

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 2016 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.



## PRESIDENT'S MALARIA INITIATIVE



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**NIGERIA**

**Malaria Operational Plan FY 2016**

## TABLE OF CONTENTS

<b>ABBREVIATIONS and ACRONYMS</b> .....	<b>3</b>
<b>I. EXECUTIVE SUMMARY</b> .....	<b>5</b>
<b>II. STRATEGY</b> .....	<b>10</b>
1. Introduction.....	10
2. Malaria situation in Nigeria .....	16
3. Country health system delivery structure and Ministry of Health (MoH) organization .....	17
4. National malaria control strategy .....	18
5. Updates in the strategy section.....	19
6. Integration, collaboration, and coordination .....	20
7. PMI goal, objectives, strategic areas, and key indicators .....	24
8. Progress on coverage/impact indicators to date .....	25
9. Other relevant evidence on progress .....	31
10. Challenges and opportunities .....	31
<b>III. OPERATIONAL PLAN</b> .....	<b>33</b>
1. Insecticide-treated nets.....	33
2. Indoor residual spraying & entomology .....	40
3. Malaria in pregnancy .....	43
4. Case management .....	49
5. Health system strengthening and capacity building.....	61
6. Behavior change communication (BCC) .....	68
7. Monitoring and evaluation.....	75
8. Operational Research .....	81
9. Staffing and administration.....	82
Table 1: Budget Breakdown by Mechanism.....	85
Table 2: Budget Breakdown by Activity .....	87

## **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
CAMA	Corporate Alliance on Malaria in Africa
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
DTET	Drug therapeutic efficacy testing
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
Global Fund	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
IDP	Internally displaced persons
IPC	Interpersonal communication
IPTp	Intermittent preventive treatment in pregnancy
IRS	Indoor residual spraying
ITN	Insecticide-treated net
LGA	Local Government Area
LMCU	Logistics Management Coordination Unit
LMIS	Logistics Management Information System
M&E	Monitoring and Evaluation
MAPS	Malaria Action Program for States
MDG	Millennium Development Goal
MIA	Malaria Implementation Assessment
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 and Drug Administration and Control
NDHS	Nigeria Demographic and Health Survey
NFELTP	Nigeria Field Epidemiology and Laboratory Training Program
NFM	New Funding Model
NMEP	National Malaria Elimination Program
NMSP	National Malaria Strategic Plan
OR	Operational research
PCR	Polymerase chain reaction
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
UNFPA	United Nations Fund for Population Activities
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

## I. EXECUTIVE SUMMARY

When it was launched in 2005, the goal of the President's Malaria Initiative (PMI) was to reduce malaria-related mortality by 50% across 15 high-burden countries in sub-Saharan Africa through a rapid scale-up of four proven and highly effective malaria prevention and treatment measures: insecticide-treated nets (ITNs); indoor residual spraying (IRS); accurate diagnosis and prompt treatment with artemisinin-based combination therapies (ACTs); and intermittent preventive treatment in pregnancy (IPTp). With the passage of the Tom Lantos and Henry J. Hyde Global Leadership against HIV/AIDS, Tuberculosis, and Malaria Act in 2008, PMI developed a U.S. Government Malaria Strategy for 2009–2014. This strategy included a long-term vision for malaria control in which sustained high coverage with malaria prevention and treatment interventions would progressively lead to malaria-free zones in Africa, with the ultimate goal of worldwide malaria eradication by 2040-2050. Consistent with this strategy and the increase in annual appropriations supporting PMI, four new sub-Saharan African countries and one regional program in the Greater Mekong Sub-region of Southeast Asia were added in 2011. The contributions of PMI, together with those of other partners, have led to dramatic improvements in the coverage of malaria control interventions in PMI-supported countries, and all 15 original countries have documented substantial declines in all-cause mortality rates among children less than five years of age.

In 2015, PMI launched the next six-year strategy, setting forth a bold and ambitious goal and objectives. The PMI Strategy for 2015-2020 takes into account the progress over the past decade and the new challenges that have arisen. Malaria prevention and control remains a major U.S. foreign assistance objective and PMI's Strategy fully aligns with the U.S. Government's vision of ending preventable child and maternal deaths and ending extreme poverty. It is also in line with the goals articulated in the Roll Back Malaria (RBM) Partnership's second generation global malaria action plan, *Action and Investment to defeat Malaria (AIM) 2016-2030: for a Malaria-Free World* and WHO's updated *Global Technical Strategy: 2016-2030*. Under the PMI Strategy 2015-2020, the U.S. Government's goal is to work with PMI-supported countries and partners to further reduce malaria deaths and substantially decrease malaria morbidity, towards the long-term goal of elimination.

Nigeria was selected as a PMI focus country in fiscal year (FY) 2011. This FY 2016 Malaria Operational Plan presents a detailed implementation plan for Nigeria, based on the strategies of PMI and the National Malaria Elimination Program (NMEP). It was developed in consultation with the NMEP and with the participation of national and international partners involved in malaria prevention and control in the country. The activities that PMI is proposing to support fit in well with the National Malaria Control Strategy and plan. They build on investments made by PMI and other partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) malaria grants. This document briefly reviews the current status of malaria control policies and interventions in Nigeria, describes progress to date, identifies challenges and unmet needs to achieving the targets of the NMEP and PMI, and provides a description of activities that are planned with FY 2016 funding.

Currently, PMI supports high burden areas in 11 of Nigeria's 36 states as follows: Sokoto, Bauchi, Zamfara, Kebbi, Oyo, Kogi, Nasarawa, Benue, Ebonyi, Cross River, and Akwa Ibom.

With U.S. Chief of Mission support, USAID/Nigeria is transforming its strategic approach to development with a focus on the health sector. This approach aims to increase state ownership and direct investment in health services. USAID will develop formal partnerships with states willing to commit to mutually agreed upon development objectives, including malaria. The PMI Nigeria team will engage in the process to select states for partnership, to define shared objectives for malaria, and to define individual state responsibilities and requirements by state formal agreements. In addition, once data from the 2015 Malaria Indicator Survey (MIS) is available it will be used to inform refinements as appropriate in malaria activity implementation approaches in existing and future focus states. Therefore, PMI's strategic approach for state selection and partnership going forward will be aligned with USG development priorities and approaches and will take into account both malaria epidemiology and states' commitment to investing their own resources in health services including malaria.

The proposed FY 2016 budget for Nigeria is \$70 million. With these funds, PMI will support the following intervention areas in its focus states:

**Insecticide-treated nets (ITNs):** The NMEP's Strategic Plan 2014-2020 affirms the goal of universal coverage with ITNs for all at-risk populations. Universal coverage is defined as one ITN for every two persons. For program scale-up, 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; and private sector involvement to generate demand for and use of nets. The NMEP also endorses monitoring of ownership, use, and net physical integrity to inform program strategy.

Ownership of at least one ITN in a household increased from 21.5% to 49.5% between 2008 to 2013 Nigeria Demographic and Health (NDHS) surveys, but ITN use appeared to decrease over the same period with variations across geographic localities even within populations that had access to a net. Of those surveyed in 2013, 36% of the household population had access to an ITN within their household, but only 13% actually used a net the previous night. This use declined from 68% in the 2008 NDHS and 81% in the 2010 MIS. The 2015 MIS should capture the outcomes of the 17 state-level universal coverage campaigns conducted starting in December 2013 and scale-up of the continuous distribution channels initiated since the 2010 MIS. The 46.2 million nets distributed in these campaigns included 5.7 million nets procured and distributed by PMI in the focus states of Bauchi, Kebbi, Nasarawa, and Sokoto. With PMI support, all 11 PMI focus states have begun ITN distribution at the first ANC visit, and at Expanded Program on Immunization (EPI) clinics during measles vaccination in 230 LGAs across these states. To complement these existing approaches, PMI is supporting the piloting of both community- and school-based ITN distribution channels including community-based distribution through community drug distributors in the five PMI focus states of Benue, Ebonyi, Kogi, Nasarawa, and Zamfara and school-based distribution in Cross River and Oyo States.

With FY 2016 funds, 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 where data suggests these channels will be an effective means of maintaining ITN ownership in households. PMI will procure 3 million long-lasting ITNs to fully cover the universal coverage campaign in Sokoto and approximately 2 million long-lasting ITNs to cover a portion of

the continuous distribution needs for 11 states. Using available data, PMI will work with the NMEP and state-level programs to assess the potential for each of the four continuous distribution channels, taking into consideration specific state capacity and projected outcomes for increasing net access by channel. Finally, with FY 2016 funds, using data from the upcoming 2015 MIS, PMI will help develop, effectively target (geographically and by population group), and intensify national communication strategies to improve net maintenance and year-round net use in households.

**Indoor residual spraying (IRS):** PMI supported a two-year IRS demonstration activity in Nigeria from 2012 to 2014. While the Nigerian National Malaria Strategic Plan 2014-2020 calls for scale-up of IRS, IRS at present is carried out in a limited capacity by the NMEP and select states using domestic funds. PMI continues to provide technical assistance for entomological and insecticide resistance monitoring. In FY 2015, six mosquito sentinel sites were established; indoor resting densities, pyrethrum spray catches, and light/human-baited traps were conducted to determine mosquito biting time and speciation. With FY 2016 funding, PMI will support NMEP by relocating four of the six surveillance sites that are outside of PMI focus states to the following PMI focus states of Oyo, Bauchi, Akwa Ibom, and Ebonyi—to align with PMI-supported ITN distribution strategies. If PMI focus states change in the future, entomologic surveillance sites will shift accordingly to ensure that monitoring can take place in geographic localities receiving PMI-supported interventions. Entomologic surveillance data will provide valuable information regarding PMI control interventions and their effect on vector infection rates. PMI will continue support for training and equipment procurement in order to build capacity for entomological expertise at the federal, state, and local levels.

**Malaria in pregnancy (MIP):** Nigeria recently revised its malaria in pregnancy (MIP) guidelines according to the current WHO MIP policy recommendations. However, effective scale-up of IPTp continues to be a challenge in Nigeria given marked variations in antenatal care (ANC) attendance across states and between rural and urban settings. A number of factors contribute to the low uptake of IPTp in public health facilities, including sporadic availability of sulfadoxine-pyrimethamine (SP) and poor quality of ANC service delivery.

To address these issues, over the past three years PMI has procured SP for IPTp as a part of focused antenatal care (FANC) support in the 11 PMI focus states. PMI also provided technical assistance at the federal level to update the MIP guidelines and training manuals as well at the state and LGA level to train health workers, provide job aids on IPTp, and address missed opportunities for IPTp delivery. With FY 2016 funding, PMI will continue support for health worker trainings on the new IPTp guidelines in 11 states, advocate for the 11 PMI focus states to introduce a budget line for purchase of SP in their state annual operational plans, and USAID-State memoranda of understanding, monitor state planned SP procurement actions, and improve IPTp coverage through interpersonal communication among communities and health workers. PMI will also support implementation of a pilot activity to introduce community IPTp (c-IPTp) programs in three northern states where facility-based ANC attendance is low.

**Case management:** With support from PMI and other donors, the NMEP is implementing measures to increase reliance on diagnostic testing to confirm malaria diagnosis. This support includes formulating policy that requires 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 11 states. In addition, PMI has supported training of health care workers 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 for both RDTs and microscopy.

Consistent with WHO guidance in 2014, the NMEP has shifted its first-line therapy for severe malaria from quinine to injectable artesunate, an antimalarial with superior efficacy. PMI has supported NMEP to train health workers on the new policy, and procured injectable artesunate for the 11 PMI focus states. PMI will increase the number of treatments delivered to facilities in the 11 PMI focus states in future years as more clinicians complete training.

With FY 2016 funds, PMI will continue to strengthen malaria case management based on diagnostic confirmation. PMI will procure 10 million RDTs and 8 million ACTs for the public sector. PMI will support training, supervision, and quality assurance activities at the health facility and community levels to strengthen RDT use and microscopy and effective case management overall. PMI will provide support to utilize the DHIS2 system to monitor key service delivery performance indicators and identify and rectify systemic issues that adversely affect service delivery performance.

**Health systems strengthening and capacity building:** Nigeria, like other countries in the sub-Saharan region, requires a functional health system to effectively control malaria. The challenges of inadequate capacity at the national and sub-national levels coupled with poor coordination of resources are well known. PMI provides significant support for capacity building as part of efforts to strengthen case management, procurement and supply management, monitoring and evaluation, and integrated vector management. In addition, PMI has provided and will continue to provide support for the Nigeria Field Epidemiology and Laboratory Training Program (NFELTP) that builds capacity of health workers in epidemiology.

Capacity building at the national and state levels remains a priority for PMI. PMI will work closely with other development partners – the Global Fund, the UK Department for International Development (DfID), the World Bank, and UN agencies – to strengthen effective program management especially at the national level. PMI will provide support beyond the NMEP to other relevant government agencies involved in malaria control including regulatory agencies such as the National Agency for Food and Drug Administration and Control (NAFDAC) to ensure high quality assured malaria medicines are available on the Nigerian market.

**Behavior change communication (BCC):** Nigeria’s updated Advocacy, Communication, and Social Mobilization (ACSM) guidelines for malaria 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 provides support for behavior change communication (BCC) across all key malaria interventions. PMI will continue to support an over-arching national ‘malaria-free’ communications campaign to increase general awareness of malaria while specific state and local-level activities will

focus on transmitting malaria communication messages in local languages through radio, and use of 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.

**Monitoring and evaluation (M&E):** PMI provides support to strengthen monitoring and evaluation of malaria control efforts and to identify and correct problems in program implementation as they occur. In the 11 focus states, PMI is strengthening the Health Management Information System (HMIS) so that routine malaria data are 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. The HMIS as well as a Logistics Management Information System (LMIS) for malaria commodities are now being implemented, with PMI supporting the training of data managers and health managers at health facility and state level on HMIS tools and data quality assessment (DQA) to analyze and use HMIS and LMIS data for decision-making. PMI also supports the printing of HMIS forms, where needed, conducting DQA and supervision for improving data quality in the 11 PMI focus states. PMI supported the 2013 NDHS, the 2015 MIS, and will support a Malaria Implementation Assessment<sup>1</sup> (MIA) in 2016, with each of these activities informing program improvements and decision-making. Moving forward, PMI will continue to support the strengthening of M&E capacity at the national, state, and local government area (LGA) levels, and improve the quality of data from the HMIS and the LMIS. There will be an increased focus on analyzing and using data from both data management systems. These data triangulation efforts using HMIS and LMIS data from health facilities will enable monitoring of malaria burden and measuring impact of malaria interventions.

**Operational research (OR):** PMI consulted with the NMEP in August 2014 to identify NMEP's highest priority areas of interest for PMI-supported operational research. These general topic areas include: (1) how best to achieve and maintain high long-lasting insecticide-treated net ownership and use; (2) clinician adherence to diagnostic testing standards; and (3) the most effective, sustainable, and moderately costed methods to monitor malaria burden and trends in different populations and settings; and (4) assessment and evaluation of the effect of interventions and strategies in place to control and prevent malaria in pregnant women. One NMEP-supported concept paper has been approved to date, entitled *Evaluating Clinician Adherence to Diagnostic Testing to Provide Effective Case Management in Nigeria*; and study implementation is anticipated to begin in early 2016.

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<sup>1</sup> Malaria Implementation Assessment (MIA) is an assessment of progress of malaria program interventions using data from health facilities, household surveys and implementation activities. It is meant to be used to understand the current situation of malaria control and burden. It replaces rapid impact assessment as MIA does not measure "impact".

## II. STRATEGY

### 1. Introduction

When it was launched in 2005, the goal of PMI was to reduce malaria-related mortality by 50% across 15 high-burden countries in sub-Saharan Africa through a rapid scale-up of four proven and highly effective malaria prevention and treatment measures: insecticide-treated nets (ITNs); indoor residual spraying (IRS); accurate diagnosis and prompt treatment with artemisinin-based combination therapies (ACTs); and intermittent preventive treatment in pregnancy (IPTp). With the passage of the Tom Lantos and Henry J. Hyde Global Leadership against HIV/AIDS, Tuberculosis, and Malaria Act in 2008, PMI developed a U.S. Government Malaria Strategy for 2009–2014. This strategy included a long-term vision for malaria control in which sustained high coverage with prevention and treatment interventions would progressively lead to malaria-free zones in Africa, with the ultimate goal of worldwide malaria eradication by 2040-2050. Consistent with this strategy and the increase in annual appropriations supporting PMI, four new sub-Saharan African countries (including Nigeria) and one regional program in the Greater Mekong Subregion of Southeast Asia were added in 2011. The contributions of PMI, together with those of other partners, have led to dramatic improvements in the coverage of malaria control interventions in PMI-supported countries, and all 15 original countries have documented substantial declines in all-cause mortality rates among children less than five years of age.

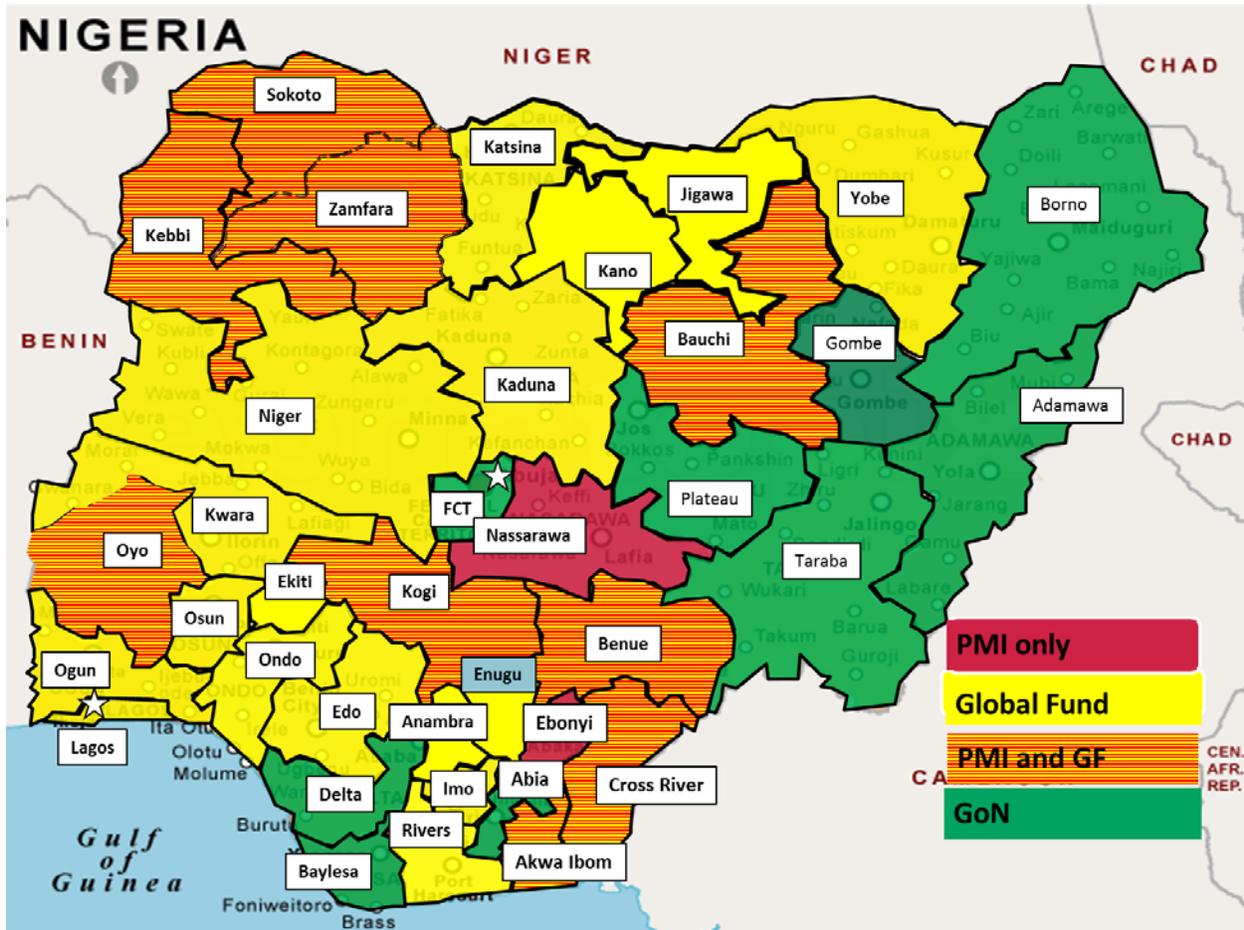
In 2015, PMI launched the next six-year strategy, setting forth a bold and ambitious goal and objectives. The PMI Strategy for 2015-2020 takes into account the progress over the past decade and the new challenges that have arisen. Malaria prevention and control remains a major U.S. foreign assistance objective and PMI's strategy fully aligns with the U.S. Government's vision of ending preventable child and maternal deaths and ending extreme poverty. It is also in line with the goals articulated in the RBM Partnership's second generation global malaria action plan, *Action and Investment to Defeat Malaria (AIM) 2016-2030: for a Malaria-Free World* and WHO's updated *Global Technical Strategy 2016-2030*. Under the PMI Strategy 2015-2020, the U.S. Government's goal is to work with PMI-supported countries and partners to further reduce malaria deaths and substantially decrease malaria morbidity, towards the long-term goal of elimination.

