. The 2010 DHS found that 10% of children under five reported sleeping under an ITN the previous night compared to 58% in the 51 malaria endemic districts sampled in the 2012 MIS.

Table 4: Estimates of Malaria Indicators, 2005-2012

Indicator	2005 DHS	2009 MIMS	2010 DHS	2012 MIS*
Proportion of households with one or more ITNs	9%	27%	29%	46%
Proportion of children under five years old who slept under an ITN the previous night	4%	17%	10%	57.9%
Proportion of pregnant women who slept under an ITN the previous night	NA	NA	10%	NA**
Proportion of women of child-bearing age who slept under an ITN the previous night	NA	NA	NA	44.6%
Proportion of women who received two or more doses of IPTp during their last pregnancy in the last two years	NA	NA	7%	35%
Proportion of children under five years old with fever in the last two weeks who received treatment with ACTs	5%	14%	2%	NA

*MIS was conducted in 51 malaria endemic districts of eight rural provinces

**Data was collected on net use by women of child-bearing age but not among pregnant women specifically

6. Integration, Collaboration, Coordination

Both USAID and CDC support programs in three key areas of GHI: HIV/AIDS, TB, and malaria. With FY 2015 funding, PMI/Zimbabwe will actively seek opportunities to collaborate with other USG health programs so as to ensure maximum impact for every health dollar the USG invests in the country. Opportunities include the following:

Maternal and child health services and malaria: Since malaria prevention and control activities have been implemented as part of integrated maternal and child health services, PMI will make a significant contribution to strengthening capacity to deliver these services. PMI will work with other USG-funded programs and other partners to support the comprehensive primary health care package, including the training and implementation of community-based diagnosis and treatment of fever, IPTp, and early treatment. PMI will continue to support universal coverage of LLINs via campaigns as well as the integration of LLIN distribution within routine antenatal care (ANC) and expanded program on immunization (EPI) services.

Integrated Community Case Management (iCCM): With increasing numbers of home births, falling household compliance with key child health household practices, and added barriers to care for women, newborns, and children (i.e., user fees and fewer rural health centers providing birthing and clinical care), the need is evident to focus increased attention on the community and households. PMI/Zimbabwe is supporting malaria prevention and treatment as a part of iCCM.

Beginning in early 2010, the MOHCC and its partners launched a training program to revitalize the VHW cadres. Other partners are also supporting iCCM. The United Nations Children's Fund (UNICEF) is currently supporting VHWs training and providing other inputs such as bicycles, and the MOHCC is using Global Fund Round 8 funding to expand VHWs refresher training to all districts, provide VHW kits, and once again offer a monthly stipend (approximately \$15 per month) to each VHW. The community-based maternal and newborn care manual, developed by WHO and UNICEF, comprises the primary content for the current VHWs refresher training.

PMI has complemented other partner resources to integrate malaria community case management (MCCM) within the scope of the VHWs program. PMI's partner is training VHWs to provide an integrated package of care using a new community register as a job aid and to record visits on conducting comprehensive care. Village health workers have an important role to play in mobilizing their communities and identifying those women, infants, and sick children who require care.

Strengthening of supply chain system: PMI will also support the strengthening of supply chains, including support for the Zimbabwe Informed Push System (ZIPS) or its successor, Zimbabwe Assisted Pull System (ZAPS), which includes TB commodities, primary health care packages, and malaria commodities, namely rapid diagnostic tests (RDTs), sulfadoxine-pyrimethamine (SP), and ACTs.

HIV/AIDS and malaria: The seroprevalence of HIV infections is high at an estimated 15.2% among individuals aged 15 to 49 years old.⁴ Infection with HIV is higher among women (17.7%) than men (12.3%) and is higher in urban areas (7.0%) than in rural (4.8%) areas.

Areas where integration will be pursued between the MOHCC's HIV/AIDS Program and NMCP include: promoting adherence to universal precautions when taking blood samples, integrating laboratory quality assurance, providing LLINs to people living with HIV/AIDS, and ensuring appropriate malaria prevention services at Prevention of Mother-to-Child Transmission clinics. At the community level, PMI will support VHWs who provide RDT and ACT services to also communicate important messages regarding HIV prevention and testing.

Tuberculosis and Malaria: The National Tuberculosis Program supports the activities of village health promoters to inform and support TB diagnosis and follow-up. Where these promoters are the same as the VHWs that provide RDT and ACT services, PMI will work to integrate activities across HIV, TB, and malaria.

Routine partner collaboration and coordination: Commitment to reducing the malaria burden and continuing on the path of malaria elimination is evident at the highest levels of the MOHCC. The NMCP staff meets weekly to review work plans and monitor progress. The NMCP coordinates with partners through five malaria technical subcommittees: vector control, M&E, case management, BCC, and procurement and supply management. These subcommittees meet quarterly and are chaired by the NMCP or other MOHCC staff, and include the PMI Zimbabwe in-country team and PMI implementing partners.

The NMCP participates actively in the multi-sectoral Inter Agency Coordination Committee on Health (IACCH) "formerly Health Cluster" group meetings, chaired by the MOHCC's Director of Epidemiology and Disease Control. Also, the Health Partners Development Group meets on a quarterly basis to discuss issues of mutual interest. Currently, USAID chairs these meetings with WHO being the alternate chair.

PMI, led by the PMI in-country team, will work closely with the NMCP, RBM partners, Global Fund-funded, and other health-related programs in Zimbabwe to provide integrated services at the health facility and community level. PMI will work with others in USAID/Zimbabwe to ensure coordination of PMI-supported activities within the broader context of the health strategies. These approaches will ensure the most cost-effective implementation of prevention and treatment measures. PMI and NMCP have agreed on a quarterly PMI implementing partners meeting, which includes PMI Resident Advisors, partners, and the NMCP.

In addition, PMI staff will provide leadership and technical assistance in other coordinating bodies such as the local RBM (including relevant RBM sub-committees). At the planning and implementation levels, PMI and other partners will work together to effectively fill commodity and human resource gaps.

⁴ Zimbabwe 2010/11 Demographic Health Survey.

7. Challenges, Opportunities, and Threats

The current USG restrictions prohibiting funding directly to the GoZ or any institution affiliated with the GoZ, make it challenging to implement NMCP-led activities in Zimbabwe. However, both major malaria donors (PMI and Global Fund) work through partners that operate under the leadership of the NMCP; planning and working closely with NMCP staff throughout all activities.

District health staff, including EHTs and health facility workers, are responsible for the implementation of malaria prevention and control activities in communities, including the training and supervision of VHWs. Because of current USG policy in Zimbabwe, PMI is unable to support government staff per diem or allowances for routine visits to the field, such as monitoring, which are critical for successful program implementation; and there are seldom funds available for supervision from GoZ. Global Fund has funded government staff per diem for some activities in the past. Nevertheless, ensuring that monitoring visits occur and that staff are compensated is a particular challenge. However, PMI does fund government staff per diem on an ad hoc basis providing support for some participation in training, monitoring and supervision events/visits.

Additionally, the need for a strong vector management strategy is increasing. Entomological surveillance is showing increasing vector resistance to pyrethroid insecticide in the highest burden districts and a higher number of *An. funestus*, a species which is resistant to pyrethroids and sensitive to DDT and more expensive organophosphates, than noted in recent years.

While Zimbabwe has made improvements in the use of parasitological diagnosis of cases to guide treatment, the diagnostic capacity needs a strong quality assurance (QA)/quality control (QC) system to maintain and advance gains made. Because of critical challenges in administration and management with a local designated partner, PMI was unable to fund a QA/QC program for diagnostics. However, PMI has prepared a description of detailed needs in this area (supervision, tools, job aids, etc.) and recent collaborations with an international partner and/or new Global Fund resources provide potential opportunities for addressing this challenge.

The recent NMCP adoption of the latest WHO-recommended guidelines for IPTp and use of ACTs and parenteral artemisinin products for the treatment of uncomplicated and severe malaria, respectively, will require updating worker guidance materials and training of the workforce, in which there are training gaps, high turnover, and hiring freezes. Additionally, the changes will lead to increased complexity in the supply chain management system. However, these policy changes provide opportunities for Zimbabwe to align with international and regional policies and enhance case management.

Zimbabwe is facing increased cross-border complexities as parts of the country near borders face the highest malaria burden while others reach pre-elimination targets. The frequent and consistent movement of populations across borders is a contributor and the fact that the provinces with vastly higher disease burden lie near areas in neighboring countries where the malaria burden is lower and less of a NMCP priority. For example, Manicaland Province on the

Table 5: Distribution of malaria outbreaks, 2013, Zimbabwe

Province	Districts Affected
Manicaland*	Mutasa, Chipinge, Chimanimani, Mutare, Nyanga, Makoni
Mashonaland Central*	Centenary, Mt Darwin, Rushinga
Mashonaland East*	Goromonzi
Masvingo	Chiredzi

* High burden province

OPERATIONAL PLAN

1. Insecticide-Treated Nets

NMCP/PMI objectives

Zimbabwe's MSP proposes universal coverage with LLINs as one of the country's key priorities for vector control in combination with IRS and targeted larviciding. The stated goal of continued decreases in transmission, if sustained as in the past decade, will support a shift from control towards pre-elimination strategies in large parts of the country over the coming years. In order to realize the full potential of LLINs to support continued transmission reduction, it is necessary to achieve high LLIN coverage. LLINs are considered to be the most promising intervention for further reductions in transmission, however the NMCP tends to prioritize IRS over LLINs.

In the past two years, the NMCP has increased the LLIN targeted districts from 30 (prior to September 2013) to 34/35 districts (October 2013) and finally to the current all 47 malaria prone rural districts (May 2014) due to the epidemiological shift in the country. As of September 2013, Zimbabwe was targeting 30 of the 62 rural districts for universal coverage of LLINs. However, the Global Fund concept note requesting additional LLINs submitted in October 2013 targeted 34/35 districts (34 districts became 35 after one district was split into 2 districts for administrative reasons).

The NMCP defines universal coverage as one net for every two persons or one net per sleeping space. The NMCP intends to: 1) increase the proportion of the general population sleeping under an LLIN to 80%, and 2) increase the number of children under five and pregnant women sleeping under an LLIN to 85% by 2015. The NMCP supports a mixed model of LLIN distribution that includes distribution through public health facilities, community-based fixed-point campaigns, and subsequent mop-up campaigns. However, despite the intention, the NMCP has relied solely on distribution through mass campaigns (fixed point distribution followed by mop-up) thus far. A system for routine distribution of LLINs through public health facilities and other outlets is being developed in 2014 and will be piloted in 4 selected districts in the Mashonaland provinces late in the year.

Table 6: Malarious Districts by Province

Province	# Malarious Districts
Mashonaland East	5 districts
Mashonaland West	7 districts
Mashonaland Central	8 districts
Manicaland	7 districts
Matabeleland South	5 districts
Midlands	4 districts
Matabeleland North	6 districts
Masvingo	5 districts
TOTAL	47 districts

The Zimbabwe NMCP’s vector control policy is to deploy both LLINs and IRS in the 47 malarious districts (Table 6). The plan suggests that LLINs complement IRS, an important vector control strategy in both low transmission areas (primarily through routine) and moderate to high transmission areas (through both routine and campaign distribution).

Table 7: NMCP/Zimbabwe LLIN Strategic Objective

Strategic Objective	Low-to-no transmission 16 districts (including urban metropolitan areas), 49% of population	Moderate-to-high transmission 47 districts, 51% of population
To ensure universal access of the population at risk to effective and appropriate malaria prevention interventions by 2017	Routine LLIN in ANC and EPI for pregnant women and children <1 No mass LLIN distribution No IRS	Routine LLIN in ANC and EPI for pregnant women and children <1 Mass LLIN distribution through campaigns IRS in targeted wards of the 47 districts, based on previous transmission patterns and incidence data

Specifically, the MSP, which is guided by global guidance on strategies for effectively cutting transmission, aims to achieve universal preventive coverage in all moderate to high transmission areas (47 districts, 51% of the population at risk) with mostly blanket (but some targeted) IRS and to complement this strategy with mass distribution of LLINs in the 47 high transmission districts. However, given the scarcity of resources, the program will optimize targets by prioritizing LLINs for pregnant women, children under five, and the immune-compromised through routine distribution mechanisms in these districts. Attaining universal coverage of the 47 districts with just one of these preventive measures, IRS, will be the priority in highly malarious areas, before including LLINs as an additional measure.

Figure 6: Map of Zimbabwe by Province and District



From 2008 to 2010, a total of 1.9 million LLINs were distributed free to targeted communities. Global Fund Round 8 phase 1 procured 1,219,309 LLINs and UNITAID procured 640,557 LLINs in 2009. The LLINs distributed by 2010 are estimated to have covered 83% of the population in 30 targeted districts, assuming that one LLIN is shared between two people. These LLINs were distributed through mass campaigns using public health facilities as fixed distribution points. Before each distribution cycle, a registration/census was carried out to determine the number of individuals in the home, sleeping spaces, and estimate nets required.

