

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 2014 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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Zambia

Malaria Operational Plan FY 2014

TABLE OF CONTENTS

EXECUTIVE SUMMARY	5
STRATEGY	9
1. Introduction.....	9
2. Country Development Indicators and Malaria Situation	9
3. Country Health System Delivery Structure and Ministry of Health Organization	12
4. Country Malaria Control Strategy	13
5. PMI Goals, Targets and Indicators	14
6. Progress on Indicators to Date	14
7. Other Relevant Evidence of Progress	16
8. Integration, Collaboration, Coordination	16
9. Challenges, Opportunities, and Threats	17
10. PMI Support Strategy	17
OPERATIONAL PLAN.....	18
1. Insecticide-Treated Nets	18
2. Indoor Residual Spraying	23
3. Intermittent Preventive Treatment During Pregnancy	26
4. Case Management.....	29
Diagnostics.....	29
Malaria Treatment.....	33
Pharmaceutical Management.....	36
5. Behavior Change Communication.....	39
6. Monitoring and Evaluation	42
7. Health System Strengthening and Capacity Building.....	47
8. Staffing and Administration.....	49

ACRONYMS

ACT	artemisinin-based combination therapy
AIDS	Acquired Immuno-Deficiency Syndrome
AL	artemether-lumefantrine
ANC	antenatal care
BCC	behavior change communication
CDC	U.S. Centers for Disease Control and Prevention
CHA	community health agent
CHAZ	Churches Health Association of Zambia
CHW	community health worker
CSH	Communication Support for Health
DDT	dichloro-diphenyl-trichloroethane
DFID	U.K. Department for International Development
DHIS2	Demographic and Health Information System 2
DHS	Demographic and Health Survey
DHO	District Health Office
EMLIP	Essential Medicines Malaria Logistics Improvement Program
EPI	Expanded Program on Immunizations
EUV	end user verification
FANC	focused antenatal care
FBO	faith-based organization
FETP	Field Epidemiology Training Program
FY	fiscal year
GHI	Global Health Initiative
Global Fund	Global Fund to Fight AIDS, TB and Malaria
GRZ	Government of the Republic of Zambia
HFS	Health Facility Survey
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
IMaD	Improving Malaria Diagnostics Project
IMCI	integrated management of childhood illnesses
IPTp	intermittent preventive treatment in pregnancy
IRS	indoor residual spraying
ITN	insecticide-treated net
LMU	Logistics Management Unit
M&E	monitoring and evaluation
MACEPA	Malaria Control and Evaluation Partnership in Africa
MOMCH	Ministry of Community Development and Mother and Child Health
MIP	malaria in pregnancy
MIS	Malaria Indicator Survey
MOH	Ministry of Health
MOP	malaria operational plan
MSL	Medical Stores Limited
NMCP	National Malaria Control Program
NMSP	National Malaria Strategic Plan

NGO	non-governmental organization
OR	operations research
OTSS	outreach training and supportive supervision
PEPFAR	President's Emergency Plan for AIDS Relief
PMI	President's Malaria Initiative
RBM	Roll Back Malaria
RDT	rapid diagnostic test
SMAG	Safe Motherhood Action Groups
SP	sulfadoxine-pyrimethamine
TFM	transitional funding mechanism
TWG	technical working group
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Program
USAID	United States Agency for International Development
WHO	World Health Organization
WHOPES	World Health Organization Pesticide Evaluation Scheme
ZAC	Zambia Anglican Council
ZISSP	Zambia Integrated Systems Strengthening Project

EXECUTIVE SUMMARY

In May 2009, President Barack Obama announced the Global Health Initiative (GHI), a comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States Government 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.

PMI was launched in June 2005 as a five-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions in high burden countries in sub-Saharan Africa. In December 2006, Zambia was selected as a PMI country. Since then, Zambia has received approximately \$127 million in PMI funding.

Although there are signs of improvement, malaria continues to be a major cause of morbidity and mortality in Zambia and control of the disease remains one of the government's highest priorities. The National Health Management Information System (HMIS) in 2011 reported more than 4 million clinical and laboratory-confirmed cases of malaria and more than 4,500 malaria deaths. Although the number of malaria cases decreased from 2000 to 2008, an increase was reported in 2010 in several provinces. Since 2010 cases have again declined somewhat but final figures are not yet available. The most up-to-date information on nationwide coverage of malaria prevention and control measures in Zambia comes from the 2012 Malaria Indicator Survey (MIS), which shows improvements. More than 68% of households own at least one insecticide-treated net (ITN) compared to 64% in 2010; 57% of children under five years of age slept under an ITN the night before the survey in 2012, compared to 50% in 2010. In 2012, almost 74% of households owned at least one ITN or were sprayed with an insecticide in the previous 12 months. Seventy-two percent of pregnant women took two or more doses of intermittent preventive treatment in pregnancy (IPTp).

The Fiscal Year (FY) 2014 PMI funding for Zambia complements the National Malaria Strategic Program for 2011-2015. The plan is also based on PMI experiences in its first five years. A planning visit took place in June 2013 with representatives from USAID and the Centers for Disease Control and Prevention (CDC) who met with the National Malaria Control Program (NMCP), the World Bank, World Health Organization (WHO), UNICEF and a variety of other partners involved in malaria prevention and control in the country. This is the seventh Malaria Operational Plan (MOP) for Zambia and describes proposed expenditures of \$24 million for FY 2014 under PMI.

Insecticide-treated nets: In 2012, the NMCP distributed almost 3 million¹ ITNs through mass distribution campaigns and routine distribution at antenatal care (ANC) and Expanded Program of Immunization (EPI) clinics. Of all the nets that were distributed, 816,333 were purchased by PMI. PMI procured a total of 753,000 nets for the use of District Health Offices in all districts for routine distribution at ANC and EPI clinics. An additional 80,000 nets were procured for distribution by the Zambia Anglican Council (ZAC) along the Angolan and Namibian borders. The NMCP is planning a harmonized mass distribution campaign to distribute 8.9 million nets

¹ Zambia National Annual Malaria Commodity Forecast and Quantification Report 2013-2015

nationwide in 2014. The NMCP wants to “flood” the country with ITNs and ensure that all households have the ITNs recommended by national policy. With FY 2014 funding, PMI will focus on the procurement and distribution of nets to maintain a supply of nets for routine distribution through ANC/EPI clinics. In addition, PMI will provide technical assistance for the development of roll-out of strategies for sustaining high ITN coverage after reaching universal coverage, including exploring alternative continuous distribution channels, as well as strategies for care and repair of nets. Results from an ongoing net durability study will be used to determine if it is necessary to adjust the number and timing of procurement of replacement ITNs in order to maintain high coverage.

Indoor residual spraying: The NMCP has the goal of achieving universal coverage with either Indoor Residual Spraying (IRS) or ITNs. IRS is prioritized in high incidence areas, mostly in urban and peri-urban areas. Although the Zambia IRS program has been very successful, it now faces several challenges, among them: 1) newly discovered evidence of mosquito resistance to several insecticides; 2) due to the need to procure more expensive insecticides; and, (3) devolution of some elements of IRS to district level because of recent changes in the Ministry of Health (MOH) policy. Over the last year, PMI supported IRS in 20 focus districts, covering approximately 460,303 structures and protecting about 1.8 million people. A local disposal mechanism for insecticide-contaminated refuse was identified and a memorandum of understanding signed. PMI also supported environmental compliance inspections and the national entomology laboratory and insectary as well resistance monitoring. With FY 2014 funding, PMI will support IRS in 20 districts, covering as many of the 800,000 households/structures present in the district. PMI will procure insecticides as well as support storage and pesticide waste disposal. PMI will work with NMCP to strengthen entomological monitoring and insecticide resistance management systems.

Intermittent preventive treatment in pregnancy: The NMCP is currently updating their recommendations for IPTp to recommend sulfadoxine-pyrimethamine (SP) as early as possible during the second trimester of gestation, with subsequent monthly doses given up to the time of delivery, in accordance with recent changes in WHO recommendations for IPTp. The 73% national coverage of two doses of IPTp hides substantially lower rates in rural areas and among poorer women. Two major barriers to increasing three-dose IPTp coverage are late attendance of women for ANC, and stockouts of SP. In 2013, PMI supported training of provincial- and district-level clinical care teams in providing supervision for IPTp, training of healthcare workers in IPTp, and behavior change and communication (BCC) activities to encourage early and frequent ANC attendance to receive IPTp. With FY 2014 funding, PMI will support supervision and training of health workers in the new NMCP guidelines for IPTp and BCC activities related to malaria in pregnancy.

Case management – Diagnostics: NMCP Guidelines for the Diagnosis and Treatment of Malaria in Zambia recommend parasitological diagnosis, by microscopy or a rapid diagnostic test (RDT), for all suspected malaria cases where confirmatory capacity is available. In the last year, PMI has supported procurement and distribution of 3 million RDTs and 40 microscopes, as well as the training of clinical and laboratory personnel in the use of these diagnostic tools, and training of national, provincial, and district level staff in providing outreach training and support supervision for quality assurance of malaria diagnostics. With FY 2014 funding, PMI will

procure 3,500,000 RDTs and reagents and supplies for microscopy. PMI will continue to strengthen outreach training and supportive supervision (OTSS) of health workers, together with quality control of laboratory diagnosis.

Case management – Treatment and Pharmaceutical Management: During 2012, NMCP trained staff in the new treatment guidelines for uncomplicated malaria. NMCP has been monitoring artemisinin combination therapy (ACT) efficacy which is still within acceptable limits. PMI procured 4 million ACT treatments in FY 2013. With FY 2014 funding, PMI will purchase 3 million ACT treatments. Facility- and community-based case management will be supported through training and supervision. An integrated BCC activity will be supported to encourage prompt care seeking for fever.

In 2013, PMI continued to support strengthening of malaria commodities distribution at all levels through the nationwide rollout of the Essential Medicines Logistics Improvement Program (EMLIP), a program under which Medical Stores Limited (MSL), the national level warehouse, provides each participating health facility with commodities based on its actual consumption data. To date EMLIP has been rolled out to 27 districts. End user verification has detected that in at least one district, facilities not supplied by EMLIP had higher stock out rates of malaria commodities. Unfortunately, both the MOH and donors experienced unexpected delays in the procurement of essential medicines. Due to the inadequate supply of essential medicines, the MOH called for the suspension of EMLIP rollout in additional districts. It is not clear when the rollout of EMLIP will be resumed. PMI continued to support the MOH in the forecasting and quantification of ACTs, ITNs, RDTs, and SP. With FY 2014 funds and in collaboration with the MOH, PMI will continue to support the nationwide rollout of the EMLIP system. In addition, PMI will provide support to increase MOH ownership and coordination of forecasting, quantification, and procurement planning for all malaria commodities. In support of MSL's new mandates, PMI will provide TA to MSL to ensure successful adoption of its new responsibilities, including forecasting and supply planning capacity, as well as the improvement of the storage and distribution of malaria commodities.

Monitoring & Evaluation: Zambia has strong monitoring and evaluation (M&E) activities. Every two years the NMCP conducts an MIS to track the Roll Back Malaria-recommended population-based indicators. The last MIS was conducted in 2012 and results are now available. The end use verification (EUV) site visits continue to be conducted quarterly and reports are disseminated and follow up actions conducted. The last EUV available is for the first quarter of 2013 and identifies stock outs of some commodities in non-EMLIP districts. The results from a national health facility survey are available and show a number of health worker deficiencies. Proposed activities with FY 2014 funding include: supporting a health facility survey in 2014, completing the financing of the 2015 MIS, continuation of the EUV site visits, and continued surveillance in low prevalence districts. Resources will also be made available to support NMCP with personnel, supervision visits, data quality auditing and training. Technical assistance from CDC for M&E and operations research has also been included. Finally, support will be provided for the assessment of a referral systems operational research.

Behavioral Change Communication: The NMCP has a well-defined and thoughtful BCC strategy. It clearly anticipates the challenges Zambia will face as it moves forward in malaria

control. Recent evidence from the MIS 2012 shows that knowledge among women 15 – 49 years of age of malaria preventive and curative actions has been maintained at a high level. In FY 2014, PMI will continue to support NMCP's BCC strategy through integrated activities at national, community and individual levels for each malaria control intervention. PMI will support programs to increase use of prenatal services, to encourage use of nets every night year round and to inform parents of the importance of seeking care quickly for children with fever.

STRATEGY

1. Introduction

Zambia was selected as a President's Malaria Initiative (PMI) country in fiscal year (FY) 2007. PMI in Zambia has supported the scale up of all major malaria prevention, control, diagnosis and treatment modalities.

This FY 2014 Malaria Operational Plan (MOP) presents a detailed implementation plan for Zambia, based on the PMI Multi-Year Strategy and Plan and the National Malaria Control Program's (NMCP's) 2011–2015 National Malaria Strategic Plan (NMSP). The MOP was developed in consultation with the NMCP, with participation of national and international partners involved in malaria prevention and control in the country. The proposed activities build on investments made by PMI and other partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), World Bank and focused support by the United Kingdom's Department for International Development (DFID). This document reviews the current status of malaria control policies and interventions in Zambia, describes progress to date, identifies challenges and unmet needs if the targets of the NMCP and PMI are to be achieved, and provides a description of planned FY 2014 activities.

2. Country Development Indicators and Malaria Situation

Zambia has a population of approximately 13.4 million (2010 census), ten provinces, and 102 districts (recent redistricting has increased the number of districts). Zambia's key health indicators are generally positive: under-five mortality has fallen from 191 per 1,000 live births in 1992, to 168 per 1,000 in 2002, and to 119 per 1,000 in 2007 (2007 Demographic Health Survey - DHS). The latest estimate for under-five mortality from UNICEF's State of the World's Children 2013 is 83 per 1000 in 2011. Eighty-seven percent of children complete primary school and overall poverty has been declining. Despite these positive trends, Zambia continues to face major challenges. The World Bank estimates that 61% (2010) of the population lives below the national poverty line. HIV/AIDS is a major problem for all sectors with an estimated 14% of adults infected (2007 – DHS). Also, according to the World Health Organization (WHO) maternal mortality continues to be high at 440 per 100,000 live births in 2010.

