

This Malaria Operational Plan has been approved by the U.S. Global Malaria Coordinator and reflects collaborative discussions with the national malaria control programs and partners in country. The final funding available to support the plan outlined here is pending final FY 2015 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.



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## PRESIDENT'S MALARIA INITIATIVE



**PRESIDENT'S MALARIA INITIATIVE**

**Nigeria**

**Malaria Operational Plan FY 2015**

# Table of Contents

<b>ABBREVIATIONS and ACRONYMS</b> .....	<b>3</b>
<b>I. EXECUTIVE SUMMARY</b> .....	<b>5</b>
<b>II. STRATEGY</b> .....	<b>9</b>
1. Introduction .....	9
2. Nigeria malaria situation .....	12
3. Country health system delivery structure and Ministry of Health organization .....	14
4. National malaria control strategy .....	15
5. Integration, collaboration, and coordination .....	16
6. PMI goals, targets, and indicators .....	19
7. Progress on coverage/impact indicators to date .....	19
8. Challenges, opportunities, and threats .....	25
9. PMI support strategy .....	26
<b>III. OPERATIONAL PLAN</b> .....	<b>27</b>
<b>PREVENTION</b> .....	<b>27</b>
1. Insecticide-treated nets (ITNs) .....	27
2. Indoor residual spraying (IRS) .....	32
3. Malaria in Pregnancy (MIP) .....	38
4. Case Management: Diagnosis and Treatment .....	43
5. Pharmaceutical and commodity management .....	50
<b>CROSS CUTTING</b> .....	<b>53</b>
7. Advocacy, communication, and social mobilization .....	53
8. Monitoring and evaluation .....	57
9. Operational Research .....	62
10. Health system strengthening/capacity building .....	63
11. Staffing and administration .....	66
<b>IV. TABLES</b> .....	<b>68</b>

## ABBREVIATIONS and ACRONYMS

ACSM	Advocacy, Communication, and Social Mobilization
ACT	Artemisinin-based combination therapy
AMFm	Affordable Medicines Facility for malaria
ANC	Antenatal care
BCC	Behavior change communication
CDC	U.S. Centers for Disease Control and Prevention
CHW	Community Health Worker
CMS	Central medical store
DDIC	Direct Delivery and Information Capture
DfID	United Kingdom Department for International Development
DHIS	District health information system
DHS	Demographic and Health Survey
DPRS	Department of Planning, Research and Statistics
DOD	U.S. Department of Defense
DOT	Directly observed therapy
EPI	Expanded Program on Immunization
EUV	End-use verification
FANC	Focused antenatal care
FELTP	Field Epidemiology and Laboratory Training Program
FMOH	Federal Ministry of Health
FSN	Foreign service national
FY	Fiscal year
GHI	Global Health Initiative
GF	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GoN	Government of Nigeria
HC3	Health Communication Capacity Collaborative
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HMIS	Health Management Information System
iCCM	Integrated community case management
IPC	Interpersonal communication
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated net
LGA	Local Government Area
LLIN	Long lasting insecticide treated net
LMIS	Logistics Management Information System
M&E	Monitoring and Evaluation
MAPS	Malaria Action Program for States
MDG	Millennium Development Goal
MICS	Multiple indicator cluster survey
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MNCH	Maternal, Newborn and Child Health
MOP	Malaria Operational Plan

NAFDAC	National Agency for Food, Drug Administration and Control
NFELTP	Nigeria Field Epidemiology and Laboratory Training Program
NMEP	National Malaria Elimination Program
OR	Operational research
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PMI	U.S. President's Malaria Initiative
PPMVs	Proprietary Patent Medicine Vendors
PSM	Procurement and Supply Chain Management
QA	Quality assurance
QC	Quality control
RA	Resident Advisor
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
RIA	Rapid Impact Assessment
SFH	Society for Family Health
SMEP	State Malaria Elimination Program
SP	Sulfadoxine-pyrimethamine
SuNMaP	Support for the National Malaria Program
TSHIP	Targeted State High Impact Project
Under-five	Under five years old
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
VOA	Voice of America
WHO	World Health Organization
WRAIR	Walter Reed Army Institute of Research
WRP	Walter Reed Program

## I. EXECUTIVE SUMMARY

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

The President's Malaria Initiative (PMI) is a core component of the GHI, along with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS), and tuberculosis. PMI was launched in June 2005 as a five-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI was extended and, as part of the GHI, the goal of PMI was adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. Expansion was authorized to additional PMI countries, including Nigeria, the Democratic Republic of Congo and up to seven additional high-burden countries. The goal for any new countries added after the initial 15 is to achieve a 50% reduction in malaria-related mortality in at-risk populations by 2015 as compared with 2009-2010 baseline levels. These goals will be achieved by reaching 85% coverage of the most vulnerable groups – children under five years of age (under-five) and pregnant women – with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), insecticide-treated nets (ITNs), intermittent preventive treatment for pregnant women (IPTp), and indoor residual spraying (IRS).

With a population of about 172 million and reporting more deaths due to malaria than any country in the world, Nigeria became the seventeenth PMI country in 2010. Malaria accounts for 60% of outpatient visits and 30% of hospitalizations among children under-five in Nigeria. The Demographic and Health Survey (DHS) 2013 reported an infant mortality of 69 per 1,000 live births and an under-five mortality of 128 per 1,000 live births in the preceding five-year period. Impressive progress has been made in malaria control efforts in recent years. The proportion of households owning one or more ITNs increased from just 8% in the DHS 2008 to 42% in the Malaria Indicator Survey (MIS) 2010 and to 50% in DHS 2013. The proportion of children under-five reported to have slept under an ITN the night before the survey increased from 6% in the DHS 2008 to 29% in the MIS 2010 but then dropped to 17% in DHS 2013.

Donor support to malaria control in Nigeria has increased dramatically in recent years. Nigeria was the recipient of a \$600 million Global Fund to Fight AIDS, Tuberculosis, and Malaria (GF) Round 8 award that was signed in 2008. Phase II of this grant, which started in August 2012, has a total approved amount of \$150 million. Combined with the last six months of funds in the Phase I grant, the total budget for the full three-year period of Phase II, from November 2011 until October 2014, is \$225 million. Nigeria was also one of nine countries to pilot the Affordable Medicines Facility-malaria (AMFm). The goal of AMFm was to reduce the retail price of ACTs to make them as affordable as many of the cheapest antimalarial monotherapies. The pilot activities are now being transitioned to full integration under the GF. In 2009, a second phase of the World Bank Malaria Booster Program provided \$100 million in addition to the

original commitment of \$180 million to support a broad set of malaria interventions in seven states. The Booster Program ended in June 2013, but the country had requested extensions of the project to June 2014, and then again to March 2015. The United Kingdom Department for International Development (DfID) launched a five-year £50 million (about \$80 million) malaria program in 2008. Currently, the program is in a period of no-cost extension until March 2015.

Nigeria's large population and decentralized system make it virtually impossible for one donor to provide meaningful assistance to the entire population. The National Malaria Elimination Program (NMEP) works with donors to ensure that the six geopolitical zones, 36 states, and the Federal Capital Territory of Abuja receive support proportional to the burden of malaria and the level of donor assistance, and that assistance is spread to reach as many states as possible. The United States Agency for International Development (USAID) has funded malaria activities in Nigeria over the past decade. When Nigeria became a PMI country with fiscal year (FY) 2011 funding, it received \$43.5 million. The final FY 2012, 2013, and 2014 budgets were \$60.1 million, \$73.3 million, and \$75 million, respectively. The FY 2015 PMI Operational Plan for Nigeria was developed during a planning visit carried out in May 2014 by USAID and the Centers for Disease Control and Prevention (CDC) headquarters' and field staff with the leadership of the NMEP. The team obtained input from all key national and international partners involved in malaria prevention and control in the country. The PMI plan supports the National Malaria Strategic Plan 2014-2020 and is coordinated with national and international partners to complement overall funding and resources. In FY 2015, the program will continue to focus on eleven states: Akwa Ibom, Bauchi, Cross River, Kebbi, Nasarawa, Sokoto, Zamfara, Benue, Ebonyi, Oyo, and Kogi. With FY 2015 funding, PMI will support a comprehensive package of malaria interventions to reach an estimated population of about 50 million in those eleven of the 36 Nigerian states. The FY 2015 budget is \$70 million.

### **Insecticide-treated Nets (ITNs):**

Under the NMEP's Malaria Strategic Plan 2014-2020, Nigeria aims for universal coverage with ITNs of all at-risk populations. Universal coverage is defined as one ITN for every two persons. The NMEP endorses a mixed model for ITN distribution, incorporating mass free ITN replacement campaigns; continuous distribution to supplement campaigns and maintain universal coverage; private sector involvement to generate demand for and use of ITNs; and monitoring of ownership, use, and ITN physical integrity to inform program strategy. PMI supports the NMEP to achieve and maintain its coverage and use targets, especially in the 11 PMI focus states. To do this, PMI will support mass, free ITN replacement campaigns and continuous distribution through antenatal care (ANC) and immunization channels; and help identify and scale up new distribution approaches.

Ownership of at least one ITN in a household increased from 42% in the 2010 MIS to 50% in the DHS 2013. However, ITN use among children under-five and pregnant women appeared to decrease over the same period. Seasonality may explain much of this difference; the MIS is conducted in the rainy season when ITN use is highest, whereas the DHS is conducted in the dry season. Results of an upcoming MIS in 2014 may provide a clearer picture of ITN use during the transmission season. In late 2013, PMI supported both ITN procurement and operations for the mass campaign in Sokoto State, and will fund four more campaigns in 2014. To sustain coverage between campaigns, PMI also supported continuous distribution strategies through ANC and

immunization clinics, and piloted new distribution methods through schools and community-based channels.

For FY 2015, PMI will continue to support the NMEP's mixed model for ITN distribution, identifying opportunities to scale up new continuous distribution approaches. Procurement of 6.5 million ITNs will support the mass campaign in Oyo State and continuous distribution in all PMI focus states. Other investments will cover logistic and operational support for ITN distribution, along with behavior change communication (BCC) efforts to promote ITN ownership and use. To inform future ITN replacement strategies, PMI will also support monitoring of ITN durability (especially physical integrity and attrition) in select sites.

### **Indoor Residual Spraying (IRS):**

The Nigerian National Malaria Strategic Plan 2014-2020 calls for scale-up of IRS to cover 20% of all households in Nigeria, or about 7 million households, by the end of 2013. The World Bank had supported IRS in seven states with PMI participating in a pilot in two local government authorities (LGAs) of Nasarawa State, covering approximately 65,000 structures and protecting a population of over 300,000 in 2011 and 2012. With FY 2013 funding, PMI shifted funding from IRS implementation to a NMEP led national surveillance program to determine vector bionomics and insecticide resistance status, while supporting IRS advocacy and training. PMI seeks to support the transition of IRS operations to the state and/or local government, while continuing to assist the NMEP to update its IRS strategy and train trainers on IRS. With FY 2015 funding, PMI will support the NMEP by maintaining seven entomologic surveillance sites, one in each of seven states, covering each of the five ecological zones in Nigeria to gain basic vector bionomics data and monitor vector susceptibility to World Health Organization (WHO) approved IRS insecticides across the country. Training and equipment support will build capacity for entomological expertise at the federal and state levels.

### **Intermittent Preventive Treatment for Pregnant Women (IPTp):**

Scale-up of IPTp continues to be a challenge in Nigeria. According to the DHS 2013, only 61% of pregnant women had access to antenatal care (ANC) from a skilled provider and 63% of pregnant women delivered at home. The ANC attendance showed marked variations across states and between rural and urban settings. For example in Sokoto State, access to ANC was only 17.4% while in Osun State it was 98.2%; rural and urban ANC attendance were 46.5% and 86%, respectively. In DHS 2008, 5% of pregnant women received two or more of the recommended doses of IPTp, with an increase to 13% in the MIS 2010 and 15% in DHS 2013. A number of factors contribute to the low uptake of IPTp including sporadic availability of sulfadoxine-pyrimethamine (SP) and poor quality of ANC service delivery.

To address these issues, with FY 2013 and FY 2014 funding, PMI procured SP for IPTp as a part of focused antenatal care (FANC) in its 11 focus states. PMI also provided technical assistance at the federal and state levels to update the malaria in pregnancy (MIP) guideline and strategy per WHO guidance, review and update the MIP training manuals, train health workers, and provide job aids on IPTp. With FY 2015 funding, PMI will advocate for the 11 PMI focus states to introduce a budget line for purchase of SP in their annual work plans, will pilot community focused ANC with IPTp in two states in Northern Nigeria where ANC attendance is below 25%,

and improve IPTp coverage through behavior change and communication for communities and health workers.

### **Case Management:**

The case management of malaria is undergoing a process of transition in Nigeria. With the support of PMI and other agencies, the NMEP has already begun to implement measures consistent with the most recent WHO case management guidelines. This includes formulating policy that supports diagnostic testing with either microscopy or a rapid diagnostic test (RDT) for all people with suspected malaria prior to instituting antimalarial treatment. PMI has aided this endeavor by supplying RDTs to public health care facilities. In addition, PMI has funded training in the use of RDTs and identification of malaria parasites with microscopy. PMI has also backed strengthening of quality assurance/quality control (QA/QC) programs of both RDTs and microscopy.

Also consistent with WHO guidance, the NMEP has shifted their first-line therapy of severe malaria from quinine to injectable artesunate, an antimalarial with superior efficacy. Over the past year, training sessions have introduced this new option to health care providers. Following these sessions, PMI as well as other agencies have procured and delivered injectable artesunate to facilities throughout the country. PMI will increase the number of treatments delivered in future years as more providers complete training.

A remaining challenge to proper case management of malaria is the fact that a large proportion of Nigerians seek care from patent and proprietary medicine vendors (PPMVs). PPMVs often provide antimalarials to febrile people seeking medical attention in their businesses, a practice not supported by Nigerian policy or law. This unregulated and undocumented activity poses many problems, including lack of proper treatment of non-malarial disease, ineffective treatment of malaria, promotion of antimalarial resistance, lack of proper follow-up, and lack of case recording for public health surveillance. Based on findings from the 2014 pilot studies which will be available in August 2014, PMI will expand provision of RDTs and ACTs (and training in the use of both) to PPMVs in order to upgrade testing and treatment services in the private sector.

### **Advocacy, Communication and Social Mobilization:**

Nigeria's updated National Malaria Advocacy, Communication and Social Mobilization Strategic Framework and Implementation Plan recommend various channels of communication based on the target audiences. Malaria educational messages generally reach households using radio, community drama, printed materials, community and religious leaders, and through community support groups and household visits of volunteers. PMI supports behavior change communication as a cross-cutting activity for all key malaria interventions. Specific activities include increasing and improving the information delivered by facility-based and community health workers, transmitting malaria educational messages in local languages through radio, and using community volunteers for information dissemination. In addition, specific BCC interventions will target health care workers to increase adherence to test results and improve interpersonal communication. PMI will place greater emphasis on state-level activities and

capacity to implement BCC interventions. PMI continues to promote the updated National Advocacy Kit to harmonize malaria educational messages.

### **Monitoring and Evaluation:**

The PMI Nigeria plan includes a strong monitoring and evaluation component to identify and correct problems in program implementation and measure progress against goals and targets. In the 11 focus states, PMI is strengthening the harmonized Health Management Information System (HMIS) so that routine malaria data is more accurate and reliable from the health facility level to the state level, and that this information is analyzed and used for planning and decision-making. Harmonized HMIS tools as well as a Logistics Management Information System for malaria commodities are now being implemented, with PMI supporting the instructional manual and training of trainers. PMI supported the Nigeria DHS 2013 and the national MIS planned for 2014. To build capacity in monitoring and evaluation within the NMEP and state malaria programs, PMI will support the training of Fellows in the Nigeria Field Epidemiology and Laboratory Training Program (NFELTP), in collaboration with CDC. PMI is also exploring increased support for operational research based on nationally articulated priorities.

## **II. STRATEGY**

### **1. Introduction**

The United States Agency for International Development (USAID) has been supporting malaria control efforts in Nigeria for more than ten years. The level of USAID malaria funding increased to about \$7 million annually in fiscal year FY 2007 and FY 2008, and then more than doubled to about \$16 million in FY 2009 and FY 2010. The following year, 2011, was Nigeria's first as a PMI country with initial funding of \$43.5 million. Since then, funding has increased yearly from \$60.1 million in FY 2012 to \$73.3 million for FY 2013 and \$75 million for FY 2014.

PMI started in Nigeria in 2011 first in three states of Cross River, Zamfara, and Nasarawa. In 2012, PMI expanded to six more states and in 2013 to two more states to make a total of 11 PMI focus states (Table 1). In each of the states, PMI works in all the Local Government Authorities (LGAs) (a total of 230 LGAs from 11 states). The total population (2016 projection) is 52 million. However, PMI supports only a proportion of health facilities within the 11 states, with Global Fund supporting another proportion. There are plans to expand the number of facilities being supported within each state. This also explains the significant increase in the commodities for FY2015. The expansion plan will more than double the number of health facilities per LGA (expand coverage to a minimum of 8 facilities or more per LGA), and the population benefiting from PMI support. PMI Nigeria will maintain the same 11 states as providing support to a new state would spread resources very thinly and compromise the ability to show meaningful outcomes and impact. Rather, expanding coverage within the existing 11 PMI-supported states will allow for greater coverage and potential for measurable impact.

**Table 1: The 11 PMI Focus States by Start-up date and Intervention**

Sn	State	Popn (2014 projection)	Start-up year	PMI Interventions						Implementing mechanism	Other Partners
				ITNs	MIP/ IPTp	Case Magt	iCCM	IRS/ Ento Mon	BCC		
1	Cross River	3,731,830	2011	X	X	X			X	MAPS, DELIVER, NetWorks	Global Fund
2	Nasarawa	2,406,891	2011	X	X	X		X	X	MAPS, AIRS, DELIVER, NetWorks	Global Fund
3	Zamfara	4,210,915	2011	X	X	X			X	MAPS, DELIVER, NetWorks	DfiD through PRRINN
4	Bauchi	6,040,836	2012	X	X	X	X		X	TSHIP, DELIVER	World Bank
5	Sokoto	4,775,609	2012	X	X	X		X	X	TSHIP, DELIVER	Global Fund
6	Benue	5,450,220	2012	X	X	X			X	MAPS, DELIVER	Global Fund
7	Ebonyi	2,807,626	2012	X	X	X	X		X	MAPS, DELIVER, MalariaCare	Global Fund
8	Oyo	7,222,950	2012	X	X	X			X	MAPS, DELIVER	Global Fund
9	Kogi	4,209,159	2012	X	X	X			X	MAPS, DELIVER	Global Fund
10	Akwa Ibom	5,063,939	2013	X	X	X			X	MAPS, DELIVER, HC3	World Bank
11	Kebbi	4,183,507	2013	X	X	X			X	MAPS, DELIVER, HC3	UNICEF/Gates Foundation

**Notes:**

WRAIR supports capacity building for malaria diagnosis at national level

ESMPIN supports integrated health communications including malaria particularly mass media

PQM works to strengthen regulatory capacity of National Drug Authority and drug quality monitoring

The World Bank Malaria Booster project was extended up to March 2015

UNICEF is planning to support iCCM in Kebbi working with Gates Foundation

PRRINN (Partnership for Reviving Routine Immunization in Northern Nigeria) was funded by DfiD and the Norwegian Government

## ***Global Health Initiative and PMI***

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

Malaria prevention and control is a core component of the GHI, along with programs to address HIV/AIDS and tuberculosis. PMI was launched in June 2005 as a five-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI was extended through FY 2014 and, as part of the GHI, PMI's goal was adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. The act called for an expansion of PMI to additional countries such as Nigeria, Democratic Republic of Congo and at most seven other high-burden countries. In 2010 and 2011, expansion countries included Nigeria, Democratic Republic of Congo, Guinea, and Zimbabwe. The goal for these new countries is to achieve a 50% reduction in malaria-related mortality in the at-risk population by 2015 as compared with 2009-2010 baseline levels. These goals will be achieved by reaching 85% coverage of the most vulnerable groups – children under-five and pregnant women – with proven preventive and therapeutic interventions, including ACTs, ITNs, IPTp, and IRS.