Nigeria was selected as a PMI focus country in FY 2011. This FY 2016 Malaria Operational Plan presents a detailed implementation plan for Nigeria, based on the strategies of PMI and the National Malaria Elimination Program (NMEP). It was developed in consultation with the NMEP and with the participation of national and international partners involved in malaria prevention and control in the country. The activities that PMI is proposing to support fit in well with the National Malaria Control Strategy. They build on investments made by PMI and other partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) malaria grants. This document briefly reviews the current status of malaria control policies and interventions in Nigeria, describes progress to date, identifies challenges and unmet needs to achieving the targets of the NMEP and PMI, and provides a description of activities that are planned with FY 2016 funding.

The proposed FY 2016 PMI budget is \$70 million.

PMI began in 2011 with support to three states: Cross River, Zamfara, and Nasarawa. In 2012, PMI expanded to six more states and in 2013 added two more states to reach a total of 11 PMI focus states with a projected population of 54.9 million people (Figure 1). While PMI does not work in all health facilities in each of the 11 PMI focus states, the Initiative provides a varying degree of support to all 230 local government areas (LGAs).

**Figure 1: PMI and Global Fund Focus States in 2015**



Kebbi, Sokoto, and Zamfara are located in Nigeria’s northwest region, which is markedly drier than the South, but still supports significant malaria transmission. Conversely, Akwa Ibom, Benue, Cross River, and Ebonyi are situated in the southeast, supporting high levels of malaria transmission in a humid and tropical environment. The central states of Bauchi, Kogi, Nasarawa, and Oyo share characteristics of both northern and southern states. The marked cultural and behavioral variation between regions and states necessitates differing delivery strategies for PMI interventions within the country. More information on the PMI focus states is listed in Table 1 below.

**Table 1: PMI Focus States by Start-up Year and Intervention Support as of 2015**

No.	State	Population (2017 projection)	Start-up year	PMI Interventions						Other Partners
				ITNs	MIP/IPTp	CM <sup>1</sup>	iCCM	IRS <sup>2</sup>	BCC	
1	Cross River	3,974,499	2011	X	X	X			X	Global Fund
2	Nasarawa	2,591,756	2011	X	X	X		X	X	
3	Zamfara	4,635,203	2011	X	X	X			X	Global Fund
4	Bauchi	6,797,416	2012	X	X	X	X		X	Global Fund
5	Sokoto	5,142,408	2012	X	X	X		X	X	Global Fund
6	Benue	5,868,834	2012	X	X	X			X	Global Fund
7	Ebonyi	2,957,485	2012	X	X	X	X		X	
8	Oyo	8,127,582	2012	X	X	X			X	Global Fund
9	Kogi	4,560,271	2012	X	X	X			X	Global Fund
10	Akwa Ibom	5,698,168	2013	X	X	X			X	Global Fund
11	Kebbi <sup>3</sup>	4,554,655	2013	X	X	X			X	Global Fund

<sup>1</sup>. CM=Case management

<sup>2</sup>. IRS includes entomological monitoring

<sup>3</sup>. UNICEF is supporting iCCM in Kebbi State with funding from the Gates Foundation.

The main sources of funding for malaria efforts within the 11 PMI focus states are PMI, the Global Fund, and the domestic resources from the states themselves. However, available external funding does not cover all technical assistance and implementation support needs for all health facilities within these 11 states. In general, PMI and the Global Fund support approximately 60-80% of all health facilities in a state with commodities and technical assistance for training, and supervision. Using domestic resources, the states also cover approximately an additional 10% of health facilities with malaria commodities as well as health worker salary and facility operational support more broadly. PMI has gradually scaled up the number of health facilities supported per LGA over time as reflected in Table 2. Expansion prioritizes those health facilities that operate on a daily basis, that have health workers available to provide health services (including malaria diagnosis and treatment), that see a high volume of patients, and that receive no support from the state or other donors.

The expansion plan will take into consideration continued improvement in service quality through adherence to recommended protocols and health worker interpersonal communication. There will also be a focus on improving collection and use of data from the DHIS2 system. This system has been extensively rolled out in most states, to provide information on key malaria indicators and identify service gaps. However, since the data is seldom used for analyzing performance, PMI plans to identify systemic service delivery bottlenecks, develop appropriate solutions, and monitor progress. The exact roll-out of this strategy will be dependent on the USAID plan to intentionally

engage states in strategic health sector agreements. The choice of states prioritized for support will be informed by the 2016 strategic discussions and data from the HMIS, 2013 NDHS, and 2015 MIS.

Table 1 provides a detailed description of PMI investment area through 2015 for each of the current 11 PMI focus states. With FY 2016 funding the aim is to cover approximately 5,468 health facilities by 2017 (Table 2). The scale-up plan addresses both the addition of more health facilities over time and also an intention to strengthen the quality of service delivery at each supported facility. The scale-up package is not standard across facilities because it takes into consideration funding from the states and the Global Fund. Some health facilities receive comprehensive support including: case management, prevention of MIP, ITNs at ANC and immunization clinics, HMIS, supportive supervision, and provision of all malaria commodities. The 17 health facilities per LGA that are supported by the Global Fund only receive SP from PMI because SP was not included in the previous Global Fund malaria grant. For the remaining health facilities, PMI support covers capacity building (training and data management support). PMI is currently supporting 11 states, covering an average of 40-50% of the facilities per state. In 9 of the 11 states, GF is also supporting some 17 health facilities per LGA, leaving a significant number of health facilities unsupported by PMI, the Global Fund, or the state. In addition, the current Global Fund grant will end December 2016. The number of unsupported health facilities will increase after December 2016 if new Global Fund, external, or domestic resources are not made available. For sustainability, PMI will work with the focus states through Mission-wide MOUs to identify domestic funding opportunities to strengthen their own efforts in malaria control and reduce their dependence on outside donors.

**Table 2: Health Facility (HF) Scale-up Actual and Planned in 11 PMI Focus States 2010-2017**

No.	State	Total LGAs	Total HFs	Total public HFs	2010-2011		2012-2013		2014		2015		2016-2017	
					Supported HFs		Supported HFs		Supported HFs		Supported HFs		Supported HFs	
					Total	%	Total	%	Total	%	Total	%	Total	%
1	Akwa Ibom	31	534	452	0	0%	0	0%	452	100%	452	100%	452	100%
2	Bauchi	20	1,091	1,015	0	0%	415	42%	415	42%	415	42%	621	62%
3	Benue	23	1,284	1,034	92	9%	184	18%	184	18%	251	24%	642	62%
4	Cross River	18	923	774	72	9%	144	19%	144	19%	235	30%	541	70%
5	Ebonyi	13	594	491	56	11%	104	21%	104	21%	163	33%	308	63%
6	Kebbi	21	738	628	0	0%	0	0%	0	0%	165	26%	545	87%
7	Kogi	21	1,045	781	84	11%	84	11%	84	11%	166	21%	523	67%
8	Nasarawa	13	935	746	52	7%	105	14%	105	14%	196	26%	480	64%
9	Oyo	33	1,217	601	132	22%	132	22%	132	22%	179	30%	614	102%
10	Sokoto	23	746	715	161	23%	161	23%	161	23%	161	23%	374	53%
11	Zamfara	14	681	666	56	8%	112	17%	112	17%	130	20%	368	55%
	<b>TOTAL</b>	<b>230</b>	<b>9,788</b>	<b>7,873</b>	<b>705</b>	<b>7%</b>	<b>1,441</b>	<b>15%</b>	<b>1,893</b>	<b>19%</b>	<b>2,513*</b>	<b>26%</b>	<b>5,468</b>	<b>56%</b>

Note:

- PMI/Nigeria will conduct a strategic review meeting to identify the states that will benefit from PMI support from 2016 onwards. Data from HMIS, 2013 NDHS, 2015 MIS, and state willingness and readiness to partner with the U.S. Government will inform the states selection process.
- The columns titled “Supported HFs-%” include PMI-supported facilities only. The Global Fund and PMI co-exist in nine of the 11 PMI focus states; in those nine states, the Global Fund supports an additional 17 health facilities in each LGA.
- \*An additional 553 health facilities received commodities procured by the GoN and other donors and these were distributed with PMI funds in 2015.

The 11 PMI focus states are diverse, with differing socio-demographic characteristics (Table 3). This means different approaches to service delivery need to be taken in each state or region. While PMI's core intervention package remains largely the same across all states (i.e. improved case management, MIP support, and ITN distribution), the methods of delivery must vary to most effectively reach the local populations. For example, in the North, ANC coverage is relatively lower than in the South of the country. Therefore service delivery methods are varied to effectively reach more pregnant women with services; e.g. community-based IPTp delivery and net distribution. High levels of school attendance in the South offer the possibility of scaling up school-based ITN distributions as an ITN keep-up strategy.

**Table: 3: Demographic Data for the 11 PMI Focus States**

	<b>PMI focus states</b>	<b>Malaria prevalence (%) (MIS 2010)</b>	<b>Under-five mortality (deaths/1,000 live births) (NDHS 2013)</b>	<b>ANC attendance (%)</b>	<b>School attendance ratio (%) (NDHS 2013)</b>	<b>Measles vaccination rate (%)</b>
	<b>North Central</b>	<b>49.4</b>	<b>100</b>	<b>67.0</b>	<b>68.0</b>	<b>48.1</b>
1	Benue	-	-	57.4	76.5	42.7
2	Kogi	-	-	87.5	74.3	75.2
3	Nasarawa	-	-	63.2	71.0	45.4
	<b>North East</b>	<b>30.9</b>	<b>160</b>	<b>49.3</b>	<b>44.1</b>	<b>26.8</b>
4	Bauchi	-	-	55.8	47.3	20.3
	<b>North West</b>	<b>48.2</b>	<b>185</b>	<b>41.0</b>	<b>47.2</b>	<b>22.3</b>
5	Sokoto	-	-	17.4	32.7	3.6
6	Zamfara	-	-	22.4	35.0	7.9
7	Kebbi	-	-	24.3	34.1	3.2
	<b>South East</b>	<b>27.6</b>	<b>131</b>	<b>90.6</b>	<b>81.4</b>	<b>72.2</b>
8	Ebonyi	-	-	85.1	85.6	61.7
	<b>South South</b>	<b>32.2</b>	<b>91</b>	<b>73.0</b>	<b>74.9</b>	<b>74.0</b>
9	Akwa Ibom	-	-	73.3	74.9	75.2
10	Cross River	-	-	72.6	73.5	77.1
	<b>South West</b>	<b>50.3</b>	<b>90</b>	<b>90.4</b>	<b>70.0</b>	<b>62.5</b>
11	Oyo	-	-	87.2	64.2	45.2
	<b>TOTAL</b>	<b>42.0</b>	<b>128</b>		<b>59.1</b>	

## 2. Malaria situation in Nigeria

Nigeria is the most populous country in Africa with an estimated annual growth rate of about 3.2% and a projected total population of approximately 195 million for 2017. It comprises six geopolitical zones, 36 states (plus the Federal Capital Territory of Abuja), and 774 LGAs, with an average population of about 257,000 residents per LGA. 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 NDHS 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

high income from crude oil sales, economic growth has not improved the welfare of the majority of the population nor has it affected 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 years of age, 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. Of those who sought treatment for fever, 57% went to the private sector (private hospitals, pharmacies, proprietary patent medicine vendors, mobile clinics), 35% went to the public sector, and 9% went to others, including traditional healers.

### **3. Country health system delivery structure and Ministry of Health (MoH) 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. 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 the 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. National Health Accounts have been developed but available reports are out of date. It is generally believed that the government spends less than 5% of its national budget on health. In 2014, a national health bill was signed into law and the Act stipulates that a specific amount be set aside for the implementation of primary health care.

Nigeria has a total of 34,173 health facilities: 30,098 primary, 3,992 secondary, and 83 tertiary. The private sector constitutes 33% of all health facilities in Nigeria. Private health facilities include private not-for-profit, private for-profit, pharmacies, proprietary patent medicine vendors (PPMVs), and mobile clinics. The total number of public health facilities in the 11 PMI focus states is 9,788. As of December 2015, PMI supports 3,066 of these health facilities. Of the 3,066 health facilities, 2,513 receive a full package of interventions (malaria case management, MIP, ITNs, HMIS, commodities, supportive supervision) while the remainder (553) receive only commodities that are procured by the GoN and other donors, which are distributed with PMI funds.

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; and
- Weak institutional capacity with inadequate supervision of health services.

Led by a coordinator, the NMEP consists of about 80 staff members and is divided into six branches: Program Management, Procurement and Supply Management, Integrated Vector Management, Case Management, Monitoring and Evaluation, and Advocacy, Communication, and Social Mobilization (ACSM). At the national level, the NMEP is responsible for establishing policies, guidelines, and norms. Each state and LGA has a Malaria Program 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, PPMVs, and unregistered drug sellers. Approximately 76% of all secondary facilities and about 28% of primary health care facilities are private. Forty-two percent of all fever cases seek treatment first in the private sector (NDHS 2013). 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 34,173 health facilities nationwide are fairly evenly distributed between urban and rural areas.

#### **4. National malaria control strategy**

The 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 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 LGAs report routinely on malaria by 2020, progress is measured, and evidence is used for program improvement

Under the strategic plan, the GoN supports the provision (free-of-charge) of ITNs, IPTp, IRS, larval source management, and diagnosis and treatment of uncomplicated and severe malaria.

The NMEP's Strategic Plan emphasizes the strengthening of public-private partnerships across intervention areas. Of note are the planned collaborations with corporate organizations in the conduct of IRS, implementation of the WHO recommendation of providing IPTp at every scheduled ANC visit after the first trimester, with a month between doses, and the integration of the commodity logistics system. Perhaps most importantly however, is the recent change in elective government at federal and state levels that has brought a renewed energy for increasing national resources for health care provision.

## **5. Updates in the strategy section**

USAID/Nigeria is developing a strategy for increasing state ownership and sustainability of USG-supported activities, including malaria, through increased advocacy and domestic financing. Through a memorandum of understanding (MOU) with every state that has USAID presence, USAID/Nigeria and the states will each define their responsibilities and levels of support. The MOUs will be in place by mid-2016. The USAID Mission will use two indicators to monitor contributions by states: 1) proportion of the state budget allocated to health activities; and, 2) proportion of state health budget that is released to support health activities. These two indicators will be disaggregated by health account—malaria, Maternal, Newborn and Child Health (MNCH), family planning (FP), and nutrition. Should a state not meet its MOU commitments, the USG could withdraw its resources from that state. However, any such decision will also be made based on coverage and epidemiological factors to avoid leaving vulnerable populations at risk. For malaria activities, PMI headquarters will also engage in these discussions and concur with any decisions.

PMI will undertake a major strategic review of its program in 2016 based on the results of the 2015 MIS, other health data, and reviews of its current portfolio. The aim of this review will be to ensure that PMI funding is being channeled to where it is needed most in order to achieve health impact at scale. In the interim, PMI will maintain its current geographic focus in early 2016. The selection of PMI focus states will depend on the disease burden as measured by the 2015 malaria prevalence rate, intervention coverage outcomes, health service uptake data, the willingness and commitment of the states to contribute to PMI-funded malaria control interventions, and the security situation. While this review could result in a change of geographic focus, PMI will ensure that its investments will prioritize coverage in high burden areas to ensure measurable and optimal impact. Any changes will be coordinated with the Nigerian government and other malaria donors to maximize resource mobilization in focus areas. In the current and future PMI focus states, PMI will work with the GoN

and other donors to strengthen the ability of functioning health facilities to provide improved quality service through both direct and indirect PMI support.

By enhancing coordination with other development partners and programs, especially around logistics management and data management, PMI will leverage other donor resources to reach more health facilities and people. Evaluating and redesigning the process for ITN mass campaigns coupled with improved donor coordination will maximize resources for that intervention. PMI with USAID Mission leadership will advocate with new state Governors to obtain state contributions to PMI-supported activities. Starting with FY 2015, PMI will monitor state budgets and release of funds for malaria control.

To increase technical oversight and monitoring of field activities, PMI will increase staffing of the PMI team from five dedicated staff to six. In FY 2015, PMI will also introduce a mid-term review of the program, in advance of the MOP consultative meetings, targeting specific areas of need. Finally, the PMI team will conduct one comprehensive field visit for all malaria control interventions to 2-3 states once every quarter, and every PMI focus state will be visited at least once in 12 months.

## **6. 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 the Global Fund, the USG, and DfID. Other key partners include the Clinton Health Access Initiative (CHAI), the United Nations Children's Fund (UNICEF), and the World Health Organization (WHO). There is also increasing corporate sector support for malaria control including ExxonMobil, Chevron Dutch Shell, and the Dangote Foundation. The Global Business Coalition under the Corporate Alliance on Malaria in Africa (CAMA) is galvanizing corporate efforts to support resource mobilization as well as to leverage the strength of this sector. For example, the Coca-Cola Company is working to improve logistics, while Access Bank and EcoBank group are supporting financial management.

Prior to 2014, Nigeria had three approved grants for malaria from the Global Fund, the latter two designating the NMEP as the Principal Recipient. In March 2014, the Global Fund launched the New Funding Model (NFM), which consolidated funding for Nigeria's existing malaria grants. The approved grant for Nigeria under the NFM is \$400,253,346 to cover the period of February 2015 to December 31, 2016. The fund will be managed by the NMEP (\$308,577,343) and the Society for Family Health (\$91,676,003) as Principal Recipients. As of the end of January 2016, \$279,554,526 is already committed to support various malaria activities, including procurement of malaria commodities. The Government of Nigeria is required to provide \$45.7 million by the Global Fund as counterpart financing for ITNs.

**Table 4: Approved Malaria grants for Nigeria under the New Funding Model (NFM)**

<b>Principal Recipient</b>	<b>Period</b>	<b>Signed Amount</b>	<b>Committed Amount</b>
NMEP	Feb 1 2015 - Dec 31 2016	\$308,577,343	\$202,391,191
Society for Family Health	Feb 1 2015 - Dec 31 2016	\$91,676,003	\$77,163,335
<b>Total</b>		<b>\$400,253,346</b>	<b>\$279,554,526</b>

In terms of activities, the Global Fund grant supports scale-up of prevention and case management activities in line with the NMEP Strategic Plan 2014-2020. The key interventions are to obtain universal coverage of ITNs through mass campaigns and continuous distribution; improve coverage for malaria in pregnancy especially with IPTp; to increase ACT roll-out in the public and private sectors; and to increase malaria diagnosis using microscopy and RDTs in public and private health facilities. The grant will also support broader health system activities: logistics management, the health management information system, and BCC.

The Global Fund will support the malaria program at the national level and in 24 states in the country. The Global Fund and PMI will co-locate in 9 of the 11 PMI-supported states, and appropriate arrangements are being worked out to enhance coordination and prevent duplication of efforts. At the national level, the Global Fund is co-funding key activities such as the Malaria Indicator Survey (US\$1.7 million or about 37% of the total budget), the Health Management Information System, and the MIA in 24 states. Previously, the Global Fund supported ITN mass campaigns in three PMI focus states: Sokoto (2013), Kebbi (2014), and Akwa Ibom (2014). Before funding was consolidated, under Global Fund 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.

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 quality assurance lot sampling surveys, to assess the impact of the program. The Booster Program ended in June 2013, but the project received a no-cost extension through March 2015. At present, the World Bank is exploring integrated health program implementation through performance-based financing options, private sector strengthening, and health governance support. The World Bank is also funding Saving One Million Lives (SOML), a GoN initiative designed to support at-scale delivery of evidence-based interventions and human resources for health in needed areas.