Malaria transmission in Zambia occurs throughout the year with the peak during the rainy season, between November and April. *Plasmodium falciparum* accounts for more than 90% of all infections. *Anopheles gambiae* and *An. funestus* are the major vectors. All ten provinces of Zambia are endemic for malaria with 90% of the population at risk. In the last five years, emerging evidence from routine information systems, national surveys, and focused studies have consistently shown declining trends in malaria rates. Encouraged by these trends, the NMCP classified the country into three malaria epidemiological zones to better focus their efforts. The NMCP used the parasitemia rates in the 2010 Malaria Indicator Survey (MIS) and what is known about malaria control in each area to establish these zones.

- Zone 1: Areas where malaria control has markedly reduced transmission and parasite prevalence in children less than five years of age is less than 1% (Lusaka city and environs).

- Zone 2: Areas where sustained malaria prevention and control has markedly reduced transmission and parasite prevalence is at or under 10% in children under five years of age at the peak of transmission (Central, Copperbelt, Northwestern, Southern, and Western Provinces).
- Zone 3: Areas where progress in malaria control has been achieved but not sustained and lapses in prevention coverage have led to resurgence of infection and illness, and parasite prevalence in young children exceeds 20% at the peak of the transmission season (Eastern, Luapula, Muchinga, and Northern Provinces).

The National Health Management Information System (HMIS) in 2011 reported more than 4 million clinical and laboratory-confirmed cases of malaria and more than 4,500 malaria deaths. Although the number of malaria cases decreased from 2000 to 2008, there was an increase in reported cases in Luapula, Northern, Muchinga, and Eastern Provinces in 2009/2010. The 2010 MIS identified an increase in malaria parasitemia rates from 10% to 16% in children under five years of age compared to the 2008 MIS—most of the increase is due to parasitemia upticks in Luapula, Northern and Eastern Provinces. The 2012 MIS documented a parasitemia rate of 15%. However, a parasitemia decrease was documented in Luapula, while Northern and Eastern provinces remained the same as in 2010 (See Table A). Severe anemia in children under five years of age increased from 4% to 9% nationally between 2008 and 2010 and remained at 9% in 2012.

Table A: Malaria parasite prevalence in children under five years of age by background characteristic. Rapid Diagnostic Test (RDT) results in parenthesis, 2006 – 2012.				
Background characteristic	Percentage with malaria parasites read by microscopy	Percentage with malaria parasites read by microscopy	Percentage with malaria parasites read by microscopy (or RDT)	Percentage with malaria parasites read by microscopy (or RDT)
	2006	2008	2010	2012
<i>continued</i>				
Age (in months)				
<12	12.6	3.6	5.7 (12.5)	9.8 (15.9)
12–23	22.8	10.2	12.1 (21.9)	11.7 (24.4)
24–35	25.3	11.2	20.1 (30.8)	16.3 (31.7)
36–47	26.3	13.8	21.4 (36.1)	16.2 (35.0)
48–59	24.4	12.5	22.0 (33.7)	19.6 (38.0)
Sex				
Male	21.9	10.5	16.9 (26.8)	14.7 (29.1)
Female	21.8	9.8	15.1 (26.7)	15.1 (30.0)
Residence				
Urban	6.4	4.3	5.2 (12.0)	3.7 (8.2)
Rural	27.8	12.4	20.4 (32.7)	20.2 (39.7)
Province				

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	2006	2008	2010	2012
<i>Age (in months)</i>				
Central	27.7	7.9	9.4 (11.5)	8.5 (12.8)
Copperbelt	12.4	9.9	12.1 (24.0)	4.7 (17.4)
Eastern	21.0	9.3	22.0 (50.1)	25.3 (51.1)
Luapula	32.9	21.8	50.5 (63.4)	32.1 (56.0)
Lusaka	0.8	1.7	0.0 (1.4)	0.0 (4.8)
Muchinga				19.4 (33.5)
Northern	35.3	12.0	23.6 (32.6)	23.7 (47.3)
North-Western	24.3	15.2	6.1 (17.3)	16.9 (32.5)
Southern	13.7	7.9	5.7 (12.2)	8.4 (10.0)
Western	11.1	2.6	5.1 (11.8)	12.6 (34.3)
<i>Wealth index</i>				
Lowest	30.4	13.1	29.2 (42.1)	27.4 (49.5)
Second	27.6	13.6	21.8 (36.2)	21.1 (42.8)
Middle	23.4	12.1	12.1 (22.9)	17.9 (35.1)
Fourth	7.5	6.7	9.4 (20.6)	13.9 (27.7)
Highest	6.2	2.8	1.4 (4.4)	1.8 (5.8)
Total	22.1	10.2	16.0 (26.7)	14.9 (29.5)

Zambia has one active Global Fund malaria grant: Round 7 (\$13 million). The Principal Recipient is the United Nations Development Program (UNDP). Round 7, Phase 2 was signed in 2011. It will provide funds for insecticide-treated nets (ITNs) and rapid diagnostic tests (RDTs) as well as monitoring and evaluation (M&E) and training. Zambia submitted a Transitional Funding Mechanism (TFM) Global Fund application in 2012. These resources will be used to purchase ITNs for the 2014 ITN campaign (See ITN section). Other major donors include DFID, the Bill and Melinda Gates Foundation through the Malaria Control and Evaluation Partnership in Africa (MACEPA), and the World Bank. MACEPA provided \$35 million over nine years for technical support. The Government of the Republic of Zambia (GRZ) is preparing a World Bank instrument, but it is unclear at the moment of the writing of this MOP if any amounts are planned for to specific malaria activities.

DFID is providing £17 million (about US \$26.7 million) to USAID for the procurement of malaria commodities during the calendar years 2012, 2013 and 2014. DFID also provided an

additional \$1.95 million to procure artemisinin-based combination therapies (ACTs) and prevent a central warehouse stock out in 2012.

3. Country Health System Delivery Structure and Ministry of Health Organization

The Ministry of Health (MOH) is responsible for planning, health policy guidelines, allocating funds, and sourcing of key health inputs including drugs and equipment for service delivery. In addition, the MOH provides technical oversight for the implementation of health activities. A basic health care package of high-impact interventions, several of which are associated with malaria control (e.g. ITNs, ACTs, etc.) is offered through the public health system. Services included in this basic health care package are provided free-of-charge or on a cost-sharing basis depending on the location and level of the system. In rural districts, these services are free.

Government-run health facilities, which provide the majority of the health care in Zambia, operate at several levels and malaria control interventions are delivered in all of them:

- Health posts and community outreach (district level)
- Health centers (district level)
- Level 1 hospitals (district level), Level 2 hospitals (provincial level), and Level 3 hospitals (central level)

Provincial Health Offices serve as an extension of the MOH. District Health Offices (DHOs) are commissioned by the MOH to provide services at the district level. The second- and third-level hospitals are referral or specialized hospitals. Due to resource constraints, however, there is generally a variation between what the levels are supposed to provide and what they actually do provide. Table B shows the breakdown of health facilities by type and provider.

Facility Type	Total	Percentage of Facilities
Health Posts	275	15
Rural Health Centers	1,060	56
Urban Health Centers	436	23
Level 1 Hospitals	84	5
Level 2 Hospitals	21	<1
Level 3 Hospitals	6	<1
Total	1,882	100
Health Facilities By Provider		
MOH	1,490	79
Mission	121	7
Private	271	14
Total	1,882	100

Source: Ministry of Health, 2010

The DHO provides overall planning, coordination, and monitoring of malaria activities within their districts. Health posts are intended to cover 500–1,000 households. Health centers, staffed

by a clinical officer, nurse or environmental technician serve a catchment area of 10,000 residents. In 2010, it was estimated that in urban areas, approximately 99% of households are within five kilometers of a health facility, compared to 50% in rural areas. Lusaka Province has the highest number of health facilities (279) followed by Southern (254), and then by the Copperbelt Province (235). Luapula Province has the lowest number of health facilities (142).

In addition to the MOH, the Churches Health Association of Zambia (CHAZ), parastatal organizations, private clinics, and traditional healers also provide health care in Zambia. CHAZ has 135 affiliates representing 16 different churches, both Catholic and Protestant, with a majority of them based in rural areas of Zambia. The membership is comprised of hospitals, health centers, faith-based organizations (FBOs), and community-based programs. Altogether, these institutions are responsible for over 50% of formal health services in the rural areas of Zambia and about 30% of health care in the country as a whole. In addition, private mining companies provide preventive and curative medical services for their workers and families, as well as surrounding communities in some cases. Several of the larger mining companies, such as Konkola and Mopane Copper Mines, have been carrying out indoor residual spraying (IRS) for many years within and around their compounds.

During 2012, the functions of the MOH, including some of the NMCP, were re-organized. The changes, required by law, transfer some MOH functions to the Ministry of Community Development, Mother and Child Health (MOMCH). A key item in the changes is the decentralization of integrated primary health care services to the district level. The MOMCH will now be responsible for all operations including service delivery at the district and local levels. Activities such as IRS will now be the responsibility of districts with NMCP in the background providing technical but not operational assistance. When this MOP was written, it was still unclear how the changes would apply to other malaria control activities.

4. Country Malaria Control Strategy

The Zambian NMCP has a new National Malaria Strategic Plan for 2011–2015. The vision of the new Strategy is to achieve progress towards a “malaria-free Zambia” through equity of access to quality-assured, cost-effective malaria prevention and control interventions close to the household. The Strategy aims to achieve the following three goals by 2015: 1) reduce malaria incidence by 75% from the 2010 baseline; 2) reduce malaria deaths to near zero and reduce all-cause child mortality by 20%; and 3) establish and five “malaria-free zones” in Zambia.

The NMCP aims to strengthen national, provincial, and district-level capacity to plan, manage, and implement malaria activities; address human resource needs; ensure that there is an established planning and forecasting framework for projecting funding needs and tracking health expenditures; develop capacity at all levels of the health system to manage the storage and distribution of malaria commodities; and reinforce coordination among partners. The plan seeks universal coverage with either IRS or ITNs by 2015. The plan also seeks to improve diagnostic testing capacity and quality as well as increase coverage of three doses of sulfadoxine-pyrimethamine (SP) for intermittent preventive treatment in pregnancy (IPTp). In addition, the plan recognizes the need to strengthen behavior change communication (BCC) for malaria

prevention and treatment and the importance of establishing a robust surveillance, and monitoring and evaluation framework.

5. PMI Goals, Targets and Indicators

The goal of PMI is to reduce malaria-associated mortality by 70% compared to pre-Initiative levels in the 15 original PMI countries. By the end of 2015, PMI will assist Zambia 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 6 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; and
- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria.

6. Progress on Indicators to Date

Zambia continues to make progress in its fight against malaria. Data from the MOH's HMIS revealed a 60% reduction in hospitalizations due to malaria and a 66% reduction in reported malaria deaths in children under the age of five years from 2001 to 2008. HMIS data showed an increase in cases in 2009–2011. Results from the 2012 MIS show progress in several areas of malaria control, although some indicators seem to have leveled off and progress is not homogeneous throughout the country. Additionally, some provinces are lagging behind or falling back to 2006 levels on some key malaria indicators. Table C shows a comparison of key national level indicators since 2001.

In 2012:

- Sixty-eight percent of households owned at least one ITN, compared to 64% in 2010 and 14% in 2001; Fifty seven percent of children under age five years slept under an ITN the night before the survey, compared to 50% of these children in 2010;
- Fifty eight percent of pregnant women reported sleeping under an ITN the previous night, compared to 46% in 2010;
- Seventy two percent of pregnant women reported taking two doses of IPTp during their last pregnancy, compared to 70% in 2010; and,
- Seventy four percent of households were covered by at least one ITN or recent IRS.

In spite of this progress, the 2012 MIS reported that 15% of children under five years had malaria parasitemia—essentially the same level as found in 2010 (16%). Of the three provinces that registered increases in parasitemia and severe anemia in children under five years in 2010,

only Luapula showed a decrease in parasitemia in 2012—and then only to the same level as registered in 2006 before malaria interventions were scaled up. Parasitemia rate in the Northern and Eastern Provinces remained essentially at the same levels as in 2010. Severe anemia remained the same nationally at 9% in 2012. Of the three provinces where an upswing of severe anemia was recorded, only Luapula reported significant decreases, from 21% in 2010 to 12% in 2012. Luapula, Northern, and Eastern Provinces reported higher ITN ownership, 90%, 83%, and 88% respectively, than the national average of 68%.

Indicator	2001/02 DHS¹	2006 MIS²	2007 DHS³	2008 MIS⁴	2010 MIS⁵	2012 MIS⁶
Percentage of households with at least one ITN	14	NA	53	62	64	68
Percentage of households with at least one ITN per sleeping space	NA	NA	NA	33	34	55
Percentage of households receiving IRS in the previous 12 months among all households	NA	10	NA	15	23	25
Percentage of households covered by at least one ITN or recent IRS	NA	43	NA	68	73	74
Percentage of children under 5 years old who slept under an ITN the previous night	7	24	29	41	50	57
Percentage of pregnant women who slept under an ITN the previous night	8	25	33	43	46	58
Percentage of household members who slept under an ITN the previous night	NA	19	NA	34	42	49
Percentage of pregnant women who took any preventive antimalarial drug during pregnancy	36	85	87	88	89	88
Percentage of pregnant women who received two doses of intermittent preventive treatment during Pregnancy	NA	59	66	66	70	72
Percentage of children ages 0–59 months with severe anemia (Hb<8 g/dl).	NA	14	NA	4	9	9
Percentage of children ages 0–59 months with malaria parasitemia (microscopy)	NA	22	NA	10	16	15

1. Zambia Central Statistical Office, Zambia Central Board of Health, and ORC Macro. 2003. Zambia Demographic and Health Survey 2001–2002.

2. Zambia Ministry of Health, 2006. Zambia National Malaria Indicator Survey 2006. Lusaka, Zambia: Ministry of Health.

3. Zambia Central Statistical Office, Zambia Ministry of Health, Tropical Diseases Research Centre, University of Zambia, and Macro International Inc. 2009. Zambia Demographic and Health Survey 2007. Calverton, MD, USA: CSO and Macro International Inc.

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7. Other Relevant Evidence of Progress

The NMCP completed a nationwide health facility survey (HFS) in 2011. It provides insight into the preparedness of health facilities to deliver quality malaria services. The survey included 148 health facilities, of which 41 were hospitals, 38 were urban health centers, 39 were rural health centers and 30 were health posts. A total of 219 health workers were observed and 1,290 patients were assessed, of which 872 were suspected of having malaria. Key findings are:

- Testing for malaria was generally available; highest in hospitals (93%) and lowest in health posts (63%).
- The first-line drug also was available; most frequently in hospitals (95%) than in health posts (73%)
- Approximately one third of health workers had not received an in-service training in the last five years.
- Testing of suspected malaria reached 76% in children under five years of age.
- Seventy-three percent of “true positives” (after re-examination) received appropriate antimalarial treatment.