In implementing this initiative, the USG is committed to working closely with host governments and within existing national malaria control plans. Efforts are coordinated with other national and international partners, including GF, Roll Back Malaria (RBM), United Kingdom Department for International Development (DfID), the World Bank Malaria Booster Program, and the non-governmental and private sectors, to ensure that investments are complementary and that RBM and Millennium Development Goals (MDGs) are achieved. Country planning and evaluation activities for PMI are done in close collaboration with the NMEP and other partners. This FY 2015 Malaria Operational Plan (MOP) presents a detailed implementation plan for Nigeria's fifth year as a PMI country. It is strongly aligned with the NMEP's finalized draft FY 2014-2020 strategic plan. The FY 2015 MOP was developed in close consultation with the NMEP leadership and with input from key national and international partners for malaria control and prevention in Nigeria. The MOP briefly reviews the current status of malaria control, prevention policies, and interventions and identifies challenges and unmet needs to achieve PMI goals. This document was developed during a visit to Nigeria by USAID and Centers for Disease Control and Prevention (CDC) staff in May 2014. Due to the large population at risk of malaria in Nigeria and the strong support of other donors, PMI focuses activities on 11 states selected in consultation with the NMEP, reaching an estimated population of about 50 million at risk of malaria. The PMI FY 2015 budget for Nigeria is currently set at \$70 million.

Figure 1: PMI Focus states, Nigeria, Fiscal Year 2015



## 2. Nigeria malaria situation

Nigeria is the most populous country in Africa with an estimated annual growth rate of about 2.6% and an estimated total population of approximately 172 million for 2014. It comprises six geopolitical zones, 36 states (plus the Federal Capital Territory of Abuja), and 774 local government authorities (LGAs), with an average population of about 200,000 residents per LGA (Figure 1). Each state has an elected governor, an executive council, and a house of assembly with the power to make state laws. State governments have substantial autonomy and exercise considerable authority over the allocation and utilization of their resources, limiting the influence of the federal government over state and local government affairs.

Figure 2: Map of Nigeria with geopolitical zones



Nigeria is ranked 153 out of 187 countries in the 2013 United Nations Development Program Human Development Index. Under-five mortality is estimated at 128 per 1,000 live births and maternal mortality is estimated at 576 per 100,000 live births, according to DHS 2013. For nearly all health and socioeconomic indicators, the south of the country is significantly better off than the north. For example, under-five mortality rates are about one and a half times higher and maternal mortality rates are three times higher in some northern zones than in the rest of the country. The South West zone has the lowest under-five mortality. The country's gross domestic product has increased during the past decade, with oil revenues as the main driver of the economy. In spite of a high income from crude oil sales, the economic growth has not improved the welfare of the majority of the population or the high incidence of poverty.

Malaria is transmitted throughout Nigeria, with 97% of the population at risk. Five ecological zones define the intensity and seasonality of transmission and mosquito vector species: mangrove swamps; rain forest; Guinea-savannah; Sudan-savannah; and Sahel-savannah. The duration of the transmission season decreases from year-round transmission in the south to three months or less in the north. *Plasmodium falciparum* is the predominant malaria species. The major vectors are *Anopheles (An.) gambiae* and *An. funestus*. Within the *An. gambiae* complex, *An. arabiensis* predominates in the north and *An. melas* in the mangrove coastal zones.

According to the NMEP Strategic Plan 2014-2020, malaria accounts for about 60% of outpatient visits and 30% of hospitalizations in Nigeria. It is a leading cause of mortality in children under-five, and is responsible for an estimated 300,000 total deaths annually. It also contributes to an estimated 11% of maternal mortality, 25% of infant mortality, and 20% of under-five mortality. Results from MIS 2010 showed that more than half of patients with fever first seek treatment in the private sector. Only 26% of household members with fever first sought treatment at a government facility. This varied by geopolitical zone (highest in the northwest at 42% and the lowest in the southeast at 7%); by age (highest for children under-five at 32%); and by residence (urban 22% and rural 27%).

### 3. Country health system delivery structure and Ministry of Health organization

The public health care system is divided into three tiers, each associated with one of the administrative levels of government: federal, state, and LGA. While the 774 LGAs are the constitutionally-designated providers of primary health care, they are the weakest arm of the health care system. There are more than 13,000 primary health care facilities nationwide. In addition to the federal Ministry of Health (FMOH), the National Primary Health Care Development Agency, a centrally-funded agency, has the mandate to support the promotion and implementation of high-quality and sustainable primary health care. This agency is particularly active in development of community-based systems and functional infrastructure as well as ensuring that infants are fully immunized against vaccine-preventable diseases. The federal budget covers tertiary care and disease control programs, including malaria control; state budgets pay for secondary care; and LGA budgets cover primary care. The amount of government spending on health and malaria is difficult to determine, as funding levels vary and actual spending does not always match the original budget. Health accounts have not yet been established, but it is believed that the government spends less than 5% of the national budget on health.

There are a number of weaknesses in Nigeria's public health system, including:

- Inadequate, inaccessible, and poor quality service delivery, particularly at the periphery, where most primary health care facilities offer only a limited package of services
- Lack of necessary referral linkages between the different levels of health care
- Weak logistics systems for commodities, with as many as six separate vertical commodities management systems with little or no coordination between them
- Poorly maintained infrastructure with many buildings and equipment in need of repair and/or maintenance
- Weak institutional capacity with inadequate supervision of health services

Led by a coordinator, the NMEP has six branches – Program Management, Procurement and Supply Management, Integrated Vector Management, Case Management, Monitoring and Evaluation, and Advocacy, Communication, and Social Mobilization (ACSM) – with a total of about 80 staff members. At the national level, the NMEP is responsible for establishing policies, guidelines, and norms. Each state and LGA has a RBM malaria officer (local civil servant) who oversees malaria activities in his or her area.

The private health care system is robust and provides care for a substantial proportion of the Nigerian population. It consists of tertiary, secondary, and primary health care facilities, as well as pharmacies, patent and proprietary medicine vendors (PPMVs), and unregistered drug sellers. More than 70% of all secondary facilities and about 35% of primary health care facilities in Nigeria are private, and 63% of all fever cases seek treatment first in the private sector (MIS 2010). Services provided by the private sector may be subsidized, as in missionary health facilities, or full-cost, as in privately owned clinics and hospitals. The latter are more common in urban areas. In rural areas, about two-thirds of the population lives within five kilometers of a primary health care clinic. The estimated 36,000 health care facilities nationwide are fairly evenly distributed between urban and rural areas.

#### 4. National malaria control strategy

The new NMEP Strategic Plan 2014-2020 is based on the National Strategic Health Development Plan 2010-2015 and is in line with national health and development priorities. The strategy outlines the provision of a comprehensive package of integrated malaria prevention and treatment services through the community, primary, secondary, and tertiary levels. The strategy also defines the roles of each health care worker relative to malaria case management and control across all health care services including public, private (including for-profit and not-for-profit), and traditional health providers.

With the vision of having a malaria-free Nigeria and the goal of reducing malaria burden to pre-elimination levels and bringing malaria-related mortality to zero, the objectives of the new NMEP Strategic Plan for the period 2014-2020 are to:

- Provide a least 80% of targeted populations with appropriate preventive measures by 2020
- Test all care-seeking persons with suspected malaria using RDTs or microscopy by 2020
- Treat all individuals with confirmed malaria seen in private or public facilities with effective antimalarial drugs by 2020
- Provide adequate information to all Nigerians such that at least 80% of the population habitually takes appropriate malaria preventive and treatment measures as necessary by 2020
- Ensure the timely availability of appropriate antimalarial medicines and commodities required for prevention and treatment of malaria in Nigeria wherever they are needed by 2018
- Ensure at least 80% of health facilities in all local government authorities report routinely on malaria by 2020, progress is measured, and evidence is used for program improvement

The government of Nigeria (GoN) supports the provision (free-of-charge) of ITNs, IPTp, IRS, larval source management, and diagnosis and treatment of uncomplicated and severe malaria under the new strategic plan 2014-2020.

## 5. Integration, collaboration, and coordination

### *Key International Partners*

Nigeria has benefited from increasing support from various partners for malaria control. Currently, the largest funding partners are GF, the World Bank, and DfID. Other key partners include the Clinton Health Access Initiative, the United Nations Children's Fund (UNICEF), and the World Health Organization (WHO). There is also increasing corporate sector support for malaria including ExxonMobil, Dutch Shell, and the Dangote Foundations.

Prior to 2014, Nigeria had three approved grants for malaria from GF, the latter two designating the NMEP as the Principal Recipient. In March 2014, GF launched the New Funding Model, which consolidated funding for Nigeria's existing malaria grants and added approximately \$316 million in additional funding for a combined total of \$499 million for 2014-2017 (see Table 1). The NMEP submitted a Concept Note to GF on June 15, 2014, with a total request budget of \$605 million for 2015 and 2016. Following review by the Technical Review Panel and the grant processes, a final budget is expected to be approved by the GF Board before December 2014.

**Table 1: Global Fund New Funding Model Allocation for Nigeria**

<b>Disease Component</b>	<b>Existing Funding (US\$)</b>	<b>Additional Funding (US\$)</b>	<b>Total Allocation as of 1 January 2014 (US\$)</b>
<b>HIV</b>	243,341,872	234,043,479	477,385,351
<b>Tuberculosis</b>	42,802,070	117,737,008	160,539,078
<b>Malaria</b>	183,228,856	316,261,563	499,490,420
<b>Total</b>	<b>469,372,798</b>	<b>668,042,050</b>	<b>1,137,414,849</b>

In terms of activities, the GF grant supports scale-up of prevention and case management activities in line with the new NMEP Strategic Plan 2014-2020. The key interventions are to obtain universal coverage of ITNs through mass campaigns and routine distribution; to increase ACT rollout in the public and private sectors; and to increase malaria diagnosis using microscopy and RDTs in public and private health facilities.

Before funding was consolidated, under GF Round 8 Phase II, approximately seven million ITNs were purchased for routine distribution, in addition to 50 million ACT treatments and 16.5 million RDTs. These commodities were split between the public and private sectors. The grant also supports information, education, and BCC; strengthening of fiduciary management, logistical management information systems (LMIS) and M&E; training on integrated community case management; revitalization of home-based management of fever; BCC on case management; and pharmacovigilance.

In February 2013, GF named the NMEP as an “interim applicant” during GF’s transition to its new funding model. As such, Nigeria received an additional \$167 million during the 2013-2014 period. The bulk of this funding – \$125 million – was used to purchase ITNs to replace the 30 million nets distributed in 2009-2011, while the remaining \$42 million was used to purchase RDTs and ACTs.

The World Bank Booster Program provided a total of about \$280 million in loans between 2007 and 2009 to support seven Nigerian states and central level malaria activities, including ITN campaigns in target states, IRS, and purchases of ACTs, RDTs, and SP for malaria control. The project supported training, supervision, and monitoring activities, including two rounds of lot quality assurance sampling surveys, to assess the impact of the program. The Booster Program ended in June 2013, but the country has requested a no-cost extension of the project to June 2014 and then to March 2015. Beyond March 2015, it is unclear whether there will be any continued support to malaria control activities from the World Bank.

DfID supports a five-year, £50 million project (about \$80 million) called Support for the National Malaria Program (SuNMaP), which started in 2009. Currently, the program is in a period of costed extension, but DfID has indicated a willingness to maintain funding at similar levels for 2014 and 2015 (£8-10 million per year; with an additional £9-10 million per year for commodities). The program provides substantial support for the NMEP and ten selected states, none of which overlap with PMI’s eleven states. In the DfID states, SuNMaP supports malaria prevention, diagnosis, and treatment, and supplies limited quantities of malaria commodities. The SuNMaP developed a private sector component that will examine diagnosis and treatment in the private sector, as well as a “market sector” component that will explore market interventions. DfID has provided \$14 million to continue the subsidy for ACTs for an additional two years, up to 2016.

The WHO supports a national malaria program officer in each of the six geopolitical zones of Nigeria. They assist the states in their zones with malaria program planning and management. The WHO supported the first-ever malaria program review in Nigeria in 2012. The review recommended some strategic shifts for Nigeria, such as using different strategies for different states. All PMI activities are coordinated with these efforts.

The Clinton Health Access Initiative worked closely with the NMEP in the preparation for and management of the AMFm program, particularly in terms of relations with private sector manufacturers and distributors. They have also taken a special interest in promoting the use of injectable artesunate as the first-line treatment for severe malaria. National policy has been changed to reflect the new WHO guidelines and hospitals are being encouraged to purchase this drug.

### ***Private Sector***

Although PMI recognizes the potential for private sector approaches in malaria control, the opportunities to work with these organizations under PMI have been limited. Large oil firms carry out their own malaria control activities in their work areas. Some firms also include malaria control in their corporate social responsibility work. ExxonMobil has funded a study on

extending IPTp and other malaria interventions to community-directed distributors in Akwa Ibom State. This study demonstrated the potential of using community-directed distributors and has helped inform PMI plans for ITN keep-up and other activities.

The AMFm program, managed by GF, has worked with a large number of private importers as “first-line buyers” of subsidized ACTs. From the time the AMFm grant was signed in September 2010 until October 2012, Nigeria had AMFm orders approved for 118.2 million treatments (96.8 million private for-profit, 11.7 million public, and 9.7 million private not-for-profits) of which 98.2 million have been delivered. Most of this has passed through purely private sector channels and has dramatically increased the supply of ACTs in the Nigerian market.

The Private Sector Alliance for MDGs includes polio and malaria as target areas for attention. This alliance is co-chaired by the state minister for health and the former chief executive officer of a Nigerian bank, and the secretariat is supported by Aliku Dangote, one of Nigeria’s most prominent businessmen. The NMEP created a committee to seek private sector support, though what role the private sector will play through these actions remains unclear. There has been discussion of local production of ITNs and ACTs, but it is unlikely that they could be competitively priced.

#### ***Within the United States Government (USG)***

PMI Nigeria has identified opportunities to integrate its work with other activities within the USAID Health Population and Nutrition team and with other USAID, U.S. Department of Defense (DOD), and President’s Emergency Plan for AIDS Relief (PEPFAR) activities. The overarching strategic document for this integration, the United States Global Health Initiative Strategy Document, was completed in September 2011 and took into account the expanding PMI program in Nigeria. In mid-2013, PMI and PEPFAR agreed to collaborate in two states and are considering opportunities to expand collaboration to other states.

Malaria is fully integrated into primary health care supported under the bilateral Targeted State High Impact Project (TSHIP) project, which is active in two of Nigeria’s 36 states. In those states all PMI-supported public sector malaria work is channeled through this project. Malaria was included in the Expanded Social Marketing Program in Nigeria (ESMPIN). This collaboration leverages this project’s large presence in terms of mass media BCC (national radio drama, spots/jingles, and a weekly radio magazine) and interpersonal approaches (community-based interpersonal communication in 15 priority states). Malaria messaging is included at low cost. This program also provides a link through mobile drug suppliers to drug vendors and private sector providers since the lead on this project, the Society for Family Health (SFH), is also a co-Principal Recipient of the Global Fund Round 8 malaria grant. Mobile suppliers working with SFH also efficiently combine malaria, family planning and maternal/child health messages with product promotion. Malaria funds also leverage the large reach of the Voice of America Hausa language service in northern Nigeria.

Support for improved diagnostics has built on the base provided by the PEPFAR DOD-Walter Reed Program to improve HIV-related laboratory services. This program included improved

malaria microscopy and RDT use under PEPFAR. PMI is expanding on this base to support malaria activities.

PMI and PEPFAR are working to support Nigeria's integrated Health Management Information System (HMIS). This is requiring a shift from the NMEP's previous parallel system, which was created to support Global Fund reporting, and from the parallel PEPFAR HIV system. It will take some time for the new system to become operational, but it is already active in several states and should eventually replace the older systems.

Steps are being taken to integrate approaches to logistics support for PEPFAR, PMI, and USAID-supported family planning programs. This is particularly promising in terms of warehousing, which is a challenge in Nigeria. In Ebonyi State, family planning and malaria funds are jointly supporting an innovative model – Direct Delivery and Information Capture – to improve distribution within states and collect better facility-level consumption data. PMI is cooperating more intensively with the PEPFAR program in two states, Benue and Cross River, which have a PMI presence and are a PEPFAR priority because of the relatively high HIV prevalence. This cooperation includes shared warehousing, PEPFAR-procured ITNs, ACTs, and RDTs, and laboratory strengthening activities in the form of combined training, supervision, and quality assurance of laboratories for malaria, HIV, and tuberculosis testing. This cooperation will expand malaria prevention and treatment programs in these two states, providing better protection of target populations.

## 6. PMI goals, targets, and indicators

The goal of PMI is to reduce malaria-associated mortality by 50% in new countries added to PMI in FY 2010 and later. By the end of 2015, PMI will assist Nigeria 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 women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy
- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria

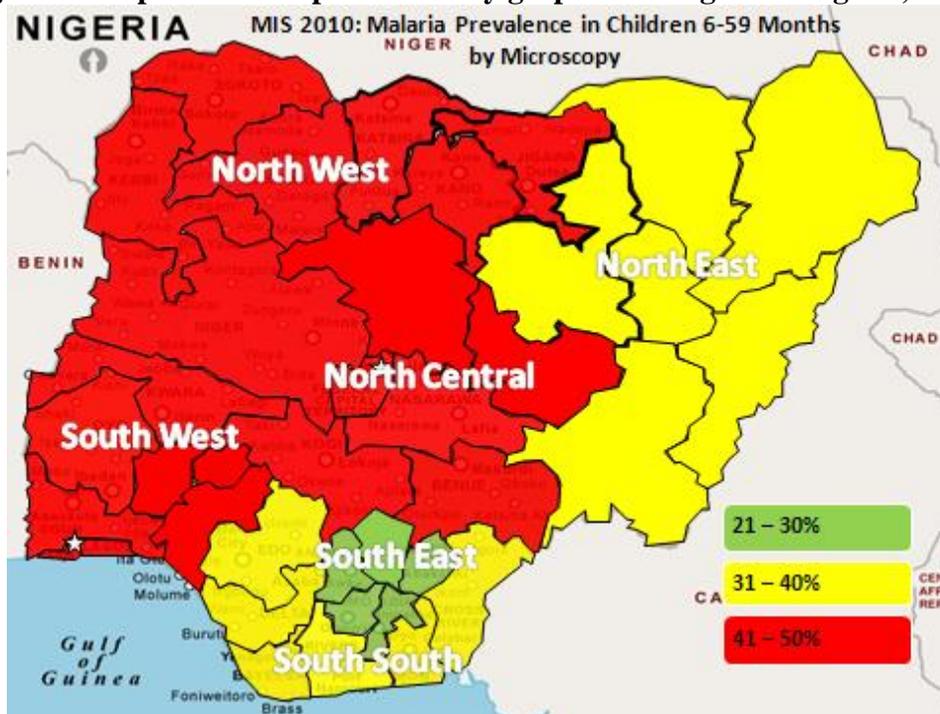
## 7. Progress on coverage/impact indicators to date

The two most recent national population-based surveys that PMI uses to measure program progress in Nigeria are the 2010 MIS, conducted just before PMI was launched in the country, and the 2013 DHS. An MIS will be conducted later in 2014 with PMI support.

As measured in the 2010 MIS, parasitemia among children aged 6-59 months was 42%. Parasitemia was higher in rural areas (48%) than in urban areas (22%), and decreased as

mother's education level improved. Malaria prevalence varies by geopolitical zone (Figure 3), with the highest malaria prevalence found in the zones of South West (50%), North Central (49%), and North West (48%), while the lowest prevalence zones were South East (28%), North East (31%), and South South (32%).

**Figure 3: Map of malaria prevalence by geopolitical region in Nigeria, 2010**



Selected national-level results from the 2013 DHS are shown in Table 4. Household ownership of at least one ITN increased from 42% in 2010 to 50% in 2013. In the 2013 DHS, approximately one-third (36%) of the population had access to an ITN in the households where they reside, assuming a maximum of two people sleep under each net. Ownership of at least one ITN in a household was greater in rural areas (56%) compared to urban areas (43%). Progress on ITN use, however, is more complex. All indicators for ITN use by children under age five years and pregnant women, whether measured in all households or only those with at least one ITN, appear to have decreased substantially from 2010 to 2013. The breakdown of survey results by geopolitical zone in Table 3 further demonstrates this drop in use, with a more dramatic decrease between 2010 and 2013 indicators in the dryer northern zones than in the south. PMI will work with NMEP and other partners to investigate. Seasonal differences are one plausible explanation: the MIS is conducted in the rainy season when ITN use is at its highest, while the DHS is conducted in the dry season. However, inadequate BCC to accompany the massive scale-up of ITN distribution through campaigns may be another factor if a true decrease occurred. The 2014 MIS will be critical to confirm the trends in ITN use between surveys conducted during rainy seasons.