DfID supports a £89 million project (about \$140 million) called Support for the National Malaria Program (SuNMaP), which started in 2008 and ends in 2016. DfID has indicated a willingness to continue funding for malaria in Nigeria but the funding levels are not yet determined beyond 2016. The program provides substantial support for the NMEP and ten selected states, none of which overlap with PMI's 11 states. In the DfID states, SuNMaP supports malaria prevention, diagnosis, and treatment, and supplies limited quantities of malaria commodities. 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 \$140 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 (CHAI) worked closely with the NMEP in the preparation for and management of the Affordable Medicines Facility for malaria (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 funded a study on extending IPTp and other malaria interventions to community-directed distributors in Akwa Ibom State and is also supporting BCC interventions through Malaria No More. The community IPTp study demonstrated the potential of using community-directed distributors and has helped inform PMI plans for ITN keep-up and other activities.

The AMFm mechanism hosted by the Global Fund has transitioned into the Private Sector Co-payment Mechanism (PSCM). With funding from DfID, Nigeria received approval to continue implementation of the mechanism for 2015-2016 under the Global Fund's NFM. There are 48 first-line buyers who are authorized to procure and sell the quality-assured ACTs using their distribution channels, mostly in the private sector. A total of 136 million doses of ACTs were approved to be procured in 2014. Within the approved quantities, 50% will be ACTs that could be used to treat children under five years of age. For the first six months of 2015, 45 million doses were approved for the first-line buyers. The country is working through the Case Management Sub-committee to monitor the implementation, strengthen parasite diagnosis before treatment, and thus improve rational drug use. There is no clear commitment for the mechanism beyond 2016, as funds were committed up to 2016.

The Private Sector Health 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 the Dangote Foundation, one of Nigeria's most prominent businesses. 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.

The Corporate Alliance on Malaria in Africa (CAMA), a malaria subgroup of the Global Business Coalition, is a unique coalition of companies from various industries with a common commitment to fight malaria. With co-chairs from the major industrial players in oil and gas, manufacturing, banking and international NGOs, skills and resources are leveraged for malaria. In its second year, the annual technical forum in Nigeria aims to mobilize resources, skills, and capacity of the private sector in support of the NMEP Strategic Plan 2014 – 2020.

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

PMI has identified opportunities to integrate investments with other USG program activities including 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. In mid-2013, PMI and PEPFAR agreed to collaborate on commodity storage and distribution in two states and are considering opportunities to expand collaboration to more states. Recently, the Global Health Security Agenda (GHSA) and the USG component within GHSA was launched. The key objective of GHSA is to prevent, detect, and respond to global health threats such as infectious disease outbreaks. To achieve this, the USG is supporting efforts to strengthen the health system in the areas of capacity building, laboratories, and surveillance which will also positively impact malaria control. The PMI and GHSA teams will coordinate to ensure USG resources are maximized as health systems are strengthened with both funding streams and that efforts that benefit malaria control are coordinated under one PMI coordinated umbrella.

Recently, PMI/Nigeria, in partnership with the Centers for Disease Control and Prevention (CDC)/Nigeria, the NMEP, and the Nigeria FELTP program, have developed an implementation plan to explore opportunities to expand PMI's reach through collaboration between programs. This NSTOP-Malaria collaboration will expand the reach of US Government-supported malaria control initiatives in certain states with NSTOP officers. The purpose is to leverage the presence of NSTOP officers serving in hard-to-reach areas of northern Nigeria for polio eradication, training them to monitor in particular the quality of case management and malaria-related health information systems. The NSTOP-Malaria collaboration complements PMI efforts to scale up the access to and use of malaria interventions and will focus on activities at the LGA level in Kano and Zamfara. In Kano, PMI is collaborating with the GoN and DfID to initiate NSTOP-Malaria activities.

Support for improved diagnostics has built on the base provided by the PEPFAR DOD-Walter Reed Program to improve human immunodeficiency virus (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 in the areas of training of trainers as well as support for the establishment of a functional malaria diagnosis quality assurance system.

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 commodities supply chain and 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. This cooperation includes shared warehousing 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.

## **7. PMI goal, objectives, strategic areas, and key indicators**

Under the PMI Strategy for 2015-2020, the U.S. Government’s goal is to work with PMI-supported countries and partners to further reduce malaria deaths and substantially decrease malaria morbidity, towards the long-term goal of elimination. Building upon the progress to date in PMI-supported countries, PMI will work with NMCPs and partners to accomplish the following objectives by 2020:

1. Reduce malaria mortality by one-third from 2015 levels in PMI-supported countries, achieving a greater than 80% reduction from PMI’s original 2000 baseline levels.
2. Reduce malaria morbidity in PMI-supported countries by 40% from 2015 levels.
3. Assist at least five PMI-supported countries to meet the World Health Organization’s (WHO) criteria for national or sub-national pre-elimination.<sup>2</sup>

These objectives will be accomplished by emphasizing five core areas of strategic focus:

1. Achieving and sustaining the scale of proven interventions
2. Adapting to changing epidemiology and incorporating new tools
3. Improving countries’ capacity to collect and use information
4. Mitigating risk against the current malaria control gains
5. Building capacity and health systems towards full country ownership

To track progress toward achieving and sustaining scale of proven interventions (area of strategic focus #1), PMI will continue to track the key indicators recommended by the Roll Back Malaria Monitoring and Evaluation Reference Group (RBM MERG) as listed below:

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<sup>2</sup> [http://whqlibdoc.who.int/publications/2007/9789241596084\\_eng.pdf](http://whqlibdoc.who.int/publications/2007/9789241596084_eng.pdf)

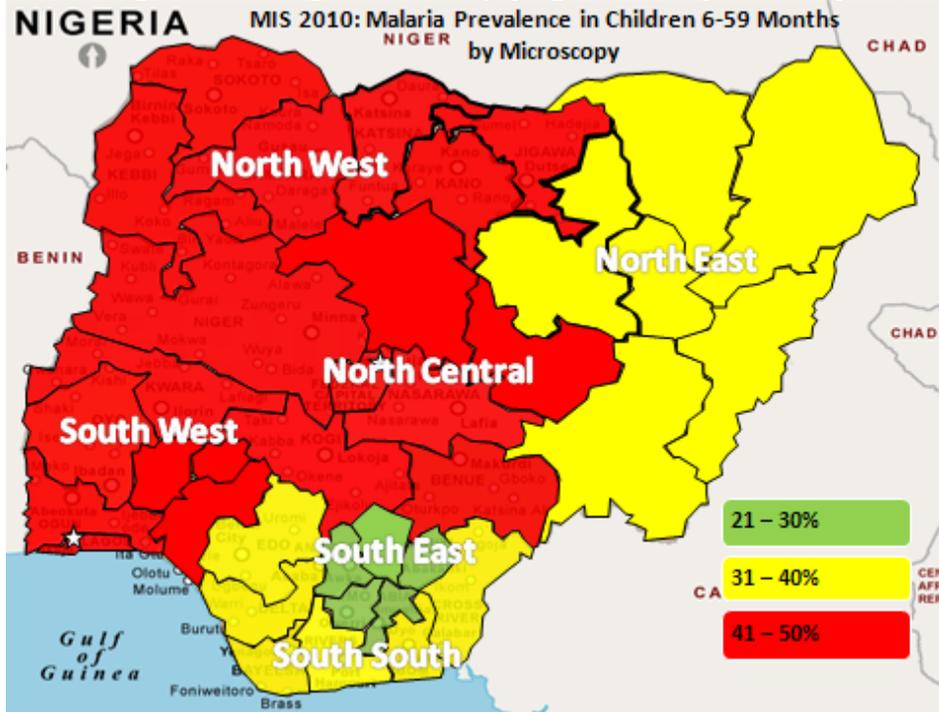
- Proportion of households with at least one ITN
- Proportion of households with at least one ITN for every two people
- Proportion of children under five years old who slept under an ITN the previous night
- Proportion of pregnant women who slept under an ITN the previous night
- Proportion of households in targeted districts protected by IRS
- Proportion of children under five years old with fever in the last two weeks for whom advice or treatment was sought
- Proportion of children under five with fever in the last two weeks who had a finger or heel stick
- Proportion receiving an ACT among children under five years old with fever in the last two weeks who received any antimalarial drugs
- Proportion of women who received two or more doses of IPTp for malaria during ANC visits during their last pregnancy

## **8. 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 NDHS. A malaria indicator survey planned for the end of 2014 was postponed due to an Ebola outbreak in Nigeria. The MIS will now take place in September/October 2015. PMI is also planning an MIA at the end of 2015 that will provide data on the impact of PMI support on service delivery indicators. Data from the MIA and MIS will be available at the end of 2015 and the first quarter of 2016, respectively.

As measured in the 2010 MIS, the parasitemia rate among children aged 6-59 months was 42%. Parasitemia was higher in rural areas (48%) than in urban areas (22%), and decreased as the mother's education level improved. Malaria prevalence varied 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 NDHS are shown in Table 5. Household ownership of at least one ITN increased from 22% in 2010 to 50% in 2013. In the 2013 NDHS, less than one-quarter (22%) 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. 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 NDHS 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 2015 MIS will be critical to confirm the trends in ITN use between surveys conducted during rainy seasons.

**Table 5: Evolution of Key Malaria Indicators in Nigeria from 2008 to 2013**

Indicator	2008, NDHS	2010, MIS	2013, NDHS
% Households with at least one ITN	8%	21.5%	49.5%
% Households with at least one ITN for every two people	N/A	N/A	22.1%
% Children under five who slept under an ITN the previous night	5.5%	28.9%	16.6%
% Pregnant women who slept under an ITN the previous night	4.8%	33.6%	16.5%
% Households in targeted districts protected by IRS	N/A	*N/A	N/A
% Children under five years old with fever in the last two weeks for whom advice or treatment was sought	33%	49.1%	70.1%
% Children under five with fever in the last two weeks who had a finger or heel stick	N/A	5.4%	11.1%
% Children receiving an ACT among children under five years old with fever in the last two weeks who received any antimalarial drugs	2.4%	5.9%	18.3%
% Women who received two or more doses of IPTp during their last pregnancy in the last two years	4.9%	9.7%	14.6%

\*PMI supported IRS only in Nasarawa State but the 2010 MIS presented IRS data at the zonal rather than state level.

The 2013 NDHS found that of the pregnant women who attended ANC, 61% received antenatal care from a skilled provider during their pregnancy and 51% of pregnant women had 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 10% in 2010 and 15% in 2013.

Use of ACTs to treat malaria remains low. Among febrile children under five years of age that were given an antimalarial medication for presumed malaria, 6% received an ACT in 2010 while 18% 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 but increased from 5% in 2010 to 11% in 2013 for children under five years of age.

Table 6 includes a sub-analysis of aggregated MIS and NDHS 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 began receiving PMI support more recently (2013). At the end of 2010, ITN ownership and access were lower in PMI focus states than at the national level. However, the 2013 NDHS demonstrated the reverse situation, with PMI focus states having slightly better ownership and access than the national average. However, better ITN access did not result in substantially higher 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 6: Malaria Indicators in 9 PMI Focus States, Nigeria**

INDICATORS	2008 NDHS						2010 MIS						2013 NDHS					
	9 PMI Focus States			Overall Nigeria MIS			9 PMI Focus States			Overall Nigeria MIS			9 PMI Focus 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
Percentage 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
<b>Case Management</b>																		

INDICATORS	2008 NDHS						2010 MIS						2013 NDHS					
	9 PMI Focus States			Overall Nigeria MIS			9 PMI Focus States			Overall Nigeria MIS			9 PMI Focus States			Overall Nigeria MIS		
	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI	%	LCI	UCI
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
Percentage 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 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 one or more doses of SP/Fansidar at least one of which is given at an ANC visit

## 9. Other relevant evidence on progress

N/A

## 10. Challenges and opportunities

### *Commodity supply chain system*

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 of health care, and generally weak and paper-based 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: PMI, PEPFAR, and the Global Fund are discussing how state logistics systems can be improved through integration of storage, commodity transportation, and logistics management through the Logistics Management Coordination Units (LMCUs). This collaborative effort has resulted in establishing LMCUs in all 11 PMI focus states. In addition, USAID led the process for establishing a donor Supply Chain Technical Working Group to improve coordination and integration of various commodities. The expected outcome is integrated and well-coordinated forecasting, quantification, procurement ordering, storage, and distribution, and logistics data management systems.

In addition, improved communication and collaboration between PMI and the Global Fund at the national level have opened up new opportunities for better coordination and pooled distribution of malaria commodities at the state level. Finally, PMI is exploring collaboration with PEPFAR in Cross River state that has the potential for developing a unified distribution system. PMI is also taking over the supply of malaria commodities to all health facilities in Ebonyi and Nasarawa that have stopped receiving Global Fund commodities. This is an opportunity for PMI to strengthen the state commodity supply systems in those two states.

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

Challenges: Many Nigerians, including those under the age of five, first seek care for fever from the private sector. While most PPMVs have received some informal training to recognize uncomplicated malaria, many are not aware of NMEP guidelines for malaria treatment. These issues, along with the continued availability of substandard drugs and monotherapies, lead to patients not receiving optimal case management in this sector.

Opportunities: At the end of 2014, the Nigeria Federal Ministry of Health passed a Task Shifting and Sharing Policy (TSSP) that will improve access and management of malaria in the community. This policy allows Community Health Workers (CHWs), including PPMVs, to conduct malaria testing in the community using RDTs. The policies provide an opportunity for PMI to scale up integrated community case management (iCCM) and malaria testing through PPMVs and Community Health Workers (CHWs).

### *Availability and use of substandard and counterfeit medicines, including monotherapies*

***Challenge:*** The NMEP and partners started addressing use of malaria monotherapy since the policy change to ACTs in 2005. Trend analysis shows that use of monotherapies in Nigeria is declining but is still high. The NDHS 2013 found that of the children with a fever within the two weeks preceding the survey who took any antimalarial drug, only 18% took ACTs (up from 6% in the 2010 MIS). The remaining children took SP (30%), chloroquine (30%), and other antimalarial drugs (22%).

***Opportunity:*** The NMEP and the National Agency for Food and Drug Administration and Control (NAFDAC) have established a national task force to enforce the ban on use of oral artemisinin monotherapies. With core funding, PMI is implementing a program in Nigeria to educate and increase awareness of counterfeit and substandard malaria drugs. In 2015, during World Malaria Day, the U.S. Ambassador to Nigeria launched a “make a difference” campaign and a free hotline for reporting activities related to counterfeit medicines. The campaign has an associated reward of up to US\$10,000 for validated and genuine reports of counterfeit medicines. This campaign and the education program provide an opportunity for Nigeria to reduce counterfeit and substandard medicines in the market.

### ***Financing for the ITN strategy***

***Challenges:*** In 2015, the NMEP planned to conduct 14 ITN mass campaigns in 14 states in which ITNs will be more than three years old in 2015. The NMEP assumed continued funding from PMI, the Global Fund, the World Bank, and DfID. However, the ITN continuous and mass campaign strategy is under threat because the only assured funding is from PMI that will fund mass campaigns in four states, in addition to continuous distribution through ANC and immunization centers, schools, and the community. Funding from the World Bank ended in March 2015 and DfID’s current round of funding for malaria is ending March 2016. The current Global Fund malaria grant that is ending June 2017 has \$45.7 million for ITN campaigns but this funding is contingent on the GoN matching these funds one-to-one (\$45.7 million).

***Opportunities:*** Although this issue does not affect any of the 11 PMI focus states, PMI and the donor community are pressing for increased domestic funding, including for malaria control interventions. PMI is actively coordinating with the local donor community to identify alternative funding possibilities to match the Global Fund contribution. Nigeria has a vibrant private sector whose resources can be harnessed for financing malaria interventions.

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

***Challenges:*** 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. The insecurity has displaced a number of populations to PMI and non-PMI focus states. PMI has been called upon to respond to the humanitarian crisis by providing ITNs to the displaced populations. The response has increased the number of ITNs needed for the PMI/Nigeria program.

***Opportunities:*** Nigeria is optimistic that the security situation will improve with the new government that came on board on May 29, 2015. USAID has issued a \$10.5 million grant to the UN agencies—UNICEF, WHO, and the UN Fund for Population Activities—to respond to the human crisis with a package of reproductive, maternal, neonatal and child health interventions, including those for malaria. The grant will become operational in March 2015 and is for 18 months.

### III. OPERATIONAL PLAN

#### 1. Insecticide-treated nets

##### NMEP/PMI objectives

The NMEP's National Malaria Strategic Plan (NMSP) 2014-2020 affirms the goal of universal coverage with ITNs for the 97% of the population that is at-risk. 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 NMSP ITN strategy is part of the malaria prevention section and identifies four key activities with associated targets:

##### **Activity:**

1. Mass free distribution campaigns.
2. "Keep-up strategy" for continuous distribution of nets.
3. Creation of an enabling environment for private sector involvement.
4. Monitoring use and durability.

##### **Targets:**

1. At least 80% of households with at least one ITN for every two persons.
2. At least 80% of children under five will sleep inside ITNs.
3. At least 80% of pregnant women will sleep inside ITNs.

The national malaria policy provides the institutional context for this strategy. The policy details the physical specifications required for nets including the shape (rectangular for the public sector), the process for scaling up ITN ownership through campaigns and continuous distribution, the importance of BCC and evaluation to ensure high levels of net retention and use, and the need for operational research to inform ITN strategies.

The Nigeria ITN continuous replacement strategy has two parts, namely: 1) continuous distribution channels; and, 2) mass campaigns. While campaigns are conducted throughout PMI's 11 focus states, the use of various continuous distribution channels depends on the prevailing health infrastructure, cultural practices and other demographic criteria. Given such diversity throughout the country, Nigeria must use a range of distribution strategies to ensure the most accessible net distribution system possible. Distribution strategies must be adapted at a state level to ensure a manageable level of specification is achieved.

PMI's goal is to support the NMEP in achieving and maintaining its targets for coverage and use, especially in PMI focus states. PMI supports mass free ITN replacement campaigns, strengthening and expanding ANC and EPI channels for routine distribution, and scaling up both school and community-based distribution where feasible and cost-effective. Routine ITN distribution through ANC and EPI clinics is well established across PMI's focus states (Table 7), though mostly in health facilities that are receiving PMI or Global Fund support. ANC coverage is variable, particularly in northern states, where attendance is significantly lower than other areas of the country. Despite low ANC attendance and coverage rates, the NMEP is committed to including ITNs as part of a comprehensive prevention ANC package of services in order to strengthen the overall service delivery platform that health facilities provide. PMI acknowledges this commitment, though it will continue to support complementary

distribution channels including campaigns and other continuous approaches to reach at-risk populations, and to maintain and achieve LLIN coverage targets.

Nigeria started piloting the school distribution channels in 2012, and the community-based distribution channels in 2013. Based on lessons learned, Nigeria is refining these two channels to scale up more broadly. The community channel is also being used to provide ITNs for internally displaced persons (IDPs) from the conflicts in the northeastern states. PMI/Nigeria, NMEP, and partners are discussing the scale-up of the school and community distribution channels, as alternatives for mass campaigns. The medium term plan is to reduce reliance on ITN mass campaigns to maintain coverage by scaling up the continuous distribution channels—ANC, EPI, and either schools or communities— to provide ITNs to at least 80% of the targeted population. Such approaches will be carefully planned and discussed with partners to prevent gaps in coverage of vulnerable populations. PMI does not consider it cost-effective or efficient to invest in all four channels equally in each state, and deems that distribution channels should be tailored to ensure the highest degree of coverage in each state. Therefore, as part of the strategic review process in early 2016, PMI will join the NMEP and partners to review the available evidence in target states to determine the most effective mix of channels to reach the highest number of people.