A program of enhanced surveillance and active community case detection and laboratory confirmation in Lusaka District has shown low levels of transmission. In 2011–2012, 395 index cases (17% of all cases of confirmed malaria) that had not traveled or had malaria in the month prior to testing were identified. A total of 5,795 persons associated with the index cases were tested in their homes or nearby homes. Only 91 (1.6%) of these neighborhood members were positive by RDT. The success of this program has been evident in the decision of the district health officials to take over funding in 10 clinics, and eventually all 29 clinics in Lusaka District by 2014. This surveillance activity has also been implemented in selected clinics in seven other districts of Southern Province to help document elimination of malaria in five districts in Zambia by 2015. The Lusaka District surveillance system will likely serve as a model for all five districts slated for elimination by 2015.

8. Integration, Collaboration, Coordination

The NMCP and its collaborating partners maintain regular communications and coordinate efforts through routine partners’ meetings and technical working groups (TWGs) on IRS, BCC, M&E, case management, ITNs and operations research. All partners contributed to the development of the new 2011 – 2015 NMSP and annual action plans.

DFID will continue to work through PMI to purchase ITNs, antimalarial and other essential medicines, and RDTs. PMI meets with World Bank regularly to ensure coordination of malaria activities, including IRS and roll out of the Essential Medicines Logistics Improvement Program (EMLIP). PMI met regularly with World Health Organization (WHO), United Nations Development Program (UNDP), MOH, and MACEPA staff to assist with completion of the 2011 – 2015 National Malaria Strategic Plan and the 2012 Global Fund Transitional Funding Mechanism application. PMI also participated with partners in the funding and production of the HFS 2011.

In April 2012, PMI met with the leaders of the Isdell-Flowers Cross Border Initiative, Christian Aid, and ExxonMobil to encourage ongoing collaboration with private sector donors. PMI also participated in a round table with Bill Gates and senior Bill and Melinda Gates Foundation staff with MACEPA and the MOH to discuss the future of malaria control in Zambia and the region. PMI is working closely with PEPFAR to purchase and distribute PEPFAR-funded ITNs.

9. Challenges, Opportunities, and Threats

An important challenge for PMI during the latter part of 2013 is the re-structuring and devolution of tasks traditionally carried out by the NMCP to the MOMCH at district level. During this MOP planning visit, PMI was advised by MOH authorities to continue planning with the NMCP but that the MOMCH needed to be informed and consulted. PMI's RAs will follow the devolution process closely to ensure that there are no disruptions in PMI activities.

An important challenge for malaria control in Zambia, especially in an environment in which donor funds are stabilizing and even decreasing globally, is the heavy dependence on external funding. Capital and revolving costs have been mainly borne by donor partners since 2004. The MOH recognizes this dependence problem and has begun to increase its own funding for malaria control. The MOH procures all SP for IPTp and has included \$24 million in its current budget (to be applied during 2013) to support several malaria activities. Additionally, in interviews with the MOP team, the Permanent of Secretary of Health reiterated that the \$24 million will be a continuing contribution from the GRZ in the fight against malaria. DFID has been instrumental in working with the GRZ to increase governmental funding for malaria.

An additional challenge that affects all interventions is the recent doubling of the official per diem rate. By some reports, depending on the type of health worker, the new per diem will be \$100-\$150 per day. The impact of this increase will be felt on activities funded under MOP 2013, as well as this MOP. The PMI in-country team and partners will be reviewing the effect this new directive will have on activities.

Zambia is moving into a new era of malaria control in which approaches and tools that have served well thus far to reach the current coverage levels will need to be revised to address the challenges of reaching the last mile. From dealing with late adopters of appropriate malaria behaviors to ensuring that commodities get to those hardest to reach, to developing monitoring and evaluation methods that provide accurate estimates in low prevalence settings, Zambia will need to maintain its gains while dealing with new scenarios to gain additional ground.

The emergence of mosquito resistance to insecticides, uncertainty about the longevity of ITNs, and problems with SP efficacy are all important challenges that will also need to be addressed. These intervention-specific challenges are discussed in the intervention sections.

10. PMI Support Strategy

PMI's support strategy in Zambia is to complement funding from other donors and focus on NMCP priorities that are not addressed by other funding sources. PMI also provides targeted technical assistance. In the recent past, PMI has supported IRS, ITN distribution through

antenatal care (ANC) clinics and procurement and distribution of antimalarials and RDTs. In all instances, PMI is not the sole donor but works with partners to ensure that all necessary resources are available for the country's needs. This strategy has meant PMI is involved, to some degree, in almost all aspects of the malaria program and is often a key player in resolving unexpected problems because of the flexibility of PMI resources.

DFID is a major partner in malaria control efforts in Zambia. DFID channels most of its malaria resources through PMI thereby enhancing both agencies' buying power and making coordination of procurements much simpler and transparent. This tactical alliance will continue under this MOP.

Zambia's strategy of eliminating malaria in five districts by 2015 will take substantial effort by all partners. PMI will continue to collaborate with the NMCP and MACEPA to support surveillance systems capable of careful and timely documentation of malaria in low-prevalence areas. This elimination effort will also include robust diagnostic and treatment capabilities.

OPERATIONAL PLAN

1. Insecticide-Treated Nets

NMCP/PMI Objectives

Zambia's Strategic Plan (2011–2015) calls for universal net coverage, which is defined as “ensuring all sleeping spaces in targeted households are covered by an ITN.” The NMCP's aim is to ensure universal coverage (100%) of ITNs in the entire country, with 80% of people using ITNs, by 2015.

In 2006, a policy decision was made to distribute only WHO's Pesticide Evaluation Scheme (WHOPES)-recommended long-lasting ITNs, eliminating the need for re-treating nets. Initially, the ITN policy only targeted children under five and pregnant women, however this policy has now been expanded to include all sleeping spaces in a household (2011). In order to achieve universal coverage, a number of delivery methods have been adopted. These include mass distribution of ITNs through door-to-door campaigns and routine distribution to pregnant women and children under five years of age through ANC and Expanded Program of Immunization (EPI) clinics; all ITNs are distributed free to the beneficiary. As a result of these efforts, the percentage of homes with at least one ITN has increased from 38% in 2006 to 68% in 2012. In addition, ITN use in children under five has increased from 24% in 2006 to 57% in 2012. Despite the progress achieved, ITN coverage remains below the country's universal coverage target. In addition, ITN coverage varies across provinces ranging from 52% in Western Province, to 90% in Luapula province. There is also urban-rural variation, with 62% ITN coverage in urban areas versus 72% in rural areas. To address these variations, the NMCP is planning a mass national distribution campaign for 2014 just before peak malaria transmission season. The NMCP has planned this harmonized effort to “flood” the country and ensure that all households have the necessary ITNs. The campaign is planned as a door-to-door campaign, with volunteers delivering nets to households and providing assistance to hang them. The campaign will account

for ITNs distributed by partners in campaigns in 2013. The 2014 campaign is expected to span 12 months, starting in the last quarter of calendar year 2013, through the third quarter of calendar year 2014.

The Zambian Government will implement the mass distribution campaign with financial and technical support from a number of stakeholders, including PMI, the Global Fund, DFID, UNICEF, WHO, MACEPA and others. PMI will provide technical assistance for planning, implementation and monitoring of the campaign, as well as providing over 1.4 million nets (910,000 – FY 2012 and 540,000 – FY 2013). Using FY 2012 funds, PMI will also provide 550,000 nets for routine distribution in EPI and ANC clinics that will be distributed in calendar year 2013.

Progress during the last year

In 2012, the NMCP distributed almost 3 million² ITNs through mass distribution campaigns and routine distribution at ANC and EPI clinics. Of all ITNs distributed, 816,333 were purchased by PMI. Of those, a total of 753,000 nets were procured for routine distribution at ANC and EPI clinics. An additional 80,000 nets were procured for the Zambian Anglican Council for distribution along the Angolan and Namibian borders. The table below shows distribution by donor and mechanism in 2012.

Table D: Distribution of ITNs in 2012			
Donor	Mass Distribution	Routine ANC/EPI Distribution	Total
MOH/World Bank	1,897,002	0	1,897,002
PMI	80,000	736,833	816,833
MACEPA	25,000	0	25,000
Total	2,002,002	736,833	2,738,835

ITN distribution efforts were further supported by community-based volunteers who provided information on correct and consistent use of ITNs to families, gave demonstrations on proper ITN use at health facilities and other distribution points. Using PMI funding, 860 community-based volunteers were trained to promote ITN use.

PMI also supported operational research to examine the durability of ITNs to guide decisions about when they should be replaced. ITNs distributed in 2011 in Northern and Luapula Provinces are being tracked and examined for structural integrity and insecticide content through 2013. Through this project, PMI engaged Peace Corps Volunteers at the provincial and local levels to do follow up. A Peace Corps Response Volunteer manages this project. The project was launched February 2012 and will end December 2013. Final results are expected to be shared in

² Zambia National Annual Malaria Commodity Forecast and Quantification Report 2013-2015

March 2014.

Challenges, opportunities and threats

The planned 2013—2014 net distribution campaign provides an opportunity for the NMCP and its partners to make strides towards achieving nationwide universal coverage. A challenge for donors will be to ensure the availability of adequate funding both for the procurement of ITNs and campaign operations. This will be the first time a nationwide distribution of this scale will be conducted in Zambia—a total of 8.9 million ITNs will be distributed during the campaign. Close collaboration and coordination between the NMCP and partners will be essential on all aspects of the distribution, including procurement of ITNs, receiving the ITNs at central level, storage and distribution of ITNs at the district and health facility level, and finally door-to-door distribution in communities. To create demand and appropriate and consistent use of ITNs, BCC will be an essential component of the campaign.

Following the campaign, maintaining high coverage and high net usage will be necessary for sustaining reductions in malaria episodes. To increase the longevity of ITNs, the NMCP and its partners will explore strategies that encourage care and repair of ITNs if this strategy is found to be effective in other trials. To replace old or worn out nets, the NMCP and its partners will determine whether the current strategy to replace nets through EPI and ANC clinics is adequate or whether additional continuous distribution channels are needed. Lastly, the NMCP is concerned about the disposal of nets and is receptive to technical assistance from PMI around this issue as there are no global guidelines on ITN disposal.

Emerging *Anopheles* resistance to pyrethroids, the family of insecticides used in ITNs and for IRS, continues to be a concern for the NMCP. *Anopheles* resistance to pyrethroids has been found in all areas where PMI is supporting vector resistance monitoring, however, the operational impact of resistance is unknown (see IRS section for details).

Commodity gap analysis

In calculating the ITN gap for 2015 for Zambia, the following data were considered:

Table E: ITNs distributed or pledged (2013-2014)	
2013 - ITNs distributed or pledged to be distributed	3,041,265³
Global Fund/CHAZ	285,800
PMI (FY 2012)	550,000 ⁴
DFID/World Vision	770,925
MACEPA	39,900
World Bank/MOH	881,630
World Vision	513,010
2014 ITNs pledged	6,491,147
Global Fund/TFM	4,641,147
PMI (FY 2012)	910,000
PMI (FY 2013)	540,000
GRZ/MOH	200,000
DFID	200,000
Grand Total ITNs distributed or pledged (2013 - 2014)	9,532,412

In calculating 2015 needs, a key assumption is that universal coverage will be achieved by the end of 2014, following the mass distribution campaign. The following commodity gap analysis has been conducted for the number of ITNs that will be needed for routine distribution through EPI and ANC clinics, as well as ITNs that will potentially be distributed through other continuous distribution channels. The need for ITNs in Zambia in for 2015 was calculated considering a population growth rate at 2.8%.

Table F: ITNs Gap in Zambia in 2015	
Criteria	2015
Total Population	15,134,524
LLINs for routine distribution to pregnant women through ANC clinics (4.5% of total population)	681,054
LLINS for routine distribution to infants (4.5% of total population through EPI clinics)	681,054
Total LLIN need in 2014	1,362,108
Number of LLINS pledged for 2014 (PMI)	800,000
Gap	562,108

³ Of the 3,041,265 nets to be distributed in 2013, only 2,131,285 will be distributed as part of full coverage campaigns and will be applied to the 2013/2014 campaign efforts.

⁴ The FY2012 MOP originally included 440,000 nets for routine distribution; however due to a budget increase and cost savings, a total of 1,460,000 nets were procured; 550,000 will be used for EPI/ANC clinics in 2013; the remaining 910,000 will be used for 2014 campaign.

In preparation for the 2013/2014 mass distribution campaign, the following gap analysis was conducted by the NMCP and partners. To cover the entire population of 14 million people, the NMCP calculated the ITN need based on the WHO-recommended quantification of one ITN for every 1.8 targeted persons. In addition, a 10% buffer was added to account for possible inaccuracies in population projections. Lastly, ITNs that are distributed through campaigns in provinces that achieve full coverage in 2013 will be taken into consideration and will be deducted from the total need.

Population	14,722,300
ITN Need: 1 ITN per 1.8 pop. + 10% buffer	8,998,200
2013 Campaign Distributions Applied to	2,131,285⁶
2013/2014 Campaign Efforts	
DFID/World Vision	770,925
World Bank/MOH	881,630
World Vision	478,730
2013 Remaining Gap	6,866,915
2014 Net Campaign Commitments	6,491,147
Global Fund/TFM	4,641,147
PMI (MOP 2012)	910,000
PMI (MOP 2013)	540,000
GRZ/MOH	200,000
DFID/UKAID	200,000
2014 Remaining Campaign Gap	375,768

Plans and justification

With FY 2014 funding, PMI will focus on the procurement and distribution of ITNs to maintain a supply of nets for routine distribution through ANC/EPI facilities. In addition, PMI will provide technical assistance for the roll out of strategies for sustaining high ITN coverage after reaching universal coverage including exploring alternative continuous distribution channels, as well as strategies for care and repair of nets. Results from the on-going net durability study will be used to determine if it is necessary to adjust the number and timing of the procurement of replacement ITNs in order to maintain high coverage.

The 2012 MIS showed a gap between overall net ownership and use; while 68% of households owned at least one ITN, only 49% of household members slept under an ITN the night before the survey. In order to improve ITN usage, PMI will continue to support BCC activities, prioritizing local over national activities (see BCC section).

⁵ Population Data and ITN calculation need figures obtained from Zambia 2014 LLIN Mass Distribution Concept Note.