**Table 3: Reported ITN Ownership and Use from 2010 to 2013 by Geopolitical Zone**

Geopolitical Zone	Survey	Percentage of households with at least one ITN (%)	Percentage of children under five years old who slept under an ITN the previous night in a household with an ITN (%)	Percentage of pregnant women who slept under an ITN the previous night in a household with an ITN (%)
North Central	2010 MIS	32.1	49.5	70.3
	2013 DHS	49.6	29.3	28.3
North East	2010 MIS	62.9	73.5	74.9
	2013 DHS	60.9	17.5	19.8
North West	2010 MIS	58.2	63.3	73.5
	2013 DHS	49.2	26.1	29.4
South East	2010 MIS	32.2	42.0	29.6
	2013 DHS	57.1	38.9	40.2
South South	2010 MIS	43.8	55.1	48.1
	2013 DHS	42.7	37.6	37.6
South West	2010 MIS	20.3	28.8	49.0
	2013 DHS	42.3	37.5	40.0

The 2013 DHS found that 61% of pregnant women received at least one ANC visit from a skilled health provider, 10% between 2-3 ANC visits, and 51% four or more ANC visits. However, ANC attendance varied significantly by region, state, residence (urban/rural), and mother's education. ANC attendance for at least one visit ranged from 17% in Sokoto to 98% in Osun. The states that reported the lowest ANC attendance were Sokoto (17%), Zamfara (22%), Katsina (23%) and Kebbi 24%), all located in northwest Nigeria. All but one (Katsina) are PMI focus states.

In general, ANC attendance for at least one visit was higher in urban (86%) compared to rural areas (47%) and lower in northern compared to southern Nigeria. Women with a secondary education had 97% ANC attendance compared with 36% for those with no education. Women over age 20 years reported ANC attendance of 61% compared to 48% in those below the age of 20 years. Despite ANC attendance of 51% for four or more visits, the proportion of women who received two or more doses of SP during their last pregnancy has remained low at 13% in 2010 and 15% in 2013.

Use of an ACT to treat malaria remains low. In febrile under-fives given an antimalarial medication for presumed malaria, 12% received an ACT in 2010 while 6% received an ACT in 2013. Use of chloroquine or SP to treat malaria dropped from 79% in the 2010 MIS to 31% in 2013. Malaria testing before treatment remained low and unchanged. Of the under-fives with fever, malaria testing was performed in 5% in 2010 increasing to 11% in 2013.

Table 4 includes a sub-analysis of aggregated MIS and DHS data to compare progress in nine of the 11 PMI focus states with national trends. The analysis did not include the two states of Akwa Ibom and Kebbi that came on board recently (2013). At the end of 2010, ITN ownership and access were lower in PMI focus states than the national level. However, the 2013 DHS demonstrated the reverse situation, with PMI states having slightly better ownership and access than the national average. However, better ITN access did not result in substantially better rates of use in PMI focus states compared to the national coverage. Other indicators, including seeking care for fever within 24 hours, treatment with ACTs, and IPTp appeared to be the same or lower in PMI focus states than the national average.

**Table 4. Malaria Indicators in 9 PMI States, Nigeria**

INDICATORS	2008 DHS						2010 MIS						2013 DHS					
	9 PMI States			Overall Nigeria MIS			9 PMI States			Overall Nigeria MIS			9 PMI States			Overall Nigeria MIS		
	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI
<b>ITNs*</b>																		
Percentage of households with at least one ITN	6.7	5.7	7.8	8.0	7.4	8.6	30.0	23.7	37.2	41.5	37.2	46.0	56.9	53.5	60.2	49.5	48.0	51.1
Proportion of population with access to an ITN in their household	4.0	3.4	4.6	4.8	4.4	5.2	19.8	15.0	24.6	28.2	24.9	31.5	42.4	39.8	44.9	36.1	34.9	37.3
Percentage of children under five years old who slept under an ITN	4.6	3.8	5.5	5.5	4.9	6.0	20.7	15.2	27.4	28.9	25.1	33.1	17.0	14.7	19.5	16.6	15.4	17.8
Percentage of pregnant women who slept under an ITN the previous night	4.7	3.3	6.5	4.8	4.1	5.7	20.0	12.9	29.6	33.6	27.5	40.5	16.9	14.0	20.3	16.4	14.8	18.1
Percentage of children under five years old who slept under an ITN in households owning at least one ITN	53.9	49.0	58.7	49.8	47.3	52.4	51.2	42.4	59.9	58.6	54.8	62.2	25.0	21.9	28.4	28.5	26.7	30.3
Percentage of pregnant women who slept under an ITN the previous night in households owning at least one ITN	49.6	37.8	61.5	44.4	39.2	49.8	48.4	35.3	61.9	65.4	58.4	71.8	25.4	20.9	30.4	29.8	27.1	32.7
<b>IPTp**</b>																		
Percentage of women age 15-49 with a live birth in the two years preceding the survey who received Intermittent Preventive Treatment (IPTp) for malaria during ANC visits during their last pregnancy	5.4	4.3	6.7	4.9	4.4	5.5	9.7	6.2	14.7	13.2	11.0	15.8	10.8	9.3	12.6	14.6	13.5	15.8

INDICATORS	2008 DHS						2010 MIS						2013 DHS					
	9 PMI States			Overall Nigeria MIS			9 PMI States			Overall Nigeria MIS			9 PMI States			Overall Nigeria MIS		
	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI
<b>Case Management</b>																		
Among children under age five with fever in the two weeks preceding the survey, the percentage who received antimalarial treatment																		
-ACT	1.9	1.2	3.2	2.4	1.9	3.0	2.1	0.7	6.1	5.9	4.5	7.6	3.6	2.3	5.4	6.0	5.1	7.0
-Other antimalarial	4.0	2.5	6.4	4.5	3.7	5.5	3.8	1.8	7.6	4.4	3.2	6.1	5.5	4.1	7.3	7.1	6.1	8.2
Among children under age five with fever in the two weeks preceding the survey, the percentage who took each type of drug the same or next day after developing fever																		
-Any	11.9	9.6	14.8	15.2	13.7	16.7	14.1	10.1	19.4	26.0	22.1	30.4	15.1	12.1	18.7	22.9	20.9	25.1
-ACT	0.8	0.3	1.7	1.1	0.8	1.5	2.5	0.7	8.7	3.2	2.3	4.6	2.5	1.4	4.2	4.2	3.4	5.3
-Other antimalarial	1.6	0.7	3.4	1.8	1.3	2.5	2.1	0.9	4.7	2.1	1.4	3.1	3.5	2.4	5.1	4.9	4.1	5.9
Proportion of children under five years old with fever in the last two weeks given any antimalarial within 24 hours that received an ACT	6.3	2.8	13.3	7.2	5.2	10.0	11.7	3.3	34.2	13.5	9.6	18.5	16.7	10.1	26.5	18.7	15.4	22.5
<b>Bio Markers</b>																		
Percentage of children age 6-59 months with malaria infection detected by rapid diagnostic test (RDT)	na			na			52.7	45.2	60.2	51.5	47.2	55.8	na			na		
Percentage of children age 6-59 months with malaria infection detected by microscopy	na			na			47.2	40.9	53.7	42.0	37.9	46.2	na			na		
Percentage of children age 6-59 months with hemoglobin lower than 8.0 g/dL	na			na			9.7	7.4	12.7	12.6	10.9	14.6	na			na		

LCI= lower 95% confidence interval; UCI = upper 95% confidence interval

\*An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further retreatment (LLIN), or (2) a pretreated net obtained within the past 12 months, or (3) a net that has been soaked with insecticide within the past 12 months.

\*\*IPTp: Intermittent Preventive Treatment during pregnancy is preventive treatment with two or more doses of SP/Fansidar at least one of which is given at an ANC visit

## 8. Challenges, opportunities, and threats

### ***Commodity quantification, procurement, and logistics management***

***Challenges:*** The commodity supply system remains a huge challenge in Nigeria. The system is multifaceted and, at the federal level, is built around the needs for specific projects and diseases. It remains a challenge given the multiple procurers, variable supply chains between and within states, lack of reliable consumption data and logistics management information system from all levels in the reporting system, and generally weak logistics management systems. These factors make it difficult to establish a management system to track supply and consumption, and develop a rational forecasting, ordering, and distribution system for malaria commodities.

***Opportunities:*** Working at the state level, PMI has the opportunity to develop and test innovative approaches to commodity quantification and distribution that, if successful, can be expanded nationally. In addition, improved communication and collaboration between PMI and Global Fund at the national level opens up new opportunities for better coordination and pooled distribution of malaria commodities at the state level. Finally, PMI is exploring collaboration with PEPFAR in two states, Benue and Cross River, which has the potential for developing a unified distribution system. PMI is also taking over the supply of malaria commodities to all health facilities in Bauchi and Akwa Ibom that are currently under the support of World Bank. This is an opportunity for PMI to strengthen the state commodity supply systems.

### ***Private sector delivery of malaria prevention and treatment***

***Challenges:*** Many Nigerians, including those under-five, first seek care for fever from the private sector (MIS 2010). While most PPMVs have received some informal training to recognize uncomplicated malaria, they are not empowered nor legally allowed to use invasive procedures to diagnose the disease. Also, many are not aware of NMEP guidelines for malaria treatment. These issues, along with the price of ACTs being higher than many patients can afford, lead to patients not receiving optimal case management in this sector.

Various partners, including the World Bank and AMFm, have been funding ACTs in the private sector. AMFm was able to register 49 first-line buyers, decreasing the cost and increasing the availability of quality ACTs sold by PPMVs<sup>1</sup>. However, the target price for the subsidized ACTs could not be reached, in part because of mark-ups by intermediaries and because there were not enough ACTs available in the market.

A threat to the availability and affordability of ACTs in the private sector exists given the unsustained investment in the private sector. It is possible that fewer ACTs will be available and that they will become cost-prohibitive for some private sector users.

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<sup>1</sup> ACT Watch Evidence for Malaria Medicine Policy, Snapshot of Nigeria: Outlet Survey results 2009 and 2011 presentation

*Opportunities:* PMI is piloting interventions in two states of Sokoto and Ebonyi to improve malaria case management, including introduction of RDTs, in the private sector. Depending on the results of the pilots, PMI will consider increasing support for scaling up this intervention.

### ***Insecurity and civil unrest***

*Threat:* The increasing and widespread violent attacks, particularly in the north and central belt, threaten the government and various government- and donor-funded programs. Travel restrictions were put in place in 2012, limiting movement of USG staff in certain parts of the country. This has made oversight of PMI activities in some locations very challenging.

## **9. PMI support strategy**

Four important factors influence PMI's support strategy. A key factor is Nigeria's size and the burden of malaria in the country. Nigeria is by far the most populous country in Africa (with an estimated 2014 population of 172 million), and almost the entire country suffers from high levels of endemic malaria. PMI focuses on 11 states with a population of about 50 million, or about 30% of the total Nigerian population. Second, the government in Nigeria is highly decentralized. About half of Nigeria's government revenues go directly to the 36 states and the Federal Capital Territory of Abuja, as well as the 774 LGAs. The federal level has relatively little influence over how these funds are used or to what extent states follow national policies. The federal level is mostly responsible for referral hospitals, while primary health care, including malaria case management, is more a local responsibility. Public health systems expend a great deal of their funds on staffing, but support for commodities and program implementation generally tends to be very low. State-level management of public health programs, such as malaria control, tends to be very weak. Third, significant support from other donors, such as GF, World Bank, and DfID, combined with decentralized governance, has led the NMEP and the GoN to pair donors with specific states across the country. Finally, PMI is aware of Nigeria's substantial financial resources and its excellent reserve of strong public health expertise. PMI, therefore, sees an important role for all partners to advocate for increasing national and state-level investment in malaria prevention and control.

Within this context, PMI's strategy is to work with the national level on policy, technical guidance, forecasting, and state support activities, while selecting specific states, in collaboration with the NMEP, to receive more intensive support for malaria control activities. States are chosen to avoid overlap, as much as possible, with the other partner-supported programs. For activities planned with FY 2015 funds, PMI intends to continue to support the same 11 states, and to scale up service coverage within those states at the health facility and community levels. In each state, project teams support the State Malaria Elimination Program (SMEP) office to help plan and implement preventive, diagnostic, and treatment programs. Even in those 11 states, PMI cannot support all commodity needs. PMI advocates to both the state and national governments to take on a larger role in purchasing malaria-related commodities and funding services such as routine health information systems.

Based on the experience in an initial seven states, the project has begun to expand the number of public primary health units supported from four to eight facilities per LGA in 11 states. These efforts will help reach over 50% coverage of facilities and over 70% of those seeking treatment

at public health facilities. In FY 2015, PMI will continue to expand its coverage of health facilities and, at the same time, advocate strongly with SMEPs, the national government, and the Global Fund to contribute further to this expansion.

PMI identifies areas of comparative advantage among partners and focuses support on the most cost-effective interventions with the highest and widest impact. For example, PMI supports malaria commodity logistics and health information systems and provides technical assistance to national mass ITN distribution campaigns. In FY 2014, PMI redirected its support from IRS in two LGAs to vector surveillance and susceptibility monitoring in six geopolitical zones around Nigeria. Although PMI will continue to provide technical guidance for IRS where implemented, it will encourage states to fund actual spray activities themselves.

### III. OPERATIONAL PLAN

#### PREVENTION

##### 1. Insecticide-treated nets (ITNs)

###### *NMEP/PMI Objectives*

The NMEP's Strategic Plan 2014-2020 identifies the goal of universal coverage with ITNs of all at-risk populations. Universal coverage is defined as one ITN for every two persons and quantified for mass distribution campaigns using the WHO-recommended ratio of one ITN for every 1.8 persons in a household. The plan calls for reaching and sustaining 80% of all households owning two or more long-lasting ITNs (LLINs) by 2020 and sets a target of ensuring that at least 80% of children under-five and pregnant women consistently sleep under an ITN.

The NMEP endorses a mixed model for ITN distribution, incorporating mass free net replacement campaigns; a keep-up strategy of continuous distribution to supplement campaigns and maintain universal coverage; private sector involvement to generate demand for and use of nets; and monitoring of ownership, use, and net integrity to inform program strategy. For continuous distribution, the plan outlines potential channels such as ANC and Expanded Program on Immunization (EPI) clinics, the integrated Maternal Newborn and Child Health week, school and community-based distribution, and "community-directed distribution" through private vendors.

PMI's goal is to support the NMEP in achieving and maintaining its coverage and use targets, especially in the 11 PMI focus states. To do this, PMI will support conducting mass, free ITN replacement campaigns, strengthening and expanding ANC and EPI channels for continuous distribution and, based on results of pilot initiatives almost completed, scaling up both school and community-based distribution where feasible and cost-effective. In addition, partners in the north of the country are investigating ways to increase social marketing and commercial sector sales of ITNs.

### ***Progress since PMI was launched***

Since launching its program in Nigeria in 2010, PMI has procured a total of 14,725,000 LLINs, and distributed approximately 9,970,000 LLINs through mass campaigns and 4,755,000 through continuous channels. As detailed in the “Progress on Coverage/Impact Indicators” section, ownership of at least one ITN in a household increased substantially from the 2008 to 2013 DHS surveys, but ITN use appeared to decrease over the same period. The reasons for the decrease in ITN use between DHSs are unclear, especially given the BCC efforts supported by PMI and other partners. These results need to be interpreted with some caution: the DHS is conducted in the dry season when ITN use tends to be lower. In contrast, ITN use was higher in the 2010 MIS, which is conducted in the rainy season when ITN use is at its peak. The 2014 MIS will capture some of the progress made especially with new universal coverage campaign strategies being implemented since late 2013.

### ***Progress during the past 12 months***

With FY 2013 funds, PMI procured 6.6 million LLINs out of which 1.3 million were for routine distribution through ANC and EPI clinics and 5.3 million for mass campaigns (Sokoto, Bauchi, Kebbi, and Nasarawa). With FY 2012 funds, Kogi and Oyo states received logistical and BCC support from PMI to complete their first universal coverage campaigns, and Sokoto conducted its second universal coverage campaign from December 2013 to January 2014.

ITN mass distribution campaigns: In its previous malaria prevention strategy 2009-2013, the NMEP focused on rapid scale-up of ITN distribution nationwide through phased mass campaigns, providing two nets per household regardless of the number of occupants. During that period, the NMEP, with partner support, distributed about 56 million ITNs to all 36 states and the Federal Capital Territory of Abuja. While household ownership of at least one ITN increased from 8% in 2008 to 50% in 2013, and children under five years of age sleeping under an ITN the previous night increased from 6% in 2008 to 17% in 2013, the strategy was not resulting in the country meeting its targets of 80% ownership and use. For the 17 states achieving low initial coverage or requiring replacement campaigns three years following their initial mass distributions, the NMEP refocused its efforts under the new national strategic plan 2014-2020 to adopt the WHO-recommended approach of one net for every two persons to achieve universal coverage.

PMI and GF, with technical support from the International Federation of the Red Cross and other partners, supported the universal coverage campaign in Sokoto from December 2013 to January 2014. This was the first campaign in which the NMEP applied its new net allocation of one net for every two persons. PMI procured nearly 1.3 million of the total 2.5 million LLINs ordered, of which nearly 2.5 million were distributed. The campaign encountered a number of challenges: inaccurate micro-planning, coordination difficulties between state and LGA-level campaign implementers, and unclear procedures for repositioning surplus stocks. A parallel polio vaccination campaign, which was not coordinated with the ITN campaign, resulted in reports of persons refusing to have children vaccinated in certain LGAs where ITN stocks had been depleted. Achievements and challenges were documented as lessons learned for subsequent campaigns. For the remainder of 2014, the following PMI-supported states are conducting mass

campaigns: Akwa Ibom (with all 2.7 million nets procured through GF); Bauchi (1.7 million nets from PMI, 1.6 million from the World Bank); Kebbi (1 million LLINs from PMI, 1.2 million from Global Fund); and Nasarawa (1.3 million LLINs, all from PMI).

Continuous distribution: Recognizing the importance of maintaining coverage between campaigns, all but two states (Akwa Ibom and Kano) and the Federal Capital Territory of Abuja have benefited from PMI-funded training and planning for continuous distribution strategies. PMI also supported the development of national guidelines for continuous ITN distribution. Four PMI-supported states have initiated distribution through ANC and EPI channels along with piloting school- or community-based distribution. Table 5 summarizes progress in the eleven PMI-supported states. All states with channels selected either to implement or plan for distribution through ANC and EPI. Pending presentation of the results of the pilot programs anticipated in July 2014, PMI will support introducing or scaling up new channels through schools (3 states), communities (7 states), and/or retail outlets (1 state). PMI will support school-based distribution in states with high (80% +) school attendance and low dropout rates, and community-based distribution with lower school attendance and high dropout rates. In addition, PMI will support plans for expanding distribution through retail outlets in Sokoto.

**Table 5: Implementation status of continuous distribution in eleven PMI-supported states as of June 2014**

State	Implementation status	Distribution Channels Selected				
		ANC	EPI	School	Community	Retail
Akwa Ibom	Training pending	n/a	n/a	n/a	n/a	n/a
Bauchi	Planning	X	X		X	
Benue	Planning	X	X		X	
Cross River	Implementing	X	X	X		
Ebonyi	Implementing	X	X		X	
Kebbi	Planning	X	X		X	
Kogi	Planning	X	X	X		
Nasarawa	Implementing	X	X		X	
Oyo	Planning	X	X	X		
Sokoto	Immediate plans to implement	X	X		X	X
Zamfara	Implementing	X	X		X	

ITN physical integrity: monitoring and care and repair: In Cross River, PMI conducted an operational research project assessing the extent to which care and repair promotion can extend the useful life of an ITN at the household level. Preliminary results indicated no difference in net condition between the intervention and control households nor did the proportion of nets with observed repairs differ.

A number of African countries have reported that the physical integrity lasts less than three years. PMI undertook a three-year study in Cross River, Nasarawa, and Zamfara States to assess ITN integrity and attrition/survivorship following mass campaigns. Preliminary results showed that 88.4% and 89.9% of surviving nets in Cross River and Zamfara States, respectively, were in serviceable condition in the third year. In Nasarawa, 72.6% and 53.1% of ITNs were in serviceable condition at years two and three, respectively. Overall, the preliminary results in these settings do not indicate the need for revising the current campaign replacement strategy of

every three years. However, the findings point to the need to intensify continuous distribution efforts to replace non-serviceable or lost nets in the years between campaigns.

### ***Commodity gap analysis***

Table 6 presents the projected needs and partner contributions for ITNs through mass replacement campaigns and continuous distribution in PMI focus states, calendar year 2014 to 2016. The timing of campaigns is based on projected replacement needs every three years. The continuous distribution channels listed cover ANC and EPI only. It is hoped that GF will approve Nigeria's New Funding Model concept note for its indicative (continuous) and incentive (campaign) requests for 2015-2016 funding.

PMI and GF will cover all estimated campaign and continuous distribution needs through ANC and EPI. A small gap in 2014 for campaigns likely reflects differences in population denominators used previously; the surplus for ITNs for continuous distribution could largely offset this gap. If the NMEP (with PMI support) can identify other partners to cover more of the ANC and EPI channel costs, and the pilot results for new channels prove promising, then PMI with the NMEP will explore allocating funds to new distribution channels through schools and communities in states prioritized by the NMEP.