According to the 2010-2011 DHS, 29% of households owned at least one ITN and 10% of children under five and 10% of pregnant women slept under an ITN the previous night.

The 2012 MIS provides estimates of the progress made in coverage of preventive and treatment services for malaria. The MIS found that in the 30 LLIN target districts, 55.7% of households had at least one net. Among households with nets, 83.3% of them had at least one LLIN. The coverage increased substantially from the 2008 MIMS figures, where the proportion of households with at least one LLIN was only 36.9%. Among 59.4% of under fives that slept under a net the night preceding the survey, 85.7% had slept under an LLIN – up from 9.2% in 2008. Of 58.3% of women aged 15–49 years that slept under a net the night preceding the survey, 85.6% slept under an LLIN.

A total of 3,201,573 LLINs was needed for mass distribution in 2013. Through the support from the Global Fund (1,368,279), PMI (699,500) and other partners, the country mobilized 2,067,779 LLINs which were distributed to the 34 priority districts. Districts were prioritized by highest transmission risk. After the distribution, a gap of 1,133,794 LLINs for 2,294,079 people in 13 eligible districts remained.

Table 8: ITN Gap Analysis by Calendar Year

	2014	2015	2016
Total Targeted Population	6,694,702	6,768,344	6,842,796
Continuous Distribution Needs			
Channel #1 (<i>Pregnant Women at ANC</i>)	267,788	270,734	276,723
Channel #2 (<i>EPI for children age 1 and under</i>)	220,925	223,355	225,812
<i>Estimated Total Need for Continuous</i>	488,713	494,089	502,535
Mass Distribution Needs			
2014/15/16 mass distribution campaigns	1,138,563 Moderate-to-high transmission 47 districts	0	3,801,553 Moderate-to-high transmission 47 districts
<i>Estimated Total Need for Campaigns</i>	1,138,563	0	3,801,553
Total Calculated Need: Routine and Campaign	1,627,276	494,098	4,304,088
Partner Contributions			
PMI (estimated contributions by year)	(FY13 ITNs) 880,000	(FY14 ITNs) 375,000	(FY15 ITNs) 700,000
Global Fund Single Stream Funding (SSF)/New Funding Model (NFM) Concept Note Requested	1,133,794	24,661	2,986,889

	(SSF)	(NFM)	(NFM)
<i>Estimated Total Partner Contributions</i>	2,013,794	399,661	3,686,889
Surplus/Carried over ITNs from previous year	0	0	0
Total ITNs available in calendar year <i>(Total Contributions + Total Surplus)</i>	2,013,794	399,661	3,686,889
Total ITN Surplus (Gap) <i>(Total Need-Total ITNs Available)</i>	386,518	(94,437)	(617,199)

The primary donors to Zimbabwe’s malaria control effort are the Global Fund, PMI, and the GoZ – each contributing 64, 28, and 7 percent respectively to the total malaria budget between 2008 and 2012. PMI support fills an important gap and is expected to fund approximately 25% of the LLIN need in 2015 and 2016 calendar years. The NMCP has requested that the Global Fund cover 50%.

In October 2013, in order to address the identified gap, the NMCP submitted a grant to the Global Fund for \$6.5 million primarily to cover LLIN procurement and distribution, and accompanying BCC/Information, Education, and Communication (IEC) activities. The budget allocation for the 1,133,794 LLINs from the pending Global Fund grant application is shown in Table 9. If the distribution of the Global Fund LLINs is successful as planned, the NMCP projects that universal coverage will be achieved in late 2014 in the targeted 47 districts. This projection was calculated at the PMI-sponsored NetCALC tool workshop in September 2013 and during the Global Fund grant application development process in October 2013.

Table 9: NMCP/Zimbabwe LLIN Budget for LLIN Gap, Global Fund Application, October 2013

Activity	Amount (USD)	Comment
M&E	178,270	NMCP to lead the monitoring of the distribution process
BCC	442,293	Production of IEC Materials and Roadshows
Training	474,228	Training of Ward Health Teams to conduct line listing and net distribution
Procurement	5,431,943	Procurement of LLINs, registration books and cards
Total	6,526,734	

Additional resources will be needed for the period 2015 onwards as the country embarks on continuous distribution to maintain the universal coverage.

Progress during the past 12 months

With FY 2013 funds, PMI procured 699,500 LLINs. These LLINs were used to meet the universal coverage targets through campaigns in targeted districts in July 2013. As previously mentioned, in September 2013 PMI sponsored a workshop for the NMCP and partners using the NetCALC tool. The workshop also included discussion on possible distribution outlets for routine distribution (ANC, EPI, social marketing, and commercial) and planning steps necessary to move routine distribution along. Attendees at the workshop realized that desired coverage levels (~ 488,000 LLINs) cannot only be maintained through ANC and EPI outlets alone; school-based distribution, community distribution (likely through VHWs), social marketing, and commercial outlets will also need to be considered. Although NMCP was committed to starting routine distribution in 2013, this did not take place due to competing priorities. However, at PMI's encouragement, discussion for routine distribution planning has continued and a pilot in four districts is planned for late 2014 facilitated by a PMI partner.

The pilot will use 80,000 of the 880,000 PMI-funded LLINs to pilot a program in four districts of the Mashonaland provinces – likely to be Mazowe, Mt Darwin, Hurungwe, and Makonde Districts, two of which have strong healthcare systems in place and two of which have systems with known challenges. The pilot program will target both ANC and EPI outlets and will try to learn from experiences before rolling out to the 47 malarious districts.

Plans and justification

The NMCP is planning to continue mass distributions of LLINs through 2014 in identified areas of need throughout the 47 targeted districts. PMI will distribute 800,000 of the 880,000 LLINs, already in procurement, in July 2014 in these districts. The Global Fund interim grant will support distribution of 1,133,794 LLINs around July 2014 via mass campaign distribution as well. As mentioned above, a portion of the 880,000 LLINs (80,000) will be reserved for the routine distribution pilot in four districts tentatively scheduled to begin September/ October 2014. Simultaneously, PMI will work with Zimbabwe's NMCP to create a routine distribution plan designed to maintain coverage between campaigns. During the planning effort for the routine distribution pilot and system, the NMCP and partners will refine numbers needed for routine distribution outlets.

Under the FY 2014 MOP, PMI plans to procure 375,000 LLINs that will be used to supply the routine distribution system roll out nationwide (in 47 malarious districts). And, with the FY 2015 MOP, PMI will procure 700,000 LLINs; a portion will support routine distribution and the balance will go toward the next campaign.

A concept note from the NMCP for the Global Fund new funding model was submitted in May 2014. The concept note included a request for LLINs for routine distribution in 2015 and for distribution in the next campaign planned for late 2016/2017. These nets are anticipated to

maintain universal coverage, which is expected to be achieved in 2014 – 24,661 LLINs in FY 2014 and 2,986,889 LLINs in FY 2015.

PMI, using FY 2014 funds, is supporting the first net durability study in Zimbabwe. The objectives are to assess net durability and longevity. The study will perform prospective monitoring of LLINs distributed during the 2014 mass campaign to determine LLIN performance under Zimbabwe field conditions. See the M&E Section on page 49 for more information.

Proposed activities with FY 2015 funding (\$3,612,000)

Following discussions with the NMCP, PMI will continue to fill strategic gaps in LLIN procurement not covered by the Global Fund and the GoZ. Using FY 2015 funding, PMI will support LLIN procurement and distribution for the ongoing continuous distribution approach designed to ensure high ITN coverage of new cohorts of pregnant women and children, and to replace worn out LLINs distributed through the campaigns.

Specific activities to be supported by PMI with FY 2015 funding include:

1. *Procure LLINs for routine replacement and keep-up distribution:* Procure approximately 700,000 LLINs for distribution through routine distribution, and other channels to be identified during planning, such as ANC and EPI clinics. As mentioned above, NMCP plans begin the routine distribution pilot in late 2014 with 80,000 PMI-funded nets targeting ANC and EPI clinics. During 2014, they expect to add other distribution outlets including schools, communities, social marketing, and commercial outlets. The NMCP will continue routine distribution in 2015 and 2016 and plan for the next campaign in 2017. (\$2,800,000)
2. *Planning, distribution, and monitoring of routine LLIN distribution systems:* PMI will provide support to the NMCP in logistics and operations to strengthen continuous, routine LLIN distribution systems including supply chain management to ensure continuous availability of LLINs and to strengthen the distribution systems capacity for efficient delivery of LLINs to end users. (\$812,000)
3. *Technical assistance to implement LLIN activities:* One USAID technical assistance visit to support overall LLIN distributions. (amount included in core PMI budget)

2. Indoor Residual Spraying

NMCP/PMI objectives

Zimbabwe has a long history of implementing IRS, dating back to 1949. Currently, the NMCP IRS strategy targets one round of spraying in the 47 malarious districts. There is not yet an articulated strategy on the combination or balance of IRS and LLINs. LLINs continue to be distributed in the 47 districts that are prone to malaria transmission. According to the 2010-2011 DHS, 17% of households received IRS within the past 12 months. This figure ranged from 40% in higher-burden malaria provinces (Matabeleland North) to 2% in Harare, where there is little or no malaria transmission. The 2012 MIS showed that 48.6% of households in the 45 targeted

districts were sprayed within the past 12 months. This figure ranged from 65.6% in Mashonaland East to 36.3% in Mashonaland West. However, not all households in the 47 IRS districts are targeted for IRS, making it difficult to quantify the proportion of targeted households that were sprayed.

The program used DDT until 1991, when it was replaced with pyrethroids. However, after the switch, a marked increase in reported malaria cases was observed, prompting the reintroduction of DDT in 2004. The IRS program continues with a mix of DDT and pyrethroids, where DDT is used only in non-commercial agricultural areas. Recent entomological monitoring data has shown a marked resistance to pyrethroids, particularly in Manicaland Province. Insecticide susceptibility testing was conducted in April 2014, and the data will be included in subsequent MOPs. Due to this resistance, the NMCP will include IRS using organophosphates in Zimbabwe's concept note for the Global Fund New Funding Model (2015-16). The NMCP's plan for 2014 (October to December) is to spray IRS using organophosphates in the areas of highest pyrethroid resistance. Areas showing little to no pyrethroid resistance will continue to be sprayed using a mix of pyrethroids and DDT.

Technical support and coordination for entomological monitoring in Zimbabwe is provided by the National Institute of Health Research (NIHR), formerly known as the "Blair Research Institute." During the early 1990s, vector mapping and vector bionomics were identified as priority activities along with insecticide susceptibility monitoring and bioassay assessments. A total of 16 entomological monitoring sites, two sites per province, were established with Global Fund support. While these sites do have some equipment and some staff have been trained, support is needed to ensure consistent entomological surveillance across all sites.

PMI progress to date

Due to the NMCP's experience and capabilities to conduct IRS, from 2012–2014 PMI provided a limited package of IRS support: stressing environmental compliance, and contributing to planning meetings, trainings, monitoring and evaluation, operational logistics and some procurement of insecticides and equipment in pyrethroid districts. This enabled PMI to fill the operational gaps in the NMCP's IRS program, and establish a robust insecticide resistance management system.

PMI began support for IRS activities in Zimbabwe in 2012 by conducting a Supplemental Environmental Assessment (SEA) to the Programmatic Environmental Assessment, to ensure that IRS activities will not adversely impact the environment, people, or bio-diversity in the country. The GoZ and the NMCP were not interested in PMI's initial goal of completing a SEA that would include DDT districts; therefore PMI support is only limited to districts which do not spray DDT.