⁶ The net distribution TWG came to a consensus that only 2,131,285 of the total 3,951,261 distributed in 2013 reached universal coverage in target provinces or districts and would be applied to 2013/2014 campaign efforts.

Proposed activities with FY 2014 funding (\$3,600,000)

- Procurement of approximately 800,000 replacement ITNs for free routine distribution through ANC and EPI clinics, estimated at a cost of \$3.59/net, (\$3,000,000);
- Support the distribution of ITNs including provision of transportation to districts and to health facilities, estimated at \$0.50/net, (\$400,000);
- Support the roll out of strategies for sustaining high ITN coverage including exploring alternative continuous distribution channels, as well as strategies for care of nets. Using FY13 funding, PMI will support an initial assessment and design a multi-channel continuous distribution strategy. FY14 funding will be used to provide TA in the implementation and evaluation of that strategy. In addition, funding will support TA in the development of net care BCC, and if evidence from OR studies is positive, TA for repair BCC. (\$200,000).

2. Indoor Residual Spraying

NMCP/PMI Objectives

The Zambian NMCP has the goal of achieving universal coverage with either IRS or ITNs by 2015. The primary 2011–2015 policy objectives include covering at least 85% of all targeted structures/households in low to high transmission zones (IRS is targeted at high incidence areas) by the end of 2011 and to have at least 80% of people living in malaria risk areas using appropriate malaria prevention and control interventions by 2015 (IRS or ITNs). The NMCP views IRS as a cost-effective method for reducing transmission with a focus on: 1) controlling malaria in urban and peri-urban areas with high population density, 2) reducing peaks of transmission in areas of intense seasonal malaria, 3) preventing outbreaks in epidemic-prone areas, and 4) eliminating new foci of infection in areas previously malaria-free. IRS is also recognized as the only intervention available to manage insecticide resistance through rotation among different classes of WHOPEs-approved insecticides, making entomological monitoring an indispensable component of an evidence-based resistance management program.

Progress during the last year

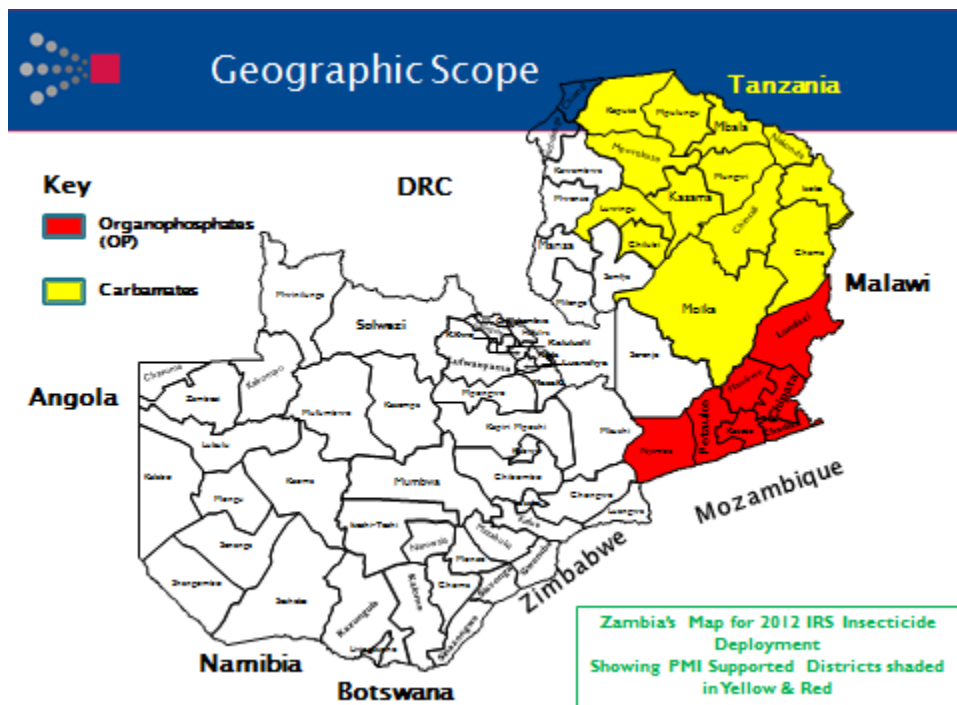
PMI supported the NMCP IRS operations in 20 PMI focus districts (seven in Eastern Province; five in Muchinga Province; eight in Northern Province). Approximately 460,303 structures were sprayed, out of the targeted 533,425, (86% coverage) protecting 1,710,833 people (approximately 10% of the Zambian population). PMI support to NMCP IRS programs included training, geocoding, and procurement of insecticides and personal protection equipment in 2012. The NMCP, with PMI support via its local contractor: 1) trained 27 geocoding supervisors (24 male and 3 female) and 108 housing enumerators (70 male and 38 female); 2) 59 district level trainers (50 males and 9 females) responsible for training spray operators; 3) assembled a team of master trainers/national facilitators to offer technical support supervision; 4) conducted cascade training of IRS operators (576 males and 294 females); 5) distributed PMI-acquired IRS commodities (insecticides and personal protective equipment) to the 20 PMI supported IRS

districts; 6) developed standard operating procedures for tracking IRS commodities; 7) completed an IRS needs assessment, and 8) supported the IRS and Insecticide Resistance technical working group to assist the Malaria Control Program.

Pre-, mid- and post-spray inspections were conducted in the 20 targeted districts, and the number and percentage of base stores with physical inventories were verified by up-to-date stock records. Follow-up observations of skills and knowledge of store keepers were conducted on stock control and inventory management after the training in September 2012. In the 2012 IRS program, carbamates (FICAM®; 140,040 units) were used in the 13 districts in Northern and Muchinga Provinces and organophosphates (Actellic®; 52,416 units) were used in the seven districts of Eastern Province (Figure 1). Equipment procured included 416 spray pumps, and personal protective equipment (780 hard hats; 71,000 respirator masks). The IRS program was in compliance with United States Government’s USAID Regulation 216; Government of Zambia environmental regulations: Zambia Environmental Management Act cap 204, No 12 of 2011; and USAID Initial and Supplemental Environmental Assessments and Pesticide Evaluation Report and Safer Use Action Plan and its amendments.

A local recycling plant was identified to dispose of empty bottles of Actellic insecticide and a Memorandum of Understanding was drafted with the plant and waste management company to conduct the recycling. The recycled plastic will be used to make products such as chairs, dust bins, etc. The bottles have been collected from the districts and are currently at the provincial center ready for delivery to the recycling company in Lusaka.

Figure 1: IRS insecticide deployment by district for 2012 campaign



PMI assisted with development of capacity to collect entomological data in the 20 districts; trained 54 environmental health technicians in entomological monitoring and insecticide resistance studies; created six sentinel sites for entomological investigations; and assisted with maintenance of the national entomology lab and insectary. Entomological monitoring studies identified resistance to dichloro-diphenyl-trichloroethane (DDT) (Copperbelt Province), pyrethroids, (throughout the country) and carbamates (Eastern Province). Resistance results were used to select a different insecticide for IRS. In response to the resistance findings the NMCP convened an Insecticide Resistance TWG which has been meeting since 2010. This group includes local entomologists as well as experts from USAID, CDC and the Liverpool School of Tropical Medicine and Hygiene. At the meeting in April 2012 the group decided on which insecticides to use in the 2012 IRS season. The TWG is developing a draft resistance mitigation strategy for consideration by the NMCP.

Challenges, opportunities, and threats

PMI IRS challenges include: coordination of multiple donors funding IRS, delays in availability of resources resulting in delays in the spray season, inadequate supervision at the district level, inadequate storage facilities, and poor store room stock-keeping practices. As a result of the delays in IRS funding from partners, PMI now focuses on 20 districts and covers all costs associated with IRS. In 2012 the World Bank provided funding for operations for all 72 districts, including the 20 PMI districts.

Opportunities for PMI include strengthening evidence-based decision making with regards to selection of IRS sites and promoting a prioritization plan to determine how IRS would be conducted if resources are not available to implement the full NMSP 2011-2015 proposed plan.

Insecticide resistance is a major threat to the effectiveness of the IRS program in Zambia. The NMCP's ability to support the IRS program is questionable given that substantial increase in insecticide costs have not been matched by increased donor funding. Resistance to DDT, pyrethroids and carbamates has been detected in several parts of Zambia. Changing to more expensive insecticides such as long-acting organophosphates and carbamates increases program costs substantially. Resistance to pyrethroids also raises concern about ITN effectiveness given that pyrethroids are the only insecticide currently available for use in ITNs.

Plans and justification

PMI will continue to focus its support of IRS in 20 districts, covering as many of the 800,000 households/structures (approximately 4.1 million people) as possible. The actual number of IRS districts that PMI will support, and the household/structures sprayed will depend on the cost of insecticides selected, the cost of implementation and the incidence of the disease in the district.

Areas for PMI assistance include: the elaboration of the IRS needs assessment showing the number of structures to be sprayed in each district; environmental monitoring and compliance; community sensitization; stores/insecticide management; procurement of insecticides, supplies and equipment; insecticide waste storage and disposal; and enhanced entomological monitoring

and insecticide resistance surveillance. PMI supports the MOH policy to change the insecticide used for IRS based on evidence of vector resistance to insecticides.

The NMCP is using other partners for small scale larviciding projects in Lusaka and has not asked PMI for support.

Proposed activities with FY 2014 funding (\$8,618,700)

- Procure insecticides and other IRS supplies/equipment for spraying up to 800,000 households, depending on the insecticides selected and associated costs and supporting environmental monitoring and environmental assessment (\$6,644,500);
- Train spray operators, supervisors, drivers and store keepers; monitoring and evaluation; BCC for IRS; pesticide storage; waste disposal; and pay for spray operations in 20 PMI-funded districts; (\$1,750,000);
- Support the insectary and entomological monitoring in at least 20 PMI focus districts per year, maintaining the operations of the insectary and work with NMCP to coordinate and facilitate the collection of entomological information, its analysis and interpretation to inform decision making in targeting vector control and pesticide selection for vector control; and continue insecticide resistance management (\$200,000); and
- CDC technical assistance for entomological monitoring and insecticide resistance (\$24,200).

3. Malaria in Pregnancy

NMCP/PMI Objectives

As of the writing of this MOP, the NMCP has revised the national policy for IPTp to align with the recently-updated WHO policy that recommends that IPTp-SP should be started as early as possible during the second trimester, given at each ANC visit, and given at least one month apart up to the time of delivery. In the previous fiscal year, the national policy was for pregnant women to receive three doses of SP IPTp with the first dose starting after 16 weeks and subsequent doses spaced one month apart.

Progress during the last year

PMI has supported three main strategies to address malaria in pregnancy: IPTp, ITNs, and case management. IPTp is discussed in detail below. ITNs were procured and distributed to pregnant women through ANCs (see ITN section for details). PMI also supported appropriate case management of malaria in pregnancy through trainings of healthcare workers on malaria diagnosis and treatment guidelines (see Case Management section for details).

Focused antenatal care (FANC) is a comprehensive prenatal care package provided to pregnant women at ANC clinics that includes care related to malaria such as providing SP for IPTp,

providing an ITN at the first ANC visit, and educating pregnant women on the importance of seeking care immediately for fever. In a FANC rapid assessment done in two districts per province in 2011, barriers to IPTp coverage were primarily lack of training in FANC in the last two years (66%), stock outs of SP (64% of facilities surveyed had SP stock outs in the last quarter), and late first-time attendance to ANC clinic (60%). Furthermore, the 2012 MIS found that women in rural areas had much lower coverage of at least two doses of IPTp than women in urban areas. FY 2013 activities focused on addressing these issues.

FANC training and supervision is provided to healthcare workers via clinical care teams present in all districts and provinces nationwide. These teams consist of staff who are already part of the health system; a clinical care supervisor and a community health worker coordinator. Provincial-level clinical teams supervise and train district-level clinical teams and health workers, and subsequently, district-level clinical teams and health workers train and supervise health workers at the facility level. PMI has supported the malaria in pregnancy component of training for the clinical teams. As of the end of the second quarter of FY 2013, 126 of the 360 health workers targeted in 27 districts across all provinces will have received training in FANC.

Because the availability of SP is critical for IPTp, PMI invested in the roll out of the EMLIP to improve distribution of malaria commodities (see Treatment and Pharmaceutical Management section) and to prevent stockouts of malaria commodities like SP in ANCs.

National and community BCC related to malaria in pregnancy (MIP) was also supported by PMI in FY 2013 (see BCC section). To help in the development of messages, PMI supported a qualitative evaluation at the end of 2011 to examine barriers to receiving SP for IPTp in two rural districts of three provinces with high malaria prevalence. They found that while knowledge of IPTp and the need to attend ANC among women was good, there was less knowledge about the need to access ANC early and at least four times (many women believed only one visit was necessary). Presenting late to ANC and presenting infrequently was identified as the top barriers to receiving IPTp as recommended. Once a woman presented to ANC, the likelihood of receiving IPTp at that visit, if appropriate for gestational age, was high. This evaluation recommended creating messages that emphasize when to initiate ANC visits and number of visits that should be made. National BCC efforts for MIP are part of a larger integrated campaign on maternal health and nutrition that disseminates messages through national radio and television spots encouraging early prenatal care, use of nets during pregnancy, and the importance of IPTp. Community BCC efforts focus around educating and training Safe Motherhood Action Groups (SMAGs) present in all districts, on MIP and the timing and number of ANC visits.

Challenges, opportunities, and threats

Stock outs of SP continue because of no supply at the central level and problems with distribution from central stores to the ANC clinic. The GRZ purchases all the SP needed for IPTp. There were procurement delays in early FY 2013, but the order of SP has since been received and there is SP centrally. The GRZ has budgeted again for the country's full SP IPTp need for FY 2014. In terms of distribution, facilities not participating in EMLIP have had stockouts of SP. PMI has an opportunity to improve SP availability with continued investments in the roll out of EMLIP (see Pharmaceutical Management for more information).

Another challenge in SP IPTp uptake is the cultural practice of not revealing a pregnancy until a woman shows obvious physical signs of being pregnant. This results in late presentation to ANC clinic. Also, as found in the aforementioned evaluation, many women believe only one ANC visit is needed, thus impacting the number of IPTp doses received. This cultural and knowledge barrier will require continued BCC regarding IPTp.