**Table 7: Nigeria ITN Continuous Replacement Strategy**

No.	State	Projected total population (2017)	Under-five population	Pregnant women population	ITN distribution channels to sustain coverage of 80% access			
					ANC*	EPI*	Mass campaign (Year)	Other continuous distribution channels
1	Akwa Ibom	5,698,168	1,139,634	284,908	X	X	2014	The other continuous distribution channels will be determined for each state based on available evidence and gaps in ownership.
2	Bauchi	6,797,416	1,359,483	339,871	X	X	2014	
3	Benue	5,868,834	1,173,767	293,442	X	X	2015	
4	Cross River	3,974,499	794,900	198,725	X	X	2015	
5	Ebonyi	2,957,485	591,497	147,874	X	X	2015	
6	Kebbi	4,554,655	910,931	227,733	X	X	2014	
7	Kogi	4,560,271	912,054	28,014	X	X	2016	
8	Nasarawa	2,591,756	518,351	29,588	X	X	2014	
9	Oyo	8,127,582	1,625,516	406,379	X	X	2016	
10	Sokoto	5,142,408	1,028,482	257,120	X	X	2017	
11	Zamfara	4,635,203	927,041	231,760	X	X	2015	
<b>TOTAL</b>		<b>54,908,276</b>	<b>10,981,655</b>	<b>2,745,414</b>				

\* Health facilities with high ANC or EPI attendance within each state will be targeted. States with low ANC attendance will have additional channels such as community-based ANC outreaches to serve as outlets for providing ITNs, IPTp, and other FANC services.

### Progress since PMI was launched

Since launching its program in Nigeria in 2010, PMI has procured a total of 26,173,175 ITNs, and distributed approximately 23,396,200 ITNs through mass campaigns and 2,776,975 ITNs 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 NDHS surveys, but ITN use appeared to decrease over the same period. In the 2013 NDHS, 28% of children under five and 30% of pregnant women slept under a net in households owning at least one ITN compared to 49.8% of children under five and 44.4% of pregnant women in the 2008 NDHS.

Several reasons may explain the reported drop in net use between the 2008 NDHS and the 2013 NDHS. An ITN durability study in three Nigerian states found that the longer nets remain in the house, the higher the attrition of use, due to attitudinal issues<sup>3</sup>. Another factor could be the period in which each survey was conducted: the MIS was conducted in October-November 2009 during the rainy season, while the NDHS was conducted in February-March 2013 during the dry season. This suggests seasonality of net use related to the population’s perception of mosquito biting and malaria risk. Finally, these data do not reflect the substantial scale-up of ITN distribution and BCC efforts by the NMEP, PMI and other partners since the 2013 NDHS. The 2015 MIS will capture the outcomes of the 17 state-level universal coverage campaigns conducted from December 2013 to September 2015, ITNs distributed through the continuous distribution channels, and the increased PMI investment in BCC.

Record reviews from April 2014 to March 2015 in 7 PMI-supported states indicate that about 65% of women receive an ITN during their first ANC visits to a public facility. Field visits confirm that ITN distribution through this channel functions well in some of the states especially where ANC attendance is high. Health workers observe that progress is somewhat slower through EPI. The quality of record-keeping is variable, complicated by the register design. Clinic registers include a column for ANC-based distribution but not for EPI. Some facilities started EPI-based distribution later than through ANC, and some have reported supply problems. Substantial training and monitoring will be required to ensure that the EPI channel is implemented more effectively.

Currently there is no consensus in Nigeria on private sector marketing of ITNs for sale, or for initiating private ITN production in country. While demand appears high for nets through the private sector, manufacturers appear reticent to invest in a market that receives so many free nets each year. DfID explored the potential of this option, especially since it would address the demand for other net shapes and sizes. Results from the DfID report should be available by the end of 2015.

### Progress during the last 12-18 months

From December 2013 to March 2015, the NMEP and its partners distributed 46.2 million ITNs through mass campaigns in 17 states, including over 11.7 million ITNs in the five PMI-supported states of Akwa Ibom, Bauchi, Kebbi, Nasarawa, and Sokoto. To strengthen campaign logistics, PMI sent advisors to all 17 states, including the five PMI-supported states. With FY 2014 funds, PMI procured 9,732,500 ITNs, out of which 232,500 were earmarked for continuous distribution and 9.5 million for mass campaigns. Due to the ongoing crisis in northeastern Nigeria and the migration of IDPs, PMI donated over 320,000 ITNs for distribution through ANC to IDPs living in camps in 2015.

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<sup>3</sup> Kilian A, Koenker H, Obi E, Selby RA, Fotheringham M., and Lynch M. Malaria Journal (2015) 14:123

To maintain coverage between campaigns, the NMEP and its partners plan to revise the continuous ITN strategy to scale up continuous distribution systems. All 11 PMI-supported states have begun distribution through ANC at first ANC visit and through EPI clinics with measles vaccination. The logistics of delivering nets to health facilities has proven challenging. PMI and the Global Fund overlap in nine states. Though PMI-supported facilities received sufficient stocks of ITNs, supply problems led to frequent stockouts in facilities supported by the Global Fund and the states. PMI lacks the resources to procure more nets to cover these gaps, but is working at the state level to pool commodity deliveries from all sources in order to smooth out the supply chain.

To complement these existing approaches, particularly in areas where ANC uptake is low, PMI supported the piloting and scale-up of both community- and school-based ITN distribution channels. In selecting distribution sites, the NMEP, with PMI support, initiated community-based distribution in states with lower school attendance and high dropout rates, and school-based distribution in states with high ( $\geq 80\%$ ) school attendance and low dropout rates. In 2013, PMI initiated a community-based distribution system through Community Drug Distributors (CDD) in Nasarawa State. The program leveraged an existing network of volunteers, supported by the Carter Center, who distribute medicines for onchocerciasis, lymphatic filariasis, and schistosomiasis in their communities. The CDDs visit households, assesses needs for ITNs, and issue slips for redeeming nets at a designated health center. The effort was launched in 52 health facilities of Nasarawa in four wards each of 13 LGAs, engaging 260 CDDs. A household survey conducted in April 2014<sup>4</sup> found that household occupants who were aware of the community-based distribution program were significantly more likely to have any net and adequate ITN access than those unaware of service. The indicators for ITN ownership decreased from baseline (31 months after the campaign) to endline (10 months later). Population access to an ITN was approximately 45% at baseline to 35% at endline for households benefiting from the community-based distribution channel, but this access at endline was significantly higher than the 16% found in households that did not benefit from a community-based distribution program. Program effectiveness was low, with 18% of households aware of the channel. Challenges encountered included stockouts of nets or net coupons, or lack of understanding of the new scheme. The effort proved highly equitable among population groups. Though the pilot results were less than expected, the NMEP and PMI opted to use the results as a framework for scaling up community-based channels in select states. The community distribution channel will be strengthened to address the challenges identified in the pilot to achieve better results. The choice of channel for each state will be made during the strategic meeting in early 2016, and will be reflected in the FY 2017 MOP.

In 2012, PMI also began piloting school-based ITN distribution in two LGAs of Cross River State. Collaborating closely with LGA education departments, PMI facilitated distribution through March 2014 of over 55,000 ITNs among four grade levels in 192 schools, reaching 95% of eligible children. An endline evaluation survey in March 2014 showed that net access in households increased from 34% to 55% in the two LGAs with school-based distribution, versus decreasing from 38% to 26% in a control LGA with ANC distribution alone. In addition, ownership of at least one ITN reached between 76% and 77% in the two intervention LGAs, a 25% increase since 2012. This contrasts with a decrease in ownership from 50% to 43% in the control LGA. As with the community-based distribution channel, school-based distribution achieved these increases with little overlap with other distribution channels. In the past year, PMI continued supporting school-based distribution in Cross River State, and expanded to Oyo State. Through this effort, 147,201 nets have been distributed in schools in these two states

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<sup>4</sup> Albert Kilian and Emmanuel Obi: Community-Based, Continuous Distribution of LLIN in Nasarawa State, Nigeria. Report prepared for VectorWorks by Tropical Health LLP and Johns Hopkins Center for Communication Programs, August 6, 2015.

Alongside the piloting of school and community-based distribution channels, PMI supported the ITN longevity study to assess the effective life of ITNs in Nigeria. A recent retrospective study<sup>5</sup> of net durability and survival in three states (one each in the North, Central, and South regions of Nigeria) demonstrated that variances in the survival of a 100-denier polyester ITN among sites was driven by three extrinsic variables: living conditions, attitudes, and household behavior. The median net survival among states ranged from 3.0 to 4.7 years. Net-hole damage was commonly caused by pulling it (mechanical damage), rodent bites, and open flame. PMI plans to begin supporting net monitoring in Zamfara, Oyo, and Ebonyi states to assess ITNs for attrition, integrity, and insecticidal effectiveness over a 36-month period. A baseline round of data collection will start in October 2015 with annual data collection points every 12 months after distribution for the next 3 years.

A related study on repair, maintenance, and care practices and their effect on ITN life was also carried out in Nasarawa State between March 2012 and April 2014.<sup>6</sup> Following comprehensive communication interventions, the study measured the proportion of nets distributed during the 2010 mass campaign that had observed repairs, and the proportion of nets in serviceable condition according to WHO guidelines. The study found that while the BCC intervention improved attitudes and behaviors about the care and repair of nets, these efforts had little effect on overall net life. While repair to damaged nets can be induced by changing attitudes towards repair, more effort should focus on preventive behavior, such as folding or tying up the net after use, and avoiding storage of food in the same room. A comprehensive BCC intervention to promote these behaviors will be incorporated into existing PMI malaria communication interventions.

#### Commodity gap analysis

In 2017, PMI will support the national distribution of ITNs through: a) mass campaigns: and, b) continuous distribution through ANC and EPI clinics in health facilities and through schools or communities. The timing of mass ITN campaigns is based on projected replacement needs every three years. By the end of 2016, 10 of PMI's focus states will have conducted an ITN mass campaign in the previous three years. The 11<sup>th</sup>, Sokoto, will be the only state to carry out a campaign in 2017. The estimated need for the Sokoto campaign is approximately 2.8 million nets.

Table 8 below presents the gap analysis for the PMI-supported states by distribution channel.

**Table 8: ITN Gap Analysis**

<b>Calendar Year</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Total population	51,548,570	53,201,796	54,908,276
Total targeted population	50,002,113	51,605,742	53,261,028
<b>Continuous Distribution Needs</b>			
<i>Estimated Total Needs from NetCalc</i>	1,326,571	2,275,036	4,977,762
Channel #1: ANC: 30%	397,971	910,014	1,991,105
Channel #2: EPI - 15%	198,986	341,255	746,664
Channel #3: Schools and Community - 55%	729,614	1,023,766	2,239,993
Channel #4: Emergency / IDP	100,000	50,000	50,000
<b><i>Estimated Total Need for Continuous Distribution</i></b>	1,426,572	2,325,036	5,027,762
<b>Mass Distribution Needs</b>			
Mass distribution campaigns	9,178,870	6,787,569	3,000,000
<i>Estimated Total Need for Campaigns</i>	9,178,870	6,787,569	3,000,000
<b>Total Calculated Need: Routine and Campaign</b>	<b>10,605,442</b>	<b>9,112,605</b>	<b>8,027,762</b>
<b>Partner Contributions</b>			
ITNs carried over from previous year	0	983,829	1,617,398
ITNs from MOH	0	0	0
ITNs from Global Fund (NFM Grant)	1,204,770	1,046,174	0
ITNs from other donors	0	0	0
ITNs planned with PMI funding	10,384,500	8,700,000	5,111,000
<b>Total ITNs Available</b>	<b>11,589,270</b>	<b>10,730,003</b>	<b>6,728,398</b>
<b>Total ITN Surplus (Gap)</b>	<b>983,828</b>	<b>1,617,398</b>	<b>(1,299,364)</b>

**Assumptions:**

- The proposed proportions of nets to be distributed through ANC, EPI and schools are included here. The ANC and EPI percentages are based on historical health-facility consumption data. The balance after EPI and ANC (55%) was then allocated to the school/community distribution channel. Definitive quantities will be agreed upon with each state. The school and community channel will deliver more nets especially in states with higher school attendance. This will be the predominant distribution channel.
- Mass distribution campaigns will occur in 2015 (for Benue, Cross River, Zamfara, and Ebonyi), in 2016 (for Oyo and Kogi), and in 2017 (for Sokoto).
- The estimate for the replacement mass campaign for Sokoto State in 2017 is total population divided by 1.8 per WHO guidelines, plus a 5% buffer given previous campaign experience in Nigeria.
- Global Fund commitments to ITNs for 2016 are estimated at approximately one million and are currently unknown for 2017.
- The security situation has deteriorated resulting in more people being displaced and requiring PMI support with more nets.

### Plans and justification

PMI will continue to support the national malaria strategy in conducting both ITN mass replacement campaigns and scaling up existing and appropriate new channels for continuous distribution. PMI will work with the NMEP and state-level programs to determine the most effective strategy for scaling up continuous distribution channels, depending on relevant state data such as ANC and school attendance, which will be assessed during the strategic review in early 2016. Intensified training and monitoring activities will be implemented to support distribution through existing channels.

Multi-channel BCC efforts will be significantly increased to address the demographic and regional variation in ITN use rates documented through PMI-supported operational research (see BCC section for more details on specific strategies). Using the findings of both the upcoming 2015 MIS and the results from the 2014 study on net care and repair, PMI will help develop, effectively target (geographically and by population group) and intensify national communications strategies to improve net preventive care and year-round net use in households. Following WHO recommendations, PMI will continue to support the monitoring of ITN physical integrity and attrition (or survivorship) linked to mass distribution campaigns in sites selected in consultation with the NMEP and its partners. The results will inform both future net replacement strategies and communication approaches to promote proper care of nets (see Monitoring and Evaluation section for more details).

The substantial gaps in both routine and campaign financing are a key concern for PMI and its partners in country. PMI will work with the NMEP and other partners to advocate for additional funding, particularly from state resources. The NMEP will need to prioritize identifying matching funds to the Global Fund contribution to ITN campaigns in 2017.

### Proposed activities with FY 2016 funding (\$22,306,320):

1. Procure approximately 5,111,000 ITNs that will be used to support the mass ITN replacement campaign in Sokoto State (3 million ITNs) and a portion of continuous distribution ITN needs (2,111,000 ITNs) in all PMI focus states. Cost includes transport from manufacturer to state warehouses. (\$16,815,800)
2. Distribution of ITNs: Deliver approximately 5,020,000 ITNs for distribution from state warehouses to service delivery points in the 11 PMI-supported states. (\$2,510,000)
3. Provide logistics and operational support for distribution of ITNs for the mass campaign in Sokoto State, and for continuous distribution channels. This includes costs for technical assistance, microplanning, training, registration, and monitoring. (\$2,980,520)
4. 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 included in cross-cutting activities described in the BCC section.*)
5. Monitoring of ITN integrity, attrition, and survivorship. (*Description and costs covered under the Monitoring and Evaluation section.*)

## 2. Indoor residual spraying & entomology

### NMEP/PMI objectives

Nigeria's NMSP 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 as complementary strategies for ITNs and IRS.

Specifically, the relevant strategies and their associated targets in the NMSP prevention section are:

#### **Strategy:**

1. Scale up IRS coverage.
2. Conduct vector sentinel surveillance and resistance monitoring.

#### **Targets:**

1. At least 40% of households in IRS targeted areas will be protected by 2020.
2. At least 85% of all structures in targeted LGAs will be covered using IRS during each spray cycle.
3. At least three vector surveillance sentinel sites will be established in each of the six ecological zones.

With respect to this strategy, at the request of NMEP, PMI is supporting entomological surveillance, vector mapping, insecticide resistance monitoring of malaria vectors, and capacity development for state-supported IRS programs. The support also covers environmental impact assessments and development of insecticide resistance mitigation plans.

### Progress since PMI was launched

In 2011, PMI supported a two-year IRS pilot activity in two local government areas of Nasarawa State. This IRS pilot program was designed as a demonstration spray program for MOH and local officials to see high-quality IRS implementation and was backed by reliable entomological surveillance and capacity building. During the two years of actual spraying, about 150,000 households were protected in the two LGAs. The IRS demonstration activity and the entomological monitoring guided the design of the additional entomological sites in the country.

During the same period, the NMEP, with funding from the World Bank Booster Program, conducted IRS in six of the seven Booster Program states, in a total of 14 LGAs. This IRS program also had an entomological monitoring component which was implemented in collaboration with research institutions in the country. Among the states, Lagos has consistently conducted IRS since 2009 in 2 LGAs, although the last spray round in 2015 was delayed due to changes in political leadership in the state. Other states have communicated interest in conducting IRS to the NMEP and some have requested technical support in planning and implementation. Yet none of the states have committed the required funds for IRS implementation to date.

Noting the importance of entomological surveillance data to guide vector control programs, PMI has been supporting this activity since 2013 in sites in 6 states (Lagos, Rivers, Nasarawa, Plateau, Jigawa, and Enugu). To support the entomological monitoring activities, PMI set up an insectary at the Nasarawa State University, Keffi, in 2013. The insectary provides susceptible mosquitoes for measuring IRS insecticide decay rates and can now support current state-managed IRS activities.

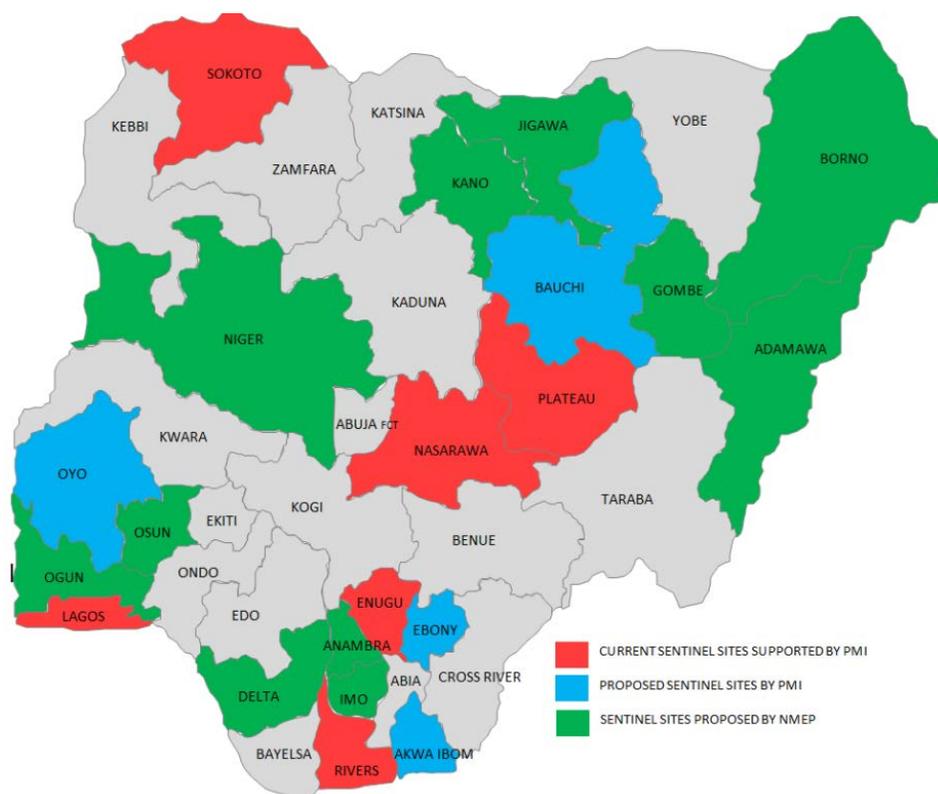
Among the corporate organizations, Chevron and Shell have conducted IRS in their drilling communities protecting both staff residential quarters and community catchment areas as part of their corporate social responsibility and desire to protect the health of their employees and their families. The Ministry of Defense has also conducted IRS in the military residential communities.

Progress during the past 12-18 months

PMI-supported mosquito surveillance included indoor resting densities (IRDs) with pyrethrum spray catches and CDC light/human-baited traps to determine mosquito biting time and to conduct speciation. From November 2014 to February 2015, a total of 2,639 anopheline mosquitoes representing 10 species were collected using two methods. *Anopheles gambiae sensu lato (s.l.)* comprised 85% of the total capture. More mosquitoes were collected using CDC light traps compared to the pyrethrum spray catches. Indoor resting densities of *Anopheles* sp. were highest in Plateau and biting times varied within all six sites. Across the six sentinel sites, indoor biting peaks were higher in Plateau, Nasarawa, and Eggon ranging from 0.0-5.9 and 2.0-5.3 mosquitoes per trap per night respectively from November 2014 through February 2015. Where insecticide resistance testing has been conducted, significant pyrethroid, organophosphate, and DDT resistance has been found.

PMI considers building the capacity of GoN personnel, particularly at the NMEP, to provide consistent entomological monitoring activities as part of their annual malaria intervention plan a crucial step in sustaining this effort. Staff members who were trained in insecticide resistance testing in 2014 received follow-up training on the CDC bottle bioassay in August 2015 with the support of PMI.