Table 10: PMI Support for IRS, 2012-2016, Zimbabwe

	Number of Districts	Insecticide Used	Number of Structures Sprayed	Coverage Rate	Population Protected
2012/13	13 (3 provinces)	pyrethroid	501,613	86%	1,164,586
2013/14	25 (7 provinces)	pyrethroid	622,300	91%	1,431,643
2014/15*	4 (1 province)	organophosphates	159,387	-	350,000
2015/16**	4 (1 province)	organophosphates	159,387	-	350,000

* planned with FY 2014 funds

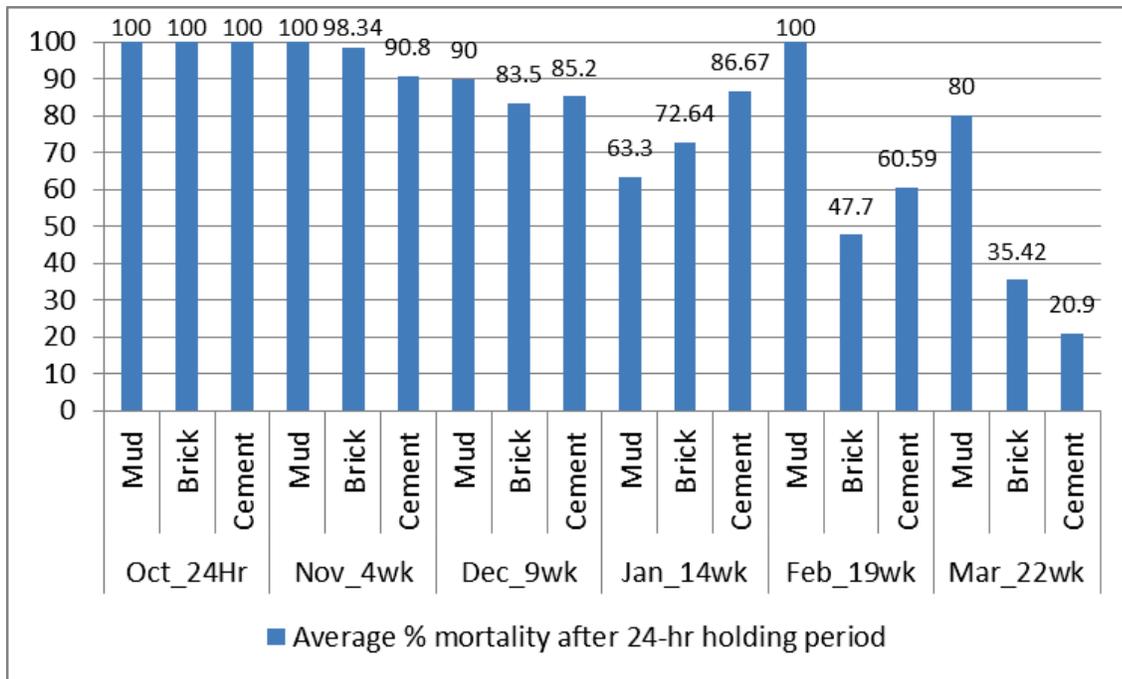
** planned with FY 2015 funds

Progress during the past 12 months

In the 2013/14 spray round, PMI supported IRS in all 25 pyrethroid spraying districts, across seven of the eight rural provinces. A total of 622,300 structures were sprayed, achieving 91% coverage and protecting 1,431,643 people. With PMI support, 356 spray operators and support staff were trained in spray operations, 127 persons were trained in environmental compliance, plus 45 smart phones were procured and distributed to 45 district staff after they were trained on the Frontline Short Message Service M&E data reporting system.

Routine entomological monitoring has been conducted with PMI funding in eight sentinel sites. Insecticide susceptibility tests were conducted in seven provinces, and cone bio-assays to verify the quality of spraying was carried out in the three highest burden provinces (Mashonaland East, Mashonaland West, and Manicaland). Insecticide susceptibility testing was done primarily with wild caught *Anopheles gambiae s.l.* However in Manicaland, testing was done with the most prevalent vector species, *Anopheles funestus*. Due to the challenges the NIHR had with maintaining a susceptible colony, and the volume of mosquitoes required for susceptibility testing, not all classes of insecticides were tested in all sites. The figure below is an example of the residual efficacy tests that were carried out in Burma Valley, Manicaland, which indicate poor residual efficacy after 14 weeks of spraying.

Figure 7: Mortality Rates of Field-Collected *Anopheles gambiae s.l.* after Exposure to Insecticide Sprayed Surfaces, 2013/2104, Burma Valley Sentinel Site, Zimbabwe



Note: Susceptible An. arabiensis strain KGB was used in 1 house during the T0 cone bioassay tests while field-collected An. gambiae s.l. was used in all other houses during T0, and during subsequent bioassay tests. This is due to the lack of sufficient mosquitoes for testing. Mortality rates actually increased for mud (in February) and cement (in January), which is probably the result of using wild mosquitoes and their varied resistance to the insecticide sprayed.

PMI funding supported a sentinel site assessment, where all of the 16 entomological sentinel sites, plus the eight therapeutic efficacy testing sites, were assessed by joint teams comprised of the NMCP, PMI, CDC entomologists, WHO, and the NIHR. In addition to understanding the resource needs, appropriateness of the location and functionality of the sites, the assessment will enable the NMCP to potentially reduce the number of sites, and possibly combine vector surveillance sites with therapeutic efficacy testing sites. Finally, PMI funding facilitated an evaluation of incinerators in the three high burden provinces, in order to further Zimbabwe’s proper disposal of insecticide contaminated wastes, and improve overall environmental compliance.

Plans and justification

PMI will shift its strategy of IRS support in Zimbabwe with FY 2014 funds, and concentrate on a robust full-package IRS implementation in the highest burden province of Manicaland. PMI’s priority of targeting the highest malaria burdened province is consistent with that of the NMCP, who requested that PMI put additional resources into IRS in Manicaland, to have a greater impact. The USG restrictions on directly funding the GoZ, along with an approved SEA which only covers non-DDT districts, restricted PMI’s ability to respond to all of the IRS needs for the

entire country. The PMI-funded independent environmental monitoring visit conducted in November 2013 noted that the intermingling of funding for the national IRS program made accountability difficult. Therefore, moving forward PMI will support a two- to three-year model IRS program in Manicaland, to demonstrate a safe and effective IRS program that other IRS districts can learn from. PMI's previous contributions to environmental compliance and other cross-cutting efforts, such as entomological monitoring, including insecticide susceptibility monitoring, M&E, and BCC will continue nationwide, however operational support (training, procurement, etc.) will be limited to only Manicaland.

Proposed activities with FY 2015 funding (\$4,022,000)

PMI will focus IRS funding to four of the seven districts in Manicaland, to establish a model IRS program that other districts can learn from. Districts not supported by PMI will be supported via the Global Fund New Funding Model, with both areas under the leadership of the NMCP. While the non-Manicaland districts will not receive direct PMI support for operations, they will receive indirect support via inclusion in national-level IRS activities, such as: higher-level training, national review and planning meetings, and technical assistance with environmental practices, entomological surveillance, and M&E.

Specific activities to be supported by PMI with FY 2015 funding include:

1. *Support spray operations:* Support the full package implementation of a model IRS program in four of the seven districts in Manicaland, spraying approximately 159,387 structures, and protecting approximately 350,000 people. Full package support will include procurement of organophosphate insecticide and equipment, training, operational logistics, environmental compliance, and overall technical assistance to the NCMP. (\$3,800,000)
2. *Entomological surveillance and monitoring:* PMI will continue to support entomological surveillance, including insecticide susceptibility monitoring, in ten existing sites: eight rural sentinel sites, plus two urban sites: Harare and Bulawayo. Entomological surveillance activities will include adult and larval mosquito surveillance; assess the impact of vector control activities, and bioassays to determine IRS longevity on treated surfaces. (\$200,000)
3. *Procure entomological supplies:* PMI will provide insecticide resistance monitoring equipment for entomological activities to the central NIHR and De Beers laboratories. (\$10,000)
4. *Technical assistance to PMI IRS activities:* One CDC technical assistance visit to support entomology, including enhanced insecticide resistance monitoring. (\$12,000)

3. Malaria in Pregnancy

NMCP/PMI objectives

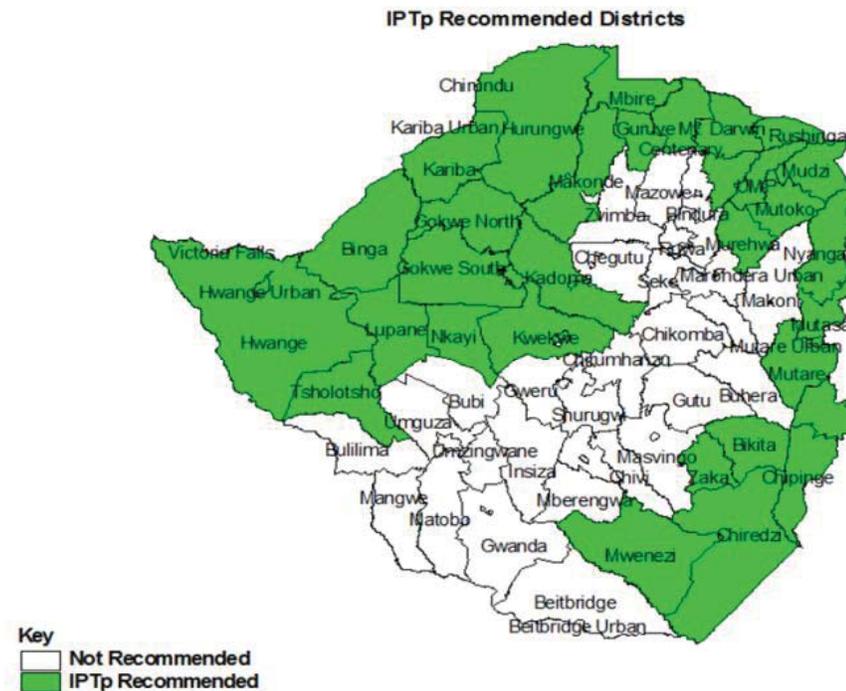
Control of malaria in pregnancy (MIP) was adopted as a policy in Zimbabwe in 2004 to be implemented in the moderate to high-burden malaria transmission areas, with 30 districts

designated for MIP interventions (see Figure 8 for map of intermittent preventive treatment (IPTp) recommended districts). The policy was a three-pronged approach that recommended IPTp with three doses of SP as the drug of choice, distribution and promotion of use of LLINs during pregnancy, and early and effective diagnosis and treatment of clinical malaria. In 2014, the NMCP adopted the latest WHO guidelines for IPTp which recommend administration of IPTp at every ANC visit starting as early as possible in the second trimester and up until the day of delivery, as long as they are at least four weeks apart. Adoption of the WHO guidelines will simplify the implementation of the IPTp for health workers and likely increase the uptake of IPTp. Each dose of SP is to be administered to the pregnant woman under a health worker's observation. The policy states that pregnant women on co-trimoxazole prophylaxis should not be administered IPTp. PMI has supported the forecasted needs for SP although there have been reports of stockouts.

According to the national guidelines iron (ferrous sulfate) and folate should be routinely given to all pregnant women in ANC starting from booking or 12 weeks gestation, whichever is earlier. The doses are ferrous sulfate 200-400 mg daily and folic acid 5 mg once per week. In the past there were problems with stockouts but these drugs are now included in the primary care packages procured by UNICEF and delivered using the ZIPS so this problem is improving though it is not resolved.

The ZIPS of drug and supply distribution has improved the availability of medications in health facilities but there still remain inefficiencies in the system resulting in some health facilities occasionally running short of certain medications, particularly SP. Routine pharmaceutical and supply chain audits have uncovered SP stocked in health facilities outside of the districts targeted by the NMCP for IPTp. The stock imbalances of SP (stockouts of SP targeted districts, and SP availability in non-targeted districts) indicate that more attention is needed to correct the imbalances and health facility staff should be trained on the SP policies. In addition to planned M&E and stock management trainings, there is a plan to sensitize focal malaria staff to conduct data quality reviews to help improve stock management of SP along with that of other commodities while other recommendations, e.g., increased M&E training and standardization of facility registers to capture consumption data are being considered. Also, improvements are needed for the national quantification of SP annually given that the central drug warehouse has had shortages at various times during the year.

Figure 8: Map of IPTp recommended districts, 2014, Zimbabwe



Antenatal attendance in Zimbabwe is very high with 90% of pregnant women visiting ANC at least once during pregnancy, 65% visiting ANC four or more times, and 65% of pregnant women delivering at a health facility (DHS 2010-11). The 2012 MIS showed that 48% of pregnant women attending ANC in the 30 target IPTp districts received SP and 35% received two or more doses of SP. A 2013 case management audit showed IPTp coverage in those same districts to be 61%, falling short of the MSP target of 80%. Sleeping under an LLIN is part of the MIP strategy and among women of child-bearing age (15-49 years) 49% slept under an LLIN the night preceding the survey according to the 2012 MIS.

Treatment of uncomplicated malaria in pregnant women is quinine plus clindamycin during the first trimester. If these drugs are unavailable, the recommendation is to use AL, which is the first-line ACT. Women in subsequent trimesters are to be treated with AL. With the recent adoption of a second-line ACT, patients in any trimester of pregnancy who do not respond to the first-line treatment should be treated with the second-line treatment: AS/AQ.

Coordination with maternal/reproductive health programs has been on an *ad hoc* basis since a formal joint meeting was held in 2011. With the change in case management guidelines, efforts to coordinate the revision and dissemination of updated guidelines and training of health facility-based and VHWs will be strengthened.

Progress during the past 12 months

A total of approximately 1.2 million tablets of SP or 500,000 treatments have been procured using FY 2013 funds which helped alleviate an impending major stockout. During the past 12 months, PMI supported the NMCP to train VHWs in MIP and broader case management issues, integrating with iCCM, MCCM, and MCH training. Even though VHWs do not give IPTp in the communities, they do advise pregnant women on MIP. Village health workers encourage early antenatal visits, uptake of IPTp, timely presentation at antenatal care, and consistent use of ITNs.