SP resistance continues to be a threat for IPTp, and a review of the current evidence on SP IPTp efficacy resulted in an updated WHO policy in 2012. The NMCP is in the process of updating their policy, which will require retraining of healthcare workers and updating BCC materials.

Another factor that reduces the efficacy of SP for IPTp is the concomitant use of high dose folate. Pregnant women are given folate as part of FANC, and 0.4 mcg is the recommended prenatal supplemental dose as it doesn't interfere with SP for IPTp. This low dose contrasts with the 5mg dose recommended for women who have folate-deficiency anemia. In Zambia, 5mg folate tablets are purchased with the intention of addressing folate deficiency. Because the tablets are cheaper if bought in bulk, 5mg tablets are the only strength of folate purchased and these tablets are given to all women at ANC whether for prenatal supplementation or for folate deficiency. The MOCH now has plans underway to procure 0.4 mcg tablets for routine prenatal supplementation. Concomitant with the use of this lower dose of folate is the need for refresher training of providers in when to use lower versus higher doses of folate. There are plans to include this material in the standard FANC curriculum and refresher trainings.

The new MOMCH is now in charge of delivery of clinical services while the MOH/NMCP is in charge of policy, monitoring and evaluation, and procurement of malaria commodities. How the two ministries will divide their responsibilities in terms of MIP has not been determined. The two ministries plan to work together to update and implement any changes in MIP policy.

Table H: Gap Analysis for SP 2013-2015 in Commodities Needed			
Need and Funding Source	2013	2014	2015
SP National Need (# of treatments)	5,282,653	5,282,653	5,282,653
Already Committed/Available			
MOH	4,579,333		
Total Available	4,579,333		
Annual SP Gap	703,320	5,282,653	5,282,653

Source: Zambia National Malaria Commodity Forecast and Quantification 2013-2015.⁷

⁷ Zambia National Malaria Commodity Forecast and Quantification utilized adjusted consumption-based methodology to estimate for anti-malaria drugs/RDT needs. Consumption data from 27 EMLIP districts were used and extrapolated and/or applied to the whole country to estimate national requirements.

Plans and justification

In spite of a 72% coverage of at least 2 doses of SP IPTp (MIS 2012), there is a disparity of coverage between urban and rural women. The strategy to increase IPTp coverage includes targeting rural areas.

To strengthen delivery of care related to prevention and treatment of malaria in pregnancy, and in light of the anticipated update in NMCP IPTp policy, PMI will continue to support supervision and training of health center clinical staff in FANC in the updated NMCP IPTp policies and use of the lower dose folate tablets) through clinical teams. Specifically, for FY 2014, provincial-level and district-level clinical care teams in all provinces will be trained in the new NMCP IPTp policies. The newly-trained district-level clinical teams will focus their initial training and supervisory visits on rural facilities where SP IPTp coverage is the lowest. National level staff will provide supportive supervision to these clinical teams on an ongoing basis.

ITNs will be procured and distributed through ANC clinics (details in ITN section).

To improve patient knowledge and demand for prevention and treatment of malaria in pregnancy, PMI will continue to support national and community level BCC activities, with an emphasis on local BCC activities such as SMAGs in rural areas (see BCC section).

Proposed activities with FY 2014 funding (\$400,000)

- Train all provincial-level, and district-level health workers (at least 2 districts per province with a focus on rural districts) on the updated NMCP IPTp guidelines, (\$400,000);
- National and community BCC efforts for MIP will include messages through national and local radio, national television spots, and SMAGs encouraging timely ANC attendance, four ANC visits during pregnancy, use of nets during pregnancy, and updated IPTp recommendations (see BCC section).

4. Case Management

Diagnostics

NMCP/PMI Objectives

In 2008, the NMCP adopted a policy of universal laboratory diagnosis of malaria prior to treatment using microscopy or an RDT where microscopy is not available. Microscopy is to be used where equipment and trained staff are already present, otherwise RDTs should be used. By 2015, the NMCP aims to have all patients with suspected malaria undergo parasitological testing via microscopy or an RDT, and all confirmed cases to receive early, effective treatment.

Progress during the last year

The NMCP, PMI, and partners have invested in three key areas related to malaria diagnostics: 1) procurement and distribution of diagnostic commodities; 2) training of clinical and laboratory personnel in the use of these diagnostic tools; and 3) training of national, provincial, and district level staff in providing outreach training and supportive supervision (OTSS) for quality assurance of malaria diagnostics.

PMI FY 2012 funds were used to purchase 3,530,000 RDTs out of the approximately 11,664,247 RDTs needed in 2012 for use by health facilities and community health workers (CHW) nationwide. An additional 3,500,000 RDTs are slated to be purchased this year with PMI FY 2013 funds. PMI furthered its partnership with DFID, by using PMI procurement mechanisms to purchase 2,000,000 RDTs funded by DFID. Other donors provided the remainder of RDTs needed in 2013. Supply status of RDTs and future RDT needs were continuously assessed by quarterly quantification exercises led by the NMCP, with technical assistance from an implementing partner. Other diagnostic commodities purchased by PMI include 40 microscopes and reagents which are being used in health facilities with staff that have received training in malaria diagnostics. These diagnostic commodities were distributed from Medical Stores Limited (MSL) to the district level through the routine supply system for most districts, and for a few districts, via EMLIP.

To strengthen malaria diagnostic capacity at all levels, PMI has invested in training laboratory technicians and clinicians in malaria diagnosis, including the development and distribution of a laboratory training manual with standard operating procedures, providing refresher training, and implementing a quality assurance program for malaria diagnostics. PMI supported the WHO accreditation of three laboratory technicians at the national level, bringing the total number of level-two certified laboratory technicians in Zambia to four, building national microscopy expertise and capacity for training. Malaria diagnostics refresher training was done for 18 district laboratory supervisors.

To ensure quality of malaria diagnostics, PMI supported the OTSS program. In OTSS visits to local health facilities, provincial- and district-level supervisors use standardized checklists to observe use of RDTs and microscopy, recheck select malaria smears, and collect information on provider adherence to laboratory results and stock-outs. These supervisors also provide on-site training and corrective action as needed.

Findings of these OTSS visits were used to monitor the impact of the quality assurance program. Data collected were entered in a database that is managed by the NMCP and were used to track diagnostic capacity, to target training, and to allocate diagnostic supplies. The most recently available data from 2012 shows OTSS has improved provider adherence to malaria diagnostic guidelines: the average percentage of microscopy tasks performed correctly increased from 66% to 80%; average percentage of RDT tasks performed correctly increased from 78% to 86%; health worker adherence to negative test results increased from 64% to 85% for RDTs and increased from 57% to 80% for microscopy; the proportion of facilities that achieved a >85% concordance with supervisor slide readings increased from 74% to 85%; and facilities

experiencing stock-outs of malaria diagnostic supplies dropped from 87% to 24%. OTSS has improved provider adherence to malaria diagnostic guidelines.

A health facility survey which looked at adherence by providers to malaria diagnostic and treatment guidelines was conducted in 2011. Testing of children under five with fever was 76% and 73% of “true” positives were given an appropriate antimalarial. The 2012 MIS showed that only 17% of children who sought treatment for a fever episode had a heel or finger stick performed in a health care facility.

Challenges, opportunities, and threats

Funding in 2013 for the purchase of RDTs continues to be uncertain, and funding in 2014 and 2015 for RDTs from other donors is unknown. A delay in disbursement of funds or in procurement of commodities could jeopardize the RDT supply. The supply chain system continues to be a challenge in terms of getting RDTs from the central stores to district level in facilities not participating in EMLIP (see Pharmaceutical Management section). Furthermore, health facilities are responsible for supplying CHWs with RDTs, and stock-outs of RDTs have impeded this part of the supply chain.

Human resource shortages continue to be a challenge. A 2008 human resources assessment supported by the Clinton Foundation found that out of 1,500 health facilities, only 417 had laboratory technicians and functioning microscopes. Additionally, staff attrition and relocation resulting in untrained staff replacing trained staff, while not quantified, increased the needs for training and supervision.

A new hurdle to implementation of training and supervision is doubling of the daily subsistence allowance for staff as required by the MOH for all activities regardless of funder. Cost for trainings and activities such as supervision that require travel have therefore increased substantially, decreasing the target number of facilities that can be visited annually

There was a gap between implementing partners for quality assurance activities for malaria diagnostics. The contract for the original implementing partner finished on September 2012 and the current implementing partner started April 2013. Some activities were put on hold such as training of OTSS teams and laboratory technicians, but fortunately, OTSS visits (implemented by provincial and district level health office staff) continued during this time.

Gap Analysis

The gap analysis for RDTs was done based on consumption data in EMLIP districts. Projected needs over time decrease based on the assumption that malaria will decrease during this during frame.

Table I: Gap Analysis for RDTs 2013-2015 in Commodities Needed			
Need and Funding Source	2013	2014	2015
RDT National Need (# of treatments)	11,664,247	11,664,247	11,664,247
Already Committed/Available			
MOH	4,500,000		
PMI MOP 12	3,530,000		
PMI MOP 13		3,500,000	3,500,000
PMI MOP 14			
DFID	2,000,000		
GF/UNDP	1,175,000		
Surplus from previous year	78,800		
Total Available	11,283,800	3,500,000	3,500,000
Annual RDT Gap	380,447	8,164,247	8,164,247

Source: Zambia National Malaria Commodity Forecast and Quantification 2013-2015

Plans and justification

To provide health care workers, laboratory technicians, and CHWs with the tools to diagnose malaria, PMI will continue to support the procurement of malaria diagnostic commodities. PMI will procure 3,500,000 RDTs for use in health facilities and by CHWs. Furthermore, reagents for microscopy will be provided for use by trained laboratory technicians at facilities receiving OTSS.

OTSS visits were found to improve quality of laboratory diagnosis of malaria, improve provider adherence to negative test results, and decrease frequency of stock-outs of malaria diagnostic supplies in participating facilities. PMI and the NMCP will continue to support roll out of OTSS to at least 50 additional facilities as well as refresher training. The target number of facilities for full scale OTSS is 400, and by the end of 2013, 200 of the 400 will have participated in OTSS. Roll out of OTSS and maintenance of laboratory capacity will continue to depend on available resources.

There are still some activities planned for the current FY 2013 funds which include: ongoing OTSS visits (for a total of 200 facilities), a lessons learned workshop with all provincial supervisors, and two district level supervisors per province to present the results of OTSS monitoring thus far and to discuss lessons learned (including challenges) in the implementation of OTSS; a local malaria microscopy course for provincial and district level staff in which the top performers will be supported towards WHO accreditation so that they may also provide microscopy training and validation; and the development of a national archive of malaria slides.

Proposed activities with FY 2014 funding (\$2,650,000)

- Procure 3,500,000 RDTs to be used at health facilities and by CHWs to contribute towards filling the RDT need of approximately 11.7 million RDTs in 2014, (\$2,000,000);
- Strengthen malaria diagnostic capacity. These activities and funding will include: 1) travel costs in Zambia of several staff (typically two laboratory technicians and one clinician for one week every quarter) to rural districts – about two visits each to 200 facilities for ongoing OTSS, and 50 new facilities, 2) refresher training for 20 microscopists, and 3) certification training of microscopists by the WHO, (\$600,000);
- Procure reagents and supplies to equip health centers for their malaria microscopy needs (417 health facilities have laboratories with microscopy), (\$50,000).

Malaria Treatment

NMCP/PMI Objectives

Treatment of uncomplicated malaria: The first-line drug for treatment of uncomplicated malaria in Zambia is artemether-lumefantrine (AL). Quinine is used to treat acute malaria in the first trimester of pregnancy. AL is used in the second and third trimesters. The NMCP aims to do AL efficacy studies regularly to ensure efficacy of this first-line drug.

Treatment of Severe Malaria: The NMCP treatment guidelines recommend parenteral quinine as the drug of choice for severe malaria. These guidelines recommend that patients with severe malaria receive pre-referral treatment with intramuscular quinine before referral to a hospital or zonal health center equipped to manage severe malaria on an inpatient basis. The Integrated Management of Childhood Illnesses (iMCI) guidelines recommend that children with very severe febrile illness or severe pneumonia classifications should receive parenteral quinine and broad-spectrum antibiotics, preferably penicillin and gentamicin, both for pre-referral and definitive treatment. Treatment guidelines for severe malaria are being updated this year to include intramuscular artemether which is licensed in Zambia. Rectal artesunate, however, is not yet licensed in Zambia, but discussions are underway in the NMCP's Case Management TWG for its use for pre-referral treatment.

Malaria Treatment in the Community and Private Sector: Zambia has a small private health sector that operates in larger towns and cities where the burden of malaria is lower than in rural areas. These providers, including private-for-profit health facilities such as private clinics, have been informed of the use of AL as first-line treatment. Antimalarial drugs available in private pharmacies include AL, quinine, SP, and artemisinin monotherapies.

Integrated Community Case Management (iCCM): A volunteer CHW workforce with an average of six weeks of formal training has been active in Zambia since the 1970s providing preventive services and community mobilization. Trained CHWs use RDTs to diagnose malaria and treat positive persons with AL. CHWs in all districts in Luapula Province, and in three

districts in each of the remaining provinces have been trained in the diagnosis and treatment of malaria, pneumonia and diarrhea.

The MOH is examining the possibility of supplementing and eventually replacing volunteer CHWs with community health assistants (CHAs) in the hope of developing a sustainable, community-level cadre of health workers. CHAs are paid MOH employees and receive one year of training. A cadre of 300 CHAs was deployed in June 2012, and there is an additional cadre of 300 CHAs in 2013. CHAs are trained and equipped to diagnose and treat malaria, pneumonia, diarrhea and other illnesses, and spend 80% of their time in the community, and 20% of their time staffing health posts. They are supervised by the clinical team at health posts. The goal is to train 2,000 CHAs by 2015.

Progress during the last year

PMI procured approximately 4,000,000 ACTs in 2013 for the treatment of malaria in health facilities and in the community. Quarterly quantification exercises to gauge ACT need were carried out by the NMCP with support from PMI and partners. AL maintains good efficacy in Zambia as observed in a 2012 AL efficacy study conducted by the NMCP.

PMI supported training and supervision of healthcare workers. A total of 153 district health workers across 27 districts in all provinces (three districts per province) received training in malaria case management in all provinces. PMI also funded the training of 542 CHWs in iCCM. Supervision was supported via training of CCTs on supervisory skills specific to malaria case management. CCTs provide supervision for case management of malaria, with provincial level teams supervising district staff, who in turn supervise staff at local health facilities.