**Figure 4. National and PMI-supported entomological sentinel sites**



**Table 9. *Anopheles gambiae* survival rates (%) using the WHO tube assays to eight insecticides from six locations in Nigeria, 2014.**

Insecticide	Class*	Plateau	Jigawa	Rivers	Enugu	Nasarawa	Lagos
Permethrin	P	95	50	73	30	81	77
Deltamethrin	P	97	69	76	84	98	92
$\alpha$ -cypermethrin	P	100	87	70	66	99	93
Lambdacyhalothrin	P	84	63	75	50	32	69
DDT	OC	63	41	63	31	9	17
Bendiocarb	C	100	100	100	100	100	100
Propoxur	C	99	100	100	100	100	n/a
Pirimiphos-methyl	OP	71	62	65	66	46	98

\*P= Pyrethroid, C= Carbamate, OC= Organochlorine, OP = Organophosphate

Source: AIRS Nigeria Entomology Report, 2014

### Plans and justification

With FY 2016 funds, PMI will continue to support the NMEP in setting up comprehensive mosquito surveillance and in providing insecticide resistance training. Currently, NMEP and its partners have 12 additional entomological monitoring sites although entomology capacity in Nigeria is still limited with the focus concentrated in Nasarawa and Lagos. Capacity needs to be broadened throughout the country.

As part of PMI's strategic review process, PMI-supported entomological surveillance sites will be re-located (if necessary) to correspond with PMI focus states. The Sokoto and Nasarawa sites will continue as these are already PMI focus states. While the scope of PMI operations may change, the number of states supported for entomological surveillance is expected to remain at six. This process will begin in 2016 when final decisions on state selection are made. Each site will have four surveillance "stations" to provide a consistent assessment of the vector population. Stations will include both pyrethrum spray catches and CDC light traps.

PMI entomological surveillance activities will aim specifically to characterize insecticide susceptibility, spatial and temporal composition and distribution of anopheline species, to assist with vector mapping, to support the expansion of the insectary and to continue to provide technical assistance to NMEP. Moreover, PMI will assist NMEP to institute vector mapping using GIS techniques. Laboratory tests for infection rates will be done with polymerase chain reaction (PCR) and be conducted at NIMR, Lagos. This will also provide valuable information to determine if PMI control initiatives are affecting vector infection rates.

### Proposed activities with FY 2016 funding (\$1,124,000):

- 1. Provide support for vector surveillance and susceptibility monitoring across four ecological zones in Nigeria and establish four new surveillance sites.* Supervision, entomological monitoring, *per diem*, vehicle rentals, and equipment are necessary to survey malaria vectors in six sites (four newly established sites and two existing 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. (\$680,000)
- 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 Nasarawa State. (\$400,000)
- 3. Technical assistance to NMEP IRS activities.* Two 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. (\$29,000)
- 4. Supplies for entomological technical assistance:* Bioassays and test kits to supplement insecticide resistance and vector surveillance monitoring. (\$15,000)

### **3. Malaria in pregnancy**

### NMEP/PMI objectives

With Nigeria's projected population of 195 million in 2017, 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. The NMSP 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.

Specifically, the NMSP's target indicators for MIP interventions are part of the overall malaria prevention plan:

#### **Strategy:**

1. Provision of IPTp to all pregnant women attending antenatal clinics in targeted districts.

#### **Targets:**

1. At least 80% of pregnant women will sleep inside ITNs.
2. 100% of pregnant women attending ANC receive at least three doses of SP-IPTp by 2020.
3. 80% of pregnant women with fever and malaria receive appropriate and timely treatment according to the national treatment guidelines by 2017, and 100% by 2020.

The NMSP promotes the use of IPTp in public and private health facilities, communities, and the provision of SP as part of a comprehensive ANC package at all levels of health care delivery in Nigeria. Nigeria recently adopted the WHO recommendation to provide IPTp at every scheduled ANC visit after the first trimester, with a month between doses. Although the new policy and strategic plan are in print, they are yet to be disseminated to the states and service delivery points. SP and ITNs are offered free of charge to pregnant women in Nigeria.

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 as outlined in the ITN section.

According to Nigeria's National Guidelines for Diagnosis and Treatment of Malaria (2011), the recommendation for treating uncomplicated malaria in pregnancy is quinine for the first trimester and an ACT for the second and third trimesters. For severe malaria, the guidelines recommend using parenteral artesunate (or intravenous quinine if injectable artesunate is not available). Since quinine is relatively cheap and available, it is included in the Essential Medicines List, which enables the GoN to procure it.

### Progress since PMI was launched

The key indicator and target for IPTp listed in the NMSP is for 100% of pregnant women attending ANC services to receive at least three doses of IPTp (IPTp3) by 2020 through directly observed therapy. The 2013 NDHS shows that 61% of pregnant women attended ANC with a professional health worker and 51.1% had four or more ANC visits. This means that only 10% of pregnant women who attend the first ANC do not receive the recommended four ANC visits. The 2013 NDHS also found that 18% of the pregnant women had their ANC visit during the first trimester, and therefore were not eligible for IPTp, and also that 34.2% of pregnant women do not attend ANC. Mother's education, age, parity, residence (urban/rural), and culture are quoted as factors affecting ANC attendance. Approximately 47%

of rural women do not attend ANC, compared to 11% in urban areas. It should also be noted that ANC attendance rates vary significantly across the country with much lower levels in northern states as compared to those in the South.

According to the 2013 NDHS, 23% of women received at least one dose of IPTp during their pregnancy, an improvement from 13% of women reporting in 2010 (MIS) and 8% of women reporting in 2008. Thirty-one percent of women in urban areas and 18% in rural areas took at least one dose of SP as compared with 13% and 6%, respectively, in 2008. Overall, 15% of pregnant women reported receiving the recommended two doses of SP in 2013; an improvement from the 5% of women reporting two doses of SP in the 2008 NDHS. A higher proportion of women in urban areas than rural areas received two or more doses of SP (19% and 12%, respectively). Among the zones, the proportion was highest in the South East (18%) and lowest in the South South (10%). Pregnant women with a secondary or more than a secondary education and those in the fourth wealth quintile were more likely to receive IPT during an ANC visit than other women.

It is clear that there are a lot of missed opportunities for IPTp even for those who do attend ANC (e.g. according to the 2013 NDHS, 23% of pregnant women received IPTp1 while 15% of pregnant women received IPTp2). One issue is that at some secondary and tertiary level health facilities, SP is only dispensed at the pharmacy or dispensing window. In the process of referring pregnant women to the dispensing window to get SP, the ANC midwife loses contact with the pregnant woman. The implications are that the woman may not go to the pharmacy to get the SP, she may get the SP but not take it as DOT, or she may take the medicine without knowing that it is SP for preventing malaria during pregnancy. This eventually affects data capture in the ANC register and IPTp coverage data during household surveys.

To improve IPTp coverage and access to SP, PMI has procured 7 million doses of SP since FY 2012, of which 3 million treatment doses have been delivered. The remaining 4 million are yet to arrive in the country. Additionally, PMI has supported the training of 2,018 health workers in MIP to date, and distributed 1,036,000 ITNs through ANC clinics.

With the approval of the new Global Fund grant, in February 2015, the Global Fund began providing support for MIP and IPTp in nine of the 11 PMI focus states, with these efforts focused in non-PMI supported facilities to avoid duplication and increase coverage. The Global Fund now procures and distributes ITNs and SP but the supply is not constant. State-level procurements are often unpredictable and *ad hoc*.

#### Progress during the past 12-18 months

PMI supported the printing of the new IPTp guideline that is aligned with the WHO recommendation to provide IPTp at every scheduled ANC after the first trimester, with four weeks between doses. PMI revised the quantification of SP to align with the new policy using three instead of two ANC visits and updated the training materials and algorithms. The national dissemination of the new guideline took place in June 2015. Dissemination to states and training in the new policy will commence soon after the national dissemination.

The strategic change has also necessitated a change in ANC data reporting to accommodate the new policy. However, reporting forms have yet to be rolled out nationally. The Federal Ministry of Health Department for Planning, Research, and Statistics is the custodian for HMIS forms and has yet to update

the ANC registers to provide space for the additional doses of IPTp. In the meantime, PMI has trained health workers to modify the recording of IPTp in ANC registers. Instead of having two columns—for IPTp1 and IPTp2—health workers just write whether a pregnant woman is receiving IPTp1, IPTp2 or IPTp3, etc.

To boost performance of MIP interventions in Nigeria, PMI continued to support capacity building and supervision of service providers to improve delivery of FANC services in the 11 PMI focus states. The training includes interpersonal communication to improve behavior and attitudes of service providers towards IPTp. With FY 2014 funding, PMI trained over 1,630 ANC service providers on prevention and management of MIP. PMI continued to train all relevant health workers in the 11 PMI focus states, irrespective of whether they work at PMI-, Global Fund- or state-supported facilities.

With FY 2015 funding, PMI procured 4 million SP doses and 860,000 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. PMI’s supply chain support has helped to organize delivery to facilities it supports, as well as to those covered by the Global Fund. However, supply issues still exist, primarily due to procurement delays of Global Fund commodities.

The expected number of pregnant women in Nigeria is 5% of the total population. State-level ANC attendance from the 2013 NDHS (Table 10) was used to compute the number of expected pregnancies by state. The NDHS 2013 figures were assumed for 2015. The percentage of women accessing ANC services from a skilled worker in NDHS 2008 and 2013 for each of the PMI focus states was compared to understand the growth trend for the ANC coverage in each of the PMI focus states. State-level 2013 NDHS ANC attendance, level of programmatic investment, and state human resource capacity in each of the PMI focus states were considered to project ANC coverage for 2016 and 2017.

**Table 10: ANC attendance in the 11 PMI focus states**

PMI focus states	Projected ANC coverage		
	2015	2016	2017
Akwa Ibom	73.3%	75%	75%
Bauchi	55.8%	60%	65%
Benue	57.4%	60%	65%
Cross River	72.6%	75%	80%
Ebonyi	85%	85%	85%
Kebbi	24.3%	30%	35%
Kogi	87.5%	87.5%	87.5%
Nasarawa	63.2%	75%	80%
Oyo	87.2%	87.2%	87.2%
Sokoto	17.4%	25%	30%
Zamfara	22.4%	25%	30%

The total ANC attendance from the 11 PMI focus states was tripled to get the total SP need for the public and private sector (Table 11). Since the current IPTp support is only in the public sector, PMI/Nigeria used the historical consumption data from all PMI-supported health facilities in the 11 PMI

focus states to get the actual estimates for 2015. To get the projected community SP need for the three states of Sokoto, Zamfara, and Kebbi for 2016 and 2017, the team deducted the public ANC attendance from the expected number of pregnant women in a year and divided by 50%. We expected to reach only half the number of pregnant women that do not attend ANC in the public sector. There is no SP gap in 2017. As of the end of 2016, there will be a surplus of 4,847,993 doses for use in 2017. At end of 2017, there will be a surplus of 1,042,978 SP doses.

**Table 11: SP gap analysis for the 11 PMI focus states**

Calendar year	2015	2016	2017
Total population	51,548,570	53,201,796	54,908,276
Target population (pregnant women)	2,577,429	2,660,090	2,745,414
<b>SP needs</b>			
Total number of pregnant women attending ANC	1,524,181	1,656,692	1,793,923
<b>Total SP needs (in treatments): public and private</b>	4,572,544	4,970,076	5,381,768
<b>Total SP needs (in treatments): public sector</b>	<b>2,882,238</b>	<b>2,974,470</b>	<b>3,069,653</b>
<b>Total SP needs (in treatments): community IPTp</b>	0	756,336	735,363
<b>Total SP needs (public sector &amp; community IPTp)</b>	2,882,238	3,730,806	3,805,016
<b>Partner contributions (public sector only)</b>			
SP carried over from previous year	1,987,725	2,745,332	4,847,993
SP from MOH	0	0	0
SP from Global Fund	639,845	1,833,467	0
SP from other donors	0	0	0
SP planned with PMI funding (Including receipts to date)	3,000,000	4,000,000	
<b>Total SP available for public sector</b>	<b>5,627,570</b>	<b>8,578,799</b>	<b>4,847,993</b>
<b>Total SP surplus for public sector</b>	<b>2,745,332</b>	<b>4,847,993</b>	<b>1,042,978</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 (Extraordinary Federal Government of Nigeria Official Gazette No 4, Lagos 19th January 2007 Vol 94. Page B 47-53. Legal Notice on Publication of the 2006 Census Report)
- The SP need is for three IPTp treatments per pregnant woman
- SP carried over (deficit) from previous year for 2015 is Stock on Hand within PMI program as of December 31, 2014.
- The Global Fund procurement plans have been approved but firmed orders are in progress and possibly impact on the lead time.

Plans and justification

Although the 2013 NDHS shows a slightly higher IPTp2 coverage in urban areas (19%) compared to the rural areas (12%), the overall coverage is still unacceptably low. The PMI strategy in Nigeria will work to raise IPTp coverage in both urban and rural areas. The results from the 2015 MIS will provide updated data to inform the targeting discussions and will feed into the PMI strategy review in 2016.

PMI will continue to support a MIP strategy that includes IPTp and ITNs for ANC, and prompt case management of malaria during pregnancy including diagnosis and treatment. Efforts will focus on increasing IPTp coverage through provision of free SP to pregnant women, implementing the new WHO IPTp policy, scaling up ITN distribution to pregnant women during the first ANC visit, and testing and promptly treating pregnant women with confirmed malaria. To address missed opportunities for IPTp, PMI, NMEP, and other partners are working with the Pharmaceutical Council to de-classify SP as a prescription-only drug. PMI is also working with State Directors of Pharmaceutical Services to allow midwives to dispense SP. PMI/Nigeria is also targeting health workers with IPC to provide IPTp as directly observed therapy (DOT).

A key problem to address is the low uptake of ANC services, especially in PMI's three northern focus states where ANC attendance is less than 25%. PMI will take a two-pronged approach to addressing these issues. Firstly, PMI will instigate routine outreach from supported facilities to provide a package of ANC services, including MIP interventions, to the communities that are served by each health facility. The intervention will be co-funded with MCH resources and integrated with focused ANC and provision of other lifesaving commodities like ITNs, folic acid, ferrous sulphate, chlorhexidine and misoprostol. PMI will also pilot the implementation of community IPTp (c-IPTp) in the same states. A concept note, to be developed in conjunction with PMI headquarters, will inform the scope and design of the c-IPTp pilot. The SP need for the c-IPTp is included in the SP gap analysis table (Table 11).

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 2016 funding, PMI funding will support mass media campaigns, innovative interpersonal communication interventions at the local government area and ward levels, and regular integrated supportive supervision to all facilities offering ANC services. With FY 2015 funding, PMI initiated the inclusion of the new IPTp policy in medical school curricula and professional association policies. This will continue with FY 2016 funding.

In addition, BCC activities will continue to promote ANC uptake among pregnant women through integrated activities that are outlined in that BCC section of this MOP. BCC strategies will need to be tailored to more effectively reach women, depending on the prevailing cultural norms that vary significantly throughout the country. There will also be a renewed focus on improved IPC for health care workers to improve uptake of IPTp.

*Proposed activities with FY 2016 funding (\$1,800,000):*

1. *Provide support for implementation of MIP and IPTp as part of FANC across 11 PMI focus states:* PMI support will include the roll-out of the MIP policy through pre- and in-service training; introducing new IPTp guidelines in medical training institutions and professional associations; training health facility workers in each of the 11 PMI focus states; piloting a "supervised" community-based IPTp-DOT in three northern states (Sokoto, Zamfara, and Kebbi), 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, and PMI/Nigeria will develop the approach with the PMI headquarters MIP team. MIP activities at the 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 ITNs at first ANC visits, caring for ITNs, testing and treatment of malaria in pregnancy, supportive supervision, data collection and analysis, and reporting. (*\$1,800,000*)

2. *Create awareness, demand, and service provider interpersonal communication for MIP services:* With FY 2016 funds PMI will support BCC activities for all MIP interventions. BCC activities will include improving interpersonal communication for IPTp, 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 will reach 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 BCC section)*
3. *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. *(Costs covered under the ITN section)*

#### **4. Case management**

##### **a. Diagnosis and Treatment**

##### NMEP/PMI objectives

The new National Malaria Strategic Plan (NMSP) clearly outlines Nigeria's priorities in the area of case management, emphasizing the need for parasitological diagnosis before treatment with an ACT. Specifically these objectives are:

##### **Diagnosis**

##### **Objective:**

- To test all care-seeking persons with suspected malaria using a rapid diagnostic test (RDT) or microscopy by 2020.

##### **Strategies:**

- Ensure availability of and access to equipment and supplies for parasitological confirmation of malaria.
- Build capacity of personnel in public and private health facilities, and at community level for parasitological confirmation of malaria.
- Update and implement policies and guidelines for parasitological confirmation of malaria.
- Deploy RDTs and microscopy for parasitological confirmation of malaria in public and private facilities and at the community level.
- Strengthen systems for quality assurance and quality control of malaria diagnostic processes and services.
- Create demand for utilization of parasitological confirmation of malaria.
- Conduct operational research on parasitological confirmation of malaria.

##### **Targets:**

- 100% of suspected malaria cases will be confirmed by RDT or microscopy in the public sector by 2018.

- At least 80% of suspected malaria cases will be confirmed by RDT or microscopy in the private sector and community by 2018 and 100% by 2020.
- At least 80% of RDTs needed in facilities and communities will be accessible and distributed by 2017.
- At least 80% of communities and facilities mapped will receive RDTs by 2018.
- 100% of procured RDTs will be lot-tested before and after deployment by 2018.
- National and state microscopy quality assurance and quality control (QA/QC) will be functional by 2015.

### **Treatment:**

#### **Objective:**

- To treat all individuals with confirmed malaria seen in private or public facilities with effective antimalarial drugs by 2020.

#### **Strategies:**

- Ensure availability of and access to commodities and supplies for treatment of uncomplicated and severe malaria.
- Treat cases of uncomplicated and severe malaria according to National Treatment Guidelines.
- Strengthen capacity of public and private facilities for management of severe malaria.
- Implement a comprehensive national strategy for effective participation of the private sector in malaria case management.
- Scale up community case management of malaria as a component of integrated community case management (iCCM).
- Strengthen sentinel surveillance of malaria treatment and conduct drug therapeutic efficacy testing (DTET).

#### **Targets:**

- 80% of persons (children under five years of age and other age groups) with parasite-based diagnosis of malaria will receive prompt antimalarial treatment according to the national treatment policy by 2017, and 100% by 2020.
- 80% of patients admitted with severe malaria will receive correct treatment at a health facility by 2017, and 100% by 2020.
- 80% of health facilities will have no stockout of recommended antimalarial drugs for a week or longer at any time during the preceding three months by 2017, and 100% by 2020.

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

Artemether-lumefantrine (AL) or artesunate-amodiaquine (ASAQ) are the two options for first-line treatment of uncomplicated malaria in Nigeria. A recently published therapeutic efficacy study demonstrated greater than 95% PCR-corrected cure rates at 28 days for both of these ACTs<sup>5</sup>. In 2012,

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<sup>5</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.

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 intravenous quinine, if injectable artesunate is not available).

Training in the use of diagnostics and antimalarial medications has been a focus of PMI since the Initiative began in Nigeria. 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, the trained health care personnel needed to provide complete coverage, and the implementing partner responsible for training in a particular area. Because partners other than PMI (e.g., UNICEF, Global Fund) 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 caregivers to doctors. These sessions cover a wide array of malaria topics, including use of RDTs, use of antimalarial medications, and prevention of malaria in pregnancy. Specialized training, such as microscopy for laboratory technicians, is also offered in each of PMI’s focus states.

By the end of FY 2014, PMI’s implementing partners had trained 14,923 health workers in case management with ACTs in all 11 PMI-supported states.