**Table 6: ITN Needs, Partner Contributions and Total Available ITNs in 11 PMI-Supported States, by Distribution Channel, CY 2014-2016<sup>2</sup>**

State	Campaigns <sup>3</sup>			Continuous Distribution (ANC and EPI Channels <sup>4</sup> )		
	2014	2015	2016	2014	2015	2016
Akwa Ibom	2,858,674 (GF)			305,649	316,220	327,157
Bauchi	3,410,148 (PMI, WB)			186,849	193,311	199,997
Benue		3,410,148 (PMI, GF)		214,763	221,303	228,043
Cross River		2,083,631 (PMI)		218,163	224,582	231,190
Ebonyi		1,553,565 (PMI)		159,672	164,206	168,868
Kebbi	2,305,651 (PMI, GF)			45,652	47,089	48,572
Kogi				271,239	279,499	288,011
Nasarawa	1,315,937 (PMI)			102,896	106,029	109,258
Oyo			4,364,383 (PMI)	388,697	402,140	416,048
Sokoto				39,478	40,681	41,920
Zamfara		2,415,469 (PMI)		51,036	52,696	54,409
<b>TOTAL ITN NEED</b>	<b>9,890,410</b>	<b>9,462,813</b>	<b>4,364,383</b>	<b>1,984,094</b>	<b>2,047,757</b>	<b>2,113,473</b>
Partner contributions	Campaigns			Continuous Distribution (ANC and EPI channels)		
	2014	2015	2016	2014	2015	2016
PMI	4,000,000	6,800,000	4,400,000	2,300,000	1,000,000	2,100,000
GF	3,979,695	2,323,254	0		731,851	13,473
DfID	0	0	0	0	0	0
World Bank	1,566,709	0	0	0	0	0
Carry-over	0	0	0	0	315,906	0
<b>TOTAL ITNs AVAILABLE</b>	<b>9,546,404</b>	<b>9,123,254</b>	<b>4,400,000</b>	<b>2,300,000</b>	<b>2,047,757</b>	<b>2,113,473</b>
<b>ITN (gap) or surplus</b>	<b>(344,006)</b>	<b>(339,559)</b>	<b>35,617</b>	<b>315,906</b>	<b>0</b>	<b>0</b>

*WB: World Bank*

Excess nets from the gap analysis will be used to scale up ITN continuous distribution channels (schools, community, retail) in the four states that have begun implementing the new approaches (Cross River, Zamfara, Ebonyi, and Nasarawa).

<sup>2</sup> Needs based on population figures extrapolated from 2006 census. Total estimated population by year: 2014 = 49,946,949; 2015 = 51,759,397; and 2016 = 53,442,484.

<sup>3</sup> Quantification of needs is based on populations divided by 1.8 to target one net per two persons. Shaded boxes indicate years when campaigns were not scheduled. Campaign partners indicated in parentheses.

<sup>4</sup> Need for continuous distribution through ANC and EPI was calculated using an annual birth rate of 40/1,000. The percentage with antenatal care from a skilled provider and measles vaccination rates from the DHS 2013 were then applied to the number of births in each state to estimate total ANC and EPI needs each year.

## ***Plans and justification***

PMI will continue to support the national malaria strategy in conducting both ITN mass replacement campaigns and scaling up existing and new channels for continuous distribution. One PMI focus state (Oyo) will require a universal coverage campaign in 2016, which PMI will fully cover. PMI will prioritize the needs for distribution through ANC and EPI channels and, depending on available funds and state-specific capacity, will contribute to school- and community-based distribution. Retail distribution in Sokoto State will also be supported in selected LGAs with program design, training, supervision, procurement of nets, and evaluation to determine the potential for future scale-up in that state. Due in part to PMI-supported pilot activities along with reports from other African countries, the NMEP incorporated routine monitoring of ITN durability (specifically, physical integrity) into its 2014-2020 malaria strategic plan. Following WHO recommendations, PMI will support the monitoring of ITN physical integrity and attrition (or survivorship) linked to mass distribution campaigns in five sites selected based on transmission zones and other factors to be determined in consultation with the NMEP and partners. The results will inform both future net replacement strategies and communication approaches to promote proper net care. More details are found in the Monitoring and Evaluation Section.

### ***Description and budget for proposed activities with FY 2015 funding (\$31,479,683):***

- 1. Procure approximately 6.5 million ITNs that will be used to support mass campaigns in Oyo State (4.5 million ITNs) and continuous distribution (2 million) in all PMI focus states. (\$26,979,683)*
- 2. Logistic and operational support for distribution of LLINs for the mass campaign in Oyo and for sustaining gains through continuous distribution in all PMI focus states. This includes the development of systems for regular planning, distribution, storage, supervision, and reporting in each of 11 PMI focus states. (\$4,500,000)*
- 3. Support for BCC for malaria prevention and treatment. PMI will support BCC activities, including interpersonal communication (IPC), mass media, and social mobilization to promote ITN ownership and use, as well as other key aspects of malaria control and prevention. (Costs covered under the ACSM section)*
- 4. Monitoring of LLIN integrity and attrition/survivorship. (Costs covered under the Monitoring and Evaluation section).*

## **2. Indoor residual spraying (IRS)**

### ***NMEP/PMI Objectives***

Nigeria's new NMEP Strategic Plan 2014-2020 calls for vector control as part of an integrated vector management strategy and includes universal access to ITNs; scaling up IRS in targeted areas to interrupt malaria transmission; and expanding larval source management (larviciding

and environmental management) as complementary strategies for ITNs and IRS. With respect to this strategy, PMI supports entomological surveillance and insecticide resistance monitoring of malaria vectors and capacity development for state-supported IRS programs.

***Progress since PMI was launched***

Prior to the launch of PMI in Nigeria, several IRS trials using four pyrethroid and one carbamate (bendiocarb) insecticide were conducted in five LGAs, one in each of five states, in collaboration with insecticide manufacturing companies. This was expanded to seven states (Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Cross River States) in 2009 with financial assistance from the World Bank. The WHO vector control staff evaluated these trials and concluded that IRS is feasible and should be scaled up in Nigeria. The NMEP Strategic Plan (2014-2020) calls for IRS in areas with a high prevalence of malaria, low utilization of ITNs, endophagic and endophilic vector bionomics, and the presence of permanent structures that are amenable to spraying. Implementation will be progressive, phased, and will target 45% of households in the country by 2020. Support from the GoN at a national and/or state level for IRS is essential to meet the stated goals.

The results from two years of PMI support of an IRS pilot in two LGAs of Nasarawa State are shown in Table 7. The goal was to provide capacity building and a corps of trained IRS personnel available to Nigerian health officials and state governments conducting IRS. PMI support of this pilot has been shifted to better support enhanced entomological monitoring and capacity building at NMEP and state governments. An ITN universal coverage campaign is ongoing in 2014 in Nasarawa State with PMI funds to protect those people who lost IRS in these two LGAs. If requested, PMI funding will support technical assistance and training of NMEP and states implementing IRS in techniques and environmental assessments.

An insectary with susceptible colonies of *An. gambiae* was established with PMI support at Nasarawa State University in Keffi in 2013. The insectary provided susceptible mosquitoes for measuring IRS insecticide decay rates and can now support current state-managed IRS activities, the national entomological surveillance project as a repository, and vector bionomics research activities for the Africa Indoor Residual Spray Project Spraying (AIRS Project), NMEP, and students of the Nasarawa State University’s Biological Sciences Department in support of national capacity development for Nigeria.

**Table 7: PMI-supported indoor residual spraying activities in Nigeria**

	Number of States Sprayed (Local Govt Areas)	Insecticide Used	Number of Structures Sprayed	Coverage Rate	Population Protected
2012	1 (2)	Pyrethroid	58,704	99.1	346,115
2013	1 (2)	Pyrethroid	64,191	97.5	346,798

### ***Progress during the past 12 months***

PMI's major IRS objective shifted with FY 2014 funding from IRS operations to an NMEP-led national surveillance program for vector surveillance and insecticide resistance monitoring. IRS training will continue as requested with partner organizations, government officials at all levels, and private organizations.

PMI funding for entomological surveillance began in March 2014 in six sentinel sites selected with guidance from the NMEP. The entomological surveillance attempts to uncover malaria vector densities, species composition and distribution, nightly biting patterns and behavior, parity rates, sporozoite rates, and the resistance status of vectors from six sentinel sites in the five predominant ecological zones (mangrove swamps, rainforest, Guinea-savannah, Sudan-savannah, and Sahel-savannah) and five of the six geopolitical zones across Nigeria. Nigeria lacks systematic coordinated surveillance and resistance monitoring (National Malaria Policy, 2014) and this project seeks to address these concerns.

Other vector-related activities supported by PMI over the past year included testing to establish baseline vector susceptibility to different classes of IRS-approved insecticides (with input from NMEP and WHO), species identification, and core IRS training of Nigerian public health officers. PMI supported a three-day entomological monitoring training session for state vector control personnel on malaria vector bionomics, identification, surveillance and use of the CDC bottle bioassay procedure for insecticide resistance detection, assessment, and management. More than 40 people including primary investigators and technicians attended this training.

### ***Challenges, opportunities, and threats***

*Challenges:* PMI has withdrawn from direct IRS spray operations and is in transitioning this intervention to the state and/or local government. Nigerian states will assume responsibility for the IRS programs, with PMI available for technical consultation and assistance, as needed. PMI will continue to work with the NMEP to update the national IRS strategy and will provide IRS training in 2015 and beyond, as requested. The World Bank (in collaboration with insecticide manufacturing companies), RBM, and PMI were the only donors supporting IRS, but World Bank support of IRS will end in March 2015.

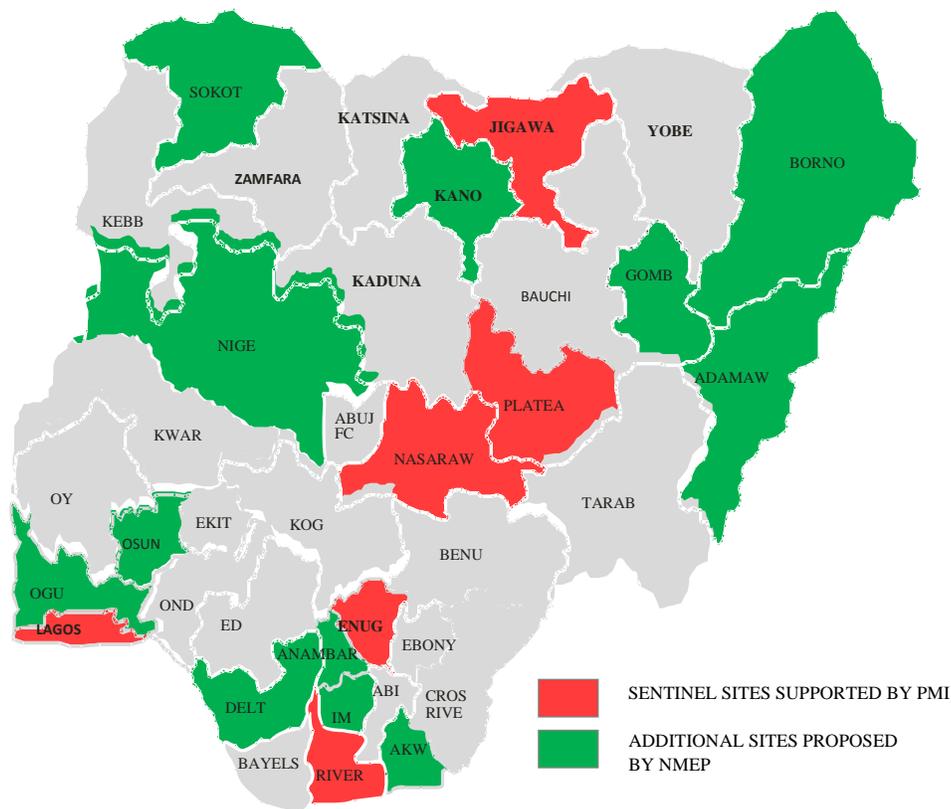
Nigeria has invested in a larvicide production facility in Rivers State. This plant will produce *Bacillus thuringiensis israeliensis*, a mosquito larvicide that kills larvae by a different mode of action from WHO-approved IRS insecticides. Unfortunately, effective larviciding requires frequent applications due to the short residual life of larvicides (< one week), is labor-intensive, costly and requires an extensive equipment infrastructure to be effective. In some situations, larviciding can be useful where breeding sites are fixed, few, and findable. Larviciding is not an intervention recommended by PMI, and PMI's position is that programs that undertake larviciding should adhere to the WHO Larviciding Interim Position Statement.

*Opportunity:* Significant in-country funds exist that can support IRS, especially the Nigerian MDG Debt Relief Fund, which has approximately \$1 billion in annual funding, part of which has been used to purchase ITNs. The MDG Debt Relief Fund has indicated its willingness to fund

IRS if it receives suitable proposals. However, it remains to be seen if the MDG Debt Relief Fund will provide funding and how much.

The NMEP and PMI have begun comprehensive malaria vector surveillance at six sites in different ecological and geopolitical zones around the country in line with the new NMEP Strategic Plan 2014-2020. A seventh state in northwest Nigeria (Sokoto) has been added to monitor malaria vector activity and insecticide resistance status in this agriculturally important area to observe the impact of irrigation on vector abundance and activity (see Figure 4). PMI will provide technical assistance for planning the program, along with equipment and funding for implementation in all seven states. These fixed sentinel sites will monitor vector populations for species composition, seasonality, and insecticide resistance, providing the FMOH with a comprehensive picture of vector activity and status across Nigeria (early results in Table 8). This project will collect resistance data through time from the same sites to monitor for changes in resistance status, an endeavor not previously performed in the country.

**Figure 4: Map of Sentinel Sites Supported By PMI, 2014**



**Table 8: Total number of anophelines collected, all sentinel sites, March–May 2014**

Mosquito Species	Enugu		Plateau			Rivers			Jigawa			Lagos			Nasarawa			Total			
	CDC*		PSC*	CDC		PSC	CDC		PSC	CDC		PSC	CDC		PSC	CDC		PSC	CDC		PSC
	In	Out	In	In	Out	In	In	Out	In	In	Out	In	In	Out	In	In	Out	In	In	Out	In
<i>An. gambiae s.l.</i>	52	61	261	95	27	421	115	49	259	3	17	1252	198	375	144	241	181	296	704	710	2633
<i>An. funestus</i>	115	300	35	2	1	6	0	0	0	149	2	549	0	0	0	0	0	0	266	303	590
<i>An. coustani</i>	2	5	0	1	0	0	0	0	0	0	0	0	0	1	1	26	0	0	29	6	1
<i>An. nili</i>	27	8	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	28	10	1
<i>An. squamosus</i>	1	1	1	1	0	0	0	0	0	0	3	0	0	0	0	3	0	0	5	4	1
<i>An. pharoensis</i>	2	1	0	0	1	1	0	0	0	0	3	0	0	0	0	0	5	0	2	10	1
<i>An. malculipalpis</i>	0	0	0	0	2	0	0	0	0	0	0	0	2	15	0	0	0	0	2	17	0
<i>An. obscurus</i>	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0
	199	376	298	99	31	428	115	49	259	153	30	1801	200	391	145	270	187	296	1036	1064	3227

\*CDC = CDC bottle bioassay, \* PSC = Pyrethrum Spray Catch

*Threats:* Insecticide resistance in malaria vectors to pyrethroid insecticides is increasing across Africa. Limited resistance status data have been collected piecemeal from Nigeria, and recent surveys indicate that resistance is developing in spot locations. PMI conducted resistance testing in Nasarawa in 2011, 2012, and 2013, and complete susceptibility to pyrethroids was seen in 2011. However, in 2012 and 2013 some resistance to pyrethroid insecticides was observed in both WHO tube and CDC bottle bioassay tests (see Table 9). High levels of resistance were seen to DDT (banned from use in Nigeria) and to deltamethrin, which is used in many brands of ITNs. Resistance management strategies will be developed in response to data collected from the seven sentinel sites over the coming year.

**Table 9: Insecticide susceptibility test results using WHO tube and CDC bottle bioassays on a minimum of 100 female *Anopheles gambiae* mosquitoes, in two LGAs of Nasarawa State (Nasarawa Eggon and Doma) November 2013.\***

Insecticide	Class	WHO tube (24 hr) (% mortality)		CDC bottle (30 min) (% mortality)
		Nasarawa Eggon	Doma	Nasarawa Eggon
Alpha cypermethrin	Pyrethroid	100	80	68.8
Deltamethrin	Pyrethroid	33	44	15
Lambdacyhalothrin	Pyrethroid	28	37	72.5
Fenitrothion	Organophosphate	100	100	n/a
Pirimiphos-methyl	Organophosphate	n/a	n/a	97.5
Bendiocarb	Carbamate	100	100	96.3
DDT	Organochlorine	9	9	25

\* For WHO test, < 90% mortality = resistance; CDC test <95% mortality = resistance

### ***Plans and justification***

PMI considers monitoring of insecticide resistance and collection of vector bionomic data to be vital to Nigeria. PMI will support the NMEP to establish a seventh entomologic surveillance site across six geopolitical and five ecological zones that will serve for annual monitoring of malaria vector susceptibility to six WHO-approved IRS insecticides from all four classes. Vector species composition, indoor densities, hourly biting behavior, and resistance status will be monitored at these seven sites monthly to gain an understanding of seasonality and vector composition and behavior across Nigeria. PMI will assist the NMEP in developing an updated National Malaria Integrated Vector Control Strategy upon request.

### ***Description and budget for proposed activities with FY 2015 funding (\$1,124,000):***

1. *Provide support for vector surveillance and susceptibility monitoring across five geopolitical and ecological zones in Nigeria.* Supervision, entomological monitoring, per diem, vehicle rentals, and equipment necessary to survey malaria vectors in seven sites around the country to determine vector species, seasonality, parity rates, biting activity, and indoor densities monthly and insecticide susceptibility status to four classes of insecticide once a year. (\$650,000)

2. *Strengthen capacity for entomological expertise at federal and state levels.* Strengthen capacity for entomological competence at federal and state levels with training and equipment support (WHO cone wall bioassays, light trap collections, pyrethrum spray collections, surveillance equipment training, larval surveillance, and insecticide susceptibility training) to perform these activities. Maintain an insectary in Nasawara State. (\$450,000)
3. *Technical assistance to NMEP IRS activities.* Three trips to provide insecticide resistance training for Nigerian IRS staff, resistance test kits, and insecticide for Nigerian vector control officers attending training. Training and technical assistance to primary investigators involved in the sentinel surveillance project with implementing partners. (\$24,000)

### 3. Malaria in Pregnancy (MIP)

#### *NMEP/PMI Objectives*

With Nigeria's population of 172 million, the annual estimated number of pregnant women is 8.5 million. Low ANC attendance, poor quality ANC services, and few institutional deliveries have resulted in a high burden of malaria in pregnancy (MIP) in Nigeria.

To reduce the negative consequences of MIP – such as low birth weight, preterm deliveries, spontaneous abortions, in-utero growth retardation, and maternal anemia – the new malaria policy (January 2014) and new National Malaria Strategic Plan (NMSP) 2014-2020 promotes the scale-up of preventive IPTp with sulfadoxine-pyrimethamine (SP); use of ITNs by pregnant women; and prompt testing and effective treatment of clinical malaria episodes. SP and ITNs are offered free of charge to pregnant women in Nigeria.

The new strategic plan adopted the WHO recommendation of providing IPTp at every scheduled ANC visit after the first trimester, with a month between doses. The policy and strategic plan promote the use of IPTp at health facility, community, and private health facilities, and providing SP as part of a comprehensive ANC package at all levels of health care delivery in Nigeria. The target for the new NMSP (2014-2020), is for 100% of all women who attend ANC (representing 61% of all pregnant women) to receive three doses of IPTp (IPTp3). However, the new policy and strategic plan are in print and are yet to be disseminated to the states and service delivery points. Under the new strategic plan, one of the distribution channels for improving and sustaining access to ITNs is to provide an ITN to every pregnant woman during the first ANC visit. With support from PMI, a number of health facilities have started implementing this strategy.

The National Guidelines for Diagnosis and Treatment of Malaria (2011) recommendation for treating uncomplicated malaria in pregnancy is quinine for the first trimester and ACTs for the second and third trimester. For severe malaria, the guidelines recommend using parenteral quinine or artesunate. Since quinine is relatively cheap and available, it is included in the Essential Medicines List, which enables the GoN to procure it.

The revised NMEP Strategic Plan (2014-2020) emphasizes that MIP interventions are a component of the FANC services delivered by Reproductive Health/Maternal Child Health Units. USAID/Nigeria's efforts to strengthen collaboration and integration among interventions that impact women and children are consistent with the strategic plan.