Challenges, opportunities, and threats

Future funding of ACTs remains uncertain. GRZ has set aside money in their budget for the second year in a row to procure ACTs, which is encouraging, but this will not meet the need. The PMI in-country team will explore opportunities for additional funding.

Also uncertain, and still being discussed among partners and the MOH, is the supply chain from the facility level to CHWs and CHAs. Supplying CHWs and CHAs is vital to their day-to-day operations. There are anecdotal reports of retention issues among CHWs and CHAs when they are not supplied with the commodities they need to do their work.

Doubling of the required per diem for government workers has resulted in a large increase in cost for implementing trainings and supervisory visits. Implementing partners have reported that this has limited the number of trainings and supervisory visits. For example, 540 health workers were targeted for training and supervision in malaria case management, but because of this increase, it is estimated that only about half of these targeted workers will be reached.

Commodity gap analysis

Quantifications conducted in 2013 show the following expected needs and supply for ACTs in Table J. Needs for ACTs are calculated based on usage as documented in the 17 EMLIP districts, and includes the need for a buffer stock to prevent stockouts.

Table J: Gap Analysis for ACTs 2013-2015 in Commodities Needed			
Need and Funding Source	2013	2014	2015
ACT National Need (# of treatments)	10,808,589	10,808,589	10,808,589
Already Committed/Available			
MOH	5,400,000		
PMI MOP 12	3,095,910		
PMI MOP 13		4,000,000	
PMI MOP 14			3,000,000
DFID	1,200,150		
GF/UNDP	3,172,500		
Total Available	12,868,560	4,000,000	3,000,000
Annual ACT Gap	-2,059,971	6,808,589	7,808,589

Source: Zambia National Malaria Commodity Forecast and Quantification 2013-2015

Plans and justification

The NMCP has prioritized technical support for case management as an area that PMI should address. A nationally-representative health facility survey conducted in 2011 found that of patients presenting with suspected malaria, about 68% were tested with either an RDT or microscopy, and of those who tested positive for malaria, 88% were prescribed AL. Of patients who tested negative for malaria, 11% received AL despite the test results. Of the patients with suspected malaria who were not tested, 26% received empiric treatment with AL. These results show that support for case management is still needed.

With FY 2014 funding, PMI will work to increase prompt and effective treatment for uncomplicated malaria at the health facility level. PMI will also support efforts to provide malaria treatment at the community level utilizing CHWs.

PMI will support effective severe malaria case management through ongoing and planned FY2013 activities which will include a revision of case management guidelines to reflect updated WHO recommendations on the use of artemisinin, and update of training materials for healthcare workers. FY 2014 funding will support the training of healthcare workers in these new guidelines.

Proposed activities with FY 2014 funding (\$3,500,000)

- Procure approximately 3,000,000 treatment courses of AL for uncomplicated malaria. Quarterly quantifications will monitor the supply and demand closely to ensure adequate AL is available throughout the year, (\$2,500,000);
- Support training and supervision of healthcare providers and CHWs in the diagnosis and treatment of uncomplicated malaria. Also, train health workers at health facilities on the new guidelines on using artemether for severe malaria. (\$50,000 for NMCP supervision and training of provincial clinical care teams, \$550,000 for clinical care teams at provincial and district level to train health workers at health facilities, and \$300,000 for training CHWs in iCCM), (\$900,000);
- Supervisory visits from the NMCP to provincial health facilities to review quality of malaria case management, (\$100,000).

Pharmaceutical Management

NMCP/PMI Objectives

As part of the Strategic Plan, the MOH aims to ensure the availability of adequate, quality, efficacious, safe, and affordable malaria commodities and consumables at all levels of service delivery through efficient and effective procurement and logistics management. Key strategies of the MOH's strategic plan to achieve this objective include the following:

- Strengthen planning and forecasting for malaria control commodities. Develop and implement comprehensive annual commodities projections, and procurement plans for malaria control commodities and consumables.
- Strengthen systems for procurement and supply of malaria control commodities and consumables. Improve linkages and coordination among NMCP, MOH and MSL. Strengthen the Malaria Commodities TWG.
- Strengthen malaria commodities distribution at all levels. Advocate MOH to continue rollout EMLIP.
- Improve storage for malaria control commodities and consumables, at all levels. Strengthen linkages and coordination with MSL and advocate for MOH to implement recommendations of the storage capacity assessment done in 2009/2010.
- Strengthen collaboration with partners involved in procurement and distribution of malaria commodities.
- Promote private sector participation, including public-private partnerships.
- Strengthen internal systems to ensure compliance with local and international regulatory frameworks with respect to procurement, storage, usage and disposal of malaria commodities and consumables.
- Strengthen pharmacovigilance.

In 2013, the MOH announced that the mandate of MSL would be increased beyond storage and distribution of commodities. MSL would also be mandated to conduct quantification and forecasting for all health commodities for all programs of the ministry. In addition, MSL would be responsible for the procurement of all health-related commodities for the entire country. Lastly, they would be responsible for monitoring the supply of commodities down to the health facility level. MSL is currently in the process of developing strategies and implementation plans outlining how it will implement its expanded mandate.

Progress during the last year

In April 2009, the MOH implemented the Essential Medicines Logistics System Pilot program. A baseline survey for the pilot program, conducted at the end of 2008, reported high stockout rates at the health-facility level for a range of essential medicines. For AL the stockout rate was around 40 percent for all four presentations. Pilot results showed that product availability was significantly increased; the stockout rate for adult ACTs was reduced from 48 to 6 percent; pediatric ACTs was reduced from 43 to 12 percent. In addition to reduced stockout rates, the number of days out of stock was reduced. In the fourth quarter of 2009, in comparison districts (where no changes were made in the supply chain), pediatric ACTs were stocked out an average of 29 days (of a maximum 92 days); in the pilot, that number was reduced to five days. Given the success of the pilot, which was supported by PMI, the MOH decided to roll out the pilot –called the Essential Medicines Logistics Improvement Program (EMLIP) nationwide.

EMLIP is a demand driven system in which individual health facilities submit monthly reports on consumption of commodities to their respective District Health Offices. These offices in turn follow a predetermined fixed schedule for submission of reports to the Logistics Management Unit (LMU) housed at MSL. Data from each facility are entered individually into a database and order quantities are determined by an automated system called Supply Chain Manager Software. MSL then packs the essential drugs, including antimalarials, for each facility. The EMLIP approach is based on evidence from a PMI-supported trial. EMLIP implementation is funded by MOH and USAID (PMI, PEPFAR, Family Planning, Maternal and Child Health); UNICEF plans to support the MOH and MSL with technical assistance in the national rollout of EMLIP. DFID funds essential medicines. The implementation of EMLIP is expected to result in improved management and awareness of stock levels at health facilities through the mandatory submission of reports to the LMU at MSL.

During the past year, EMLIP has been rolled out to seven additional districts, bringing the total to 27 districts of the country's 102. To date, there are 625 active sites (target: 1,800 sites) that are currently using EMLIP and 1,814 health care workers who have been trained in the use of EMLIP. The LMU recorded 93% reporting rate for EMLIP districts in the last six months of FY 2012. In addition, there has been an increase in stock availability in EMLIP districts compared to non-EMLIP districts. According to monthly reports sent to the LMU from health facilities, the percentage of health facilities stocked out of all presentations of ACT fell from 10% in June 2012 to 8% in April 2013.

PMI continued to provide support to the national core group led by the MOH/NMCP to conduct annual and quarterly forecasting and quantification exercises for ACTs, ITNs, RDTs, and SP.

The national core group successfully conducted a transparent forecast and quantification exercise for 2013 through 2016. The entire process was facilitated by MOH/NMCP staff.

The rollout of EMLIP strengthened this process through the availability of health facility data that was used to provide more accurate forecasts and quantifications. Regular quarterly meetings were held to re-visit quantification and forecasting data to ensure that it was up-to-date.

Additional quarterly end use verification exercises are conducted at health facilities to determine the type and number of patients treated with ACTs and SP.

To improve strategic management and planning for increased commodity security, PMI provided support to the NMCP prevention and treatment TWG. As part of this support, PMI contributed to the finalization of a costed National Supply Chain strategy (including an implementation plan).

The final strategy is yet to be publicly released. Technical assistance was also provided in support of formulating a procurement strategy for MSL in view of its new mandates. Technical support was also provided to plan and implement a Community Health Assistance Logistics system.

Challenges, opportunities and threats

A key requirement for successful implementation of EMLIP is having a full supply of all required commodities at the central level in order to be able to fully satisfy demand of all lower level facilities. However, both the MOH and donors experienced unexpected delays in the procurement of essential medicines and the MOH called for the suspension of EMLIP rollout in additional districts. As a result, only 2 of the planned 21 new districts have received training over the past 12 months. In addition, the MOH mandated the return to the kit system for essential medicines in all districts. As such, in EMLIP districts essential medicines are being provided through kits while malaria commodities (except for quinine, which is included in the kit) are still being provided through EMLIP. With this EMLIP hybrid system, it is yet to be seen how the quality of the data that will be reported by EMLIP districts will be affected. In addition, without additional districts implementing EMLIP, the availability of facility-level data is limited to only 27 districts. It is not clear when rollout of EMLIP to additional districts will be reinitiated.

Despite these challenges, to maintain the improvements that have been achieved to date, PMI continues to provide technical assistance to the 27 districts in which EMLIP has been rolled-out and in which malaria commodities are still provided through the EMLIP system. In addition, PMI is providing support at the central level in implementing the hybrid EMLIP system.

It remains unclear whether MSL can successfully take on all of its new mandate. Currently, MSL lacks personnel to target for capacity building in forecasting and quantification. MSL also has limited capacity to undertake timely procurements, pipeline monitoring and procurement coordination of antimalarial commodities, and storage has been a problem over the past twelve months. At times, partners were asked to source their own warehousing for incoming shipments, while waiting for space to open up at MSL.

It is encouraging that the GRZ has committed \$24 million dollars in its official approved budget for the purchase of ACTs, RDTs and other malaria commodities. In the past, the GRZ has required extended lead times for its procurements so it is unclear whether the ACTs will arrive as planned. In addition, it is still uncertain whether the entire \$24 million will be made available.

The GRZ has indicated that inclusion of funding for malaria commodities in its budget is not a one-time occurrence and they expect to allocate funding for malaria commodities in future budgets.

Plans and justification

In collaboration with the MOH, PMI will continue strengthening the GRZ's commodities supply and logistics systems at central, provincial, district and health center level. PMI anticipates that the rollout of EMLIP will continue once there is an adequate supply of essential medicines. As such, PMI will provide support for the continued rollout of EMLIP in collaboration with the MOH to improve the availability of malaria commodities at all levels of the health system. In addition, support will be provided to increase the MOH's ownership and coordination of forecasting, quantification and procurement planning for malaria commodities. PMI will continue to provide support to assess and monitor stock status for antimalarial drugs and RDTs at central, District Health Office and health center levels. In support of MSL's new mandate, PMI will provide technical assistance to MSL to ensure successful adoption of its new tasks, including forecasting and supply planning capacity, as well as the improvement of the storage and distribution of malaria commodities.

Proposed activities with FY2014 funding (\$1,000,000)

Assist the MOH in the roll out of the national logistics and pharmaceutical management system which includes EMLIP. Specific activities will include the following:

- Quarterly forecasting of antimalarial drug and RDT needs and gaps in all districts;
- Importing, quality control, storage, distribution, and inventory management down to the health facility level;
- The rollout of EMLIP including training health workers and improving feedback and reporting on consumption/stocks from health facility to district and higher levels;
- Monitoring of implementation/evaluation of coverage;
- End-use verification/monitoring in a sample of all districts of availability of key antimalarial commodities at the facility level. Specifically, end use verification entails the regular supervisory/monitoring visits to a sampling of health facilities to detect: ACT (or other drug) stockouts; expiration dates of ACTs at health facilities; leakage; anomalies in ACT use by clinicians; and to verify quantification/consumption assumptions; and
- Support to MSL in support of its new mandate.

5. Behavior Change Communication

NMCP/PMI Objectives

The NMCP's BCC strategy for 2011 – 2014 has clear behavior change objectives for each of the malaria control interventions and also identifies barriers to the desired behaviors as well as problem behaviors that compete with the desired behaviors. Target audiences are also identified and measurable communication objectives are clearly stipulated. Finally, for each control intervention, messages are articulated and a media mix suggested. All institutions working on

malaria in the public, private, and non-governmental organizations (NGOs) and PMI partners, follow the national strategy.

Progress during the last year

The recently released 2012 MIS included several knowledge-based indicators linked to BCC that indicate high knowledge in women 15 – 49 years of age of appropriate preventive and curative measures for malaria (Table J). Although knowledge is not equivalent to “practice” nor is it a guarantee that an individual will exhibit the target behavior to prevent or treat malaria, it does indicate to a certain extent that BCC activities in Zambia have been successful at increasing and maintaining awareness about malaria.

Table J: General malaria knowledge among women ages 15 – 49 years (2012)	
Indicator	Percentage
Percentage who had heard of malaria	96
Percentage who recognized fever as a symptom of malaria	78
Percentage who reported mosquito bites as a cause of malaria	89
Percentage who reported mosquito nets as a prevention method	86

Source: Zambia National Malaria Indicator Survey 2012. National Malaria Control Program. May 2013. N=2,699.

When queried about the sources of information in the 2012 MIS, women aged 15 - 49 who had heard about malaria (96%), 67% had heard a message from a health provider and 42% had heard it from other sources (including PMI-supported BCC); there was some overlap on sources of information, as expected. Surprisingly, malaria messages of one sort or another are prevalent in the BCC target group as the average number of months since last hearing a malaria message was three months. Although urban dwellers fared a little better in their knowledge about malaria, knowledge was very similar across provinces, wealth indices and levels of education, attesting to the wide dissemination of malaria messages.

As suggested by the national BCC strategy, PMI supports several vehicles for its communication activities. During 2012, PMI partners reached 72,446 individuals through interpersonal communication activities during ITN distribution activities. An orientation package on malaria was developed for community radio stations and 23 radio station staff were trained as malaria BCC focal persons. Work with the SMAGs was continued in support of IPTp and other MIP messaging.

Challenges, opportunities and threats

As Zambia advances in its control of malaria, the behavioral issues it will encounter will be more and more complex and likely demand further investment to resolve them. Improving coverage of some interventions will likely slow down as early adopters of malaria interventions have already been reached while late adopters require additional and innovative convincing to adopt and maintain behaviors that, up to now, they have rejected. Late adopters may not be homogeneously distributed in the population and it will require special efforts to identify and reach them.