**Table 12: Personnel Eligible for Training in Case Management in 9 PMI Focus States**

<b>State</b>	<b>Health facility staff</b>	<b>CORPS</b>	<b>Total</b>
Akwa Ibom	5,201	7,589	<b>12,790</b>
Benue	6,604	23,003	<b>29,607</b>
Cross River	5,106	4,507	<b>9,613</b>
Ebonyi	2,774	9,026	<b>11,800</b>
Kebbi	3,725	2,040	<b>5,765</b>
Kogi	3,334	2,420	<b>5,754</b>
Nasarawa	5,901	16,431	<b>22,332</b>
Oyo	6,025	4,208	<b>10,233</b>
Zamfara	3,458	4,681	<b>8,139</b>
<b>Total in 9 states</b>	<b>42,128</b>	<b>73,905</b>	<b>116,033</b>
<b>Total trained through PMI support</b>	<b>14,923</b>	<b>34,861</b>	<b>49,784</b>
<b>Outstanding (training need)</b>	-	-	<b>66,249</b>

Source: State Training Plans

## Progress during the past 12-18 months

### Diagnosis

Between October 1, 2014, and September 30, 2015, PMI delivered 7,420,794 RDTs to PMI- and Global Fund-supported health facilities in selected LGAs in the 11 PMI focus states. A PMI end-use verification (EUV) survey conducted in PMI-supported states in November 2014 showed that stockouts of RDTs dropped to 9%, down from 14% in late 2013. In 117 randomly selected health facilities throughout the 11 states, 89% of malaria cases under age five were diagnosed with an RDT, 1% by microscopy, and 9% clinically. RDT training involved nurses, midwives, and laboratory technicians while microscopy training focused on medical laboratory scientists and microscopists. Diagnostic training has continued in the last 12 months, with 688 health workers trained in parasitological diagnosis of malaria in the 11 PMI-supported states. 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. According to the National Malaria Guideline, microscopy is restricted to secondary and tertiary health facilities where there are trained laboratory scientists; RDTs are recommended for all PHCs and in hospitals where laboratory scientists are not available.

The NMEP has crafted Malaria Diagnostic External Quality Assurance Operational Guidelines for parasite-based confirmation of malaria. These guidelines 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 examining five “unknown slides,” for which they submit their diagnosis. Quarterly supervisory visits will continue to occur in PMI-supported states, with every supported facility visited at least once 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

Between October 1, 2014, and September 30, 2015, 11,633,121 ACT treatment doses were delivered to the 11 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 operational barriers (poor referral linkages to the formal health system that limit availability of rectal artesunate at community level, supervision, and reporting) remain, which have prevented the scale-up of this activity. An EUV survey in November 2014 showed that 100% of facilities had some form of ACT available, up from 93% in late 2013; and 99.7% of the ACTs were WHO pre-qualified. In 117 randomly selected health facilities throughout the 11 states, about 80% of malaria cases under the age of five were prescribed an ACT.

### 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 (2014) states that 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 5km radius.” To implement the new policy, one community health worker (CHW) or PPMV should provide iCCM for every 500 persons. In total, 84,500 community-based frontline CHWs and PPMVs will be required to adequately reach these hard-to-reach populations (based on a projected total population of 195 million in 2017, with 65% residing in rural areas and a third of these living outside the 5km radius). PMI has supported training of CHWs in two pilot LGAs in Bauchi State. 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 2013 NDHS reported that 34% of children under five with fever first sought treatment from a chemist or patent medicine store. However, because PPMVs could not legally diagnose or treat malaria until recently, case management had occurred mostly unrecorded and unregulated in this sector. A pilot study of malaria RDT feasibility and use among Nigerian PPMVs was done with Global Fund support in June 2014, showing that more than 90% of the PPMVs adhered to correct RDT techniques. In order to effectively reach the large percentage of Nigerians who seek malaria care in the private sector, PMI has funded two pilot studies of PPMVs in Bauchi and Ebonyi. The studies have intervention and control arms focusing on PPMVs and their corresponding catchment areas. Training of PPMVs in iCCM (including febrile respiratory disease, diarrhea, and malaria) is done in one of the intervention areas. In January 2015, the Pharmacists Council of Nigeria approved registered PPMVs and community pharmacists to carry out RDTs before providing antimalarial drugs.

#### Commodity gap analysis

In June 2015, PMI supported a gap analysis of malaria commodities. Population projections were based on the 2006 census and growth rates supplied by the National Population Commission. In regards to care-seeking behavior, 40% of cases were assumed to be treated in the public sector and 60% in the private sector; and similar percentages of RDT consumption were assumed. The gap tables reflect only the need of the public sector where PMI focuses its support.

#### 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. It was assumed that each member of the population would have 1.82 febrile episodes per year in 2015 and 2016, and 1.87 in 2017. It was assumed that 45% of fevers would be tested by RDTs in 2015, 50% in 2016, and 60% in 2017.

**Table 13: RDT gap analysis (2015-2017)**

Calendar year	2015	2016	2017
<b>RDT needs</b>			
<b>Total population</b>	51,548,570	53,276,475	54,981,322
Total number of projected fever cases	93,818,398	96,963,185	100,066,006
Fever cases seeking care (70.1%)	65,766,697	67,971,197	70,146,270
Fever cases seeking care in public sector (40%)	26,306,679	27,188,477	28,058,508
Fever cases receiving diagnostic testing in the public sector	11,838,005	13,594,238	16,835,105
<b>Total RDT needs (public sector)</b>	<b>10,890,965</b>	<b>12,506,699</b>	<b>15,488,297</b>
<b>Partner Contributions</b>			
RDTs carried over from previous year	4,291,338	9,783,216	8,648,453
RDTs from MOH	0	0	0
RDTs from Global Fund	8,392,806	6,371,936	6,000,000
RDTs from other donors	1,272,037	0	0
RDTs planned with PMI funding	6,718,000	5,000,000	10,000,000
<b>Total RDTs available for public sector</b>	<b>20,674,181</b>	<b>21,155,152</b>	<b>24,648,453</b>
<b>Total RDT surplus (gap) for public sector</b>	<b>9,783,216</b>	<b>8,648,453</b>	<b>9,160,156</b>

## Assumptions:

- The gap analysis assumes an average annual growth rate of 3.2% for the 11 PMI focus states. (Extraordinary Federal Government of Nigeria Official Gazette No 4, Lagos, 19th January 2007, Vol 94. Pages B 47-53. Legal Notice on Publication of the 2006 Census Report). Forty percent of cases are assumed to be treated in the public sector and 60% in the private sector.
- Each member of the population would have 1.82 febrile episodes per year in 2015 and 2016, and 1.87 in 2017.
- 45% of fevers would be tested by RDTs in 2015, 50% in 2016, and 60% in 2017.
- Assumes 92% of all diagnoses is by RDT in public sector.

## 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 years accounting for 30%. It was assumed that 95% of malaria cases would be uncomplicated, and that a 5% buffer may be required to account for quality assurance and training. It was assumed that the test positivity rate would decrease from 35% in 2015 to 33% in 2016 and 30% in 2017.

**Table 14: ACT gap analysis (2015-2017)**

Calendar year	2015	2016	2017
<b>ACT needs</b>			
<b>Total population</b>	51,548,570	53,276,475	54,981,322
Total number projected fever cases	93,818,398	96,963,185	100,066,006
Fever cases seeking care (70.1%)	65,766,697	67,971,197	70,146,270
Fever cases seeking care in public sector (40%)	26,306,679	27,188,477	28,058,508
Fever cases receiving diagnostic testing in the public sector	11,838,005	13,594,238	16,835,105
ACT need for tested cases	4,143,302	4,486,099	5,050,531
ACT need for non-tested	14,468,673	13,594,238	11,223,403
<b>Total ACT needs</b>	<b>18,611,975</b>	<b>18,080,337</b>	<b>16,273,934</b>
<b>Partner Contributions</b>			
ACTs carried over from previous year	4,977,606	7,270,231	2,810,881
ACTs from MOH	0	0	0
ACTs from Global Fund	4,072,000	2,952,632	0
ACTs from other donors	0	0	0
ACTs planned with PMI funding	16,832,600	10,668,355	8,000,000
<b>Total ACTs available for public sector</b>	<b>25,882,206</b>	<b>20,891,218</b>	<b>10,810,881</b>
<b>Total ACT surplus (gap) for public sector</b>	<b>7,270,231</b>	<b>2,810,881</b>	<b>(5,463,053)</b>

Assumptions carried over from RDT gap analysis:

- The gap analysis assumes an average annual growth rate of 3.2% for the 11 PMI focus states. (Extraordinary Federal Government of Nigeria Official Gazette No 4, Lagos, 19th January 2007, Vol 94. Pages B 47-53. Legal Notice on Publication of the 2006 Census Report)
- Each member of the population would have 1.82 febrile episodes per year in 2015 and 2016, and 1.87 in 2017.
- 45% of fevers would be tested by RDTs in 2015, 50% in 2016, and 60% in 2017.

Assumptions specific to ACT gap analysis:

- The projected malaria test positivity rate would decrease from 35% in 2015 to 33% in 2016 and 30% in 2017.

Injectable artesunate for the treatment of severe malaria only began scaling up in 2014, accounting for only a small portion of the total antimalarial budget. A formal gap analysis for injectable artesunate has

not been developed by the NMEP and its partners. However, it is assumed that 5% of all malaria cases will be severe and—averaging the amount required for the different ages and treatment durations—that each case will require 5.5 ampules for a full treatment course. Each ampule is assumed to cost \$2.60. Even with Global Fund and PMI contributions in 2015 and 2016, there still remains a large gap, partially because more money is required to initially fill the pipeline.

### 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, training, supervision, and quality assurance activities at the health facility and community levels.

PMI will support the procurement and delivery of RDTs, ACTs, and microscopy supplies to public health facilities to ensure that commodities are available to carry out parasitological diagnosis and to treat accordingly in the case of a positive test. Commodities will be procured for all age groups in PMI’s 11 focus states. The priority for commodity distribution are the health facilities where PMI has conducted training of health workers and are providing on-the-job capacity building. Other facilities in each state may receive commodities based on availability and need. PMI will continue to work with other donors and the state governments to more effectively pool supplies to ensure that supported facilities will experience a smoother supply chain with fewer stockouts.

PMI will build on its experience and progress to date to further improve case management practices by health care providers. A core component of this will be the on-the-job training and supervision of health care providers to continue to enhance capacity at facility and state level. This ongoing support will 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. While this support builds on existing norms, the opportunity presented by a well-developed DHIS2 system in some states means that additional performance analysis and monitoring will also take place. This information will be used to identify systemic performance issues (e.g. stockouts, over-prescription of ACTs, under-diagnosis of fevers, etc.) with solutions applied and monitored through the routine data systems.

PMI will also support a focus on quality assurance of microscopists working in PMI’s 11 states. This support will primarily be focused at facilities that provide supervision and training at the state level. Another crucial part of this work will be to build trust in RDTs among health workers. In-country QA lot testing will take place on RDTs in use throughout the country, and BCC support will be given to build health care providers’ confidence in RDT results (see description in the BCC section).

### Proposed activities with FY 2016 funding (\$25,320,000):

1. *Procure RDTs and basic microscopy supplies:* Procure approximately 10 million RDTs to fill gaps and prevent stockouts of malaria diagnostic tests kits in the public sector in 11 states. Consumables for microscopy will also be procured as needed. (\$5,000,000)
2. *Strengthen quality assurance for malaria diagnostics:* Support an existing laboratory in Cross River State to serve as a state reference laboratory for malaria diagnostics QA/QC. Conduct training of trainers and quality assurance for malaria diagnosis in 11 states. Expand training and QA for malaria diagnosis in the private sector. (\$500,000)

3. *Technical assistance:* Two CDC technical assistance (TDY) visits to provide technical support to microscopic and RDT diagnosis of malaria. (\$20,000)
4. *Procure ACTs and severe malaria drugs:* Procure 8 million ACTs to narrow the gap of antimalarial medications in the public sector (a portion of the ACTs will be directed to PPMVs) in 11 PMI focus states. (\$7,800,000)
5. *Strengthen malaria case management in 11 states:* In each of its focus states, PMI will work to improve fever case management practices of facility staff and community health workers. Activities will provide on-the-job training for staff to better manage febrile cases and provide treatment based on confirmatory diagnosis of malaria. Training topics will include use of RDTs (in primary care health facilities and communities) and microscopy (in secondary and tertiary hospitals) to sort out fever cases into malaria and other causes, up-to-date treatment of confirmed malaria with ACTs, and further diagnosis, treatment and referral of non-malarial fevers. These activities are carried out in conjunction with state MoH staff and will increasingly utilize DHIS2 data, where available, to identify, address, and monitor recurring case management performance issues. (\$12,000,000)

Specifically, the activities to be conducted in each state will include:

- i. Train the different categories of health workers (doctors, nurses and midwives, community health officers, community health extension workers, laboratory scientists, laboratory technicians, pharmacists, and pharmacy technicians) on case management for the public sector. The target is to have a site train a minimum of 25% of health workers in approximately 1,200 health facilities in the 11 focus states. (\$6,800,000)
- ii. Train and supervise community-level health workers including PPMVs in all aspects of malaria case management. This activity will complement the iCCM activity within selected states and LGAs. (\$3,000,000)
- iii. Conduct supportive supervision and on-the-job capacity building for health facility staff, state, and LGA health program managers; e.g. medical record review to determine extent of adherence to current guidelines, reinforcement of appropriate practices using high performers as cascade trainers for other staff, and counseling and retraining where deficiencies exist. (\$2,000,000)
- iv. Provide basic tools such as printed or on-line guidelines and job aids in the form of guideline summaries and wall charts for rapid reference on the job, for malaria case management. (\$200,000)

## **b. Pharmaceutical Management**

### NMEP/PMI objectives

Pharmaceutical management is a key component of the new NMSP as the NMEP and states recognize the chronic supply issues that have blighted the public health sector for many years. Stockouts of all commodities are frequent, which adversely affects the quality of care offered at public sector facilities. The NMSP lays out clear objectives and targets to remedy this situation.

#### **Objective:**

- To 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.

**Strategies:**

- Strengthen procurement-related processes.
- Develop efficient distribution systems for antimalarial medicines and commodities (storage, transport distribution, and inventory management).
- Strengthen logistics management.
- Implement policies on quality assurance and pharmacovigilance.
- Operationalize and update where necessary existing policies for malaria case management in the private sector.
- Increase access to antimalarial prevention and management commodities in the private sector.
- Strengthen collaboration with NAFDAC to put in place regulatory requirements for distribution including storage and transportation of antimalarial products in the private sector.

Procurement and supply chain management of essential medicines in the public sector is weak and fragmented. Frequent stockouts and expiries of all commodities, including ACTs and RDTs, occur at all levels. 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. Because there are multiple sources of malaria medicines in Nigeria, including 40 registered ACTs, it is critical that the national and state malaria elimination programs (SMEPs) address issues surrounding quality of medicines to combat counterfeit and substandard quality drugs. 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) or the state CMS. States often have difficulty delivering commodities to the facility level. The supply of Global Fund- and other donor-procured ACTs is unpredictable, resulting in stockouts in some health facilities. This has led 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 screening and confirmatory diagnosis are not done and standard treatment guidelines are often not followed. The NMEP has limited capacity and authority to oversee this sector.

NAFDAC is responsible for the registration of antimalarials and quality control (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 Central Quality Control Laboratory of NAFDAC in Oshodi, Lagos, received ISO 17025 accreditation with PMI support in 2015. This accreditation will help improve QA/QC and encourage laboratory QC of medicines to assist in identification of substandard and counterfeit medicines. The country needs appropriate equipment to move NAFDAC toward meeting WHO standards for prequalification. The agency needs support at the various laboratories in the six geo-political zones to strengthen QA/QC and post-marketing surveillance of medicines in the country.

### 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 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 the 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 24 million ITNs to support mass campaigns and continuous distribution through ANC, vaccination centers, and schools. Over 33 million ACTs, 14 million RDTs, 7 million SPs, and 90,000 doses of injectable artesunate have also been procured with PMI funds. PMI funding has supported the establishment of an LMIS in 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 the LMIS and the malaria commodities logistics system.

PMI continues to assist the national and state malaria elimination programs to establish pharmaceutical supply management working groups in all 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. Availability of consumption data for decision-making has increased. Such data help 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 on average 165 pallet positions in a pharmaceutically-compliant store in Abuja. Some state governments have provided storage space, but only Cross River State has pharmaceutically-compliant stores in all of the PMI-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. PMI encourages federal and state commitments to the commodities logistics system to continue building the capacity of personnel to reduce stockouts across all states. 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 supports distribution of malaria commodities using a direct delivery and information capture system (DDIC). This is a direct delivery of commodities from the state Central Medical Stores to facilities via trucks. At the time of delivery, a trained State Ministry of Health staff member on the truck checks the facility's stock, determines need using an inventory control software package, and immediately provides the needed commodities. This model is designed to be an informed push or vendor-managed inventory system that is based on regular data collection, bimonthly distribution, and reporting. The goal is to enhance effective distribution of commodities with real-time logistics data collection for decision-making. Importantly, DDIC frees health facilities' staff time to concentrate on their core clinical duties.

PMI also supports the strengthening of quality assurance/quality control (QA/QC) of antimalarials. A gap analysis of the QA/QC of medicines was conducted to help support NAFDAC and the NMEP in developing a QA/QC policy for antimalarial medicines and diagnostics. The QA/QC policy document, stipulating the roles and responsibilities of the various government procurement and regulatory agencies, has now been finalized. In addition, PMI supported the procurement of basic equipment including Minilabs® and consumables for monitoring quality of antimalarial medicines.

Progress during the past 12-18 months

PMI FY 2014 funding contributed to strengthening the malaria commodities logistics system and the LMIS through training and tools for data collection. PMI supported the establishment of Logistics Management Coordination Units (LMCUs) in all 11 supported states. The LMCUs, set up within the Directorate of Pharmaceutical Services, SMOH, are at various levels of operationalization. Units carry out all logistics activities (forecasting, supply plan, budgeting, pipeline monitoring, monitoring and supportive supervision, distribution plans and activities, inventory management, stock status analysis, among others) within the state. The state drives the processes with PMI support.

PMI supported the establishment of a Development Partners Group for Health (DPGH) supply chain technical working group at the national level. The TWG coordinates supply chain activities for donors in Nigeria and advises the DPGH on health commodities logistics issues. The DPGH supply chain TWG will enhance effective coordination of supply chain activities in the country.

PMI supported the training of 4,014 state-level officers in basic supply chain management and on the malaria commodities logistics system. PMI FY 2014 funding supported two rounds of EUV surveys in 91 health facilities in 11 states. Through these trainings, PMI expects a cascading effect in which non-PMI supported health facilities will experience indirect benefits from this capacity building.

PMI funding supported the continued distribution of ACTs, RDTs, and SP in 3,066 health facilities, including 750 Global Fund-supported health facilities. In the last 12 months, PMI supported the distribution of more than 11.2 million ACTs, 2.8 million RDTs, 1.6 million SP treatments, and 40,000 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, NAFDAC has a difficult task providing quality control measures in this sector.

PMI supported the ISO 17025 accreditation of the Central Quality Control Laboratory of NAFDAC in Oshodi, Lagos. The certificate of accreditation was presented on January 28, 2015. PMI plans to support accreditation of other NAFDAC zonal QC laboratories. The central laboratory will carry out QA/QC for medicines produced by Nigerian manufacturers and imported into the country.

PMI support for improved QA/QC of antimalarial medicines also includes training staff to strengthen the regulatory capacity of NAFDAC. Also, the QA/QC enhancement will strengthen NAFDAC's laboratory capacity and post-market surveillance. With support from PMI, NAFDAC conducted a monitoring quality for medicines survey using Minilabs® across the country.

### 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. PMI plans to strengthen the capacities of state central medical stores, including establishing electronic databases and LMIS. PMI also looks to further integrate the LMIS and DHIS2 for better data for decision-making and forecasting needs at the facility level. PMI funding will also be used to increase the proportion of 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. Efforts will be made to advocate for integrated state logistics management systems with other donors and programs, particularly with the Global Fund. PMI will continue to look at possibilities to pool malaria commodities at state level in order to lessen the procurement-related supply shortages seen in non-PMI supported facilities.

PMI will continue building the capacity of the government to conduct logistics monitoring and supervisory visits for post-distribution verification, eventually removing the EUV surveys currently employed by PMI. 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.

### Proposed activities with FY 2016 funding (\$4,516,680):

1. *Strengthen the pharmaceutical and commodity management system by:*
  - a. Strengthening the LMIS for better forecasting and management,
  - b. Improving distribution of pharmaceuticals, RDTs, and ITNs to mitigate the risk of stockouts of malaria commodities, and
  - c. Providing proper warehousing, where needed, of malaria commodities to reduce the risk of expired drugs. (\$3,516,680)
  
2. *Provide support to strengthen NAFDAC's capacity:* Strengthen NAFDAC's capacity for drug quality control including the procurement of necessary equipment and supplies. Support will include scaling up use of Minilabs® to perform key tests 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 the public and private sectors. The support will also include technical assistance for upgrading an additional NAFDAC regional laboratory and maintenance of the Lagos QC laboratory. (\$1,000,000)

## **5. Health system strengthening and capacity building**

PMI supports a broad array of health system strengthening activities which cut across intervention areas, such as training of health workers, supply chain management and health information systems strengthening, drug quality monitoring, and NMEP capacity building.