PMI also engaged the NMCP on updating the national policy to reflect the new WHO recommendations for administering IPTp. Additionally, PMI has supported the delivery of MIP messages in BCC activities.

Plans and justification

With FY 2014 funds, approximately 285,000 treatments of SP will be procured, and PMI staff will continue to work closely with the NMCP and the MOHCC Reproductive Health Staff as they revise the national guidelines for implementing IPTp to ensure that the Zimbabwe policy is consistent with the recent WHO revised guidance.

With FY 2015 funds, PMI will continue to provide support in the MIP-implementing districts for the training and supportive supervision of district and health facility level staff on the newly revised IPTp and MIP implementation guidelines. This training is part of comprehensive maternal health care delivery training which aims to improve the uptake of IPTp by improving demand for ANC service. Other MIP topics covered by the training will include ITN promotion and treatment of malaria for pregnant women. The PMI implementing partner will document progress toward targeted numbers of workers trained. Also, case management audits, pharmaceutical and supply chain management consumption and health facility utilization data, supervisory visit reports, plus data from the 2016 MIS will be used to monitor success. PMI will also provide technical assistance to the NMCP to improve the forecasting and distribution of SP to the target health facilities to ensure a stable supply. PMI will procure and distribute approximately 285,000 treatments of SP.

Gap analysis

Table 11: SP Gap Analysis, Calendar years 2015-1017, Zimbabwe

SP Needs and Contributions	2015	2016	2017
Estimated population	13,497,019	13,645,486	13,795,586
Estimated population in IPTp target areas	6,768,344	6,842,796	6,918,067
Total number of pregnant women attending ANC	270,734	273,712	276,723
Total SP needs (Treatments)	1,082,935	1,094,847	1,106,891
Total SP needs (Tablets)	3,248,808	3,284,544	3,320,676
SP from MOHCC (Treatments)	0	0	0
SP from PMI (Treatments)	285,000	285,000	0
SP from Global Fund (Treatments)	135,975	139,936	0
Surplus (Gap in Treatments)	(661,960)	(669,911)	(1,106,891)

Assumptions: Includes total number of pregnant women which is approximately 4% of the population in targeted districts. The target for ANC attendance is 100% and the NMCP based SP needs on four treatment doses per pregnant woman attending ANC. The Global Fund support assumes award of requested amount in Concept Note.

Proposed activities with FY 2015 funding (\$30,000)

1. *Procurement of SP: PMI will procure approximately 285,000 treatments of SP for distribution to health facilities located in the target districts for IPTp. Technical assistance will also be provided to improve the quantification and forecasting of SP to ensure a stable supply annually. (\$30,000)*
2. *Support health worker training and supervision in MIP: PMI will support the training of health workers in the newly revised IPTp and implementation guidelines, the support will cover the districts designated for MIP interventions to guide pregnant women to follow the current WHO recommended IPTp SP dosing, use of LLINs during pregnancy, and early and effective diagnosis and treatment of malaria. The training will also include data recording and reporting. This training and supportive supervision support will benefit health center nurses and ANC nurses in the district hospitals. As part of the integrated iCCM/MCH/MCCM activities implemented by a partner, nurse aides, and VHWs will increase their knowledge of new practice guidelines as well. (Costs included in case management treatment)*

4. Case management: Diagnosis

NMCP/PMI objectives

Since August 2010, the NMCP's policy has been to have parasitological confirmation of all suspected malaria cases by microscopy or RDT before prescribing treatment. Exceptions to this policy are made in the case of malaria epidemics or stockouts of diagnostic tests at the health facility. Rapid diagnostic tests and/or microscopy are typically used for malaria diagnosis at all health facilities, with the exception of primary health facilities where only RDTs are available. Monospecies *P.f.* RDTs had been used in 80% of the country with multispecies ones used in the pre-elimination region of Matebeleland South Province but given minimal cost difference multispecies tests were procured with Global Fund resources for use in other districts.

Zimbabwe has five central hospitals, eight provincial hospitals and 68 district hospitals, four of which are situated in urban areas; all of these facilities have laboratories.

The Department for Laboratory Service is located under the Division of Curative Services of the MOHCC, and is funded primarily by the GoZ. This department is responsible for policy formulation and organizes supervision and refresher training of laboratory personnel. It also recommends quantities of microscopy and laboratory supplies. The department's activities are conducted in collaboration with the Tuberculosis Reference Laboratory in Bulawayo, National Virology Laboratory at the University of Zimbabwe medical school, and the National Microbiology Reference Laboratory (NMRL). Through Global Fund support, about 200 microscopes were purchased under the TB program. The Ministry supplies laboratory reagents but the quantities are usually not sufficient to meet all needs.

Zimbabwe has three main cadres of facility-based laboratory staff: clinical scientists with a master or doctorate-level degree; general laboratory scientists with a bachelor's degree from the university; and state certified laboratory technicians who receive two years of training post-high school at the polytechnic level. A professional registry, the Medical Laboratory and Clinical Scientist Council, accredits personnel before they can practice. There is a critical need for more laboratory scientists and technicians. The microscopists currently employed in the health services are paid through the Global Fund Round 8 so at the end of the grant in December 2014 it will be difficult to retain them without future donor or government funding. While the government hiring freeze has ended and staff who leave may be replaced, recruitment takes time and there remains a freeze on the creation of new positions.

According to the NMCP, parasitological diagnosis of malaria has been fully rolled out to all health facilities and technical assistance visits in 2013 to a sample of facilities confirmed the availability of malaria microscopy and RDTs. All of the 12 facilities visited consistently had available microscopy, RDTs, or both. As a result, and as required by policy, all malaria cases should be laboratory confirmed. Health centers have mainly RDTs but a few of the health centers visited also had microscopy capability with trained microscopists who perform both TB and malaria microscopy. In facilities with both RDTs and microscopy, RDTs are mainly used at the outpatient department for testing suspected malaria cases prior to seeing the clinician.

The microscopy QA/QC system involves the NMRL, and provincial and district hospitals have microscopy supervisors in place who conduct on-site visits. Quarterly integrated trainings for malaria and TB have been conducted in the past for supervisors. However, due to inadequate funding for malaria, most of their supervisory activities are centered on TB. Currently, no malaria or RDT QA/QC system is in place. In the past malaria QA/QC activities involved microscopists reading positive and negative smears prepared from patients that had already been diagnosed as positive or negative and recording results in laboratory notebooks. Also, initially with Global Fund Round 5 award support through 2009, and subsequently with other funding, an in-country designated partner, in collaboration with NMCP and NMRL, conducted quarterly on-site supervisors and a proficiency testing program for malaria microscopy as part of a system wide QA program. The testing involved sending two blinded unstained smears to facilities where they were treated as routine samples; stained, read, and results sent to the partner. However, due to inadequate funding, follow up testing was not done by either the partner or the MOHCC who received the partner's reports of deficiencies.

Currently, the funding for the partner has been reduced significantly and no malaria diagnostic QA/QC is being supported by them. No other in-country entity is available to provide malaria QA/QC so it is lacking for microscopy and RDTs. Through support from another donor, an internationally-based organization is providing laboratory services including laboratory monitoring for those with HIV/AIDS as well as HIV Rapid Test Kit QA and technical assistance for the national laboratory services and the partner which previously provided malaria diagnostic QA/QC. The organization will enhance this assistance with the assignment of a consultant in country for three years starting mid-2014. As capacity building increases, it is anticipated that the PMI, NMCP, and NMRL will be able to critically assess the capacity of in-country entities and work to build a more robust and structured malaria diagnostic QA/QC program.

An additional missing piece of QA/QC is lot testing of RDTs which currently is not being done. However, determination of a national laboratory's capacity to do so is being explored.

Malaria diagnostic capacity using RDTs has been strengthened since the 2009 national policy allowing VHWs to use ACTs and RDTs and the inclusion of RDT training in case management training provided to health workers and VHWs. However, initial limited funding support of village and facility-based worker training and procurement of laboratory diagnostic commodities, including RDTs, impeded progress in case management. Nonetheless, increased support has facilitated progress and helped mitigate these issues. More recently, near- to adequate supplies of RDTs have been procured with donor support. If current Global Fund requests are granted, adequate supplies should continue (Table 12).

The training, supervision, and procurements efforts have contributed to increased parasitological confirmation of cases. Historically, malaria case reporting data has included both laboratory-confirmed and unconfirmed cases. Since 2005, the number of cases diagnosed clinically is decreasing whereas parasitological diagnosis is increasing. In 2005, only 8.5% of clinical cases were tested (126,640/1,484,919) with 18,954 positive cases while in 2013 the percentage had increased to 97.9% (939,569/959,762) with 379,632 reported as positive.

Progress during the past 12 months

PMI has procured approximately 2 million RDTs. Training support is discussed in the case management treatment section.

Gap analysis

Table 12: Rapid Diagnostic Tests Gap Analysis, Calendar years 2015-2017, Zimbabwe

	2015	2016	2017	Totals
Total population at risk	13,497,019	13,645,486	13,795,586	n/a
Total number of malaria cases	303,683	266,087	206,934	776,704
Total needs	2,125,780	1,862,609	1,448,538	5,436,927
Commitments (PMI)	2,000,000	2,000,000	0	4,000,000
Commitments (Global Fund)*	0	0	1,448,538	1,448,538
Surplus (Gap)	(125,780)	137,391	0	11,611

**1,448,538 RDTs requested in Global Fund Concept Note submitted May 2104*

Plans and justification

PMI will continue to procure approximately 2 million RDTs and microscopy supplies and support strengthening microscopy and RDT QA/QC and facility-based and VHWS training to enhance case management at the facility and community levels. (*More detail in case management treatment section*).

Proposed activities with FY 2015 funding (\$1,162,000)

- 1. Procure RDTs for malaria diagnosis:* PMI will procure approximately 2 million RDTs to complement those procured through the Global Fund. The RDTs will be used at both health facilities and the community level. (*\$1,000,000*)
- 2. Procure laboratory supplies:* Support procurement of laboratory reagents and basic supplies for microscopy (*\$50,000*)
- 3. Support quality assurance for diagnostics:* PMI will support quality assurance of malaria diagnostics to improve malaria case detection, via an international or local implementing

partner. PMI will also explore the possibility of using the same partner support for laboratory supervision. This activity will build upon existing and improving QA systems and help to build capacity. (\$100,000)

4. *Technical assistance visit:* A technical assistance visit will be conducted by a CDC laboratory expert to provide technical support to the NMCP on ongoing diagnostic activities in country and progress on recommendations given after previous technical assistance visits. (\$12,000)
5. *Support the training of staff at health facilities:* Staff at health facilities will receive training on microscopy slide preparation and RDTs, as appropriate. This activity is co-funded with the Global Fund and is part of malaria case management training. (Costs included in case management treatment)
6. *Support the scale up of the training and supervision of VHWs:* Training on malaria case management and diagnosis using RDTs will be provided to VHWs. This activity will be co-funded with the Global Fund. (Costs included in case management treatment)

5. Case management: Treatment

NMCP/PMI objectives

In 2004, Zimbabwe adopted artemether-lumefantrine (AL) as its first-line treatment for uncomplicated malaria. When Zimbabwe was awarded the Global Fund Round 5 grant in 2007, the country procured AL and trained health workers on the new policy. In 2014, the country revised its treatment guidelines to align with WHO recommendations. Consequently, it adopted artesunate-amodiaquine (AS) as its second-line ACT for uncomplicated malaria. Additionally, it adopted IV artesunate as the first-line option for severe malaria. Some stocks of quinine will be maintained to combine with a second drug as an alternative for first trimester pregnant women and in the case of stockouts of artesunate. The use of artesunate suppositories for pre-referral treatment of severe malaria, especially in children and at the community level, was also adopted. To decrease transmission, the country will also introduce the use of low-dose primaquine for its gametocytocidal effect in infections in low transmission/elimination areas, initially with robust pharmacovigilance. These new policies will be incorporated into training manuals, training and supervision, and revised treatment guidelines by late 2014 while procurement is being planned.

In 2009-10, the NMCP adopted a policy of community case management for malaria and conducted a pilot study to evaluate this program. Trained VHWs follow an algorithm to test all suspected cases with an RDT and treat those with positive results with an ACT. Based on this pilot, the NMCP has been scaling up the training of community VHWs to implement community-based treatment on a national scale in malaria endemic districts. The VHWs are selected from their ward by the community. They receive training in iCCM which has a malaria component as well as focused training in community malaria case management to deliver care in an integrated manner. The primary health facility staff is responsible for supervising the VHWs and their data collection. The EHTs are also trained to provide VHW supervision. According to

the new policy of parasitological confirmation of cases, the NMCP planned to train 6,600 VHWS in malaria case management by 2013.