### ***Progress since PMI was launched***

The key indicator and target for IPTp, listed in the National Malaria Strategic Plan (2014-2020), is for 100% of pregnant women attending ANC services, representing 61% of all pregnant women, to receive at least three doses of IPTp (IPTp3) by 2020 through directly observed therapy at ANC clinics. The proportion of women who received two or more doses of SP (IPTp2) during their last pregnancy at an ANC visit was 5% in 2008 (DHS), 13% in 2010 (MIS), and 15% in 2013 (DHS). However, the number of women who receive at least one dose of IPTp (IPTp1) was 49% in 2013 (DHS), showing a big drop out from IPTp1 to IPTp2.

With FY 2012 funding, PMI supported a study on the social, cultural, and economic factors that serve as barriers to uptake of IPTp in two states, Cross River and Nasarawa<sup>5</sup>. The study confirmed significant gaps between ANC attendance and uptake of IPTp among pregnant women. It identified social and community factors – such as the support or disapproval of spouses or partners, relatives, and friends – that affect women's health-seeking behavior relating to MIP. Uptake of IPTp is also constrained by perceptions of rude and unfriendly attitudes of health workers and system factors, such as long waits and the requirement to pay for prescription drugs. Furthermore, front-line health workers indicated they do not have sufficient training and experience in FANC that integrates malaria prevention and treatment. The study report recommended communication programs to mobilize communities as a whole, rather than seeking to change individual behavior in piecemeal fashion and hoping for “trickle-down” or “trickle-up” effects.

Progress on coverage and use of ITN by pregnant women in Nigeria is presented in detail in the “Progress on coverage/impact indicators” section above.

To improve IPTp coverage and access to SP, since FY 2012, PMI procured 5 million doses of SP, of which over 4 million doses have been delivered to support continuous distribution approaches in other focus states, principally through ANC clinics. The remaining 1 million are to be distributed by the end of FY 2014.

### ***Progress during the past 12 months***

With FY 2013 funding, PMI supported the implementation of the recommendation from a PMI-funded Cross River and Nasarawa study on the social, cultural and economic factors that serve as barriers to uptake of IPTp. The main recommendation was in the area of ACSM. The findings encouraged communication through community meetings and radio messaging in addition to

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<sup>5</sup> C. Diala, T. Pennas, P. Choi, and S. Rogers. 2012. Barriers to Uptake of Malaria Prevention and Treatment During Pregnancy in Cross River and Nasarawa States, Nigeria. Washington, DC: C-Change/FHI 360. The article can be found at <http://www.malariajournal.com/content/12/1/342>

interpersonal communication through house-to-house visits to improve IPTp and treatment seeking among pregnant women. Findings of the study also supported the NMEP to review the communication strategy around prevention of MIP. PMI also supported the review and updating of the MIP Guidelines to align with WHO recommendations of providing IPTp at every scheduled ANC after the first trimester, with four weeks between doses. Also updated were training materials and algorithms. The work is awaiting production and dissemination to states.

To boost performance of MIP interventions in Nigeria, PMI continued supporting capacity building of service providers to improve delivery of FANC services in nine of the eleven PMI focus states. The training includes interpersonal communication to improve behavior and attitudes of service providers towards IPTp. The last two states (Kebbi and Akwa Ibom) came on board late and MIP activities were not initiated in those two states with PMI funding. With FY 2013 funding, PMI trained over 1,045 ANC service providers on prevention and management of MIP.

With FY 2013 funding, PMI procured 1 million SP doses and 506,150 ITNs for routine distribution through health facilities. Some states and local governments are procuring limited amounts of SP but these procurements have been ad hoc and unpredictable.

**Table 10: Sulfadoxine-pyrimethamine need for 11 PMI focus states, Nigeria, 2014**

STATE	Annual Exponential Growth Rate	Total Population (2006 Census)	Projected Popn 2014	ANC Attendance	Public Sector ANC	Public sector ANC women	SP Doses (3 doses)
Akwa Ibom	3.4	3,920,208	5,145,614	73%	80%	150,252	450,756
Bauchi	3.4	4,676,465	6,138,267	56%	95%	163,278	489,834
Benue	3.0	4,219,244	5,363,710	57%	50%	76,433	229,299
Cross River	2.9	2,888,966	3,643,332	73%	80%	106,385	319,156
Ebonyi	2.8	2,173,501	2,719,204	85%	55%	63,561	190,684
Kebbi	3.1	3,238,628	4,150,172	24%	95%	47,312	141,936
Kogi	3.0	3,278,487	4,167,774	88%	60%	110,029	330,088
Nasarawa	3.0	1,863,275	2,368,687	63%	77%	57,452	172,357
Oyo	3.4	5,591,589	7,339,447	87%	58%	185,174	555,523
Sokoto	3.0	3,696,999	4,699,807	17%	95%	37,951	113,853
Zamfara	3.2	3,259,846	4,210,915	22%	95%	44,004	132,012
<b>TOTAL</b>	<b>3.2</b>	<b>38,807,208</b>	<b>49,946,929</b>	<b>59%</b>	<b>76%</b>	<b>1,041,831</b>	<b>3,125,498</b>

**Table 11: SP gap analysis for the 11 PMI focus states, 2013-2016**

SP Needs and contribution	2014	2015	2016
Estimated population for 11 PMI focus states	49,946,929	51,759,397	53,442,484
Total number of potential women attending ANC in public sector	1,041,831	1,146,014	1,260,615
Total SP Needs	3,125,498	3,438,042	3,781,846
<b>SP procured or on order</b>			
SP from Federal MOH/States	0	0	0
SP from GF	0	0	0
SP from PMI	3,000,000	4,000,000	0
SP from other sources	0	0	0
SP procured or on order	0	0	0
<b>SP (gap) or surplus</b>	<b>(125,498)</b>	<b>561,958</b>	<b>(3,781,846)</b>

*Assumptions:* The gap analysis assumes an average annual growth rate of 3.2% for the 11 PMI focus states with an estimated 5% of the population that could become pregnant. For the 11 PMI focus states, ANC attendance varies from 17% to 88% (Table 10). The SP gap analysis uses 2013 DHS state-level ANC attendance and assumes an annual increase in ANC attendance of 10% and 80% IPTp2 coverage in PMI focus states. The NMEP bases SP needs on 3 doses for each pregnant woman attending ANC. Due to the relatively low cost of SP, lack of SP provision by GF, and no firm commitment from the FMOH and states, PMI proposes to cover the total SP gap in the eleven PMI focus states.

### *Plans and justification*

PMI will continue to support a MIP strategy that includes IPTp, LLINs for ANC, and prompt case management of malaria during pregnancy including diagnosis and treatment. Effort will be on increasing IPTp coverage through provision of free SP to pregnant women, implementing the new WHO IPTp policy, scaling up LLIN distribution to pregnant women during the first ANC visit, and testing and promptly treating pregnant women with confirmed malaria.

PMI will continue to build on the gains made in improving access to IPTp among the pregnant women who attend ANC clinics. To expand demand for and access to IPTp services with FY 2015 funding, PMI funding will support mass media campaigns, innovative interpersonal communication interventions at the local government facilities and ward levels, and regular integrated supportive supervision to all facilities offering ANC services, with an increased focus on rural and hard-to-reach communities. FY 2015 funding will be used to scale up the rollout of the new IPTp policy medical school curricula and professional associations. PMI funding will also support the piloting of outreach by health care workers for community-based ANC and IPTp directly observed therapy (DOT) in two states in northern Nigeria where ANC attendance is less than 25%. In addition, BCC activities will include specific interventions for health care workers for improved IPC to improve uptake of IPTp.

Targeting PMI interventions, including MIP, is currently being discussed with the NMEP. However, although 2013 DHS shows a slightly higher IPTp2 coverage in urban areas (19%) compared to the rural areas (12%) targeting for IPTp in Nigeria is premature. PMI strategy in Nigeria is to raise IPTp coverage in both urban and rural areas. The results from the ongoing 2013 MIS will provide more updated data to inform the targeting discussions. MIS preliminary results will come out early 2015.

***Description and budget for proposed activities with FY 2015 funding (\$2,200,000):***

1. *Procure and distribute adequate quantities of SP in 2016:* In FY 2015, PMI will procure approximately 4 million doses of SP for health facilities in PMI focus states and for the community-based IPTp pilot. Funding will also support the provision of other resources such as disposable cups and clean water for health facilities to deliver direct observation of IPTp. (\$900,000)
2. *Provide support for implementation of MIP and IPTp as part of FANC across 11 PMI focus states:* PMI support will include the rollout of the new MIP policy; updating implementation guidelines and training materials; introducing new MIP guidelines in medical training institutions and professional associations; aligning the NMEP MIP policy documents with the Reproductive Health Unit policy documents; training health facility workers in each of the eleven PMI states; designing and piloting a “supervised” community-based IPTp-DOT in two northern states, periodic supportive supervision; and improved delivery of IPTp and ITNs during pregnancy. The community-based-IPTp will be a pilot intervention and not operational research. The details, including the design of the pilot are yet to be worked out. There will be a concept note to guide the implementation of the pilot. The MIP WG will be included in the discussions and will provide input in the concept note. The community IPTp pilot will require small quantities of SP and the costs are included in the budget line for commodities. MIP activities at health facility level include sensitization and training of health workers on the new IPTp policy, training of health workers in preventing MIP, management and provision of LLINs at first ANC visits, caring for LLINs, testing and treatment of malaria in pregnancy, supportive supervision, data collection and analysis, and reporting. (\$1,300,000)
3. *Create awareness and demand for MIP services:* With FY 2015 funds PMI will support BCC activities that support BCC efforts for all MIP interventions including LLIN use by pregnant women, provision of LLINs at 1st ANC visit, monthly IPTp with free SP at every ANC visit starting early in the second trimester, and prompt case management of malaria during pregnancy including diagnosis and treatment according to national policy. BCC activities will include interpersonal communication, mass media, and social mobilization to promote IPTp, as well as other key aspects of malaria control and prevention. BCC activities will target health workers attitudes and practices, and communities through interpersonal communication, mass media, community rallies, and community change agents. Details on BCC activities for MIP are elaborated on in the BCC section. (Costs covered under the ACSM section)

4. *Scale up routine distribution of ITNs to pregnant women:* PMI will support the scale-up of routine distribution of ITNs to pregnant women during the first ANC visit. The distribution will be at ANC clinics. (*Costs covered under the ITN section*)

#### 4. Case Management: Diagnosis and Treatment

##### *NMEP/PMI Objectives*

PMI's case management objectives are:

- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria
- 85% of children under-five with confirmed malaria will have received treatment with ACTs within 24 hours of onset of their symptoms

The NMEP's objectives for case management are consistent with WHO Guidelines and are articulated in the National Malaria Policy (2014). They include:

- Testing of all suspected cases of malaria before the institution of treatment at all levels of health care delivery in the country; except in extraordinary circumstances where a diagnostic facility is not accessible
- Use of quality-assured ACTs for the treatment of uncomplicated malaria
- Discouraging antimalarial monotherapies for the treatment of uncomplicated malaria
- Adoption of the use of injectable artesunate as the primary drug for the treatment of severe malaria
- Provision of the environment for use of pre-referral treatment including the use of rectal artesunate at the community level for suspected cases of severe malaria who present to community health workers and at primary health care levels
- Prompt referral from one health care level to a higher level in suspected cases of severe malaria

##### *Progress since PMI was launched*

Artemether-lumefantrine (AL) or artesunate-amodiaquine (ASAQ) are the two options for first-line treatment of uncomplicated malaria. A recently published therapeutic efficacy study demonstrated greater than 95% PCR-corrected cure rates at 28 days for both of these ACTs<sup>6</sup>. In 2012, the NMEP changed the first-line treatment of severe malaria from quinine to injectable artesunate, consistent with WHO guidelines. National policy specifies that pregnant women with uncomplicated malaria should receive oral quinine in the first trimester and an ACT in the second and third trimesters, while severe malaria should be treated with injectable artesunate (or quinine, if injectable artesunate is not available).

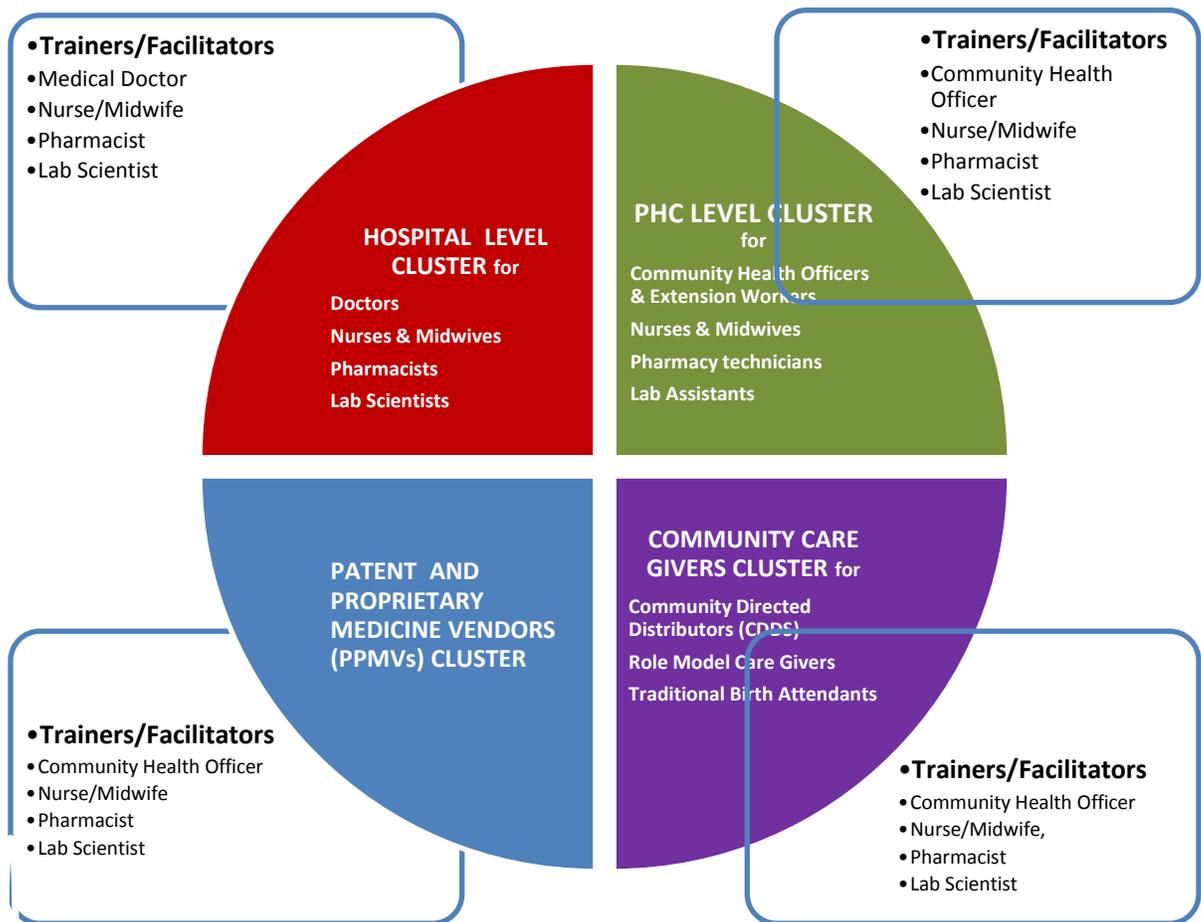
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<sup>6</sup> Falade CO, Dada-Adegbola HO, Ogunkunle OO, Oguike MC, Nash O, Ademowo OG. Evaluation of the comparative efficacy and safety of artemether-lumefantrine, artesunate-amodiaquine and artesunate-amodiaquine-chloroquine (artemoclo) for the treatment of acute uncomplicated malaria in Nigerian children. *Medical Principles and Practice: International Journal of the Kuwait University, Health Science Centre.* 2014; 23(3):204-11. PubMed PMID: 24732940.

Since PMI was launched, 10,124,259 ACTs (complete treatment courses), 2,509 injectable artesunate treatment courses, and 3,331,025 RDTs have been procured and delivered to LGAs in the nine initial PMI focus states.

Training in the use of diagnostics and antimalarial medications has been a focus of PMI since inception. For every state, detailed training plans have been developed through state-level working groups, which incorporated input from each state’s ministry of health, local health care institutions, and implementing partners. Each plan identifies the number of facilities, trained health care personnel needed to provide complete coverage, and partner responsible for training in a particular area. Because partners other than PMI (e.g., UNICEF, GF) also support this large-scale training initiative—often with many partners in the same state—efforts are harmonized in order to ensure uniformity and not duplicate work. For each state, a corps of trainers (consisting of doctors, nurses, pharmacists, and laboratory scientists) is trained in the fundamentals of case management. These trainers subsequently conduct training events in LGAs throughout the state. Separate sessions target specific providers, ranging from community care givers to doctors (see Figure 5). These sessions cover a wide array of malaria topics, including use of RDTs, use of antimalarial medications, and prevention of MIP. Specialized training, such as microscopy for laboratory technicians, is also offered in each of PMI’s focus states.

**Figure 5: Case management training scheme for each LGA (MAPS Project Presentation)**



By the end of FY 2014, PMI's implementing partners will have fully trained all personnel in case management in their portions of the states of Sokoto and Bauchi. For the other seven initial PMI states, training is well underway, with between 15% and 50% of all targeted health facility workers already trained and plans for the remaining portion to receive training funded by PMI or other organizations. For the recently added PMI-focus states of Akwa Ibom and Kebbi, state malaria technical working groups have been formed and state training plans have already been drafted; initial training sessions will commence over the next few months.

### ***Progress during last 12 months***

#### **Diagnosis**

In the past 12 months, PMI procured and delivered 1,285,895 RDTs to selected LGAs in the nine PMI focus states. A PMI End-Use Verification (EUV) survey conducted in PMI-supported states in late 2013 showed that stockouts of RDTs dropped to 14%, down from 17% in early 2013. Post-deployment RDT evaluation is endorsed by the NMEP's Malaria Diagnostic External Quality Assurance Operational Guidelines and is currently performed at the University of Lagos in conjunction with the NMEP. RDT training involved community health officers, community health extension workers, nurses, midwives, and laboratory technicians while microscopy training focused on medical laboratory scientists and microscopists. Diagnostic training will continue in the ensuing fiscal year and will expand to the private sector as well as the two newly added PMI states of Akwa Ibom and Kebbi. PMI provides equipment and reagents for microscopy based on consumption data collected over a three-month period from each facility. PMI has also supported the development of standard operating procedures in microscopy and the use of RDTs.

The NMEP is in the final stages of crafting Malaria Diagnostic External Quality Assurance Operational Guidelines for parasite-based confirmation of malaria. These guidelines will encompass all appropriate QA strategies, many of which PMI already supports. For example, laboratories are instructed to keep previously read slides which will be periodically reviewed by an expert to confirm the correct diagnosis was made. QA officers receive periodic testing by receiving five "unknown slides," which they examine and submit their diagnosis. Quarterly supervisory visits will continue to occur in PMI-supported states, with one facility in each state visited per quarter. During these on-site supervisory visits, evaluators and local microscopists read slides together and discuss discrepancies. Areas identified for improvement through QA are addressed in one-day technical review meetings involving supervisors, microscopists, state QA officers, and representatives from the NMEP. Plans for the creation of a malaria slide bank, to be used for training, have already started and distribution is projected to occur on or before FY 2016.

#### **Treatment**

In the past 12 months, 3,638,297 ACTs and 790 injectable artesunate treatments were delivered to the nine of the eleven PMI focus states. Although NMEP policy supports the use of pre-referral rectal artesunate in suspected cases of severe malaria presenting to community health workers or peripheral health facilities, cultural and legal barriers remain, preventing the scale-up

of this activity. An EUV survey in late 2013 showed that 93% of facilities had some form of ACT available. Although the amount of treatment courses for severe malaria is very low compared with that for uncomplicated malaria, this was related to the recent introduction of artesunate as the first-line medication for severe malaria and the need to initially train health care personnel and distribute this medication to health care facilities.

### Integrated community case management

Integrated community case management (iCCM) has not been a major component of past national malaria policies, but the most recent NMEP policy states the government will “create [an] appropriate environment for access to malaria diagnosis and treatment through community health workers in areas without access to a fixed health facility within a 5 km radius.” In order to fulfill this new initiative, one community health worker (CHW) should provide iCCM for every 500 persons. In total, 225,561 community-based frontline CHWs will be required to adequately reach these hard-to-reach populations (based on a projected total population of 173 million, with 65% residing in rural areas). PMI supports training of CHWs in target states. The NMEP also acknowledges that CHW attrition is a barrier to successful iCCM implementation and intends on reviewing various retention strategies.