### NMEP/PMI objectives

The main objective for health system strengthening under the NMEP Strategic Plan 2014-2020 is captured under the program management objective. Additional strategies, particularly for capacity building, are included under the case management, procurement and supply management, monitoring and evaluation, and integrated vector management objectives. The overall objective is 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 (through the SuNMaP project), and the Global Fund provide assistance to the NMEP, SMEPs, and LGA malaria programs 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 provide operational and scientific guidance. Decentralization and 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, has 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 distribution of ITNs through campaigns and routine channels; 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 government IRS programs to ensure high quality implementation under Nigerian leadership.

Through its Abuja-based resident advisors, senior program experts and 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 Global Fund concept notes, to develop the protocol and implement the MIA, to provide technical guidance for all PMI-supported malaria interventions, and to advise the NMEP on disseminating such guidance to the state and local levels.

PMI has also strengthened malaria-related epidemiological capacity by supporting three to five 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.

The NFELTP, which is co-located with the NSTOP program, has received PMI support since FY 2011 and works to build the capacity of federal and state-level health workers. This program builds needed expertise and skills in epidemiologic principles and concepts, good laboratory practices, 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.

There have been six cohorts of NFELTP residents since the beginning of the program. The fifth (9 residents) and sixth (4 residents) cohorts are still in training. All 13 residents have been posted to malaria programs for their current or upcoming field assignments, 11 in state programs and two at the NMEP. 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. Participants created an inventory of relevant research projects that they could implement and drafted research proposals on those topics. Of the 30 projects on the May 2014 list (cohorts 1-5), 29 of them relate to malaria. Fifteen have been presented either at conferences or are in print; 13 are research proposals; and the remaining two are pending. Another malaria-specific research proposal workshop (supported with FY 2013 funds) is planned for 2015, and will involve cohorts 6 and 7. It will be done in collaboration with NMEP and PMI to ensure coordination with national OR priorities.

#### *Progress during the past 12-18 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 11 PMI focus states.

In 9 states between 2014 and mid-2015, PMI trained 2,266 facility-based health workers and 288 community health workers in malaria case management; 2,258 facility workers in IPTp; and 1,409 facility workers in parasitological diagnosis. Training targets for 2014 were largely met but there was a slow start in 2015 due to the national elections. State and LGA staff then joined PMI to reinforce capacity through supportive supervision. In Bauchi and Sokoto states, PMI enhanced workforce capacity by supporting the job capacity strengthening for health service providers in malaria prevention and case management. In addition, community-based health volunteers were trained and supervised to conduct house-to-house counseling and education on malaria and other health priorities. In Bauchi and Ebonyi states, PMI also trained and supported PPMVs on iCCM under the PPMV case management pilot, thus further extending PMI’s reach and experience in the private sector. In the 11 PMI focus states, PMI has strengthened the management and planning for the SMEP staff. PMI has supported SMEP staff to develop state malaria implementation guidelines, annual costed work plans, and training and supervision plans. At national level, PMI has supported NMEP to review malaria control policies and strategic plans, to develop implementation guidelines, to design systems for supportive supervision and training, and to develop the capacity for commodity forecast, quantification, procurement planning, and commodity logistics management. PMI has worked with other development partners to develop capacities for data collection through routine health information systems and data use.

With funding from PMI and the Global Fund, NMEP conducted a Therapeutic Efficacy Study on antimalarial medicines in eight sites within the country. The field activity has been concluded; currently molecular analysis and report writing are ongoing at designated sites in the country. This activity is conducted biennially at designated sites and aims to inform malaria case management policy.

PMI organized a national entomology technical review workshop for entomologists and entomology technicians from PMI-supported 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 data quality, PMI also supported data quality assessments and routine LGA data validation meetings in nine states. With FY 2014 funding, PMI is supporting the implementation of the MIS in the country and this will provide up to state level data for all key outcome indicators.

In 2014, more than 1,409 state-level laboratory technicians in nine PMI focus states were trained on malaria diagnosis using RDTs and microscopy, including use of new standard operating procedures. PMI also provided both training and follow-up to state-level personnel, including the private sector, to implement the newly-completed national guidelines on quality assurance in malaria diagnostics.

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 frequently even at the national level. Commodity stockouts impede health workers' ability to implement the training they have received, and to provide critical services. Last year, a national health worker industrial action that lasted several months led to closure of health facilities, expiration of health commodities, and lack of reporting to state levels. Recent field visits revealed 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 have not been 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 efficiency and high program impact. Although Nigeria is operating a decentralized health system, the central NMEP has retained the functions of policy-setting; developing strategies, implementation guidelines, and training materials; standardizing training and BCC materials; maintaining the quality of care; and training health workers. Responding to emergencies such as malaria outbreaks also remains a central responsibility of the NMEP. Given these responsibilities, in addition to coordinating all malaria control activities in the country, NMEP is a critical organization and strengthening their technical and management capacity is important.

At the same time, the states and LGAs are the operational levels of the malaria elimination program in Nigeria. Implementation and service delivery happen at state and LGA level. The most important program outcomes occur at the state level, making strengthening of state and LGA-level management

and technical capacity absolutely essential to any programmatic success. Consequently, PMI will continue such support at all three levels—national, state, and LGA—to effectively and efficiently plan, implement, coordinate, monitor, and evaluate malaria control program interventions. PMI investment will include supporting the national level to develop policy and strategic documents, revising training and BCC guidelines, developing standard operating procedures, conducting supportive supervision, supporting coordination meetings, and training.

At the state level, PMI support will go into strengthening the malaria coordination at state and LGA level, training of health workers, supportive supervision, and support for review meetings to use data for improving service delivery. A key component of this work will be using the rich, routine, DHIS2 data that are collected in states to guide programmatic decision-making, rather than just reporting. Capitalizing on this opportunity will play a major role in PMI's ability to improve service provision in its focus states. Capacity building will be a key factor in PMI's upcoming strategic review as PMI will be considering each state's commitment to developing their own capacity and systems in the final decision-making process to determine eventual geographic scope.

PMI will work with the NFELTP 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 M&E, surveillance, and research. 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 presented during the training of NFELTP fellows. The 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.

PMI proposes to support training for five NMEP and SMEP personnel for the two-year NFELTP course; an increase from the 2-4 residents supported in prior years. With the proposed increase in NFELTP's involvement in malaria-specific projects (versus projects focused on other conditions), the additional personnel are justified. Table 15 gives a summary of HSS activities by technical area.

**Table 15: Health Systems Strengthening Activities**

<b>HSS Building Block</b>	<b>Technical Area</b>	<b>Description of Activity</b>
<b>Health Services</b>	Case Management	<ul style="list-style-type: none"> <li>• Expand training of health workers in malaria case management to more health facilities in each state.</li> <li>• Improve, through training and supervision, QA systems to monitor the quality of laboratory diagnostic services.</li> <li>• Strengthen malaria policy through support for Therapeutic Efficacy Studies in five sites.</li> <li>• Expand the training and service quality for malaria diagnosis in the private sector.</li> </ul>
<b>Health Workforce</b>	Health Systems Strengthening	<ul style="list-style-type: none"> <li>• Build, through training and technical assistance, host country managerial and leadership capacity for effective malaria control</li> <li>• Support training of NMEP and SMEP staff on monitoring and evaluation, data analysis, reporting, and use.</li> <li>• Support for training of epidemiologists under the NFELTP program.</li> </ul>
<b>Health Information</b>	Monitoring and Evaluation	<ul style="list-style-type: none"> <li>• Strengthen disease surveillance systems to improve decision-making, planning, forecasting and program management.</li> <li>• Support for establishment of three surveillance sites to provide ready evidence of improved malaria case management and reporting on key indicators.</li> </ul>
	Operational Research	<ul style="list-style-type: none"> <li>• Provide facilities, equipment, training and financial support for in-country malaria operational research.</li> </ul>
<b>Essential Medical Products, Vaccines, and Technologies</b>	Case Management and ITNs	<ul style="list-style-type: none"> <li>• PMI will support improved forecasting, procurement, quality control, storage and distribution of malaria commodities, such as insecticide-treated nets, artemisinin-based combination therapies and rapid diagnostic tests.</li> <li>• Strengthen the QA for procured commodities especially RDTs and ACTs within the country.</li> <li>• Support deployment of Minilabs® for monitoring drug quality.</li> </ul>
<b>Health Finance</b>	Health Systems Strengthening	<ul style="list-style-type: none"> <li>• Provide technical assistance to leverage financial contributions and services from private sector partners (i.e. extractive industries) for malaria prevention and control.</li> <li>• Participate in national and regional forums with private sector and work with private sector health alliances such as CAMA.</li> </ul>
<b>Leadership and Governance</b>	Health Systems Strengthening	<ul style="list-style-type: none"> <li>• Strengthen national coordinating and regulatory bodies to direct and manage malaria resources, develop guidelines, and improve quality of services.</li> <li>• Support to strengthen the regulatory function of the national drug authorities through support for monitoring ACTs and regional laboratories.</li> <li>• Advocacy meetings with state leadership armed with targets and funding needs for action plans to mobilize resources.</li> </ul>

Proposed activities with FY 2016 funding (\$2,050,000):

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. This may include support for workshops to revise and develop policies, strategic documents, guidelines, and training materials as well as technical assistance to states, and other related activities. (\$500,000)
2. *Support for capacity building to the 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. PMI will also provide support to 11 states and their LGAs to plan, implement, and monitor their malaria control programs. (\$1,000,000)
3. *Support for the 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 with reprogrammed FY 2014 funds, 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 will 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. PMI/Nigeria will work with PMI headquarters to determine whether this activity can transition to NSTOP-Malaria collaboration, with funding from the GHSA. (\$550,000)

## **6. Behavior change communication (BCC)**

### NMEP/PMI objectives

Social and behavior change communication is a core component of the NMSP 2014-2020 and outlines the NMEP's priorities for that period. At the NMEP, the BCC strategy is managed by the Advocacy, Communication and Social Mobilization (ACSM) subcommittee. Members of the ACSM subcommittee are drawn from RBM partners including PMI. The core responsibility of this subcommittee is to assist the NMEP to coordinate and provide technical oversight to BCC activities in malaria. PMI has been an active member of this subcommittee and worked with other stakeholders to develop the ACSM guidelines as one of its strategic areas in the new NMSP.

The ACSM subcommittee facilitated the development of the BCC section of the new NMSP. The strategy aims to maintain high knowledge of malaria prevention and treatment practices, scale up demand for these services, and enhance political will and an enabling environment for malaria control activities while improving ACSM coordination at federal, state, and local government levels. Specifically, its objectives are:

#### **Objective:**

To provide adequate information to all Nigerians such that at least 80% of the populace habitually takes appropriate malaria preventive and treatment measures as necessary by 2020.

#### **Strategies:**

1. Maintain high knowledge of malaria prevention and treatment practices.
2. Scale up demand for malaria prevention and management services.
3. Enhance political will and enabling environment for malaria control/elimination activities.
4. Scale up facilities-based dissemination of appropriate information for malaria prevention and management practices.
5. Improve ACSM coordination at all levels.

#### **Targets:**

1. To reach 100% of Nigerians aged five years and above with sustained information, education, and communication about prevention and management of malaria by 2020.
2. To advocate to at least 80% of targeted political leaders, policy-makers and the private sector leaders for adequate, timely, and sustained funding of malaria control activities by 2020.
3. To ensure that at least 80% of individuals visiting health facilities receive information for malaria prevention and management by 2020.
4. To ensure that at least 80% of individuals visiting health facilities receive information at the community level (schools, community and faith-based organizations, etc.) on malaria prevention and management by 2020.
5. To set up functional ACSM core groups in all the states and the Federal Capital Territory by 2016.
6. To ensure that 80% of pregnant women and children under five years of age use ITNs by 2018.

### Progress since PMI was launched

Low perception of malaria risk and poor practices related to malaria are common in Nigeria. While awareness about malaria transmission has increased, many misconceptions persist. For example, although 82% of women interviewed in the MIS 2010 identified mosquitoes as a source of malaria, other causes cited included dirty surroundings (27%), the presence of stagnant water (12%), and eating certain foods (6%). Among children under the age of 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 10% received two doses of IPTp. These data point to the need for increased and more effective BCC for malaria prevention and control.

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%).

Since its inception in 2011, PMI has supported a variety of BCC activities aimed at supporting demand and uptake of key interventions and strengthening the capacity of the ACSM branch of the NMEP. In PMI's 11 focus states, implementation of BCC activities has used various channels, such as mass media, community groups, and interpersonal activities to specifically increase awareness of malaria as well as the key interventions to prevent and treat it. This has largely focused on ITN use and care, encouraging ANC attendance, and instilling prompt case management-seeking behavior.

PMI broadly employs mass media communications through television and radio that promote awareness of malaria issues. This is reinforced at community level with IPC through volunteers at the community level to motivate, raise awareness, and encourage attendance at ANC clinics. PMI's community intervention strategy used different community structures to facilitate IPC sessions through household visits and community dialogues. Between 2013 and 2014, over 2.5 million individuals were reached with BCC messages on ITN use. About 700,000 individuals were reached with BCC messages on ANC and IPTp. IPC was also employed to influence health worker behaviors and compliance with test results; increasing the frequency and quality of information provided by facility-based and community health workers to clients; using local language radio and television to disseminate malaria messages. PMI funding also supported journalists to identify and develop appropriate malaria news items.

PMI has also supported short-term training and technical assistance to the NMEP; supported the NMEP to harmonize and coordinate SBCC activities; supported the NMEP and the SMEPs in focus states to engage in strategic level advocacy and resource mobilization for malaria control; and supported the NMEP to develop and adapt tools that will guide BCC implementation in Nigeria.

### Progress during the past 12-18 months

In FY 2014, PMI provided direct support to the updating of the ACSM guide to reflect BCC priorities in the NMSP. The malaria ACSM guide was designed to enhance the capacity of ACSM program planners, implementers, and stakeholders to develop and manage interventions that will contribute to achieving the national objectives and targets for malaria elimination as outlined in the NMSP. The document was developed as an interactive tool that state-level stakeholders and RBM partners can use to design and implement BCC programs and to mobilize funds for malaria control. It provides an integrated

communication plan that standardizes messages and tools for all partners, with the understanding that states may need to adapt it to their specific demographic and cultural situations.

The guide 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. In order to better coordinate efforts, an overarching national campaign was conceived to create general awareness of malaria and to reinforce key behavior change messages. The strategy advocates for an integrated approach to ACSM based on standard messages that reinforce each other on the various channels employed. Messages aired through wide-reaching media channels (radio and television) reinforce more interpersonal channels at the community or household level. This approach delivers malaria-focused messages through multiple platforms (mass media, IPC, and community dialogues) that are systematically linked to ensure that the audience receives consistent information no matter what the channel.

Coverage of community IPC sessions is currently low, therefore greater emphasis will be placed on community-focused sessions (rather than on individual sessions) to increase coverage without negatively affecting the quality of each interaction. Activities in FY 2014 focused on intensifying community-level interventions for malaria prevention, case management, and MIP. PMI supported community mobilization activities, including community dialogue, compound meetings, and house-to-house visits by trained community volunteers. These volunteers use flip-cards to keep messaging consistent and provide visual aids to reinforce messages. Over 511,309 households were visited in nine PMI focus states. PMI also supported sensitization of religious and traditional leaders to mainstream malaria messages in sermons and public speeches.

In total, 1,027,729 out of a population of an estimated 52 million people in PMI focus states were reached through interpersonal communication with messages on ITN ownership and use, 564,769 on ANC and IPTp messages, and 873,741 on prompt care-seeking for fever and severe malaria in under-five children. PMI engaged 16 radio stations to deliver malaria prevention and case management messages to about 12 million people across the 11 PMI focus states.

In April 2014, PMI launched a national ‘malaria-free’ campaign; with the aim to increase national awareness of the burden of malaria by raising the perception of risk of malaria infection among the population. This was based on the results of the 2010 MIS survey which showed that low perception of malaria risk and poor practices related to malaria are common in Nigeria. The national campaign consisted of a malaria song/anthem called ‘Play Your Part’ that emphasized the need for every Nigerian to play their part in malaria control by: sleeping inside a mosquito net every night; promptly testing all fevers with RDTs; taking an ACT if a malaria test is positive; and urging women to attend ANC centers during pregnancy. The popularity of the song is reinforced by airing on two national- and state-level radio stations.

In 2014, PMI in collaboration with other development partners such as the Bill and Melinda Gates Foundation, funded an educational-entertainment TV series called ‘Newman Street’. This television serial drama uses family-oriented characters to educate on the various aspects of malaria prevention and control while motivating behavior change by appealing to the emotions of audiences that might find commonalities between themselves and the characters in the drama series. The first season of the ‘Newman Street’ drama was broadcast on two national-level television stations and 13 state-level television stations. ‘Play Your Part’ and ‘Newman Street’ are also available through online and social media platforms to broadcast to the rapidly growing IT-savvy populations at national level.

In 2015, PMI supported the NMEP to develop a Radio Magazine Centerpiece Program called ‘Play Your Part’; a reality radio program that incorporates different communication elements into a 15-minute weekly radio show. Activities include: expert opinion interviews and discussions on malaria issues using community voices through testimonials, music, and drama. This show uses real people and real stories in an entertaining way to engage the audience with malaria discussions. PMI will produce a northern and southern Nigerian version of the show, tailored to geographic, linguistic, religious, and environmental factors specific to both parts of the country. The flexible magazine format of the program allows for states to further tailor content to fit the needs of their state while featuring local community voices, celebrities, and experts. This national program uses the transmedia approach by incorporating relevant content from the TV series ‘Newman Street’, the national malaria song ‘Play Your Part’, and the NMEP’s national centerpiece Radio Spots.

In PMI focus states, the state malaria focal persons are supported by state-level ACSM technical committees, which were established with PMI support. In general, a handful of states have adopted and adapted the national ACSM guide as a basis for state-level operations. All 11 PMI-supported states have done this with PMI support. PMI continues to support quarterly meetings of the 9 state-level 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. In FY 2014, PMI finalized grant agreements with 20 community-based organizations to conduct IPC activities at the household level in 9 states.

PMI has also supported the ACSM branch to develop an annual advocacy plan that provides more methodology and structure to advocacy activities in the country. The ACSM committee had highlighted the need to partner with private sector organizations to increase demand for malaria interventions in Nigeria. A private sector engagement strategy was developed to provide guidance for resource mobilization. The ACSM is now distributing this strategy to states and training state-level staff on how to better plan and implement their advocacy efforts.

In January, 2015, PMI bought into a national omnibus survey. These surveys are done twice per year and are useful in monitoring trends in net use, malaria testing, and treatment behaviors in communities and at individual levels. PMI now has two data points for these behavior indicators. PMI is also fielding a baseline survey in three PMI focus states in 2015. The three states are in different geographical zones of the country. The results of the omnibus survey and baseline survey will further inform BCC activities.

*Proposed activities with FY 2016 funding (\$6,150,000):*

BCC efforts will continue to focus on increasing net use, malaria in pregnancy and correct care-seeking behavior. A key priority will be to identify ways to scale up coverage of high quality IPC interactions to more rapidly reach target populations. There will also be a focus on advocacy to increase domestic funding for malaria while engaging the private sector to increase coverage of malaria interventions.

Standardized messages from the ACSM guidance will continue to be delivered through various channels, although PMI will focus on ways to scale up IPC interactions to reach a large proportion of the population in focus states. The BCC strategy will harmonize the more general messages on malaria that are delivered through mass media with the higher quality messages that are delivered via community-focused activities which allow participants to dialogue with community volunteers and thus ensure that

messages are understood and participants are motivated to act appropriately. PMI will also assess the possibilities of capitalizing on the high levels of mobile phone ownership in Nigeria to disseminate messages.

While messages are standardized, the approach to their delivery will be nuanced at state level. The huge cultural variation throughout Nigeria necessitates a broad strategy that can be localized to best address the cultural norms in each state. Implementers will work to ensure that messages are conveyed effectively and that cultural barriers to desired behaviors are addressed to ensure the maximum potential for uptake.