Despite the institution of community-based malaria case management, overall expansion of case management capacity has been hampered by the difficult national economic conditions that have resulted in high turnover of health workers leaving inadequate numbers of qualified and trained workers. A review of historical records shows that of 18,000 health workers who were earmarked for malaria training (case management/MIP/RDTs), approximately 10,000 have ever been trained. This figure must also be considered by taking into account high staff attrition so numbers have likely been variable over time. The NMCP estimates that there were approximately 18,000 health workers in 2013. While it is encouraging that the GoZ removed the hiring freeze on some nursing positions, for which the final number is to be determined, this group of workers will also need to be trained. At a minimum, the NMCP has a target of training 500 health workers in the calendar years 2014 and 2015 which should help meet the need to cover untrained health workers in the 47 high burden districts.

Challenges notwithstanding, improvements in malaria case management have occurred. More recent NMCP reports indicate that more than 8,000 (more than 44%) of the estimated 18,000 health workers were trained in malaria case management and M&E and 1,325 (20%) of the required 6,600 VHWSs were trained in RDTs and ACT treatment use by the end of 2011. Global Fund supported the training of VHWSs in recent years; 90 in 2010, 2,893 in 2011, 1,142 in 2012, and 215 in 2013 for a total of 4,325. During 2013, the NMCP had trained a total of 1,412 health workers in case management, RDT use, and malaria in pregnancy, exceeding their target of 1,112. PMI supported the training of an additional 300 health workers. This total of 1,712 workers is 9.5% of the 18,000 health workers.

A PMI partner conducted a training gap analysis in early 2014 in Manicaland to assess gaps in malaria case (facility and community) case management. Training registers and health information databases were cited by participating district health staff as sources of information. In the seven districts in the province, there were 4,976 workers in the categories of doctors, nurses, EHTs, nurse aides, VHWSs, and SHMs. Of that number, 3,055 (65%) lacked training. The gaps ranged from 32% (449/1,410) among nurses and EHTs (37/117), 68% (1,405/1,968) among VHWSs, 85% (34/40) among doctors to 100% of the 993 SHMs. A challenge is the lack of a database to track trained personnel making it difficult to definitively quantify those trained. To address this issue, PMI is supporting a partner to develop a database.

PMI is also supporting the training and supervision of VHWSs in MCCM. This training is integrated with iCCM and MCH activities and platforms. The strategies include MCCM training, supportive supervision, including by peers, documentation and reporting, quality improvement, and integrating MCCM and MCH. Additionally, the problem of a lack of a standardized malaria curriculum was corrected when a PMI implementing partner facilitated its creation.

Progress during the past 12 months

PMI procured approximately 700,000 ACT treatments during the past 12 months.

With PMI support, 772 of 1,200 health facility workers in high burden districts in rural provinces and in the uniformed forces were trained on malaria diagnosis and case management, representing 64% of the implementing partner's training gap goal. Additionally, 884 were already trained using Global Fund resources. A PMI partner conducted the above mentioned training gap analysis, including a review of VHW registers, in Manicaland which helped another partner quantify the need and define its training activities in the province. The districts reported a total of 1,968 VHWs in the province. The partner trained 290 in two districts in 2013 reaching all who had been identified as VHWs at that time. An additional 699 (48%) of the partner's target of 1,450 had been trained by May 2014 along with 47/62 (76%) health workers targeted as VHWs trainers in MCCM. In the absence of a more recent number of VHWs nationwide and by using the 6,600 estimate from a few years ago, in the past year PMI has supported the training of approximately 15% of this group. PMI supported the roll out of a national MCCM standardized training package printing 1,300 copies. The MCCM training for VHWs, peer-peer model of supportive supervision, and performance quality improvement were implemented in one high malaria burden district in Manicaland as part of iCCM/community MCH training and 40 supervisors were covered. The partner also standardized tools for MCCM documentation and reporting which were successfully piloted in Manicaland.

Plans and justification

To enhance access to recommended case management, PMI will procure approximately 450,000 ACT treatments for use at health facilities and by VHWs. Additionally, PMI will procure medicines needed to comply with the revised treatment guidelines, namely AS/AQ and parenteral and rectal artesunate in quantities and on a timeline guided by progress of new treatment training and implementation activities. The NMCP is planning to continue to provide training, refresher training, and supportive supervision of facility-based health workers, VHWs, and community workers to not only close the existing training gap in case management but also educate staff on the new treatment guidelines adopted in 2014. Using FY 2015 funding, PMI plans to continue to support refresher training for health workers but emphasize more on supportive supervision. PMI will work to synchronize health facility training and that for VHWs. PMI will also continue to support training of VHWs with building on the ongoing expansion of the activities from two to five high burden districts in Manicaland. These activities will include the printing and dissemination of job aids and registers for MCCM to all of the five priority districts in addition to training and supervision of VHWs. In addition to VHWs, nurse aides, EHTs and school health masters will be trained in MCM/MCCM with the total target of 1200 including 800 VHWs, 120 EHTs, 200 nurse aides, and 80 SHMs. Supportive supervision for workers will reach more than this targeted figure.

PMI plans to build upon current VHWs training figures and continue to support VHWs training in FY 2015 MOP year and also focus on better coordination and advocacy for VHWs, including the use of the standardized curriculum, use of standardized M&E tools and reporting, expansion of a peer supervisor system, and promotion of quality performance.

Gap analysis

Table 13: Artemisinin Combination Therapy Gap Analysis, Calendar years 2015-2017, Zimbabwe*

	2015	2016	2017	Totals
Total population at risk	13,497,019	13,645,486	13,795,586	n/a
Total number of malaria cases	303,683	266,087	206,934	776,704
Total needs (AL treatments)	303,683	266,087	206,934	776,704
Commitment (PMI)	260,000	450,000	0	710,000
Surplus (Gap)	(43,683)	183,913	(206,934)	(66,704)

**Final figures will change as quantities of AS/AQ and medications for severe disease are determined based on progress and timeline of training on and implementation of new treatment guidelines and requested Global Fund support.*

Proposed activities with FY 2015 funding (\$1,800,000)

1. *Procure ACTs and medicines for severe malaria:* PMI will procure approximately 450,000 ACT treatments for use in health facilities and by VHWs, treatments for severe malaria, and pre-referral rectal artesunate. (\$1,000,000)
2. *Training and supervision for health facility workers:* PMI will work with the NMCP to improve malaria case management by supporting the training and supervision of health facility workers. The training proposed will include ACTs, RDTs, and IPTp, including new treatment guidelines, and will be co-funded by Global Fund if the current application is approved. (\$500,000)
3. *Scale up training and supervision of VHWSs in MCCM:* PMI will support the capacity building of 1,200 VHWs, EHTs, nurse aides, SHMSs, and supervisors to improve access to the population and the quality of malaria case management at the community level by funding the training and supervision of VHWSs on ACTs, rectal artesunate, and RDTs. These activities will be co-funded by Global Fund if the current application is approved. (\$300,000)

6. Pharmaceutical and Commodities Management

NMCP/PMI objectives

Over the past 10 years, MOHCC has developed and implemented a number of supply chains in order to ensure availability of health commodities at facility level. These include the Delivery Team – Topping Up (DTTU), the ZIPS/Primary Health Care Package (ZIPS/PHCP), the Zimbabwe ARV Distribution System (ZADS), the Essential Medicines Pull System (ZEDAP) and Zimbabwe Laboratory Commodity Distribution System (ZiLaCoDS), a system for ordering/managing laboratory products. The Directorate of Pharmacy Services (DPS) developed a strategic plan for 2012–2015. The availability of medicines is one of the key performance indicators for the MOHCC.

ZIPS/PHCP overview and ZAPS Pilot

The ZIPS distributes malaria, TB, and selected (26) essential medicines and medical supplies to approximately 1,500 service delivery points (SDP) every quarter. The MOHCC DPS in conjunction with NatPharm provides leadership to the ZIPS, including leading the annual national quantification process and bi-annual updates. The quantification of malaria commodities is integrated with that for other program commodities such as TB, HIV/AIDS, drugs for opportunistic infections, and other essential medicines & medical supplies. The MOHCC programs (AIDS, TB, malaria) and partners (Clinton Health Access Initiative, UNDP, UNICEF, Elizabeth Glazer Pediatric AIDS Foundation, Supply Chain Management System, and USAID|DELIVER PROJECT) participate and provide input to the quantification.

Looking towards the future when MOHCC will be responsible for funding public health supply chain management systems, DPS and Zimbabwe National Family Planning Council have begun looking at the possibility of harmonizing the management of health commodities. The vision is to bring the management of all health commodities under a single unified commodities system for all primary care facilities and also have TB, malaria, and preventive commodities distributed via one system to all levels. The MOHCC's stated goal is to reduce the number of systems to one or two, and to implement more effective and efficient supply chain operations that are sustainable in the medium to long term. The MOHCC plans to effect these changes while still ensuring that the needed data is collected, that re-supply takes place according to a defined schedule, and that coverage/order rates and stockout rates remain at or are better than those achieved under the current multiple systems.

Since November 2012, DPS has begun laying the groundwork for the design and implementation of the harmonized supply chain(s), including an input-gathering meeting involving over 50 local staff from all levels of the supply chain and central-level partners, and a subsequent smaller technical working group meeting that agreed on an outline to integrate the management of several sets of health commodities that are currently managed using different systems into a single “assisted ordering” system at primary health care level. The technical working group further developed a plan of action towards implementation of the assisted ordering system key, including a system pilot in one province.

In October 2013, the MOHCC with support from the USAID|DELIVER PROJECT designed the ZAPS which will manage the several categories of products that are currently managed by multiple logistics systems at primary care level, as well as at secondary and upper levels for selected preventive products. In December 2013, PMI funding further supported the Zimbabwe MOHCC in developing the Standard Operating Procedures manuals and training curricula for a

harmonized assisted ordering logistics system that will serve as a model to integrate the management of health products and replace existing multiple systems. The project is currently supporting pilot trainings in preparation for pilot implementation in Manicaland Province from April 2014 to June 2015. If the ZAPS pilot project proves successful, then ZAPS will replace ZIPS and will be rolled out nationwide as a model for distributing health commodities in the future.

The NMCP has adopted the WHO recommendations for managing severe malaria cases at community and health facility levels using artesunate suppositories for referral purposes and injection, respectively, as well as the use of AS/AQ as 2nd line treatment for uncomplicated malaria. Although this change comes as an opportunity for the country to transition towards more effective and safe regimens for malaria, it presents supply chain changes. The challenge lies in ensuring a good balance between making sure new regimens are available in full supply, while minimizing overstocking and possible losses of the old and new products. PMI will support this transition on a phase in, phase out basis. The concurrent drafting of the concept note for the Global Fund new funding model and the FY 2015 MOP for PMI provide an opportunity to analyze the gaps in the supply chain and ensure that both grants complement each other.

Progress during the past 12 months

The following quantities of commodities were procured with PMI under the FY 2012 MOP to support malaria prevention and treatment activities across the country: 581,460 ACT treatments, 1,135,375 RDTs, 567,800 SP tablets, 948,300 quinine tablets, and 699,500 LLINs. PMI together with other partners (Global Fund, UNICEF) co-supported the distribution via the ZIPS of the following products across the country: 770,370 ACT treatments, 1,765,621 RDTs, 592,570 SP tablets, 69,617 quinine tablets, and 36,246 ampoules of quinine injection.

PMI has supported ZIPS operations, ensuring that malaria commodities are delivered on a quarterly basis to the approximately 1,500 primary health facilities in Zimbabwe. The ZIPS also delivers TB and PHCP, hence quarterly visits to all facilities. In 2013, the ZIPS has managed to maintain > 98% delivery coverage every quarter. The ZIPS has also managed to maintain >90% availability of RDTs and ACTs at health facilities during the same period. However, stock levels decreased significantly during the October - December 2013 period due to a missed quarter (July - September 2013) of delivery because of the unavailability of other donor products.

Activities covered under the ZIPS operations budget line include fuel, maintenance and repairs for delivery trucks and monitoring vehicles, ZIPS forms printing, internet technology hardware and software maintenance, ZIPS mop up training, support and supervision of the distribution system, direct and indirect costs of technical assistance including, but not limited to, maintaining critical positions and field office operations.

In addition to supporting the ZIPS operations, PMI, through the USAID|DELIVER PROJECT supports the quantification of malaria commodities including RDTs, ACTs, SP, and severe malaria pharmaceuticals and the quarterly end-use verification (EUV) survey. The quantification process, including updates every trimester, is led by the DPS in consultation with the NMCP.

Plans and justification

PMI will continue to support and ensure that malaria commodities, such as ACTs, RDTs, severe malaria medicines, and SP, are available in health facilities through ZIPS until another system(s) comes into play to replace ZIPS. Strengthening as well as expanding supervision and a quality assurance program will also be supported. PMI also plans to support the nationwide rollout of ZAPS if it is successful in replacing ZIPS.