Plans and justification

All PMI indicators have human behavior components. They are dependent on the presence of the appropriate commodity and the right incentives and motivation of individuals to use those commodities. A mix of communication activities—mass media, community, and interpersonal—is necessary to inform, promote and maintain the behaviors to prevent and treat malaria. The mix of activities is dependent on the types of behaviors, barriers to behaviors, and whether the behavior has reached a critical mass in the population. However, in all cases, communication activities need to be sustained or the behavior will change over time, as the risk is perceived to have disappeared.

Proposed activities with FY 2014 funding (\$2,000,000)

The NMCP believes that both national and community BCC activities are needed to change and maintain behaviors in malaria prevention and treatment. Each approach reaches different audiences and reinforces key messages. The final mix of mass, community and interpersonal communication activities, technical orientation and geographic locale will be based on evidence that will help focus efforts. A part of the M&E strategy for BCC will be through the regular MIS that collects knowledge and practice information as well coverage estimates (final results of BCC efforts). Emphasis will be to maintain current levels of coverage and expand to cohorts that have been difficult to reach or are recalcitrant in adopting the desired behaviors. The list below provides potential tasks and their rationale.

- National BCC to maintain ownership and proper use of ITNs through national multi-media efforts. Net use lags behind ownership and needs both community and national efforts to achieve an increase. National activities will focus on at least three groups; first, maintenance of appropriate behaviors in the population that is already exhibiting them; second, introduction of new cohorts to the desired behaviors; and, third reaching late adopters and those that are difficult to reach geographically (\$180,000);
- Community-based BCC through NGOs/Faith-based organizations to increase net ownership and use. Zambia has good ITN ownership and use indicators in the general population, but late adopters require a more focused and interpersonal approach (\$600,000);
- National BCC to increase ANC attendance and demand for IPTp. Every year, there is a new cohort of primigravid women. Therefore, continued investment is required for outreach activities related to malaria in pregnancy. National BCC efforts for malaria in pregnancy are part of a larger integrated campaign on maternal health and nutrition that disseminates messages through national radio and television spots (\$100,000);
- Community-based BCC to increase ANC attendance and demand for IPTp. BCC activities through community groups (SMAGs) will be implemented to increase use of IPTp (\$540,000);

- National BCC campaign to increase ACT usage. Care seeking outside the home is relatively high in Zambia. Still, not all patients seek treatment at a health facility. Mass media activities will promote early care seeking and treatment of malaria cases in children under five years of age (\$80,000); and
- Community-based BCC campaign through NGOs/FBOs to increase ACT usage. This activity has the same objectives as the national BCC campaign but its focus is on community-level activities support by NGOs/FBOs (\$500,000).

6. Monitoring and Evaluation

NMCP/PMI Objectives

Along with the new National Malaria Strategic Plan, a new Monitoring and Evaluation Plan has been developed addressing the challenges facing the NMCP as it moves along malaria's epidemiological continuum. The M&E strategy tracks all Roll Back Malaria-recommended indicators.

PMI cooperates with several M&E partners all supporting one M&E plan. PMI provides technical assistance and resources for M&E activities. Institutions such as MACEPA, the World Bank, UNICEF, WHO, and others support the implementation of the MIS and facility surveys, while other partners support routine information systems. PMI provides technical and financial support to the bi-annual MIS and also supports implementing, and maintenance of routine systems.

Monitoring: An important source of data for routine monitoring of malaria is the national HMIS. The HMIS reports monthly on information from all public and mission health facilities and some private facilities. Information flows from the health facility to the district and provincial level before being transmitted to the HMIS group within the MOH. This reporting system also takes advantage of existing data flow for facility-based reporting through District Health Management Teams. The HMIS collects data on suspected and confirmed cases of malaria, malaria case fatality rate (in hospitals), and stocks of medicines and RDTs. Information is also collected on a regular basis on the therapeutic efficacy of antimalarial drugs.

Evaluation: To evaluate outcomes and impact of malaria prevention and control activities in Zambia, nationally-representative surveys such as the DHS and the MIS are performed every two to five years. All-cause mortality in children under five years of age is tracked using the DHS; other child health indicators are also collected by the DHS and used in assessing impact. The most recent DHS was conducted in 2007 and provides a baseline estimate of mortality at the start of PMI. It was conducted during the last month or two of the malaria transmission season and the beginning of the post-transmission season. The next DHS is scheduled for 2013.

A nationwide MIS was carried out in 2006, 2008, 2010, and 2012 to provide information on the coverage of the four major malaria interventions, malaria parasite prevalence and the prevalence

of severe anemia, and are useful for measuring changes over time. PMI supported an MIS in 2008, 2010 and 2012.

A number of other non-PMI financed surveys and evaluations provide additional provincial, district, and community level data on malaria epidemiology in Zambia, and provide useful information on the progress of malaria control efforts. These include health facility surveys to assess health worker performance and the quality of health care, availability of health guidelines, personnel, and equipment, and household surveys to assess knowledge, attitudes, and practices related to malaria. As part of routine supervisory visits to MOH facilities, checklists are also completed on health worker performance and other technical aspects of health care.

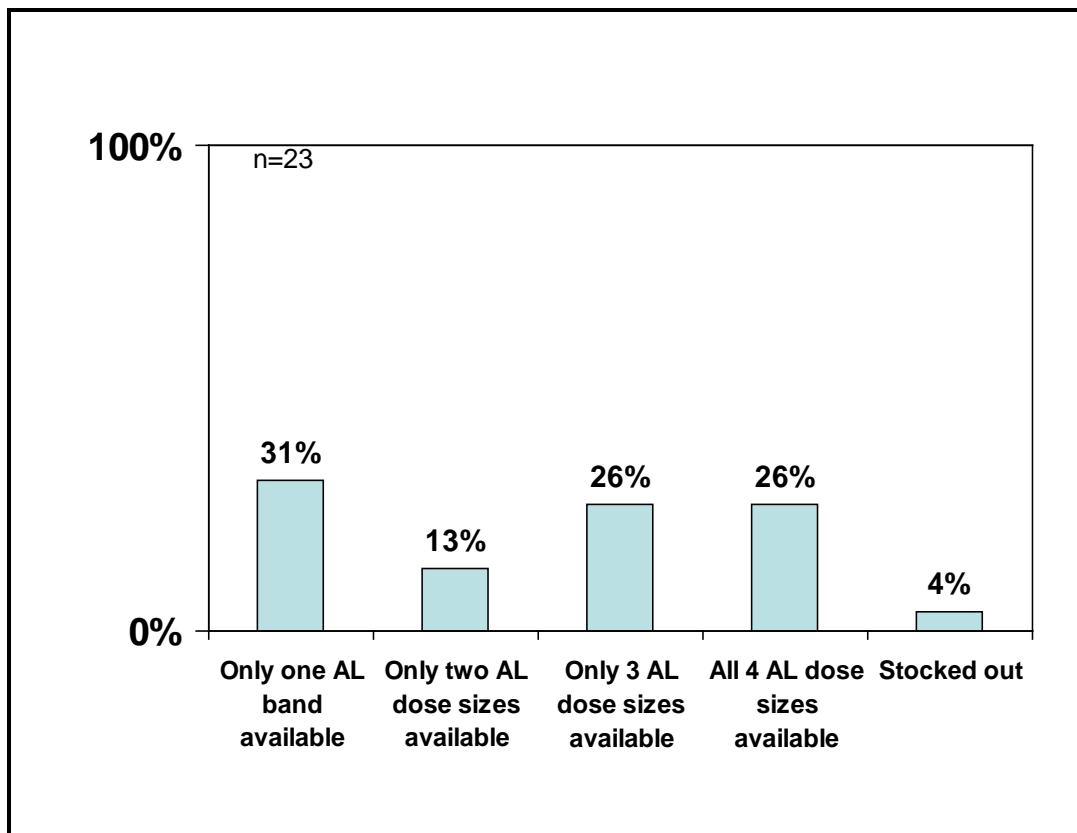
Table L shows household and facility surveys implemented and planned from 2003 to 2015.

Table L: Household and Facility Surveys in Zambia, 2003 – 2015													
Survey	Year												
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
DHS					X						X		
MIS				X		X		X		X			X
RBM Baseline		X											
IMCI Health Facility Survey						X							
WHO Service Availability Mapping				X									
Health Facility Survey			X	X					X			X	X

Progress during the last year

End Use Verification: The EUV collects data on malaria commodities every quarter from 25 – 30 facilities to assess availability. The last report for EUV is for the first quarter of 2013. The survey was conducted in districts in which EMLIP has not been rolled out and which still follow a kit allocation system. Twenty-three health facilities were visited. Only one facility was stocked out of all ACTs and consequently would not be able to treat malaria cases. The rest of the facilities had varying degrees (4% - 35%) of stock outs of the different ACTs. The index of ACT availability shown in Figure 2 indicates that almost 50% of the 23 facilities were stocked out of at least two of the ACT presentations. These stock outs were in spite of the local availability at the DHO warehouse. According to the EUV, none of the facilities visited were stocked out for more than three days in the last three months of SP, RDTs, injectable artesunate or injectable quinine.

Figure 2: Index of AL availability in health facilities of the MOH, EUV, 1st Quarter 2013 in 23 facilities surveyed



Note: each band is a dose packet size.

Source: End Use Verification report, 1st Quarter 2013. NMCP, SIAPS.

Malaria Indicator Survey: PMI supported the implementation of a MIS in 2012 in collaboration with MACEPA and other donors. A report is available and indicators are quoted in previous tables in this MOP.

Health Facility Survey: A health facility survey was completed in 2011 and a report is now available. A nationally representative sample of 148 health facilities of various types and ownership were visited. This survey is significant because it includes observation of case management and provides a picture of how well malaria case management is being performed in health facilities. Additionally, the survey collected data on availability of commodities and stockouts as well information on the preparedness of health services to conduct appropriate case management. Data from the survey is reported elsewhere in this document. This survey was funded by the World Bank and MACEPA with technical support from WHO and PMI. Results from the survey are mentioned in previous tables in this MOP.

Operational Research: PMI supported an operational research project on ITN durability that is currently ongoing (see ITN section) and anticipated to be completed by December 2013. Additionally, final results of a previously PMI-funded study on SP IPTp efficacy have been disseminated to the NMCP and partners (see IPTp section).

Surveillance and Active Infection Detection: Enhanced surveillance in Lusaka District over the last year has identified 133 locally acquired malaria cases and tested over 4,300 persons in their homes and neighborhoods where only 1.7% of those tested by RDT were positive. This activity was initially funded for five health centers. Since the DHO has taken over the operation of this activity in ten clinics (including the original five), PMI has been able to expand to eleven additional health centers such that all health centers in Lusaka District are participating in enhanced surveillance. The Lusaka District Health Office plans to take over all 21 health centers in 2014, no longer requiring PMI funds at this location.

The Lusaka District enhanced surveillance activity supported by PMI served as a model for a Step 1, 2, 3 strategy being implemented in the southern half of the country with MACEPA funding and technical support. In Step 1, the malaria indicators are reported using the Demographic and Health Information System 2 (DHIS2) online platform, with rapid reporting facilitated by weekly uploads of community-level data to a central data repository using mobile phones. Health care workers report malaria cases, lab testing, and drug availability by web-enabled cell phones on a weekly basis. Step 1 is implemented in over 300 facilities in about 23 out of 32 districts in the southern half of the country (Western, Central, Southern, and Eastern Provinces, plus Lusaka District). Step 2 is an operational research activity looking at mass screen and treat in high prevalence areas during low transmission season to decrease the malaria parasite reservoir. Step 3 is a focal screen and treat activity implemented in very low prevalence areas. It uses the ongoing DHIS2 platform to inform CHWs where “hot spots” of transmission activity are located, requiring localized screening and treatment for malaria.

Challenges, opportunities and threats

Areas in Zambia where malaria is declining pose an important challenge to M&E activities. As malaria prevalence declines, standard household surveys will become less and less useful to detect, with appropriate accuracy, changes in malaria population-based indicators. Other methods for monitoring trends and impact—possibly more operationally complex and expensive—will need to be devised and implemented. Additionally, more attention and resources will need to be paid to HMIS as it will become the backbone information source as prevalence declines.

An important challenge to M&E is the capacity of the HMIS system, which uses an Access-based database. The MOH has indicated recently that it will migrate HMIS to DHIS2 software, which has a more robust database application and will allow for internet access to the HMIS data. Other problems include limitations in the timeliness and completeness of HMIS data. These forms are forwarded to higher levels of the MOH, but the information they provide is not tabulated nor disseminated in a timely manner. As community case management is implemented the question of how the data generated at the community level will be incorporated, analyzed and interpreted within the MOH’s regular information system will need to be addressed.

Plans and justification

Some of the proposed activities, such as support to 2015 MIS and surveillance in peri-urban areas, are a continuation of previous M&E activities. Human resource support for M&E at NMCP and resources for training and supervision are also regular activities that have been supported in the past.

Two operations research projects will be continued. The first is an ITN use qualitative study and survey that was proposed and fully-funded in FY 2013. The 2012 MIS showed a gap between overall net ownership; 68% of households owned at least one ITN, and of these households, only 49% had a member who slept under an ITN the night before. In light of the upcoming ITN universal coverage campaign, the NMCP is seeking information to develop and target interventions to improve ITN use and care. This project will be implemented at the beginning of FY 2013. The second research activity proposed in FY 2013, and requiring additional FY 2014 funding, is an evaluation of the patient referral system for severe malaria to inform recommendations for improvement of this system. The current NMCP strategic plan calls for an expansion of community-based diagnosis and treatment of malaria. For severe malaria, this strategy depends on CHWs being able to identify severe malaria, referring the patient, the patient following through with the referral, and the referral health facility providing adequate treatment. Furthermore, in the future, Zambia may consider introducing the WHO-recommended pre-referral treatment with rectal artesunate; however, this depends on a well-functioning referral system. Because of the priority of the ITN use study, this study is anticipated to start in mid-2014 after the ITN use study is complete. Both of these studies will be carried out under the leadership of NMCP with assistance from PMI partners as needed.