Another major challenge to iCCM is that most Nigerians seek treatment of febrile disease initially through the private sector. The 2010 MIS reported that 57% of those with fever first sought treatment from a chemist or patent and proprietary medicine vendor (PPMV). However, because PPMVs cannot legally diagnose or treat malaria, case management occurs mostly unrecorded and unregulated in this sector. In order to effectively reach the large percentage of Nigerians who seek malaria care in the private sector, PMI is helping fund a 9-month pilot study of PPMVs scheduled to start in September 2014. This study will have intervention and control arms focusing on PPMVs and their corresponding catchment areas. Training in iCCM (including febrile respiratory disease, diarrhea, and malaria) will be provided to the PPMVs and a waiver is being sought in order to permit use of RDTs and ACTs in the intervention sites. If this pilot study yields encouraging results (e.g., appropriate distribution of an ACT based on a positive RDT), then the next intended step would be to advocate for revision of regulations that would permit PPMVs to diagnose and treat or refer non-severe febrile disease, as appropriate.

### Commodity gap analysis

In December 2013, the NMEP oversaw state-specific exercises to collect and analyze data related to case management commodity needs<sup>7</sup>. Population projections were based on the 2006 census and growth rates supplied by the Population Reference Bureau. Malaria was assumed to account for 35% of all febrile episodes. In regards to antimalarial use, 40% of cases were assumed to be treated in the public sector and 60% in the private sector whereas these numbers were the converse for RDT use. The gap tables reflect only the need of the public sector and assume that a 20-month supply of a commodity is needed to “fill the pipeline.” Once the pipeline is filled (as should be the case with ACTs), then it does not need to be refilled. Malaria cases

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<sup>7</sup> All assumptions taken from the NMEP’s “Quantification and Gap Analysis of Anti-Malarial Medicines and Rapid Diagnostic Tests, 2014-2015.”

were assumed to decrease 10% yearly due to ITN coverage, spraying, and improved diagnosis. Surpluses from one year were carried over to the next. Future commitments from other donor (e.g., GF) were based on past allocations.

### Diagnosis

Needs for RDTs were calculated based on the projected number of febrile episodes because the initial scale-up of microscopy would fractionally exceed the scale-up of RDT training, the percentage of cases of malaria diagnosed with RDTs would decrease from 75% to 70% between 2014 and 2015. The price of an RDT was assumed to be \$0.35, including shipping and handling, a value used in estimates for 2015 and 2016.

**Table 12: RDT gap analysis (2014-2016)**

<b>RDT needs and contributions</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Estimated population in PMI areas</b>	49,946,929	51,759,397	53,442,484
<b>Febrile episodes</b>	61,376,062	63,313,110	58,749,263
<b>Febrile episodes in public sector</b>	36,825,637	37,987,866	35,249,558
<b>Projected RDT needs in public sector</b>	27,619,228	26,591,506	24,674,690
<b>Pipeline needs</b>	46,032,047	44,319,177	41,124,484
<b>Total Stock available</b>	3,639,663	0	0
<b>RDTs procured by GF</b>	6,904,807	6,647,877	6,168,673
<b>RDTs procured by PMI</b>	3,500,000	11,428,571	13,428,571
<b>RDTs procured by other sources</b>	0	1,151,815	0
<b>RDT (gap) or surplus</b>	(59,606,805)	(51,682,420)	(46,201,930)

### Treatment

Per the NMEP's estimates, the age breakdown for those needing ACTs is: 0-11 months accounting for 30%; 1-5 years accounting for 21%; 6-12 years accounting for 19%; and older than 12 year accounting for 30%. Based on the current price estimates for AL at a > 26 week delivery time, this yields a weighted average price for one AL course of \$1.05, including shipping and handling. The average ASAQ course is \$0.63, including shipping and handling. These estimated costs of AL and ASAQ were used for 2015 and 2016. Per the NMEP plan, the ratio of AL to ASAQ is 4:1 (due to greater patient tolerability of AL), which was used in 2015 and 2016 estimates. PMI's plan is to completely fill ACT gaps at the states level in 2015 and 2016, with the left-over balance applied to purchasing injectable artesunate for the treatment of severe malaria.

**Table 13: ACT gap analysis (2014-2016)**

<b>ACT needs and contributions</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Estimated population in PMI areas</b>	49,946,929	51,759,397	53,442,484
<b>AL needs per NMEP</b>	5,624,276	5,801,780	5,983,304
<b>AS/AQ needs per NMEP</b>	1,406,068	1,450,556	1,495,668
<b>Total ACT needs per NMEP</b>	7,030,344	7,252,336	7,478,972
<b>Total pipeline needs</b>	11,717,240	2,984,372	0
<b>AL stock on-hand</b>	6,170,706	0	0
<b>AS/AQ stock on-hand</b>	3,186,437	0	0
<b>Total ACT stock on-hand</b>	9,357,143	0	0
<b>AL commitments PMI</b>	3,750,000	2,738,921	4,487,383
<b>AL commitments GF</b>	1,406,069	1,450,445	1,495,826
<b>AL commitments (other)</b>	0	4,000,000	0
<b>Total AL commitments</b>	5,156,069	8,189,366	5,983,209
<b>AS/AQ commitments PMI</b>	1,250,000	1,662,918	1,099,415
<b>AS/AQ commitments GF</b>	0	384,424	396,348
<b>AS/AQ commitments (other)</b>	0	0	0
<b>Total AS/AQ commitments</b>	1,250,000	2,047,342	1,495,763
<b>Total ACT commitments</b>	6,406,069	10,236,708	7,478,972
<b>ACT (gap) or surplus</b>	2,984,372	0	0

Injectable artesunate for the treatment of severe malaria was just being scaled up in 2014, accounting for only a small portion of the total antimalarial budget at that point. For the following table, it was assumed that 5% of all malaria cases would be severe malaria and—averaging the amount required for the different ages and treatment durations—that each case would require 5.5 ampules for a full treatment course. Each ampule was assumed to cost \$2.86. Even with GF and PMI contributions in 2015 and 2016, there still remains a large gap, partially because more money is required to initially fill “the pipeline.”

**Table 14: Artesunate injectable gap analysis (2014-2016)**

<b>Artesunate injectable (inj) needs and contributions for severe malaria</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Severe malaria cases</b>	351,517	362,617	373,949
<b>Total ampule needs for cases</b>	1,933,345	1,994,392	2,056,717
<b>Total ampule needs for pipeline</b>	--	3,323,987	3,427,862
<b>Artesunate inj commitments PMI</b>	30,000	1,355,418	837,628
<b>Artesunate inj commitments GF</b>	0	415,190	428,295
<b>Artesunate inj commitments other</b>	0	0	0
<b>Artesunate inj (gap) or surplus</b>	(1,903,345)	(3,547,772)	(4,218,656)

***Plans and justification***

PMI will continue to support the NMEP’s policy of malaria case management based on diagnostic confirmation by supporting RDT use and strengthening microscopy through provision of commodities, as well as training, supervision, and quality assurance activities at the health facility and community levels. PMI will also supply ACTs for all age groups to support appropriate treatment based on a confirmed diagnosis. Commodity procurement will continue to focus on the 11 PMI states. Training and supervision will aim to provide long-term, ongoing support to strengthen diagnostic and treatment services at all levels of the health care system by identifying areas that require improvement and providing on-site feedback and technical advice.

***Description and budget for proposed activities with FY 2015 funding (\$18,949,000)***

1. *Procure an estimated 12 million RDTs:* PMI intends on providing RDTs in selected LGAs of 11 states. Coordination with other major malaria donors — including GF and SuNMaP — will continue to ensure comparable coverage throughout the country. (\$5,000,000)
2. *Support for malaria diagnostic training:* These training activities will focus on training of trainers in each of the 11 states. These training activities will focus on training of trainers and refresher training in each of the 11 PMI states. These trainers will then provide training and supervision for health facilities. QA/QC will also be supported through the creation of standard operating procedures for microscopy/RDTs, supervisory visits, and the formation of a malaria slide bank. (\$525,000)
3. *Technical assistance visits:* Two CDC TDYs to provide technical support for microscopic and RDT diagnoses of malaria. (\$24,000)

4. *Procure ACTs and severe malaria drugs:* PMI intends on providing antimalarials in selected LGAs of 11 states. Coordination with other major malaria donors—including GF and SuNMaP—will continue to ensure comparable coverage throughout the country. (\$7,800,000)
5. *Train and provide supportive supervision for case management in the public sector:* Improve malaria case management, including management of severe malaria, in the public sector, with a focus on training and motivation of health workers. This will focus on the 11 PMI states with increasing effort at the community level, including training CHWs in diagnosis, treatment, and referral. PMI will also work with the NMCP and relevant partners to improve the rollout of integrated community case management of childhood illnesses at the state, LGA, and community level to improve the appropriate use of diagnostics including interpreting laboratory results and managing patients based on results. Support will include in-service training and supervisory visits for laboratory workers and health care providers as part of a comprehensive program for case management (\$4,100,000)
6. *Improve the quality of malaria case management in the private sector:* Scale-up iCCM in PPMVs if current pilot proves to be successful. At the community level, PMI will support the use of innovative strategies to improve the rollout of iCCM of childhood illnesses through PPMVs. (\$1,000,000)
7. *Provide support to strengthen the national drug regulatory agency's capacity:* Strengthen NAFDAC's capacity for drug quality control including the procurement of necessary equipment and supplies. This support will include establishing functional mini-labs that can perform key test for drug quality in the field. Activities include post-market surveillance in three states to detect counterfeit antimalarials and use of monotherapies in public and private sectors. (\$500,000)

## 5. Pharmaceutical and commodity management

### *NMEP/PMI Objectives*

The public sector procurement and supply chain management of essential medicines is weak and fragmented. Consequently, frequent stockouts and expiries of all commodities, including ACTs and RDTs, occur. Supplies of malaria-related commodities come from a variety of sources and may be donated or procured at various levels of the government health system. Donors, the federal government, states, and LGAs all can procure ACTs, SP, and RDTs. The states, LGAs, and individual health facilities can supplement donated and federal government-procured commodities by using revolving drug funds and/or oil and tax revenues. Both the sources of commodities and the distribution systems are varied. In principle, donor and government-procured essential medicines flow either through the national Central Medical Stores (CMS) to the state CMS. States often have difficulty delivering commodities to the facility level. The supply of World Bank- and GF-procured ACTs has been varied and unpredictable, resulting in stockouts in some health facilities. This has also led other facilities to acquire medicines from

local pharmacies that do not always align with national policy. Many Nigerians use the private sector and local pharmacies for health care. In these cases, laboratory confirmatory diagnosis is not done and standard treatment guidelines are often not followed. However, the NMEP has limited capacity and authority to oversee this sector.

The NAFDAC is responsible for the registration of antimalarials and QC at the point of entry for internationally procured drugs or at the factory gate for locally produced ones. This agency and the NMEP collaborate to conduct post-marketing surveillance of drugs. However, there is no WHO prequalified QC laboratory in Nigeria so the NMEP must pay outside laboratories to test medicines and other products. The country needs appropriate equipment to move NAFDAC toward meeting WHO standards for prequalification.

### ***Progress since PMI was launched***

Despite many challenges, opportunities have emerged to help ameliorate some of the problems facing Nigeria's pharmaceutical and commodity management. PMI funding has helped the GoN establish a malaria commodities logistics system (MCLS) for distribution of malaria commodities that include ACTs, RDTs, SP, artesunate injections, and ITNs. The support includes quantification and procurement planning, procuring and storage of commodities, distribution to states and health facilities or communities in case of ITNs for mass campaigns, and EUV surveys to monitor stock levels and prevent stockouts, excesses, and leakage.

Since FY 2011, PMI funding has procured over 14 million LLINs to support mass campaigns and continuous distribution through ANC and vaccination centers, over 16 million ACTs, 7 million RDTs, 5 million SPs, and 50,000 doses of injectable artesunate. PMI funding has also supported the establishment of a LMIS in nine of the 11 PMI focus states. The LMIS generates data for quantification and procurement planning, and effective management of malaria commodities to prevent excesses and expiries. PMI funding is also used to train health workers in LMIS and MCLS.

PMI has continued to assist the national and state malaria control programs to establish pharmaceutical supply management (PSM) working groups in 9 of the 11 PMI focus states. As a result, state-specific quantifications and gap analyses have been developed and used to inform commodity planning by partners and as advocacy tools for resource mobilization. As a result of these trainings, the availability of consumption data for decision making has increased. Such data are helping state and national malaria control staff to conduct more accurate forecasting and quantification, and are used to advocate with local governments for support with commodities procurement and management. Still, there remains a need to focus on improving data quality.

Many PMI focus states lack sufficient storage space and in some cases have no warehouses capable of storing malaria commodities according to standard pharmaceutical guidelines (i.e., ample space, acceptable storage conditions and standard storage procedures, explicit quality assurance mechanisms, and adequate product security). PMI continues to lease 216 pallet positions in a pharmaceutical-compliant store in Abuja and warehouse space for ITNs in Lagos. Some state governments have provided storage space, but PMI has not been able to identify pharmaceutical-compliant stores in any of its supported states. While access will improve with

PMI and other partners' inputs, the need for trained personnel in warehouse management will continue and is being addressed. Despite these challenges, PMI-supported facilities have been appropriately stocked, including through *ad hoc* redistribution of stocks between states, as needed.

In four states—Ebonyi, Bauchi, Sokoto, and Zamfara—PMI is supporting distribution of malaria commodities using a direct delivery and information capture system. This is a direct delivery of commodities from the state central medical store to facilities via trucks. At the time of delivery, a staff member on the truck checks the facility's stock, determines need using a software package, and immediately provides the needed commodities. The data are sent to headquarters where stock balances and procurement decisions are made. This model is designed to be a push or vendor-managed inventory system that is based on regular data collection, bimonthly distribution, and reporting. The goal is to achieve full supply of facilities based on the data reported.

PMI is also supporting the strengthening of QA/QC of antimalarials. A gap analysis of the QA/QC of medicines was conducted to help support the NAFDAC and NMEP in developing a QA/QC policy for antimalarial medicines and diagnostics.

### ***Progress during the past 12 months***

PMI FY 2013 funding was used to continue strengthening the MCLS and LMIS through training and tools for data collection. PMI funding provided technical assistance for quantification of the GF new funding mechanism malaria concept paper (2014-2016) and micro-planning for ITN mass campaigns in seven states (Akwa Ibom, Bauchi, Nasarawa, Jigawa, Rivers, Gombe, and Anambra). PMI supported the training of 25 NMEP and 148 state-level officers in forecasting and procurement planning. FY 2013 funding supported two rounds of end-use verification surveys in 189 health facilities in 9 states.

PMI funding supported the continued distribution of ACTs, RDTs, and SP in 1,856 health facilities, including 699 GF-supported health facilities. In the last 12 months, PMI supported the distribution of more than 3.6 million ACTs, 1.3 million RDTs, 846,000 SP treatments, and 2,644 vials of injectable artesunate.

While there are almost 40 registered ACTs that are manufactured in Nigeria, to date there is no producer that is WHO-prequalified for ACTs. Additionally, there are products from nonqualified foreign manufacturers, as well as artemisinin monotherapies, SP, and chloroquine in the private sector. Given the scope and size of the private sector market and its common use by many Nigerians, the National Agency for Food and Drug Administration and Control (NAFDAC) has a difficult task when providing quality control measures in this sector.

PMI support for improved QA/QC (Quality Assurance/Quality Control) of antimalarial medicines will include training staff to strengthen the regulatory capacity of NAFDAC. Also, the QA/QC enhancement will strengthen the NAFDAC's laboratory capacity and post-market surveillance.

## ***Plans and justification***

Given the numerous challenges with the disjointed procurement, supply, and distribution system, PMI remains committed to strengthening pharmaceutical and commodity management systems at the state level and below, ideally to the facility level. The plan is to strengthen the capacities of state central medical stores, including establishing electronic databases and LMIS. PMI funding will also be used to increase the health facilities benefiting from PMI support within the 11 PMI focus states, using the most cost-effective and state-owned systems for commodity storage and distribution. Effort will be made to advocate for integrated state logistics management systems with other donors and programs. PMI funding will continue to support training of facility staff on the LMIS and provide technical assistance to support it becoming fully operational. In this way, facilities and states will improve their ability to generate reliable data on consumption, supply, needs, and distribution of pharmaceuticals and commodities.

### ***Description and budget for proposed activities with FY 2015 funding (\$4,200,000):***

1. *Strengthen the pharmaceutical and commodity management system* by improving forecasting, management, and distribution of pharmaceuticals, RDTs, and ITNs, and provide warehousing, where needed, and strengthening LMIS. This activity will help mitigate the risk of stockouts of malaria commodities and the improper disposal of expired drugs. (\$4,200,000)
2. *Provide support to strengthen the national drug regulatory agency's (NAFDAC) capacity* for drug quality control, including the procurement of necessary equipment and supplies. This support will include establishing functional mini-labs that can perform key testing of drug quality in the field, providing NAFDAC with additional tools to detect fake and poor quality drugs. (Costs covered under the Treatment section)

## **CROSS CUTTING**

### **7. Advocacy, communication, and social mobilization**

#### ***NMEP/PMI Objectives***

The RBM partners, under the leadership of the NMEP, developed an updated National Malaria ACSM Strategic Framework and Implementation Plan. The framework and plan are consistent with the NMEP Strategic Plan 2009-2013. In FY 2014, PMI supported activities to update the national ACSM framework (released in July 2014), as well as implement BCC capacity strengthening workshops for NMEP-ACSM staff to improve their capacity to coordinate and facilitate BCC activities among partners. The updated strategic framework will provide an integrated communication plan that standardizes messages and tools for all partners with the understanding that states may need to adapt it to their particular situation. The strategic framework recommends various channels of communication based on specific attributes of the target audiences, such as literacy levels, access to television or radio, and other social and economic characteristics. The objective of these interventions is to increase and/or improve ITN demand, ownership and net care, repair, and use; patient demand for diagnostics by promoting

awareness of appropriate testing and treatment for malaria; health care provider adherence to test results through activities directed at health facilities; delivery of IPTp at the facility level; and treatment seeking behavior and treatment adherence. In general, households and families are reached using radio, community drama, printed materials, community and religious leaders, and through community support groups and household visits of volunteers IPC.

The National Malaria ACSM branch is one of the six branches of the NMEP and is supported by the ACSM technical sub-committee. Members of the technical committee are drawn from RBM partners, including PMI. The ACSM technical sub-committee plays critical roles in revising the strategic framework, helping develop tools, and assisting in coordinating activities across RBM partners. It also reviews the technical content of all BCC messages pertaining to malaria to ensure their accuracy and harmonization.

At the state level, the ACSM program liaises with the state malaria focal person. In PMI focus states, the state malaria focal persons are supported by state-level ACSM technical committees, which were established with PMI support. Nationally, some states have adopted and adapted the national ACSM framework as a basis for state-level operations and others have not. All 11 PMI-supported states have done this with PMI support.

### ***Progress during the past 12 months***

PMI supports BCC as a cross-cutting activity focusing on all interventions: case management (including diagnostics), ITNs, and IPTp. The focus of activities includes increasing and improving the information delivered by facility-based and community health workers, use of local language radio to disseminate malaria messages on malaria prevention and treatment, and use of IPC through volunteers at the community level. PMI funding also supports journalists to identify and develop appropriate malaria news items.

With FY 2014 funds, PMI supported community mobilization activities, including community dialogue, compound meetings, and house-to-house visits by trained community volunteers. Over 99,000 household in seven states were visited. In Bauchi and Sokoto states, a total of 5,670 community volunteers conducted house-to-house counseling and education on malaria prevention and treatment. PMI supported sensitization of religious and traditional leaders to mainstream malaria messages in sermons and public speeches. PMI support was also used to engage the media to promote ITN use through jingles, radio discussions, phone-in programs, and short dramas.

In total, 383,108 individuals were reached with messages on ITN ownership and use, 291,151 on ANC and IPTp messages, and 325,725 on prompt care seeking for fever and severe malaria in under-five children.

PMI continued to support quarterly meetings of the seven state ACSM committees and Ward Development Committees (WDCs) to improve the quality of BCC activities in communities and at all levels of the states' health systems, as well as to enhance coordination across line ministries, donors, implementing partners, and the private sector. Advocacy with the private sector resulted in the appointment of one of Nigeria's most successful businessmen as Malaria

Ambassador. In April 2014, PMI finalized grant agreements with six community-based organizations expanding to three additional states beyond the four initiated in FY 2013. The community-based organizations conduct IPC activities at the household level in seven states. Activities in FY 2014 focused on intensifying community-level interventions for malaria prevention, case management, and MIP.

In addition, BCC work with Voice of America provided local language (Hausa) radio broadcasting service to northern Nigeria to broadcast health messages. VOA broadcasted malaria, MCH, immunization, and family planning messages in the North, which is deemed a high priority region by the USAID Mission in Nigeria.