Proposed activities with FY 2015 funding (\$900,000)

1. *Support approximately 33% of the ZIPS or ZAPS:* Support ZIPS/ZAPS operations to provide ACTs, RDTs, severe malaria medicines, and SP to approximately 1,500 health facilities nationwide. Funds will complement other pharmaceutical and commodities management funding from other partners. PMI support will go towards Logistics Management Information System forms printing, ZIPS or ZAPS trainings, and delivery team support. *(\$900,000)*

7. Monitoring and Evaluation

NMCP/PMI objectives

The NMCP's M&E Plan was released in 2009 and has since been updated twice. The most recent update was completed in 2014 when the plan was extended to 2017 to align with the MSP and also reflect the WHO pre-elimination strategy. The new, revised goal of the MSP is to reduce malaria incidence from 22 per 1,000 in 2012 to 10 per 1,000 population in 2017 and malaria deaths to near zero by 2017. The M&E plan is based on the Global Fund M&E Toolkit, WHO recommended indicators, and internationally accepted tools and practices related to M&E. The M&E plan defines national malaria indicators, sources and frequency of data collection, measurement procedures, as well as mechanisms to track progress towards targets. Surveillance, M&E, and research in malaria have evolved over time with the National Health Information System (NHIS) reporting morbidity and mortality data through the District Health Information System (DHIS). Major M&E activities include nationwide surveys (2015 DHS/AIDS Indicator Survey (AIS), 2016 MIS), program reviews, rapid impact assessments, planning and data review meetings, support and supervisory visits to provincial and district health offices, collaboration with global and national institutions, and routine data collection. Information obtained is used for evidence-based decision making, program management, and accountability.

Surveillance, M&E, and operational research data are collected, reported, and recorded from many channels including routine data systems, programmatic monitoring, and national surveys. Additional M&E data are available, including insecticide resistance monitoring, and therapeutic efficacy studies. The table below summarizes some of the key M&E data for malaria in Zimbabwe, including national-level surveys, routine and specialized surveillance systems, and other data sources.

Table 14: Key Monitoring & Evaluation Data Sources, 2009-2016, Zimbabwe

Data Source	Survey Activities	Calendar Year							
		2009	2010	2011	2012	2013	2014	2015	2016
Household surveys	Demographic Health Survey (DHS)*		X					X	
	AIDS Indicator Survey (AIS)*		X					X	
	Malaria Indicator Survey (MIS)				X				X
	Multiple Indicator Monitoring Survey (MIMS)*	X					X		
	EPI survey*					X			
Health facility and other surveys	Rapid Impact Assessment*					X			
	Tracking Results Continuously (TRaC)*	X				X		X	
	EUV survey				X	X	X	X	X
	LLIN durability monitoring						X	X	X
Malaria surveillance and routine system support	Support to malaria surveillance system/IDSR			X	X	X	X	X	X
	Support to HMIS			X	X	X	X	X	X
Therapeutic	In vivo efficacy testing					X	X**		X
Entomology	Entomological surveillance and resistance monitoring				X	X	X	X	X

*Not PMI funded **WHO supported two additional sites

Routine data systems

The main sources of routine malaria data are the NHIS and the Weekly Disease Surveillance System (WDSS), which is a subset of Integrated Disease Surveillance and Reporting (IDSR). The NHIS expanded to include a DHIS in 2011; DHIS now forms the foundation for the country's Health Management Information System (HMIS). Monthly reports on malaria cases and deaths from all public health facilities and mission clinics are reported through the DHIS. The reported malaria-related data includes the number of suspected cases, proportion of suspected malaria cases that received parasitological test (microscopy/RDT), number of parasitologically-confirmed cases, ACT consumption, and IPTp uptake. The DHIS information is currently being reported via paper, from health facilities to district health information officers who enter these data into the DHIS electronic database. Consolidated electronic data are then reported to the ten provincial offices where data are consolidated and reported to the national level. Zimbabwe has transitioned to DHIS-2, a web-based HMIS reporting system. In 2013, DHIS-2 was piloted in Manicaland Province and the national scale up of the DHIS-2 is complete despite some delays; training of provincial, district, and primary health facility staff is ongoing.

Implementation barriers include lack of resources for on-site validation checks, supervision and supervisory visits, staff vacancies at the district and provincial levels, hardware, and difficulty with internet connectivity in some settings. However, the national reporting system has been showing improvements in the timeliness and completeness of data; during the most recent reporting, facilities reporting completeness was approximately 80%.

The WDSS provides weekly data on 12 epidemic-prone diseases, including laboratory-confirmed malaria cases and deaths, from approximately 1,350 health facilities nationwide. Health facilities reporting to WDSS submit data to the districts which then transmit to provincial and central levels. A weekly report is produced and distributed to the national program areas. Malaria epidemic thresholds are calculated using this weekly data. An alert epidemic threshold is reached when the number of confirmed weekly cases exceeds the three-year mean of the confirmed weekly cases plus one standard deviation (SD). An action epidemic threshold is reached when the reported weekly cases exceed the three-year mean plus two SDs of reported cases. During an outbreak in 2013 threshold calculations issues were identified and likely delayed the outbreak response. The issues included instances where new facilities did not have the historical data to calculate the thresholds and facility staff were not properly trained on utilizing the thresholds to recognize and report an increase in cases. Weekly meetings are held at the national level to review and discuss data quality, potential outbreaks, and action steps. In the case of the 2013 outbreak, the situation was first recognized at the district level. The national malaria incidence in 2013 was 29 cases per 1,000 people, which is a 7% increase from the 2012 incidence of 22 per 1,000 population; the outbreaks partly contributed to the increase.

Programmatic monitoring

Programmatic data on IRS, LLIN distribution, and larviciding are managed by the NMCP using the WHO Global Malaria Database, and are used to monitor and report on the implementation of all malaria control activities. Data are collected from the sub-district level and passed through district and provincial levels to the national level on a weekly, monthly, or quarterly basis, depending on the data being reported. The system was initiated in 2010; full implementation began in late 2011. However, data completeness is an issue with this system as reporting is not always consistent.

LLIN durability monitoring

The WHO Pesticide Evaluation Scheme (WHOPES) recommends that all LLIN programs monitor different net products in their local settings. Following the mass LLIN distribution campaign in 2014, prospective LLIN durability monitoring is conducted at six, 12, 24 and 36 months post-distribution to determine the LLIN performance under Zimbabwe field conditions, the findings of which will be used to guide the country-specific LLIN replacement rate.

National surveys

In April 2009, UNICEF supported a MIMS, which is similar to the Multiple Indicator Cluster Survey and included a malaria module. The most recent DHS was completed in 2010-11 and also included a standardized malaria module. Data from the DHS and MIMS provided pre-PMI baseline estimates (Table 4) for most of the coverage indicators used by PMI. In 2012, PMI supported an MIS, which also included anemia and parasitemia biomarkers collected from children aged 6-59 months in households from 51 malaria endemic districts in eight rural

provinces. Key results from the 2012 MIS include the finding of low national parasitemia in children less than five years of age: 1% by RDT confirmation and 0.4% by microscopy confirmation, yet there was high anemia prevalence. Additional findings from the survey include: moderate ITN utilization, low IPTp uptake, and that radio or TV were not common sources of malaria information. The next DHS is being planned for 2015 with an AIS planned as a follow-on survey using the same enumeration areas and sampling scheme as the DHS. The timing and sampling scheme of the DHS is not optimal for collecting appropriate malaria biomarkers and will not be measuring parasitemia. Because of these limitations PMI will not be a major contributor to the 2015 DHS, the majority of the funding will be provided by other donors. Due to the timing and national focus of the DHS with the additional complexity of the follow-on AIS, high-quality district-level malaria data needed by the NMCP for planning purposes will not be collected. Therefore, the NMCP has begun planning for a second MIS to be conducted in 2016, which will be four years after the 2012 MIS. The PMI team will work closely with the survey partners and stakeholders to determine the optimal strategy for collecting the necessary biomarkers.

Six EUV surveys (a quarterly survey to verify availability of malaria commodities in health facilities and warehouses), were conducted in 2012 through 2014. Quarterly reports are provided summarizing the EUV activities and findings. These reports provide key observations, recommendations, and next steps for commodity distribution and are distributed widely to MOHCC personnel and in-country partners in Zimbabwe. Four more quarterly surveys will be conducted during FY 2015.

Progress to date

A total of 480 health workers were trained in M&E; and 290 village health workers have been trained and 40 VHW trainers or supervisors have been trained. In 2013, a national MCCM manual and standard training package was developed for health care worker trainings, including VHW trainings; 13,000 copies have been printed. In addition, as part of the iCCM support for VHWs, a performance and quality improvement approach was successfully completed in Manicaland Province.

After significant delays, the therapeutic efficacy monitoring began collecting samples for evaluation at six sites in mid-2013; PMI supported four sites and WHO two sites. Data collection started late into the transmission season due to logistical challenges and failed to enroll the desired sample sizes. Preliminary polymerase chain reaction (PCR)-uncorrected results showed 183 out of 190 patients (96.3%) were treatment successes with 7 out of 190 (3.7%) failed. Final PCR-corrected results are pending. In 2014, the therapeutic efficacy monitoring began on time and was conducted at four PMI-supported sites (Dindi, Hauna, Nyamhunga, and Simatelele) with two additional sites supported by WHO.

Plans and justification

With FY 2015 funding, PMI will continue to support malaria surveillance and survey activities. PMI support will continue support for M&E trainings at all levels including village and community health workers as well as supervisory and district health facility trainings. In

addition, PMI support will be used to facilitate quarterly meetings for district-, provincial- and national-level representatives to meet and discuss surveillance and M&E related issues. PMI will continue to support four therapeutic efficacy monitoring sites every other year. PMI will continue supporting LLIN durability monitoring of nets that were distributed in a mass campaign in 2014. PMI will contribute modestly to the 2015 DHS, as a portion of the total USAID support, as well as support the MIS in 2016. PMI will work with the NMCP to ensure the most up-to-date standardized malaria indicators will be collected during the DHS. However, the sampling and timing of the DHS are not optimal for measuring malaria parasitemia. Therefore, the NMCP has begun planning for a second MIS to be conducted in 2016. In light of the findings of low national parasitemia from the 2012 MIS and in line with 2014 WHO recommendations on malaria diagnostics in low transmission settings, the collection of dried blood spots to be tested via PCR will be considered for the next MIS. The testing of these dried blood spots will likely be conducted as part of an operational research (OR) project (please refer to the OR section).

Proposed activities with FY 2015 funding (\$812,000)

1. *End-use verification survey:* Conduct quarterly surveys to assess availability of malaria commodities in health facilities and warehouses. (*\$100,000*)
2. *Therapeutic efficacy monitoring:* Continue support of ACT therapeutic efficacy studies of first- and second-line ACTs with partners, including WHO, in four designated sentinel sites every other year. (*\$200,000*)
3. *Conduct LLIN durability monitoring:* Continue prospective monitoring of the performance and durability of LLINs distributed during the mass campaign in 2014. This will be the 12 month post-distribution assessment. (*\$100,000*)
4. *National M&E support:* Support quarterly district health team meetings, provincial M&E review meetings, training support, and supervision across all levels. Implement recommendations from the training needs assessment conducted with FY 2014 funds. Continue to support the routine data collection systems (DHIS-2 and IDSR). PMI will provide assistance to ensure that the malaria component of the DHIS-2 is implemented consistently across all provinces. Also, IDSR/WDSS training will be supported to improve capacity to analyze and monitor the malaria trends, and improve preparedness for epidemic detection and response. (*\$300,000*)
5. *MIS:* Support secondary analysis of MIS data and support stakeholders meetings to discuss implications of results for future malaria programming in Zimbabwe. Support dissemination of MIS results. (*\$100,000*)
6. *Technical assistance:* One CDC TDY to support PMI Zimbabwe M&E activities. (*\$12,000*)

8. Operational Research

Table 15: Operational Research Studies

Completed OR Studies			
Title	Start date	End date	Budget
None			
Proposed/Ongoing OR Studies			
Title	Start date (est.)	End date (est.)	Budget
Title: Assessment of seasonal population movements, health care access, and malaria disease burden in Manicaland Province, Zimbabwe – Phase I	01/2015	09/2015	\$200,000
Planned OR Studies FY 2015			
Title	Start date (est.)	End date (est.)	Budget
Title: Assessment of seasonal population movements, health care access, and malaria disease burden in Manicaland Province, Zimbabwe – Phase II	10/2015	06/2016	\$100,000
Title: PCR analysis of dried blood spots from the 2016 MIS	10/2016	06/2017	\$100,000

Assessment of seasonal population movements, health care access, and malaria disease burden in Manicaland Province, Zimbabwe – Phase I & Phase II

With Global Fund and PMI support, malaria control interventions have been scaled-up throughout Zimbabwe. According to the 2012 MIS, the transmission pattern based on incidence levels suggest major changes in the malaria epidemiology in the country marked with a sharp decline in incidence from 2004 to 2012. However, Manicaland Province, which shares a stretch of approximately 1,000 km border with Mozambique, is thought to have a large mobile population although the composition of this population is not well known. Manicaland Province has remained outbreak-prone and currently accounts for 51% of the national malaria burden in Zimbabwe. The proposed OR activity seeks to better understand the changing burden and risk of malaria in this province and to understand the driving forces behind persistently high incidence levels and re-occurring outbreaks. Results from this OR activity will be used to assess the population dynamics, disease burden, and health care access; these data will be used to guide programmatic decisions to minimize future outbreaks and inform epidemic preparedness and response planning. The OR activity will be conducted in two phases. Phase I of the activity will be a prospective assessment and pending approval of the concept note will be funded by reprogramming FY 2014 funds. The assessment will help PMI and the NMCP understand the burden of malaria in the province with the highest malaria incidence, which will guide targeted interventions. The assessment will quantify the impact of population movement in malaria transmission and incidence, including health care seeking behaviors in an outbreak-prone province in Zimbabwe. A follow-up monitoring activity will be funded through FY 2015 funds

and would implement recommendations from findings of the assessment, including updating strategies and intervention efforts for malaria prevention, control, communications, and improving access to care in Manicaland Province. The second phase activity will also provide a platform to engage global partners to discuss findings from the assessment.