Proposed activities with FY 2014 funding (\$811,300)

- Support the Malaria Indicator Survey in 2015. The MIS is a biannual survey that provides the NMCP with standard population-based indicators for monitoring and evaluating malaria interventions. These resources complement resources from FY 2013. This will be the fifth survey with standard methodology and malaria indicators. A data access agreement will be required for this funding to be released (\$200,000);
- Support rollout of Step 1, the DHIS2, to health facilities in one additional district (\$100,000);
- Support a health facility survey in 2015. This survey will be implemented almost four years (2011) after the last one and will provide follow up of data on performance of the malaria program at the facility level, including: case management skills, interpersonal communication, availability of malaria commodities, management of pre-referrals, etc. (\$300,000);
- Provide resources for central-level NMCP personnel to conduct and follow up on data quality audits in all districts and provincial offices in one year. This activity entails visiting officers responsible for collecting, collating and reporting data from health

facilities to higher levels of the health system and ensuring that appropriate quality procedures are followed. No other donors are currently funding this activity (\$100,000);

- CDC technical assistance in monitoring and evaluation activities (\$12,100);
- PMI is supporting operations research in Zambia that will help clarify several important issues. Among them, ITN longevity, reasons for non-use of ITNs, and compliance with referral. CDC will provide two technical assistance visits to support the on-going OR (\$24,200);
- Additional support for OR on evaluation of the patient referral system. As Zambia advances in malaria control, a functioning referral system will be a requirement for success. This evaluation will involve assessing the different levels of the system and how they function vis-à-vis each other (\$75,000).

7. Health System Strengthening and Capacity Building

NMCP/PMI Objectives

A re-organization of the public health sector has been mandated by Parliament in Zambia. Two ministries will conduct malaria activities. The MOH is tasked with surveillance, monitoring and evaluation, resource mobilization, and research. The MOMCH is tasked with service delivery including FANC and malaria case management from the district level to the local level. The exact division of malaria-related activities between these two ministries is still under discussion. The NMCP will remain a department under the Directorate of Disease Surveillance and Research of the MOH, and provides technical and management oversight to malaria activities in public health facilities to the provincial level, as well as supporting and coordinating a wide range of partners, including research and training institutions. The NMCP has 10 staff positions, including a Case Management Officer; Chief Entomologist; Chief Parasitologist; Malaria Epidemiologist; BCC, IRS, Surveillance and Information, and ITN Officers; Medical Laboratory Technologist; and Operations Research Officer. At the provincial and district level, Provincial Health Offices serve as an extension of the MOH, while the District Health Offices have the fiscal authority to manage district health centers and therefore become the main implementers of the IRS program.

The NMCP staff is committed to scaling-up malaria control and prevention activities; however, they are currently understaffed, and need further support to effectively supervise provincial-level activities and effectively coordinate the many partners contributing to malaria efforts in Zambia. In particular, the NMCP and partners recognize its need for additional coordination of IRS activities and advocacy and outreach efforts. The NMCP requires support to conduct provincial-level visits for supervision and program management which MACEPA and PMI are providing. PMI will use its health systems strengthening partner to support the IRS and M&E programs. This partner will provide support for IRS training, mapping of households, entomology expertise and assistance for NMCP in gathering and analysis of malaria data.

Progress during the last year

The PMI Zambia team has been providing technical assistance and capacity building at the NMCP including M&E. Time spent at NMCP by PMI Resident Advisors will continue as a priority. The PMI Zambia team will continue to work closely with the Surveillance and Information Officer to help build capacity in M&E.

USAID partners for BCC, health systems strengthening, and social marketing activities have formed close partnerships with civil society organizations, including NGOs, CBOs, and FBOs in order to scale up the delivery of high-quality malaria prevention and treatment interventions. To enhance national capacity in this area, the PMI BCC contractor will support the NMCP in their national campaigns including campaigns on ITNs and IRS.

The previously PMI-funded malaria focal person at the Zambia WHO Country Office provided technical leadership for the development of the 2010 national malaria program and the development of the national malaria strategic plan for 2011-2015; and development of the national malaria monitoring and evaluation strategic plan for 2011-2015. He also provided technical support to the drafting team to conduct a comprehensive gap analysis, partner mapping, and the writing of the Transitional Funding Mechanism Global Fund Application and its presentation to the Country Coordinating Committee for endorsement before transmission to the Global Fund Secretariat in Geneva. He provided technical support for the therapeutic efficacy testing; the 2012 MIS and the 2011 Health Facility Survey, and for the revision of 2010 national malaria treatment guidelines.

The PMI and Peace Corps have strengthened their partnership by jointly implementing an ongoing ITN durability study (see ITN section). The Peace Corps Malaria Coordinator in Zambia manages this project. Over 35 Peace Corps Volunteers have been engaged at both the provincial and local level within the two provinces where the study is taking place. Additionally, the PMI Resident Advisor provides subject matter expertise to the Peace Corps Malaria Coordinator to educate the over 250 Peace Corps Volunteers in Zambia on malaria.

Challenges, opportunities and threats

The reorganization of the public health sector is still a work in progress. Division of malaria-related activities between the two ministries is under discussion. The NMCP will need to coordinate with the MOMCH on malaria service delivery from the district level down.

Recently unstaffed positions at the NMCP include the Case Management Officer, the ITN Officer, and the Chief Entomologist. The MOH has stated that filling these positions are a priority.

Another opportunity for NMCP capacity building is the initiation of CDC's Field Epidemiology Training Program (FETP) in Zambia in January 2014, with a second cohort starting in September 2014. The FETP program is two-year, applied epidemiology training program that results in a masters degree in public health or masters of science. The program would be open only to Zambian nationals, and as part of the training program, this trainee would be assigned to the NMCP.

To continue ongoing collaborations with Peace Corps, PMI will contribute \$10,000 for housing and travel for the Peace Corps Malaria Coordinator.

Proposed activities with FY 2014 funding (\$190,000)

- Provide funds through a bilateral partner for NMCP staff travel and training. This will support NMCP staff to attend meetings such as the American Society for Tropical Medicine and Hygiene, regional M&E or commodity quantification workshops, (\$30,000);
- One year of support for two Zambian nationals to participate in a Field Epidemiology Training Program. This activity will support long-term local capacity within the MOH, (\$150,000).
- One year of support for housing and travel for the Peace Corps Malaria Coordinator (\$10,000).

8. Staffing and Administration

Two health professionals oversee PMI in Zambia, one representing CDC and one representing USAID. New PMI Resident Advisors for both USAID and CDC have been hired and start in the summer of 2013. All PMI staff members are part of a single interagency team led by the USAID Health Team Leader. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, and managing collaborating agencies. The two resident advisors supervise day-to-day activities including all technical and administrative aspects of the PMI, 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 Health Team Leader. CDC supervises the CDC staff person both technically and administratively. PMI undertakes all technical activities in close coordination with the NMCP and other national and international partners, including the WHO, UNICEF, the Global Fund, World Bank, and the private sector. PMI funds part of support and accounting staff salaries at USAID/Zambia. The staffing and administration budget planned for FY 2013 is \$1,230,000.

The USAID Mission Director approves locally hired staff that support PMI activities at USAID. Because of the need to adhere to specific country policies and USAID accounting regulations, any transfer of PMI funds directly to Ministries or host governments will need to be approved by the USAID Mission Director and Controller.

Table 1
President's Malaria Initiative - Zambia
(FY 2012) Budget Breakdown by Partner

Partner	Geographical Area	Activity	Budget (\$)	%
TBD	National	Procurement of ACTs, RDTs, lab supplies, roll out of logistics system	\$8,550,000	35.6%
MalariaCare	National	Guidance on diagnostics, implementation of QA lab diagnosis, training, purchase of slide sets	\$600,000	2.5%
TBD	National	Support distribution of ITNs	\$400,000	1.7%
TBD (IRS)	20 Districts	Procurement of insecticides for IRS. Support environmental monitoring, insecticide resistance monitoring	\$8,594,500	35.8%
USAID - for Peace Corps support	District	Support OR	\$10,000	0.0%
TBD	National	Strengthening FANC, malaria case management training, drug efficacy, capacity building. Support MIS and surveillance.	\$1,630,000	6.8%
TBD (BCC)	National	BCC at all levels to increase usage of nets, IPTp and ACTs	\$2,000,000	8.3%
CDC IAA	NA	Entomologic monitoring and insecticide resistance, M&E, operations research and FELTP training	\$210,500	0.9%
USAID - CDC Staff	NA	Personnel	\$1,230,000	5.1%
NMCP	NA	OR on ITN longevity, OR on patient referral system, district and provincial data audits, training on M&E, QA, review of case management guidelines	\$575,000	2.4%
Networks	TBD	Provide TA to roll out continuous distribution LLIN strategy	\$200,000	0.8%
Total			\$24,000,000	100%

Table 2
President's Malaria Initiative - Zambia
Planned Obligations for Year 7 (FY 2014) (\$24,000,000)

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total \$	Commodity \$		
PREVENTIVE ACTIVITIES					
Insecticide Treated Nets					
Procurement of LLINs	TBD	3,000,000	3,000,000	National	Procure approximately 800,000 replacement LLINs
LLIN Distribution	TBD	400,000		National	Support the distribution of LLINs, including transportation and other logistics, to districts and health facilities.
Provide technical assistance to develop innovative, effective strategies for sustaining high LLIN coverage	TBD	200,000		TBD	Roll out innovative approaches for LLIN distribution in selected provinces/districts
SUBTOTAL ITNs		3,600,000	3,000,000		
Indoor Residual Spraying					
Procurement of IRS commodities and support to other components of the program.	TBD	6,644,500	6,644,500	23 districts	Procure insecticides and other IRS supplies/equipment for spraying up to 800,000 households, pending selection of insecticide and associated costs. Support environmental monitoring and environmental assessment. (includes additional OP or carbamates) *This is not an expansion of the number of structures sprayed, rather an administrative expansion resulting from a division of the some of the original 20 districts.
Implementation of IRS program, monitoring and evaluation, storage/incinerator, community sensitization, geocoding, BCC	TBD	1,750,000		23 districts	Training, monitoring and evaluation, and BCC for IRS; pesticide storage, waste disposal. (includes 50,000 for M&E position)
Entomological monitoring and insecticide resistance monitoring and support to insectary	TBD	200,000		NA	Support insectary and entomological monitoring

CDC technical assistance on entomological monitoring and insecticide resistance	CDC IAA	24,200		NA	Provide technical assistance on entomological monitoring and insecticide resistance.
SUBTOTAL IRS		8,618,700	6,644,500		
Intermittent Preventive Treatment in Pregnancy					
Strengthening of FANC for IPTp	TBD	400,000		National	Strengthen FANC in existing provinces and expanding to all ten provinces.
SUBTOTAL IPTp		400,000	0		
SUBTOTAL PREVENTIVE		12,618,700	9,644,500		
Case Management					
Diagnosis					
Procure rapid diagnostic tests	TBD	2,000,000	2,000,000	National	Procure approximately 3,500,000 RDTs for health facilities
Strengthen malaria diagnostic capabilities at the health center level	MalariaCare	600,000		National	Local malaria microscopy preparatory course and in-country accreditation course for provincial and district level. OTSS support. Build slide bank.
Procure reagents and supplies	TBD	50,000	50,000	National	Procure reagents and supplies for microscopy
SUBTOTAL -- Diagnosis		2,650,000	2,050,000		
Treatment & Pharmaceutical Management					
Procure ACTs	TBD	2,500,000	2,500,000	National	Procure approximately 3,000,000 ACTs for the treatment of malaria in facilities and communities
Strengthen facility- and community-based treatment with ACTs	TBD	900,000		National	Training, supervision support, to improve service delivery in health facilities including treatment of malaria, and to assist with roll-out into communities through CHWs (\$50,000 for NMCP supervision) (\$550,000 for training workers at health facilities and 300,000 for training CHWs in iCCM).
Supervisory visits from central level	NMCP	100,000		National	Supervisory visits from central level to provincial health facilities to review malaria case management.
Roll out the national logistics and pharmaceutical management system for malaria commodities	TBD	1,000,000		National	Strengthen supply chain and logistics for all malaria commodities and essential drugs, including Pharmaceutical Regulatory Authority and the End Use Tool

SUBTOTAL - Treatment & Pharmaceutical Management		4,500,000	2,500,000		
SUBTOTAL CASE MANAGEMENT		7,150,000	4,550,000		
BCC					
National BCC to maintain ownership and proper use of ITNs through national multimedia efforts	TBD	180,000		National	BCC for net usage at national level
Community-based BCC through NGOs/FBOs to increase net ownership and use	TBD	600,000		28 districts	BCC for net usage at community level in 28 districts
National BCC to increase ANC attendance and demand for IPTp	TBD	100,000		National	BCC for IPTp promotion
Community-based BCC to increase ANC attendance and demand for IPTp	TBD	540,000		28 districts	BCC for IPTp at community level in 28 districts
National BCC campaign to increase ACT usage	TBD	80,000		National	BCC for promotion of care seeking and ACT usage
Community-based BCC campaign through NGOs/FBOs to increase ACT usage	TBD	500,000		28 districts	BCC for community-level care seeking and ACT usage
SUBTOTAL BCC		2,000,000			
Monitoring and Evaluation/Operations Research					
Support for MIS	TBD	200,000		National	Fund 2015 MIS
Surveillance in one district	TBD	100,000		One district	Continue enhanced peri-urban surveillance in one district
Support for a health facility survey	NMCP	300,000		National	Support health facility survey
District and provincial data audits	NMCP	100,000		NMCP	Resources for central level personnel to conduct and follow up data quality audits in all districts and provincial offices in one year
Technical assistance for M&E	CDC-IAA	12,100		NA	Technical assistance on monitoring and evaluation issues.
Technical assistance for OR	CDC-IAA	24,200		NA	Technical assistance on operations research
Operations Research -- Referral System	NMCP	75,000		NA	Research the state of research systems for malaria at various levels of the health care system
SUBTOTAL - M & E		811,300	0		
Health System Strengthening and Capacity Building					
Training and travel to build capacity of NMCP staff	TBD	30,000		National	Fund travel and registration to international meetings such as MIM, SARN, and ASTMH and regional trainings. Support strategy development

Field Epidemiology Training Program	CDC-IAA	150,000		National	Training for two Zambian nationals in field epidemiology
Peace Corps third year volunteer	USAID	10,000		NA	Housing and travel for one volunteer
SUBTOTAL Capacity Bldg.		190,000	0		
In-country Staffing and Administration					
In-country Staffing and Administration	CDC/USAID	1,230,000		NA	Salary, travel and in-country support for resident advisors
SUBTOTAL - In-country Staffing and Admin	CDC/USAID	1,230,000	0		
GRAND TOTAL		24,000,000	14,194,500		