In FY 2014, PMI initiated a new activity to strengthen BCC capacity at the state level in Kebbi and Akwa Ibom. Activities included BCC capacity building of state-level ACSM staff, and development of BCC action plans rooted in the national ACSM framework, IPC Manual, and Social Mobilization Manual. In addition, community mobilization materials for net campaigns were developed in the two states. Additional activities focused on capacity strengthening of one of Nigeria's largest and most influential civil society organizations, the Nigeria Interfaith Action Association (NIFAA). In addition, partners have begun using the National Advocacy Kit that was previously updated with PMI support. The National Advocacy Kits are a collection of policy briefs that were developed by NMEP-led malaria partners. After the development of the ACSM Strategic Framework and Implementation Plan, the kits were developed to ensure uniformity of messages being used for advocacy and to harmonize malaria messages.

PMI continues to support the ongoing operational research on approaches to promote ITN care and repair. In previous years, PMI supported a study on the social, cultural, and economic factors that serve as barriers to uptake of IPTp in two states, Cross River and Nasarawa. The study confirmed significant gaps between ANC attendance and uptake of IPTp among pregnant women. The findings were used by PMI partners to develop more integrated community-level mobilization approaches addressing attitudes of partners and relatives as well as attitudes and skills of health workers.

Misperceptions, lack of knowledge, and poor practices related to malaria are common in Nigeria. While awareness about malaria transmission has increased, many misconceptions persist. Although 82% of women interviewed in the MIS 2010 identified mosquitoes as a source of malaria, common misconceptions persist as other causes cited include dirty surroundings (27%), the presence of stagnant water (12%), and eating certain foods (6%). Among children under-five treated for malaria in the two weeks preceding the survey, only 6% took an ACT, while 31% took chloroquine. ANC attendance is low; only 58% of women received ANC from a skilled provider, and only 17% received two doses of IPTp. These data point to the need for increased and more effective BCC for malaria prevention and control.

The vibrant and independent media in Nigeria provides opportunities to reach the public. Over 120 local radio stations exist nationwide and they can be found in all states, with heavier concentrations in urbanized areas. Local radio stations broadcast in the range of local languages, providing an opportunity for targeted communications. According to the MIS 2010, 30% of women surveyed had heard a message about malaria in the previous four weeks. Of these

women, 63% heard them on the radio, while 39% reported seeing them on television. Overall, in rural areas, women more frequently heard the message on radio (74%), while in urban areas women more frequently saw messages on television (45%).

Various types of community structures provide opportunities to promote BCC in the communities. The robust local, cultural, traditional, and religious gatherings provide opportunities to reach rural communities. For example, community meetings and sermons delivered in places of worship have created more opportunities for BCC messages to be disseminated to a large number of individuals.

### ***Plans and justification***

PMI will continue to support the BCC efforts of the NMEP and state malaria control programs to create demand for malaria diagnosis before treatment, treatment with ACTs as the drug of choice, IPTp, and nightly use of ITNs for prevention of malaria. The MIS 2010 results indicate that mass media is effective in reaching the target population. PMI will continue to support dissemination through these mass media channels as well as household-level IPC. Starting with ITNs, PMI will support communication on care and use both before and after mass campaigns, with increasing association with continuous delivery. With scale-up and improvements to case management and IPTp, health care workers will increasingly become important agents for promoting ITNs, IPTp, and ACTs to their patients. Additionally, PMI will strengthen the integration of BCC messaging in the health care setting with efforts to expand the role of CHWs as active promoters of ITNs, IPTp, and ACTs. In addition, PMI will expand support to strengthen state-level capacity to implement BCC activities beyond Kebbi and Akwa Ibom to all 11 PMI-supported states. PMI will also continue to strengthen capacity and coordination with NIFAA with regard to community mobilization activities around net campaigns.

The BCC activities will cover mass media, interpersonal communication as well as other community mobilization activities in the 11 PMI-supported states, with a total projected 2016 population of 52 million. The NDHS 2013 showed a net ownership of 49.5% (for ITNs) with only 24% of households with nets sleeping under an ITN. The gap in net usage can be improved with sustained BCC activities targeted at household levels. Similar statistics are reported for diagnostics and intermittent preventive treatment of malaria in pregnancy. A specific component of the program will also address testing and adherence to test results by health care workers. With the huge investments in commodity supply and health worker training, outcomes can be improved at household level with additional investment on BCC. With FY 2014 funds, PMI will procure and distribute about 8 million LLINs through mass campaigns and routine channels. The uptake and utilization of these commodities will depend a lot on BCC support.

### ***Description and budget for proposed activities with FY 2015 funding (\$6,150,000):***

1. *Provide Hausa language broadcasting service to northern Nigeria to broadcast malaria messages, incorporating these into a variety of programs and health topics. Activities include weaving malaria messaging into production of special reports, dramas, panel discussions, radio contests, town hall meetings and public service announcements. (\$150,000)*

2. *Scale up support for integrated ACSM in 11 PMI-supported states.* A comprehensive approach will be implemented, to include state-level capacity strengthening, engagement and support of national civil society organizations (NIFAA), and BCC activities in the context of LLIN campaigns, case management, IPTp. BCC activities will focus on community level-engagement, as well as health workers (IPC, improving health workers compliance to testing & treatment). Moving forward, PMI will apply a more comprehensive and strategic approach to ACSM in all PMI focus states. Support an integrated ACSM program for malaria in the 11 PMI-supported states. Activities will focus on community, health workers, and state-level capacity. Community-level ACSM activities will focus on care seeking behavior and ITN use, and engage key civil society organizations. Health worker-level interventions will focus on adherence to test results and IPC skills. Finally, state-level capacity to implement and oversee BCC activities will be strengthened. (\$6,000,000)

## 8. Monitoring and evaluation

### *NMEP/PMI Objectives*

In 2009, the NMEP developed the National Monitoring and Evaluation Plan for Malaria Control in Nigeria. The process was led by the NMEP's Monitoring and Evaluation (M&E) Technical Working Group and was supported by a broad group of partners including GF, World Health WHO, World Bank, UNICEF, USAID, DfID, and local non-governmental organizations. The plan covered three main areas: strengthening routine data systems, strengthening periodic household surveys, and improving operational research to ensure that new intervention strategies are evidence-based. The plan was updated in 2011 with the M&E Plan for Malaria Control in Nigeria 2011-2013. There will be further updates to the M&E plan to align with the national malaria strategic plan 2014-2020.

The PMI M&E approach in Nigeria fits within the framework of the National Malaria Monitoring and Evaluation Plan. Specifically, PMI supports strengthening routine data systems at various levels of the health system; periodic population-based surveys such as the MIS and the DHS to measure the status of key malaria indicators; and operational research to guide programmatic decisions.

A harmonized approach to collecting routine malaria data through the national HMIS managed by the FMOH's Health Information Unit has been adopted. National HMIS data are to be reported monthly from health facilities to the LGA level. The LGA HMIS focal persons will collate and summarize these data quarterly and submit reports to their respective states. The state HMIS office will collate data from the LGAs and report to the national HMIS coordinator on a biannual basis.

### *Progress during the past 12 months*

**Strengthening of routine M&E systems:** In April 2012, the Department of Health Planning, Research & Statistics held a stakeholders' workshop to harmonize all data collection and

reporting tools into one HMIS. The NMEP and malaria partners participated in the process that produced the new HMIS tools. GF supports the harmonized HMIS for the collection of epidemiologic data and expects the LMIS to provide data on malaria commodities. With partner support, the harmonized HMIS tools were being implemented in 2013. PMI assisted in developing the instructional manual and trainer guide and supported the national training of trainers in Abuja. This national team of HMIS trainers will support the rollout of the HMIS to the states.

The national platform for the electronic HMIS is the District Health Information System (DHIS). PMI provided technical support to commence implementation in PMI-supported states. The Department of Planning, Research and Statistics (DPRS) in each state organized a team of health data stakeholders to coordinate financial and technical support.

Phases I to III of the 2012 Malaria Program Review have been completed. The review will document findings along nine thematic areas: epidemiology; program management; policies and strategies; integrated vector management; case management; malaria in pregnancy; procurement and supply management; advocacy, communication and social mobilization; malaria in complex emergencies; and surveillance, monitoring and evaluation, and operational research. The report will provide direction for developing the new five-year malaria strategic plan.

PMI supported the Nigeria DHS 2013, with data collection occurring from February to June 2013. National-level results showed an increase in ownership of ITNs, but decreases in the proportion of young children and pregnant women who slept under nets. Although 61% of pregnant women attended ANC clinic, only 14% of them received IPTp. These results provide an opportunity to follow Nigeria's progress in malaria program scale up and identify future program directions.

**Table 15: Malaria Data Sources, Nigeria, 2010-2015**

Data Source	Year						
	2010	2011	2012	2013	2014	2015	2016
<b>Household surveys: national</b>	MIS	MICS*	NARHS	DHS	MIS		MICS
<b>Household surveys: sub-national</b>	World Bank* (9 states)	MABA (7 states)					
<b>Other surveys</b>				EUV#	RIA##		
<b>Malaria surveillances and routine system support</b>			HMIS	HMIS	HMIS	HMIS	HMIS
MABA – Malaria and Anthropometric Baseline Assessments NARHS - National AIDS and Reproductive Health Survey # EUV – End Use Verification ## RIA – Rapid Impact Assessment							

One objective of the NMSP 2014-2020 is for 80% of health facilities in all LGAs to report routinely on malaria by 2020, that progress is measured, and that the evidence is used for program improvement. In 2013, 56% of health facilities submitted their monthly reports.

Achieving timely and complete data collection and reporting on malaria from the health facility to the LGA and then to the state and national levels continues to be a challenge. Poor reporting at the facility level is the result of several factors: poor training, lack of motivation, confusion over multiple reporting forms, no supportive supervision, and essentially no accountability or feedback. Although timeliness with respect to NMEP's ability to make programmatic decisions is an issue, there is no other organized system of data collection at the LGA level. It is hoped that the new harmonized HMIS will be an opportunity to greatly improve the availability of consistent malaria information. The transition to the one single HMIS will take time to complete and success will vary from state to state. In the last year, a malaria module has been created on the DHIS. Training on the harmonized HMIS tools has been completed in all 36 states as well as the capital of Abuja. PMI supports M&E personnel in the 11 focus states who are facilitating the harmonization process. However, the likelihood of success is low if malaria partners alone promote the harmonized HMIS; collaboration with other stakeholders (MNCH, reproductive health/family planning, HIV/AIDS, tuberculosis) is critical. This will require ongoing collaboration between PMI staff and the other stakeholders to build a consensus around the value of the HMIS. An assessment of the success of these efforts can be planned for the FY 2016 MOP to determine whether PMI's investment in the HMIS effort should continue. The assessment will include updated analysis of what other stakeholders have a financial investment and in what proportion in the harmonization of the HMIS.

Nigeria has conducted two national surveys (MIS 2010 and MICS 2011) that have included malaria modules.

A malaria epidemiology analysis was carried out in March 2014. The results were used to inform the planning for the FY2015 MOP and the Global Fund malaria concept note under the new funding mechanism.

A rapid impact assessment has been planned for two states for 2014. Its main objectives are: (1) to assess trend in malaria morbidity and mortality at hospital-level following the scale-up of malaria control interventions in Nasarawa (2008-2013) and Sokoto (2005-2013) states; 2) to compare key malaria indicators among primary health care facilities supported/non-supported by PMI/USAID in Nasarawa and Sokoto states; and 3) to assess the quality of malaria care in a sub-sample of primary health facilities (public sector only) in Nasarawa. Preliminary results will be available at the end of 2014.

After three years of data collection in three states, PMI completed a study of the durability (namely, physical integrity and attrition) of LLIN distributed one year following mass LLIN distribution campaigns. Preliminary results revealed three-year net attrition rates from wear and tear of 13.5% – 21.4 %, serviceable net survival rates of 53.1% – 89.9%, and median net durability of 2.7 – 5.2 years. The NMEP, PMI and partners are reviewing the findings for future policy implications, and to help inform the plans and protocols for routine LLIN durability monitoring.

**M&E and operational research supported from the Nigeria Field Epidemiology and Laboratory Training Program (NFELTP):** Since FY 2011, PMI has supported FMOH staff participation in the NFELTP. This program builds needed expertise and skills in epidemiologic

principles and concepts and leads to improvements in data collection and use by NMEP and state-level M&E staff. The NFELTP residents have supported the monitoring of malaria burden in PMI focus states and ultimately assist in measuring the impact of program scale-up on malaria morbidity and mortality.

Previously, three malaria residents graduated from the program with PEPFAR support. After completion of the program, one of the graduates was deployed to the NMEP in the case management unit and mentors other residents. The other two graduates are posted at state ministries of health and mentor NFELTP residents posted to the SMEPs of Kaduna, Oyo, Nasarawa, and Kogi.

With FY 2011 funding, the program supported three residents: one posted at the FMOH/NMEP M&E unit and two at state ministries of health in Oyo and Nasarawa. The residents have evaluated the national malaria surveillance system, evaluated the validity of rapid diagnostic test kits, and helped with malaria data analysis. The residents are also being supported and mentored towards developing proposals for operational research addressing key malaria interventions (assessment of intervention overages, performance of rapid test kits, home-based care, etc.). Currently the three supported residents are posted to Lagos, Kaduna, and the M&E unit of NMEP. In their second year of posting, two of the residents will be deployed to the Oyo and Nasarawa state malaria control programs.

With 2012 funding (implemented between October 2013 and September 2014), the program is supporting four residents to focus on malaria at the NMEP and three PMI-supported states (Zamfara, Ebonyi, and Benue). These residents will be involved in supporting data analysis at the national and state levels, RDT performance evaluation, surveillance evaluation, and operational research. Funds will also be provided for a malaria specific research proposal development workshop for the residents.

In the last year, NFELTP residents conducted research on topics including IRS, non-use of ITNs among pregnant women, evaluation of the malaria surveillance system in Oyo State, malaria infection among HIV positive children, malaria household costs of children under 5 years of age, comparison of microscopy and other diagnostic tools, and adherence to national malaria treatment guidelines among local government area health care providers. In addition, an abstract on 2011 malaria surveillance data analysis in Oyo State was submitted to the 2013 African Field Epidemiology Network conference.

In September 2013, a NFELTP scientific seminar was held in Abuja, entitled “Strengthening NFELTP Malaria-Related Research,” in order to develop malaria related research projects to address identified gaps in NMEP research needs. Gaps were identified in the areas of case management, MIP, surveillance, vector control, and the socio-behavioral science and economics of malaria control. Participants created an inventory of relevant research projects that they could implement and drafted research proposals on those topics.

### ***Plans and justification***

Monitoring and evaluating PMI's activities will rely on a combination of routine malaria data collection, household surveys, and information from partners. With FY 2015 funds, PMI will provide support to strengthen routine malaria data collection at the health facility, LGA, and state levels through the harmonized HMIS. The objective is to achieve 100% on-time reporting of malaria cases by LGAs and 80% by functioning health facilities in PMI focal states.

PMI proposes to support training for five NMEP and SMCP personnel for the two-year NFELTP course, from the 2-4 residents supported in prior years. With the proposed increase in NFELTP's involvement in malaria-specific projects (versus other conditions), the additional personnel are justified.

The malaria short course will comprise a review of malaria epidemiology, technical overview of key malaria prevention and control interventions, discussion of the NMEP's strategic and monitoring and evaluation plans, principles of M&E evaluation for malaria programs globally and in Nigeria (including core process, outcome and impact indicators), a review of population-based survey methods and recent results, as well as didactic and hands-on instruction on conducting routine surveillance for malaria. The objective is to increase state-level epidemiological capacity to monitor and report on malaria trends that will inform state-level program planning. The course will be an expanded version of the material being presented during the training of NFELTP fellows. NFELTP will conduct this activity, given their expertise in training epidemiologists in Nigeria and previous experience in overseeing malaria surveillance and research. PMI/Nigeria team members will provide technical support in teaching and monitoring the activities of state epidemiologists during field visits.

To verify the quality and effectiveness of LLIN products distributed, PMI will work with the NMEP to establish routine LLIN durability monitoring in five sites. This activity will build on methods applied during the PMI-supported research in three states

***Description and budget for proposed activities with FY 2015 funding (\$2,174,000):***

1. *Strengthen routine M&E systems in 11 focus states:* PMI will help strengthen the harmonized HMIS at health facility, LGA, and state levels in 11 PMI-supported states. Implementation activities will include training and supervision of data clerical staff at selected health facilities, LGAs, and states; completion of unified data collection formats including creation and training on a DHIS malaria module; and improving collection and reporting of routine malaria indicators by states on a quarterly basis, as well as national feedback sent back to the states. *(\$1,300,000)*

2. *Support for NFELTP:* Support training for five NMEP and SMEP personnel for the two-year NFELTP course (\$50,000/year/trainee). The additional \$50,000 will support the continuation of a short malaria course begun under FY 2014 reprogramming, which is intended for the NFELTP residents initially, but is planned as an activity apart from the usual NFELTP curriculum. As this course develops, it is anticipated that it would be useful for other health professionals involved in malaria care as well. The course will target state epidemiologists to further their capacity for monitoring, evaluation, and surveillance related to malaria. *(\$550,000)*

3. *Technical assistance for M&E strengthening*: CDC will provide two in-country technical assistance visits to strengthen M&E during FY 2015. (\$24,000)

4. *LLIN durability monitoring*. PMI will conduct durability monitoring of LLINs at five monitoring sites. (\$300,000)

## 9. Operational Research

### *NMEP/PMI Objectives*

The NMEP, with support from SuNMaP, held an Operational Research Prioritization Workshop in 2010 to set national research priorities in malaria control; however, limited follow-up was made to move a research agenda forward. The 2012 Malaria Program Review (MPR) identified a lack of operational research (OR) conducted to inform both scientific and communications-related strategy development. The new Malaria Strategy 2014-2020 incorporated the MPR recommendation to convene an OROROR stakeholders meeting as defined by technical working groups, and proposed earmarking 40% of the total M&E budget to OR. Funding would include support to strengthen the NMEP Operational Research Unit. The NMEP convened a research symposium supported again by SuNMaP in 2012, with technical input from PMI and NFELTP, centering on 11 priority research questions in all intervention areas. A follow-up symposium is planned for mid-2014 to further refine this list and to identify partners (including those in academia) and resources to address these priority questions.

### *Progress since PMI was launched*

PMI has conveyed to the NMEP and partners its commitment to help establish, expand and carry out a national malaria OR agenda. As previously mentioned, PMI supported a workshop in 2013 organized by NFELTP to provide a forum for fellows to present and refine their malaria-related research. To date, PMI has supported a number of OR projects focused on address key ITN-related questions (Table 16).

**Table 16: Status of PMI-supported operational research**

<b>Completed OR Studies</b>	
<b>Title</b>	<b>End date</b>
Feasibility of continuous distribution of ITNs through schools in two states	July 2014
Feasibility of continuous distribution of ITNs through community-based channels in two states	July 2014
Effects of BCC activities on household net care and repair behaviors	July 2014
LLIN durability in three eco-geographical zones	July 2014
<b>Ongoing OR Studies</b>	
<b>Title</b>	<b>End date</b>
None	n/a

### ***Plan and justification***

The NMEP consulted with PMI in August 2014 and identified its highest priority areas of interest for PMI-supported OR, reflecting the topics previously identified. The following general topic areas cover these NMEP interests and are consistent with PMI priorities for OR

1) Conduct research to determine how best to achieve and maintain high LLIN ownership and use. Given the results of recent national population-based surveys, the primary focus in most areas will be on identifying factors responsible for inadequate access/ownership in different geopolitical zones and for low- or non-usage of LLINs.

2) Evaluate and improve clinician adherence to diagnostic testing; specifically, identify factors associated with clinicians' non-adherence to diagnostic testing and test methods to increase clinicians' adherence in public and private sectors.

PMI will work closely with the NMEP and partners to further focus and refine the research questions and methodologies within these subject areas, and once they have been finalized, will consider identifying PMI funding to support them.

### ***Description and budget for proposed activities with FY 2015 funding***

*Operational research workshop:* PMI will support another NFELTP-sponsored malaria operational research workshop to continue highlighting the work of NFELTP fellows to address key questions in malaria control (*funding covered under M&E/NFELTP support*).

## **10. Health system strengthening/capacity building**

### ***NMEP/PMI Objectives***

To address malaria program capacity development, the NMEP Strategic Plan 2014-2020 includes an overall objective of strengthening governance and coordination of stakeholders for effective program implementation. The six strategies for accomplishing this objective are:

- Build capacity at national, state, and LGA levels to deliver malaria control/elimination interventions
- Strengthen program coordination at national and sub-national levels
- Improve unified annual operational planning
- Strengthen malaria resource mobilization and financial management mechanisms.
- Develop a comprehensive strategy for private sector engagement
- Strengthen timely reporting of malaria control activities at all levels and promote dissemination of all reports to relevant stakeholders

To support these strategies, PMI, DfID, the SuNMaP project, and GF provide assistance to the NMEP, SMEPs and LGAs to improve program management and provide operational and technical guidance through training, supervision, and coordination meetings. The PMI team joins other partners to participate in various national-level technical and program management

working groups, which develop policy as well as operational and scientific guidance. Decentralization along with NMEP leadership changes have made it challenging to translate national policies and guidance to the state level. State malaria program leadership has tended to be more stable over time. With that in mind, PMI with other partners have paid special attention to the state and LGA levels for strengthening malaria program management, technical expertise, and monitoring and evaluation capacity.