Polymerase chain reaction (PCR) analysis of dried blood spot samples from the 2016 Malaria Indicator Survey (MIS)

Zimbabwe is a low malaria transmission setting. Findings from the 2012 MIS indicated that malaria positivity (RDT) among children less than five years of age was 1.0% and 0.4% of blood smears had malaria parasites. Dried blood spots will be collected during the 2016 Zimbabwe MIS and tested by PCR, this will provide an opportunity to better quantify national parasitemia levels using a more sensitive test. In addition, this is consistent with the 2014 WHO policy recommendation on malaria diagnostics in low transmission settings where the use of nucleic acid amplification methods by malaria programs should be considered for epidemiological research and surveys aimed at mapping submicroscopic infections at low transmission intensity.

Proposed activities with FY 2015 funding (\$212,000)

1. *Operational research study: Assessment of seasonal population movements, health care access, and malaria disease burden in Manicaland Province, Zimbabwe – Monitoring of Phase I outcomes (\$100,000)*
2. *Operational research study: PCR analysis of dried blood spots from the 2016 MIS (\$100,000)*
3. *Technical assistance: One CDC TDY to support PMI Zimbabwe's OR activities. (\$12,000)*

9. Behavior Change Communication (BCC)

NMCP/PMI objectives

This year, PMI supported the revision and development of two key guiding documents for BCC, the National Malaria Communication Strategy and the BCC Implementation Guide. Two international consultants supported by PMI worked with the BCC focal person at the NMCP to lead a workshop that reviewed and extended the National Malaria Communication Strategy from 2008-2013 to 2015 in line with the MSP.

The National Malaria Communication Strategy remains a key document that provides direction and coordination of malaria BCC interventions in Zimbabwe. The National Malaria Control Program Communications Strategy, extended to 2015, is guided by the PRECEDE- PROCEED Model, and the Health Belief Model. The strategy sets forth seven key interventions to be achieved by 2013; Vector Control (IRS, Larviciding and LLINs), Case Management, Epidemic Preparedness and Response, IPTp, BCC, and OR and M&E. The goal of the MOHCC Malaria Strategic Plan 2008-2013 is to reduce malaria morbidity from 9.5% in 2007 to 4.5% and mortality from 4.5% in 2007 to 2.5 % by 2013.

The following strategic objectives form the basis for the implementation of the malaria control program in Zimbabwe:

- To ensure universal access of the population at risk to effective and appropriate malaria prevention interventions by 2015.
- To ensure access to prompt and appropriate management of all malaria cases within 24 hours of onset of symptoms by 2015
- To detect 100% of epidemics within one week of onset and effectively manage 100% of malaria epidemics within two weeks of detection
- To expand districts implementing pre-elimination activities from 7 to 15 by 2015
- To increase utilization of correct malaria prevention and control measures to at least 80% by 2015
- To strengthen monitoring and improve evaluation of malaria activities at all levels
- To expand and maintain strong multi-sectoral partnership for effective program management and coordination

These objectives will be achieved in part through the development of advocacy, social mobilization, and behavior change communication interventions.

The second document that was drafted by the two PMI-supported consultants and discussed at a partner workshop was the BCC Implementation Guide. The first of its kind in Zimbabwe, the BCC implementation guide provides principles for malaria BCC including communication theories, situational analysis, strategic design (approach, messages, channels), development and testing of materials, implementation, and monitoring and evaluation. The discussions in the workshop helped partners to understand the NMCP's expectations for BCC activities and encouraged information sharing and coordination on BCC activities. Partners with little experience in BCC, learned how to better plan and manage BCC activities in order to assist communities in malaria control.

Achieving and maintaining the goals of the NMCP to control malaria in Zimbabwe depend on correct and consistent use of ITNs, acceptance of IRS and adherence to diagnosis and treatment. Behavior change communication and social mobilization play an important role in the overall effectiveness and uptake of these interventions.

Behavior change communication activities in Zimbabwe occur at the national, provincial, district, and community level. PMI support is approximately allocated to 15% national level and 85% at the community/interpersonal level. Mobilizing traditional and religious community leaders and civic organizations to support and promote malaria prevention and control is critical for achievement of the NMCP's MSP and PMI objectives. At each primary health facility, there is one or more WHTs, which is composed of community health workers, school administrators, and community leaders who assist with malaria communication for IRS and LLIN distribution campaigns. Community malaria committees are made up of volunteers selected by their communities and trained by the primary health facility staff on key malaria messaging at an interpersonal communication level. With the implementation of community case management of malaria using VHWs, the NMCP emphasizes VHWs interactions with individuals, households, and small groups. The VHWs test, treat, and refer for malaria treatment as warranted and can serve as important conveyors of appropriate health messages and information.

Progress during the past 12 months

This past year, PMI worked through VHWs to promote LLIN use and IPTp as well as early treatment seeking behavior. These outreach activities included routine and specific BCC activities in areas where outbreaks of malaria were reported. PMI also supported increased messaging in advance of the IRS spraying season to manage expectations for spraying and provide safety messages for families.

For LLIN activities, there were 105,506 people reached during net hang-up campaigns; and 479,630 people were reached during road shows. Radio spots on the importance of sleeping under an LLIN every night were also aired.

PMI supported malaria commemoration events that mobilized the community and the production of some print materials for communities on the prevention and treatment of malaria. PMI also supported a small household survey (Tracking Results Continuously (TRaC)) in 2013 to assess communities' understanding of malaria transmission, recognition of signs and symptoms, perceptions of cause, treatment-seeking patterns, and preventive measures and practices in order to inform the NMCP's malaria BCC interventions.

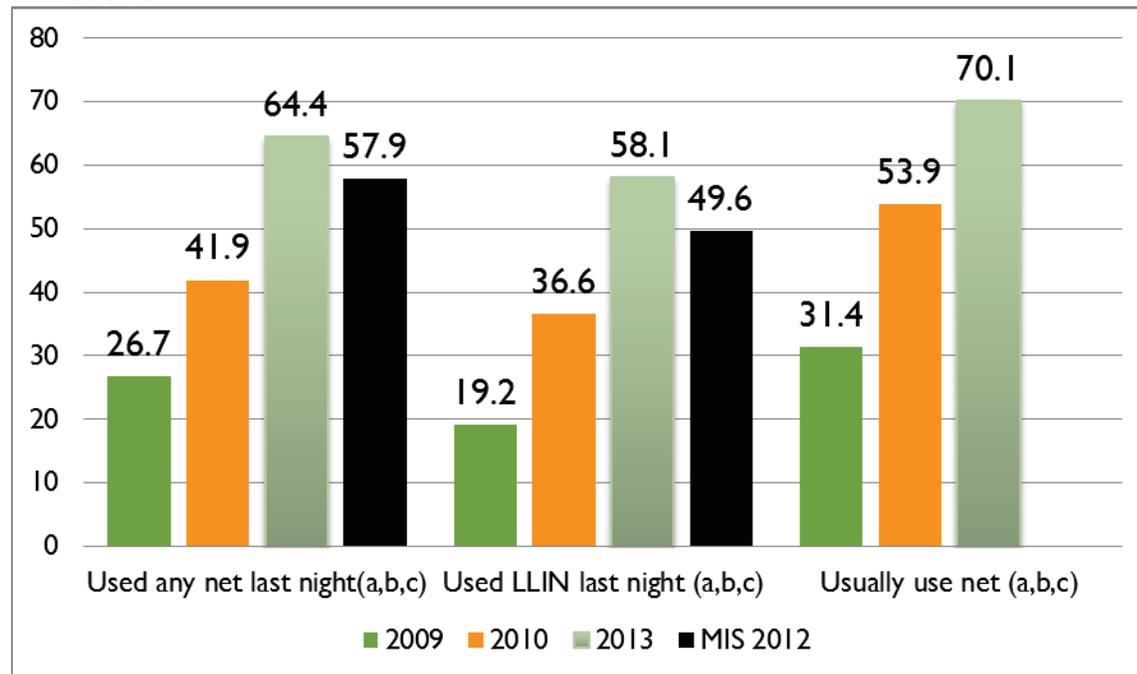
The results from the 2013 TRaC survey shows that LLIN use increased from 37% in 2010 to 58% in 2013 (Figure 9). PMI is in the process of evaluating the non-users of nets in line with the same methodologies to build on these results to increase net usage. PMI will work with the same implementing partner to analyze the remaining information on the management of fever at the household level.

PMI also supported the malaria BCC Working Group, an active technical group led by the NMCP to share information, encourage high standards in BCC activities, and provide general guidance.

Plans and justification

PMI support will complement Global Fund activities with a budget of \$837,188 (mass media and radio) for 2014 and, under the NMCP's guidance focus on inter-personal communication, print materials development, pre-transmission season malaria prevention activities (LLINs, IRS), early care seeking behavior, and MIP uptake early in pregnancy. In line with the new NMCP Implementation Guidelines, PMI will use evidence-based messages, focusing on a target audience and delivery methods such as mass media, interpersonal communication, and print media. PMI will also support a monitoring and evaluation component for BCC in order to evaluate specific interventions and behavior change.

Figure 9: Monitoring Individual Net Utilization, by Percent surveyed, 2009-2013, Zimbabwe



Proposed activities with FY 2015 funding (\$400,000)

1. *Support malaria BCC:* With FY 2015 funds PMI will support VHWs and religious leaders to conduct interpersonal communication on key malaria messages around ITNs, malaria in pregnancy, RDTs, and ACTs in the 47 districts with the highest malaria transmission. The VHWs’ BCC activities will be complemented by printed materials that accompany packaged LLINs, RDTs and ACTs; radio spots, and drama skits at various locations including religious institutions, schools, and community events. The primary focus for all activities will be to support LLIN distribution (campaign), improve MIP uptake (SP at each ANC at least one month apart, starting in the second trimester, use of LLINs during pregnancy, and early and effective diagnosis and treatment of malaria), and promote IRS and appropriate case management. PMI funds will also support the malaria BCC Working Group to conduct an annual meeting. (\$400,000)

10. Capacity Building and Health Systems Strengthening

NMCP/PMI objectives

The NMCP was established to operate at the national and provincial levels and work with the district level to implement malaria programs. The NMCP leads Zimbabwe’s malaria control efforts through the formulation of policy strategies, coordination of all partners involved in malaria control in Zimbabwe, and directs the country’s current malaria-related Global Fund grants. The NMCP collaborates with several partners including USAID, UNICEF, WHO, CDC, and other international and local institutions to implement the Global Fund projects and PMI.

The NMCP has outstanding staff expertise and capacities; however, with increasing funding opportunities, the need for more intensive management and coordination also increases, and additional resources are required for the NMCP to address that need.

Through the Field Epidemiology and Laboratory Training Program (FELTP), the University of Zimbabwe trains public health personnel in field epidemiology, data analysis, epidemiologic methods, and use of strategic information to make appropriate health decisions. This is a two-year course, which typically benefits central- and provincial-level MOHCC personnel. The University also organizes a short course on leadership and health management for middle-level MOHCC personnel who work at the district level.

In response to the NMCP's various human resource challenges, PMI is invested in training programs at various levels including health facility and VHWs and CHWs. PMI helps fund the supervision of health workers in health facilities involved in the implementation of malaria activities at the health district level. PMI also supports national and provincial meetings, which provide a platform to exchange information and increase communication within the country. PMI will continue to support strengthening and reinforcing the capacity of the logistics management system and overall supply chain management.