### ***Progress since PMI was launched***

From its inception in Nigeria, PMI has supported a variety of capacity building activities to improve delivery of malaria interventions through health facilities and, more recently, at the community level. Specifically, PMI has supported short-term training and technical assistance to the NMEP; engaged in improving routine monitoring and data collection at state and LGA levels; provided guidance for implementing continuous distribution of LLINs; expanded national capacity in commodity systems management; and strengthened entomological capabilities, particularly for monitoring insecticide resistance. In the past, PMI also conducted training in the management of IRS programs. Since it no longer supports IRS operations, PMI wanted to ensure that effective activities continue under Nigerian leadership.

Through its Abuja-based resident advisors and senior program experts as well as its implementing partners, PMI has provided significant on-the-job management and technical support to all government levels. Other than supporting the working groups, the PMI team has worked closely with the NMEP to develop funding proposals under GF, provided technical guidance for all PMI-supported malaria interventions, and advised the NMEP on disseminating such guidance to the state and local levels.

PMI has also strengthened malaria-related epidemiological capacity by supporting three to four fellows each year in the CDC NFELTP. The NMEP and SMEPs identify promising individuals to complete experiential and didactic learning opportunities during a two-year fellowship.

### ***Progress during the past 12 months***

PMI has supported training, refresher training, supportive supervision, provision of job aids, and other activities to improve delivery of malaria interventions in primary health care and secondary health facilities in eleven PMI focus states.

In nine states between 2013 and mid-2014, PMI trained 4,723 facility-based health workers and 661 community health workers in malaria case management; 1,285 facility workers in IPTp; and 1,754 facility workers in parasitological diagnosis. Training targets for 2013 were largely met or exceeded. State and LGA staff then joined PMI to reinforce capacity through supportive supervision. In Bauchi and Sokoto states, PMI enhanced workforce capacity by training 1,039 health service providers in malaria prevention and case management. In addition, 5,670 community volunteers were trained and supervised to conduct house to house counseling and education on malaria and other health priorities. In Bauchi and Ebonyi, PMI also trained and supported PPMVs on iCCM, further extending PMI's reach and experience in the private sector. In all states, management and planning skills have been improved by helping SMEP staff

develop state malaria strategies, annual costed work plans, training and supervision plans, and at the NMEP as well as designing systems and training on quantification to improve commodity logistics management, and routine health information systems.

PMI organized a workshop for over 40 entomologists to conduct entomological monitoring in six sentinel sites. Additional technical assistance reinforced the monitoring protocols through on-the-job training.

With new, harmonized DHIS2-based reporting systems designed and tools in place, PMI helped train health workers and provide feedback to data collectors to move implementation forward. Emphasizing on data quality, PMI also supported data quality assessments and routine LGA data validation meetings in nine states.

Important strides were made in training 69 state-level laboratory technicians on conducting malaria diagnosis using RDTs and microscopy, including use of new standard operating procedures. Over 110 technicians in four National Ministry of Defense sites received similar training. PMI also provided both training and follow-up to eight technicians to implement the newly-completed national guidelines on quality assurance in malaria diagnostics. PMI continued its support for NFELTP by funding five fellows for the two-year course. A PMI-supported workshop, conducted in September 2013, gave fellows a forum to present their research to their peers and to experts from the NMEP, PMI and Nigerian academia, further building their malaria surveillance skills.

Despite these efforts, PMI continues to face enormous challenges in supporting capacity building. Program coordination at all levels remains difficult given overlapping partner support in some states. State and LGA-level capacity in management and technical oversight varies considerably among the PMI-supported states. Staff reassignments occur with frequency. Commodity stockouts impede health workers' ability to implement the training they have received, and to provide critical services. Recent field visits found that the new IPTp guidance and NHMIS facility registers may not have been disseminated as widely as needed. Pre-service training curricula, textbooks and other professional training materials may not be updated with the most current national and global guidelines, for example on IPTp and RDT use. This further complicates efforts to increase confidence in and adherence to new malaria in pregnancy and diagnostic protocols.

### ***Plans and justification***

Given Nigeria's large population, decentralized health system, and multiple donors, the NMEP must coordinate its own activities and those of partners to ensure efficiently and high program impact. At the same time, the most important program outcomes will likely come at the state level, making strengthening of state and LGA-level management and technical capacity just as critical. Consequently, PMI will continue such support at all three levels, though focusing more on the states and LGAs. PMI will expand its Abuja-based technical team to help national, state, and LGA programs meet their program objectives. PMI implementing partners will scale up coverage of their activities within the 11 PMI-supported states, strengthening strategic planning, training, and supervision. PMI will again support five new NFELTP fellows, and work with the

program to develop and implement a malaria course for state-level epidemiologists. This course will further extend the NMEP and PMI's reach into the states to ensure strong capacity in MMM&E, surveillance, and research.

In its program coordination and management section, the NMEP's Strategic Plan highlights the need to target pre-service training in universities, teaching hospitals, schools of nursing, colleges of health technology, and continuing medical education. PMI has worked with professional organizations to promote standard diagnosis through continuing medical education, but the curricula and teaching material may be outdated. Given the challenges of health worker adherence to diagnostic and case management protocols, PMI will support updating these materials and ensure their incorporation into pre-service training.

***Description and budget for proposed activities with FY 2015 funding (\$500,000):***

1. *Support the NMEP to strengthen technical capacity and national level coordination of the malaria program.* PMI will support the NMEP's role as the lead coordination body through meeting support, supervision support, and training. PMI will also provide support to 11 states and their LGAs to plan, implement, and monitor their malaria control programs. This may include support for workshops, travel, technical assistance to states, and other related activities. (*\$500,000*)
2. *Support for capacity building to the NMEP, states, and LGAs.* Through implementing partners, PMI will strengthen training capacity (including pre-service training), technical expertise, supportive supervision, and monitoring and evaluation capacity of state and LGA health workers. (*Costs covered across Case Management, IPTp, and ITN sections.*)
3. *Support the NFELTP.* The PMI will support five NFELTP trainees, and assist in developing and implementing a malaria course for state-level epidemiologists. (*Costs covered under the M&E section*)

## 11. Staffing and administration

Two health professionals serve as resident advisors (RAs) to oversee PMI in Nigeria, one representing CDC and one representing USAID. In addition, three program managers and one program assistant foreign service nationals (FSNs) work as part of the PMI team. Two of the three technical FSNs are on board and one will be recruited in 2014.

All PMI staff members are part of a single inter-agency team led by the USAID Mission Director or his/her designee in country. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, managing collaborating agencies and supervising day-to-day activities. Candidates for RA positions (whether initial hires or replacements) will be evaluated and/or interviewed jointly by USAID and CDC, and both agencies will be involved in hiring decisions, with the final decision made by the individual agency.

PMI professional staff work together to oversee all technical and administrative aspects of PMI, including finalizing details of the project design, implementing malaria prevention and treatment activities, MMM&E of outcomes and impact, reporting of results, and providing guidance to PMI partners.

The PMI lead in country is the USAID Mission Director. The two PMI RAs report to the Senior USAID Health Officer for day-to-day leadership and work together as a part of a single interagency team. The technical expertise housed in Atlanta and Washington, D.C., guides PMI programmatic efforts. Thus overall technical guidance for both RAs falls to PMI staff in Atlanta and Washington, D.C. Since CDC RAs are CDC employees (CDC USDD—38), responsibility for completing official performance reviews lies with the CDC Country Director who is expected to rely upon input from PMI staff across the two agencies that work closely day in and day out with the CDC RA and thus best positioned to comment on the RA's performance.

The two PMI RAs are based within the USAID health office and are expected to spend approximately half their time sitting with and providing technical assistance to the national malaria control programs and partners.

Locally-hired staff to support PMI activities either in ministries or in USAID will be approved by the USAID Mission Director. Because of the need to adhere to specific country policies and USAID accounting regulations, any transfer of PMI funds directly to ministries or host governments will need to be approved by the USAID Mission Director and Controller, in addition to the USG Global Malaria Coordinator.

***Description and budget for proposed activities with FY 2015 funding (\$3,223,317):***

1. *USAID in-country staff and administrative costs:* FY 2015 funding will be used to provide oversight to PMI malaria activities and technical assistance to the NMEP. PMI funding will support the Nigeria Mission's Administration and Oversight (A&O) to cover salaries, benefits, and associated costs of training and field visits for: 1) five full time PMI staff (1 resident advisor, 3 technical FSNs, 1 program assistant); 2) partial salaries and benefits for four USPSC staff working on PMI from HPN and contracting office ; and, 3) partial salaries and benefits for nine FSNs that contribute to the PMI program from HPN office (MNCH program manager, M&E specialist, logistics and commodities manager, budget/operations manager, administration assistant), Office of Financial Management (1), and the Executive Office (3 drivers). (\$2,593,317)
2. *CDC staff and administrative costs:* FY 2015 funding will be used to support oversight for PMI malaria activities and technical assistance to the NMEP. Costs include salaries and associated costs for the CDC PMI resident advisor. (\$630,000)

## IV. TABLES

**Table 1**  
**President's Malaria Initiative - Nigeria**  
**Budget Breakdown by Partner**

<b>Partner Organization</b>	<b>Geographic Area</b>	<b>Activity</b>	<b>Total Budget, by Partner</b>	<b>% of Total</b>
TBD/New commodity/supply chain project	11 PMI Focus States	Procure and deliver ITNs, ACTs, drugs for severe malaria, RDTs, SP for IPTp.	<b>\$44,879,683</b>	<b>64%</b>
IRS IQC T06	Federal and State level	Strengthen entomological monitoring and capacity at federal and state levels.	<b>\$1,100,000</b>	<b>2%</b>
TBD/Case Management	11 PMI Focus States	Support malaria service delivery; increase diagnostic and treatment capacity of health workers at facility and community level, including private sector Patent Medicine Vendors; strengthen HMIS reporting. Includes support to the NMEP to strengthen capacity and leadership role.	<b>\$7,200,000</b>	<b>10%</b>
TBD/LLIN & Vector Control	11 PMI Focus States	Support malaria service delivery; increase diagnostic and treatment capacity of health workers at facility and community level, including private sector Patent Medicine Vendors; strengthen HMIS reporting; support to the NMEP to strengthen capacity and leadership role. Support microplanning and distribution of LLIN through mass campaigns and continuous distribution channels.	<b>\$4,500,000</b>	<b>6%</b>
TBD/LLIN Physical Integrity Monitoring	PMI Focus States	LLIN physical integrity monitoring in five monitoring sites.	<b>\$300,000</b>	<b>&gt;1%</b>
VOA	Nationwide	Support for mass media for malaria prevention and control, including working with journalists to improve coverage of malaria issues.	<b>\$150,000</b>	<b>&gt;1%</b>
HC3	11 PMI Focus States	Integrated ACSM activities targeting community-level (net use, care seeking behavior), health workers (adherence to test results, IPC), and state-level capacity (ACSM strategy, work plan, implementation and oversight).	<b>\$6,000,000</b>	<b>9%</b>

United States Pharmacopeia	Nationwide	Strengthen NAFDAC capacity for drug quality control including support for mini-labs to perform drug quality testing in the field.	<b>\$500,000</b>	<b>1%</b>
Malaria Care	11 PMI focus states	Scale up interventions to improve integrated management of childhood illness to all PMI focus states.	<b>\$1,000,000</b>	<b>1%</b>
WRAIR (DOD)	11 PMI focus states	Scale up interventions to 11 PMI focus states. Greater focus on supportive supervision.	<b>\$525,000</b>	<b>1%</b>
CDC-IAA	Federal and State level	CDC TDYs to support, entomology, IRS M&E, and case management activities; support for FELTP for five NMEP personnel. This year also includes CDC annual staffing and administration costs of 630k.	<b>\$1,252,000</b>	<b>2%</b>
USAID	Nationwide	Support for USAID annual staffing and administration costs.	<b>\$2,593,317</b>	<b>4%</b>
<b>TOTAL</b>			<b>\$70,000,000</b>	<b>100%</b>

**Table 2**  
**President's Malaria Initiative - Nigeria**  
**Planned Obligations for FY 2015 (\$70,000,000)**

<b>Proposed Activity</b>	<b>Mechanism</b>	<b>Budget</b>	<b>Commodities</b>	<b>Geographic area</b>	<b>Description of Activity</b>
<b>ITNs</b>					
Procure approximately 6.5 million ITNs	TBD/New commodity/supply chain project	\$26,979,683	\$24,119,683	11 PMI-supported states	Procure and deliver approximately 6.5 million through campaigns: 4.5 million LLINs for Oyo, and 2 million LLINs for routine continuous distribution in the rest of PMI-supported States.
Logistic and operational support for routine continuous distribution of ITNs	TBD/New Malaria Vector Control Project	\$4,500,000	\$0	11 PMI-supported states	Support for microplanning and issuing of LLINs to community of about 4.5 million LLINs through a mass campaign in three PMI focus states and about 2 million through continuous distribution approaches in other PMI focus states with the goal of maintaining high ITN coverage. Includes the option of using CDD to distribute LLINs at the community level and difficult to reach populations. This includes scaling up of evidence-based continuous distribution of LLINs.
<b>Subtotal: ITNs</b>		<b>\$31,479,683</b>	<b>\$24,119,683</b>		
<b>IRS</b>					
Provide support for vector surveillance and susceptibility monitoring in six geopolitical zones around Nigeria	IRS 2T06	\$650,000	\$60,000	Seven sentinel sites	Supervision, entomologic monitoring, per diem, vehicle rentals and equipment necessary to survey malaria vectors in six geopolitical zones throughout the country to determine vector species, seasonality, parity rates, indoor densities six times/year and insecticide susceptibility status to four classes of insecticide once/year.
Strengthen capacity of entomological expertise at federal and state levels	IRS 2 T06	\$450,000	\$65,000	Federal and State level	Strengthen capacity of entomological competence at federal and state levels with training and equipment support to State Vector Control Officers and NMEP staff.

Technical assistance (TA) to PMI IRS activities	CDC IAA	\$24,000	\$19,000	Federal and State level	Two CDC TDYs (\$12,000/each) to provide support for IRS refresher training and resistance test kits for ~ 40 Nigerian staff attending training.
<b>Subtotal: IRS</b>		<b>\$1,124,000</b>	<b>\$144,000</b>		
<b>IPTp</b>					
Procure adequate quantities of SP	TBD/New commodity/ supply chain project	\$900,000	\$900,000	11 PMI-supported states	PMI will procure about four million doses of SP to meet the needs for IPTp in eleven states.
Scale-up MIP activities	TBD/Case Management	\$1,300,000	\$0	11 PMI-supported States	Budget includes piloting health care worker outreach delivery of IPTp and updating curricula for pre-service training
<b>Subtotal: IPTp</b>		<b>\$2,200,000</b>	<b>\$900,000</b>		
<b>Case Management</b>					
<b>Diagnostics</b>					
Procure an estimated 12 million RDTs	TBD/New commodity/ supply chain project	\$5,000,000	\$5,000,000	11 PMI-supported states	Procure about 12 million RDTs to fill gaps and help prevent stockouts of malaria diagnostic tests in the public sector in eleven states.
Support for malaria diagnostic training	Walter Reed Army Institute of Research	\$525,000	\$0	11 PMI-supported states	WRAIR training activities will focus on training of trainers in each state, who will then roll out training to the health facilities. QA/QC for diagnostics at the national, zonal, and state levels will also be strengthened.
Technical assistance	CDC IAA	\$24,000	\$0	Nationwide	Two CDC TDYs to provide technical support to microscopic and RDT diagnosis of malaria.
<b>Subtotal: Diagnostics</b>		<b>\$5,549,000</b>	<b>\$5,000,000</b>		
<b>Pharmaceutical Management</b>					
Strengthen the pharmaceutical and commodity management system	TBD/New commodity/ supply chain project	\$4,200,000	\$0	11 PMI-supported states	Strengthen the pharmaceutical management system, forecasting, management and distribution of pharmaceuticals and RDTs and provide warehousing and distribution of PMI-procured commodities to the facility level. This activity will help mitigate the risk of stockouts of malaria commodities and the improper disposal of expired drugs.

<i>Subtotal: PSM</i>		<i>\$4,200,000</i>	<i>\$0</i>		
<b>Treatment</b>					
Procure ACTs and severe malaria drugs in quantities to be determined.	TBD/New commodity/supply chain project	\$7,800,000	\$7,800,000	11 PMI-supported states	Procure ACTs to fill gaps and help prevent stockouts of antimalarial medications in the public sector in eleven PMI focus states while also beginning to support the private sector through PPMVs.
Train and provide supportive supervision for case management at public health facilities	TBD/Case Management	\$4,100,000	\$0	11 PMI-supported states	Improve malaria case management in the public sector, with a focus on training and motivation of the health workers. This includes management of severe malaria.
Improve the quality of malaria case management in the private sector	Malaria Care	\$1,000,000	\$0	11 PMI-supported states	Scale-up iCCM based on pilot findings. At the community level, PMI will support the use of innovative strategies to improve the roll out of integrated community case management of childhood illnesses through PPMVs
Provide support to strengthen NAFDAC's capacity	United States Pharmacopeia	\$500,000	\$0	Federal	Strengthen NAFDAC's capacity for drug quality control including the procurement of necessary equipment and supplies. This support will include establishing functional mini-labs that can perform key test for drug quality in the field. Activities include post-market surveillance in three priority states to detect counterfeit antimalarial drugs and use of monotherapies in public and private sector.
<i>Subtotal: Treatment</i>		<i>\$13,400,000</i>	<i>\$7,800,000</i>		
<i>Subtotal: Case Management</i>		<i>\$23,149,000</i>	<i>\$12,800,000</i>		
<b>Advocacy, Social Mobilization, and Communication</b>					
Support BCC for malaria prevention and control	VOA	\$150,000	\$0	Nationwide	BCC for malaria prevention and control through the mass media, including working with journalists to identify and develop appropriate malaria news.

Integrated ACSM for malaria	HC3	\$6,000,000	\$0	11 PMI - supported states	Support integrated ACSM for malaria in the 11 PMI-supported states.
<b>Subtotal: BCC</b>		<b>\$6,150,000</b>	<b>\$0</b>		
<b>M&amp;E and OR</b>					
Strengthen routine M&E systems in 11 focus states	TBD/Case management	\$1,300,000	\$0	11 PMI-supported states	Strengthen the harmonized HMIS at health facility, LGA, and state levels in 11 PMI-supported states. Implementation activities will include training and supervision of data clerical staff at selected health facilities, LGAs, and states; completion of unified data collection formats; and improving collection and reporting of routine malaria indicators.
Support for NFELTP	CDC IAA	\$550,000	\$0	Federal	Support training for five NMEP and SMEPSMEPE personnel for the two-year FELTP course (\$50,000/year/trainee). To include funding for a short malaria course.
TA for M&E strengthening	CDC IAA	\$24,000	\$0	Federal and State level	Two CDC TDYs to provide technical support for monitoring and evaluation.
LLIN Durability Monitoring	TBD	\$300,000	\$0	Five sites	Durability monitoring in five monitoring sites
<b>Subtotal: M&amp;E</b>		<b>\$2,174,000</b>	<b>\$0</b>		
<b>Capacity Building</b>					
Support to the NMEP to strengthen technical capacity and national level coordination of the malaria program	TBD/Case management	\$500,000	\$0	Federal NMEP	Support for the NMEP's role as the lead coordination body through meeting support, supervision support, and training. The PMI will also provide support to 11 states to plan, implement, and monitor their malaria control programs.
<b>Subtotal: Capacity Building</b>		<b>\$500,000</b>	<b>\$0</b>		
<b>Staffing and Administration</b>					

In-country staffing and administration costs	USAID	\$2,593,317	\$0	Nationwide	Support for USAID annual staffing and administration costs. Also includes A&O and PD&L. To include two malaria technical specialists for the PMI program.
In-country staffing and administration costs	CDC IAA	\$630,000	\$0	Nationwide	Support for CDC annual staffing and administration costs. Also includes A&O and PD&L.
<b><i>Subtotal: Staffing and Administration</i></b>		<b>\$3,223,317</b>	<b>\$0</b>		
<b>GRAND TOTAL</b>		<b>\$70,000,000</b>	<b>\$37,963,683</b>		