Progress during the past 12 months

With FY 2011 and FY 2012 funds, PMI supported the University of Zimbabwe to strengthen the malaria curriculum within the existing FELTP program. Funds were made available in April 2013 and are being used to support the new cohort of FELTP students that began coursework and training in January 2013. One FELTP candidate has been assigned to the NMCP to support their programmatic and monitoring work and another FELTP candidate has been assigned to Matabeleland North to support malaria work at the provincial level. In 2013 and 2014 the FELTP supported eight malaria outbreak investigations in Zimbabwe. These investigations were presented to the NMCP and MOHCC staff during monthly FELTP sponsored seminars.

PMI support of additional training programs (e.g., VHWs, health facility workers, provincial and district health information officers) was discussed in the Case Management and M&E sections. In addition, the two PMI Resident Advisors worked closely with the NCMP staff to further enhance the NCMP capacity.

PMI is also building capacity at the NIHR in two critical areas. Firstly, entomologic support is being provided to improve their insectary and establish a colony of susceptible mosquitoes for insecticide resistance monitoring. A PMI entomologist worked with the NIHR staff to address structural and environmental challenges (temperature, humidity, etc.) that adversely affected mosquito colonies. PMI also refurbished the Harare NIHR and Chiredzi insectaries and updated standard operating procedures. Secondly, PMI is supporting NIHR to conduct therapeutic efficacy monitoring for antimalarial drugs in four sites and efforts are now being made to increase PCR capacity to help differentiate malaria re-infection from recrudescence.

Plans and justification

PMI will continue to support the FELTP program in Zimbabwe. PMI and the NMCP will continue to work with the FELTP to identify areas to strengthen the malaria portion of the curriculum and provide increased malaria-specific training opportunities and projects for the students.

Proposed activities with FY 2015 funding (\$100,000)

1. *Support Field Epidemiology and Laboratory Training Program:* Promote malaria-specific field studies and support at least two trainees to enhance field epidemiology skills. The FELTP funding is obligated to and managed by the African Field Epidemiology Network (AFENET) Cooperative Agreement to provide support for the FELTP activities in Zimbabwe. These funds will provide support for the execution of epidemiologic, outbreak investigation and surveillance evaluation-related activities in Zimbabwe involving the Zimbabwe FELTP. This activity will strengthen mid- to high-level capacity, and develop skilled field supervisors in the malaria field as they learn how to actively identify, evaluate, and help scale up effective activities against malaria. (*\$100,000*)

11. Staffing and Administration

Two health professionals serve as Resident Advisors to oversee PMI in Zimbabwe, one representing CDC and one representing USAID. In addition, one foreign service national (FSN) supports the PMI team. All PMI staff members are part of a single inter-agency team led by the USAID Mission Director in country. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, managing collaborating agencies and supervising day-to-day activities. Candidates for resident advisor positions (whether initial hires or replacements) will be evaluated and/or interviewed jointly by USAID and CDC, and both agencies will be involved in hiring decisions, with the final decision made by the individual hiring agency.

The two PMI professional staff work together to oversee all technical and administrative aspects of PMI, including finalizing details of the project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, and reporting of results. Both staff members report to the USAID Mission Director. The CDC staff person is supervised by CDC both technically and administratively. All technical activities are undertaken in close coordination with the MOHCC/NMCP and other national and international partners, including WHO, Global Fund, NIHR, and the private sector.

Locally hired staff to support PMI activities either in Ministries or in USAID will be approved by the USAID Mission Director. Because of the need to adhere to specific country policies and USAID accounting regulations, any transfer of PMI funds directly to Ministries or other host government institutions will need to be approved by the USAID Mission Director.

Proposed activities with FY 2015 funding (\$1,450,000)

1. *In-country PMI staff salaries, benefits, travel, and other PMI administrative costs:* Support for two PMI (CDC and USAID) Resident Advisors and one FSN staff member to oversee activities supported by PMI in Zimbabwe. Additionally, these funds will support pooled USAID Zimbabwe Mission staff and Mission-wide assistance from which PMI benefits. *(\$1,450,000)*

Table 1: FY 2015 Funding Breakdown by Partner

Partner	Geographical Area	Activity	Budget (\$)	%	
TBD	Nationwide	Procure and distribute LLINs	\$2,800,000	41%	
		Procure SP	\$30,000		
		Procure RDTs for case management of malaria	\$1,000,000		
		Procure malaria diagnostic supplies	\$50,000		
		Strengthen malaria diagnostic capacity	\$100,000		
		Support for ZIPS/ZAPS distribution system for ACTs and RDTs	\$900,000		
		Procure ACTs and severe malaria drugs	\$1,000,000		
		End-use verification	\$100,000		
		Support for LLIN mass distribution campaign	\$812,000		
		Facilitate supportive supervision and training on malaria case management for health facility workers	\$500,000		
New Malaria Bilateral	Nationwide	Conduct LLIN durability monitoring	\$100,000	17%	
		Support & facilitate M&E activities, including IDSR/DHIS2 at provincial, district and primary health facility levels	\$300,000		
		MIS 2016	\$100,000		
		Support malaria BCC	\$400,000		
		Therapeutic efficacy tests	\$200,000		
		Assessment of population dynamics and disease burden	\$100,000		
		Support IRS implementation activities	\$3,800,000		
		4 sites nationwide			
		Manicaland			
		Manicaland			
IRS 2 TO6				28%	

	8 rural sentinel sites, plus Harare and Bulawayo	Conduct entomological surveillance and monitoring	\$200,000	
MCHIP	Nationwide	Training and supervision of VHWs by health facility workers and EHTs	\$300,000	2%
USAID	Nationwide	In-country staffing and administration costs	\$900,000	6%
		Entomologic supplies	\$10,000	
		Technical assistance to IRS activities	\$12,000	
		Technical assistance trip to support diagnostics	\$12,000	
		Technical assistance trip to support M&E	\$12,000	
CDC/IAA	Nationwide	PCR analysis of dried blood spots from MIS 2016	\$100,000	6%
		Technical assistance trip to support OR FELTP	\$12,000	
		In-country staffing and administration costs	\$550,000	
Total			\$14,500,000	100%

Table 2: FY 2015 Planned Obligations for Zimbabwe

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total \$	Commodity \$		
PREVENTIVE ACTIVITIES					
Insecticide Treated Nets					
Procure and distribute LLINs	TBD	\$2,800,000	\$2,800,000	Nationwide	Purchase approximately 700k LLINs for mass campaign distribution and pilot continuous distribution channels in malaria districts. Assumption of \$4/LLIN.
Support for LLIN mass distribution campaign	New Malaria Bilateral	\$812,000	\$0	Nationwide	Support the distribution of 700k LLINs via mass campaign distribution
SUBTOTAL ITNs		3,612,000	2,800,000		
Indoor Residual Spraying					
Support IRS implementation activities	IRS 2 TO6	\$3,800,000	\$1,500,000	Manicaland	Support full package IRS implementation in approximately 4 districts in Manicaland, including the procurement of organophosphates, equipment and material, training support and other logistics required for spray operations.
Conduct entomological surveillance and monitoring	IRS 2 TO6	\$200,000	\$0	8 rural sentinel sites, plus Harare and Bulawayo	Provide support to the NMCP and NIHR for comprehensive entomological surveillance.
Entomologic supplies	CDC/IAA	\$10,000	\$10,000	Nationwide	Procure entomological supplies necessary for entomological surveillance.
Technical assistance to IRS activities	CDC/IAA	\$12,000	\$0	Nationwide	One CDC TDY to provide support for entomological activities.
SUBTOTAL IRS		4,022,000	1,510,000		
Malaria in Pregnancy					

Procure SP	TBD	\$30,000	\$30,000	Nationwide	Purchase approximately 285,000 treatments of SP for IPTp.
SUBTOTAL MIP		30,000	30,000		
SUBTOTAL PREVENTIVE		7,664,000	4,340,000		
Case Management					
Diagnosis					
Procure RDTs for case management of malaria	TBD	\$1,000,000	\$1,000,000	Nationwide	Purchase approximately 2 million RDTs for use at primary health facilities and by VHWs. Assumes \$.5/RDT
Procure malaria diagnostic supplies	TBD	\$50,000	\$50,000	Nationwide	Purchase laboratory supplies and reagents to support microscopy diagnosis of malaria
Strengthen malaria diagnostic capacity	TBD	\$100,000	\$0	Nationwide	Provide technical support for RDT and microscopy at the district and primary health facility levels, in collaboration with national partners
Technical assistance trip to support diagnostics	CDC/IAA	\$12,000	\$0	Nationwide	One CDC TDY to support on-going diagnostic activities in country.
SUBTOTAL - Diagnosis		1,162,000	1,050,000		
Treatment & Pharmaceutical Management					
Support for ZIPS/ZAPS distribution system for ACTs and RDTs	TBD	\$900,000	\$0	Nationwide	Support ZIPS/ZAPS, including operational costs, technical assistance, trainings, quantification support and logistics.
Procure ACTs and severe malaria drugs	TBD	\$1,000,000	\$1,000,000	Nationwide	Procure approximately 450k ACT treatments for use at health facilities and with VHWs.
Facilitate supportive supervision and training on malaria case management for health facility workers	New Malaria Bilateral	\$500,000	\$0	Nationwide	Support NMCP to conduct training and supervision on malaria case management for primary health facility staff on ACTs, RDTs, and MIP.

Training and supervision of VHWs by health facility workers and EHTs	MCHIP	\$300,000	\$0	Nationwide	Support training and supervision on malaria case management for VHWs at the community level on ACTs and RDTs.
SUBTOTAL - Treatment & Pharmaceutical Management		2,700,000	1,000,000		
SUBTOTAL CASE MANAGEMENT		3,862,000	2,050,000		
Monitoring and Evaluation					
End-use verification	TBD	\$100,000	\$0	Nationwide	Quarterly surveys to assess availability of malaria commodities in health facilities and warehouses.
Therapeutic efficacy tests	New Malaria Bilateral	\$200,000	\$0	4 sites nationwide	Support therapeutic efficacy tests with partners, including WHO. Assumes four therapeutic efficacy test sites used every other year.
Conduct LLINs durability monitoring	New Malaria Bilateral	\$100,000	\$0	Nationwide	Prospective monitoring of LLINs distributed during the 2014 mass campaign to determine performance under Zimbabwe field conditions to guide LLIN replacement rate.
Support & facilitate M&E activities, including IDSR/DHIS2 at provincial, district and primary health facility levels	New Malaria Bilateral	\$300,000	\$0	Nationwide	Support quarterly district health team meetings, provincial M&E review meetings, training support and supervision across all levels. Implement recommendations from assessment conducted with FY14 funds. Funds will also continue to support the IDSR/DHIS2.
2016 MIS	New Malaria Bilateral	\$100,000	\$0	Nationwide	Secondary analysis and stakeholders meetings to discuss implications of results for future malaria programming in Zimbabwe. Including dissemination of results.
Technical assistance trip to support M&E	CDC/IAA	\$12,000	\$0	Nationwide	One CDC TDY to support on-going M&E activities in country.

SUBTOTAL M&E		812,000	0	Operational Research	
Assessment of population dynamics and disease burden	New Malaria Bilateral	\$100,000	\$0	Manicaland	Continuation of prospective assessment of impact of population movement in malaria transmission and incidence, including health care seeking behavior
PCR analysis of dried blood spots from MIS 2016	CDC/IAA	\$100,000	\$0	Nationwide	Quantify parasitemia levels from national surveys in low prevalence settings via PCR analysis of dried blood spots.
Technical assistance trip to support OR	CDC/IAA	\$12,000	\$0	Nationwide	One CDC TDY to support OR activities in country.
SUBTOTAL OR		212,000	0		
Behavior Change Communication					
Support malaria BCC	New Malaria Bilateral	\$400,000	\$0	Nationwide	Support malaria BCC for LLINs, MIP, IRS, and case management, particularly for the VHWs. Includes revision of existing materials, reproduction, dissemination and evaluation.
SUBTOTAL BCC		400,000	0		
Health System Strengthening/Capacity Building					
FELTP	CDC/IAA (AFENET)	\$100,000	\$0	Nationwide	Support malaria-specific field studies and at least two student trainees to enhance field epidemiology skills.
SUBTOTAL HSS/Capacity Building		100,000	0		
In-country Staffing and Administration					
In country staffing and administration costs	USAID	\$900,000	\$0	Nationwide	Support for USAID staffing and administration costs
In country staffing and administration costs	CDC	\$550,000	\$0	Nationwide	Support for CDC staffing and administration costs

SUBTOTAL - In-Country Staffing		1,450,000	0	
GRAND TOTAL		14,500,000	6,390,000	