### **Mass media:**

1. *National 'malaria-free' campaign.* PMI will continue to support integrated advocacy and social mobilization for national malaria communication activities. These activities will be based around the 'malaria-free campaign' and utilize the national malaria song, educational radio, and television drama shows. The national-level mass media is targeted to reach 20% of all households, i.e. approximately 35 million Nigerians, in one year. The messages will be integrated along the technical areas in the malaria program. (\$500,000)
2. *Integrated 'malaria-free' campaign in PMI-supported states.* Again, leveraging the standardized messages from the national 'malaria-free' campaign, PMI will tailor BCC approaches to the relevant audiences in its focus states. Depending on demographic, socioeconomic, and epidemiological profiles, PMI will devise BCC activities that utilize mass media and appropriate IPC channels to effectively reach target populations and support services provided by PMI, Global Fund, and the state government. This will reach approximately 35 million people. (\$1,500,000)
3. *Hausa language broadcasting service in Northern Nigeria.* Continuing to support the Hausa language broadcasting service to northern Nigeria to deliver 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)

### **Community mobilization and interpersonal communication:**

4. *Community outreach and engagement through Action Learning Platforms, formal groups' outreach.* Community leadership structures and potential champions such as religious and community leaders, civil society organizations, and opinion leaders will be engaged through group dialogues to mobilize behavior change in communities. Household and community interactive sessions using IPC will be carried out in communities in PMI focus states. This will reach about 3.5 million people in 9 PMI focus states and focus on delivering messages to promote net usage and preventative care, ANC attendance, and the risks of malaria in pregnancy and correct care-seeking behavior. (\$2,500,000)

### **IPC to health workers:**

Health workers are also seen as a key target of IPC activities. Even with training and supervision, poor practices, particularly around malaria diagnosis, are still observed. These are often driven by misguided perceptions of the utility of diagnostic tools. To address this, PMI will work to use respected medical

and academic figures to address these issues and improve practices around case management and IPTp delivery.

5. *RDT use and trust.* This activity will be carried out in PMI-supported states with the aim to improve service providers' testing of fevers by RDT and compliance with test results. Service provider engagements and group interactive sessions will aim to improve provider-patient interactions and compliance of service providers with RDT results. (\$400,000)
6. *IPTp uptake.* In seven PMI focus states, IPC activities will be carried out with ANC health workers to promote IPTp 1, 2, and 3+ uptake. This will leverage the training to health workers on malaria in pregnancy. During community mobilization activities and routine ANC outreach, traditional birth attendants and private midwives will be encouraged to refer clients for IPTp in health facilities. BCC activities will be integrated into the community IPTp campaigns in the three selected states in Nigeria. (\$350,000)

**School-based campaign:**

7. *School-based BCC campaign.* PMI will conduct school-based campaigns to engage primary school students in focus states in order to generate discussions around positive behaviors necessary for malaria prevention, diagnosis, and treatment. This will rely on the theory that young children can drive positive behavior change within households in Nigeria. (\$750,000)

**Table 16. Summary of PMI-supported BCC activities by intervention area.**

Technical area	Behavior objectives	Delivery channel	Geographical coverage & groups targeted with FY 2016 funding	Population to be reached
Insecticide-treated Nets	Use and longevity of ITNs	Mass media State and national mass media	National: 20% of all 36 states in Nigeria Target: 80% in 5 PMI focus states	35 million
			Target: 80% in Bauchi and Sokoto through MNCH activity	21 million
		Community IPC	10% in 5 PMI focus states	3.5million
		Community dialogues	5 PMI focus states	3.5 million
		School-level campaign	5 PMI focus states	
Malaria in Pregnancy	Uptake of IPTp through increased demand, positive health worker behavior, and increased ANC attendance	IPC to service providers	5 PMI focus states	50% of health workers in 5 states
		Community IPC	10% in 5 PMI focus states	3.5 million
		Community dialogues		
		Cell phone messages	5 PMI focus states	-
		Mass media State and national mass media	National: 20% of all 36 states in Nigeria Target: 80% in all 5 PMI focus states	35 million 21 million
Case Management -Diagnosis -Treatment	Early testing and complete treatment with ACTs	IPC for service providers	5 PMI focus states	50% of health workers in each state
		Community IPC	10% in 9 PMI focus states	3.5 million
	Community dialogues			
	Compliance of health workers with test results	Mass media State and national mass media	National: 20% of all 36 states in Nigeria Target: 50% in all 11 PMI focus states	35 million 21 million

Technical area	Behavior objectives	Delivery channel	Geographical coverage & groups targeted with FY 2016 funding	Population to be reached
Health Systems Strengthening	Increasing domestic funding for malaria	High level advocacy for increased domestic financing.  Create and sustain an overarching national ‘malaria-free’ campaign.  Capacity building for BCC programming.	National and federal level (association of governors)  Targeted groups in 5 PMI focus states	

## 7. 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 the Global Fund, WHO, the 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 NDHS 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 reported monthly from health facilities to the LGA level. The LGA HMIS focal persons collate and enter the data into DHIS2, a web browser-based free public domain software used for reporting facility-level aggregate data using the internet, as the national HMIS platform. The Department of Planning, Research and Statistics (DPRS) in each state organized a team of health data stakeholders to coordinate financial and technical support for DHIS2, and PMI provided technical support to commence implementation in PMI-supported states. Facility level data, once entered into DHIS2 are available immediately to higher level political units, and can be reviewed or analyzed.

### Progress since PMI was launched

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. The Global Fund 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 implemented in 2013. PMI assisted in developing the instructional manual as well as the trainer's guide and supported the national training of trainers in Abuja. This national team of HMIS trainers supports the roll-out of the HMIS to the states.

Phases I to III of the 2012 Malaria Program Review have been completed. The review documents findings along the following 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 provided direction for developing the new five-year malaria strategic plan.

PMI supported the NDHS 2013, with data collection occurring from February to June 2013. The results from surveys such as the NDHS provide opportunities to follow Nigeria's progress in malaria program scale-up and identify future program directions. The 2013 NDHS showed an increase in ownership of ITNs nationally, but decreases in the proportion of young children and pregnant women who slept under nets. Although 61% of pregnant women attended antenatal clinics, only 15% of them received IPTp.

Since 2011, PMI continues to support the Mission-wide M&E services contract which oversees a broad range of M&E services such as: performance monitoring (via a web-based reporting system); M&E capacity building for Mission staff and implementing partners; Data Quality Assessment (DQA) for indicators, and performance evaluation of activities. The web-based performance monitoring system collects and stores activity-level indicators, including all required PMI indicators. Implementing partners enter performance data quarterly and upload their narrative reports that serve as data sources.

#### *Progress during the past 12-18 months*

PMI is the co-chair of the M&E technical sub-committee of NMEP which coordinates: (1) M&E activities with other partners, (2) various surveys and assessments, and (3) efforts at strengthening the HMIS.

In the past year, PMI has continued the support for HMIS at national and state levels. This support includes capacity building of health workers at all levels, printing and distribution of reporting tools, periodic data quality assessments, and the roll-out of the DHIS2. PMI also supported the coordination of monitoring and evaluation efforts, including LGA meetings, state and federal data consultative meetings as well as the NMEP M&E sub-committee meetings.

In the last 12 months, the Mission-wide M&E services contract reviewed the M&E plans of PMI implementing partners, conducted data quality assessments for malaria-specific indicators, and trained implementing partners on the performance reporting system.

**Table 17: Malaria Data Sources, Nigeria, 2010-2017**

Data source	Survey activities	Year								
		2009	2010	2011	2012	2013	2014	2015	2016	2017
Household surveys	Demographic Health Survey (DHS)*					X				
	Malaria Indicator Survey (MIS)		X					X		
	ACT Watch Surveys (Household)*	X			X					
	SMART Survey*					X		X		
	Multiple Indicator Cluster Survey (MICS)*			X				X		
	Media Impact Surveys*						X			
	Omnibus Surveys*	X	X	X	X	X	X	X	X	X
	National AIDS and Reproductive Health Survey (NARHS)*				X					
Health facility and other surveys	Health Facility Survey		X				X			
	ACT Watch Surveys (Outlet)*	X		X		X				
	Rapid Impact Assessment (RIA)*					X	X			
	End-use verification (EUV)	X	X	X	X	X	X	X	X	X
	Service Delivery Index (SDI)*						X			
Malaria surveillance and routine system support	Support to malaria surveillance system									
	Support to HMIS	X	X	X	X	X	X	X	X	X
Therapeutic efficacy monitoring	<i>In vivo</i> efficacy monitoring	X				X			X	
Entomology	Entomological surveillance and				X	X	X	X	X	X

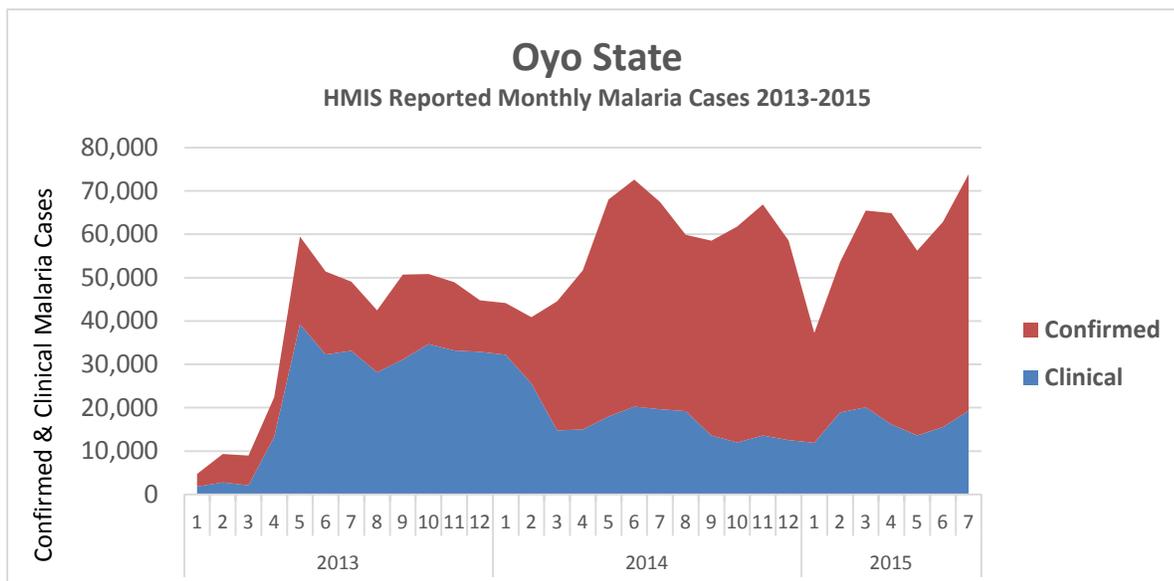
	resistance monitoring									
Net durability monitoring	ITN monitoring								X	X
Other data sources	Malaria Implementation Assessment (MIA)							X		

Note: Surveys with an asterisk (\*) are not funded by PMI

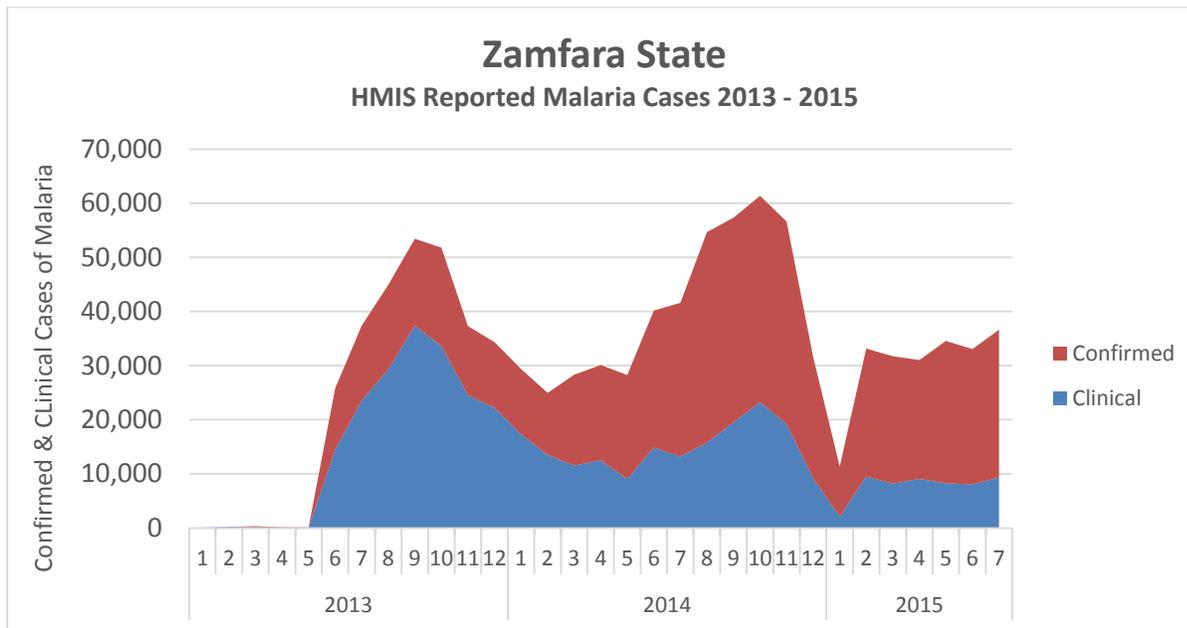
### HMIS Strengthening

One objective of the National Malaria Strategic Plan 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 2014, 57% of health facilities submitted their monthly reports, essentially unchanged over 2013, and only 47% of health facilities submitted their reports in a timely manner. The latest reporting rate as of June 2015 is over 60% but ranges from 50% to 95% in different states. There is also evidence of increasing use of data for planning procurement of commodities, and other resources. All the 11 PMI focus states have developed Annual Operational Plans (AOP) for malaria based on some of the data from the HMIS. However, 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, inadequate supportive supervision, and essentially no accountability or feedback. Although timeliness with respect to the NMEP’s ability to make programmatic decisions is an issue, there is no other organized system of data collection at the LGA level outside the HMIS. It is hoped that the HMIS will be an opportunity to greatly improve the availability and timeliness of consistent malaria information. PMI supports M&E personnel in the 11 focus states who are facilitating the HMIS harmonization process. Preliminary data from HMIS data give us valuable information, such as showing that Zamfara has a short transmission season (3-4 months) and a 96% reporting rate, while Oyo has a longer transmission season (7-8 months) with an 86% reporting rate (see Figures 5 and 6, below).

**Figure 5. Monthly malaria cases, Oyo State, 2013-2015 (source: HMIS)**



**Figure 6. Monthly malaria cases, Zamfara State, 2013-2015 (source: HMIS)**



A DPRS-planned assessment of HMIS in 2015 did not take place. PMI, working with other partners, will continue to engage with the DPRS to plan and conduct an assessment of the HMIS as soon as possible. In the interim, PMI will conduct an MIA to examine the outcome of HMIS investment in four states. The MIA will analyze data from health facilities, results of secondary data analysis, and key informant interviews. For the remaining 7 (out of 11) PMI-supported states, PMI will use the Malaria Action Program for States Project evaluation (planned for 2016) to assess the HMIS. The findings from the assessment will help guide future PMI investment in HMIS strengthening.

**Malaria Implementation Assessment**

The main objectives of the MIA are: (1) to assess trends 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. The results of the MIA will be available in early 2016. The findings from the assessment, along with other relevant malaria M&E data, will be used to inform programmatic decisions, identify gaps, and provide information for future MOP planning. The findings will also be used to revise and update HMIS tools and protocols.

**Household surveys**

Nigeria has conducted three national surveys (MIS 2010, MICS 2011, and NDHS 2013) that have included malaria modules. The next MIS is planned for 2015.

**ITN durability monitoring**

After three years of data collection in three states, PMI completed a study of the durability (namely, physical integrity and attrition) of ITNs distributed one year following mass ITN 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 ITN durability monitoring.

### Plans and justification

Monitoring and evaluating PMI's activities will rely on a combination of routine malaria data collection using the HMIS and the LMIS, household surveys, health facility surveys and assessments, and information from partners. With FY 2016 funds, PMI will continue to provide support to strengthen routine malaria data collection at the health facility, LGA, and state levels through the harmonized HMIS (using the DHIS2 platform). The objective is to achieve at least 80% on-time reporting of malaria cases by LGAs and 80% by functioning health facilities in PMI focus states.

To contribute to surveillance on antimalarial medicines, PMI plans to support the drug therapeutic efficacy monitoring to be conducted in three sites in collaboration with the NMEP and research institutions.

Given the increasing availability of malaria data in Nigeria, PMI will support an effort to conduct additional analysis of available data from household surveys and routine data systems. Triangulating various data sources will further the understanding of data gaps, data quality, and provide a platform for directing resource to improve the quality and timeliness of malaria data.

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

PMI contributes to the Program Design and Learning (PD&L) budget for USAID/Nigeria. The PD&L budget is managed by the Nigeria USAID Mission. These funds cover external mid-term and endline evaluation of PMI-supported programs. In FY 2016, PMI will support the evaluation of U.S. Government contributions for HMIS, and an endline evaluation of a PMI-funded activity. The PD&L funds also contribute to the Mission-wide M&E services contract which will support PMI implementing partners to: develop performance management plans; update activity performance data on to the web-based reporting system; and train Mission staff or implementing partner staff on relevant M&E topics; and conduct data quality assessments of PMI indicators.

### Proposed activities with FY 2016 funding (\$3,299,025):

1. *Strengthen routine M&E systems in 11 focus states:* PMI will continue to 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 DHIS2 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. Emphasis will be put on identifying and using existing data. (\$1,800,000)
2. *Drug therapeutic and efficacy testing:* Support drug therapeutic efficacy testing (DTET) in five sentinel sites to monitor efficacy of first-line antimalarial drugs. (\$250,000)

3. *Secondary data analysis*: Analysis and triangulation of data from available sources such as the MIS, MIA, and MICS to provide information for PMI programming. This activity will augment the review and analysis of routine data from HMIS and LMIS. (\$200,000)
4. *ITN durability monitoring*: PMI will conduct durability monitoring of ITNs at five monitoring sites. (\$300,000)
5. *Program Design and Learning (PD&L)*: Evaluations of U.S. Government contribution for HMIS (\$209,000), endline evaluation of a PMI-funded activity (\$300,000), Mission-wide M&E services contract (\$220,025)
6. *Technical assistance for M&E strengthening*: CDC will provide two in-country technical assistance visits to strengthen M&E during FY 2015. (\$20,000)

## 8. 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, there was limited follow-up on moving a research agenda forward. The 2012 Malaria Program Review (MPR) identified a lack of operational research (OR) available to inform both scientific and communications-related strategy development. The new National Malaria Strategic Plan 2014-2020 incorporated the MPR recommendation to convene an OR stakeholders meeting, and proposed earmarking 40% of the total NMEP M&E budget to OR. Funding was to include support to strengthen the NMEP Operational Research Unit. The NMEP convened a research symposium in 2012, supported again by SuNMaP with technical input from PMI, centering on 11 priority research questions in all intervention areas.

### Progress since PMI was launched

To date, PMI has supported a number of OR projects focused on addressing key questions (Table 18). PMI continues to work with the NMEP finalize new concept notes for OR projects.

**Table 18: 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
ITN durability in three eco-geographical zones	July 2014
<b>Ongoing OR Studies</b>	
<b>Title</b>	<b>End date</b>
Evaluating clinician adherence to diagnostic testing to provide effective case management	To be determined

### Plans 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 ITN ownership and use. Given the results of recent national population-based surveys, the primary focus will be on identifying factors responsible for inadequate access and ownership and for low- or non-usage of ITNs in different geopolitical zones.
- 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 the public and private sectors.
- 3) Determine the most effective, sustainable, and cost-effective methods to monitor malaria burden and trends in different populations and settings, with different transmission levels. These methods could include but would not be limited to school-based surveys, cross-sectional surveys, serologic surveys, and sentinel surveillance sites.
- 4) Assess and evaluate the effect of interventions and strategies in place to control and prevent malaria in pregnant women. Conduct operational testing of best evidence-based practices compared to current practices.

In March 2015, two concept papers were submitted to the PMI OR committee for review. The committee approved the study *Evaluating Clinician Adherence to Diagnostic Testing to Provide Effective Case Management in Nigeria*, and requested a resubmission of another proposed study looking at factors associated with ITN ownership and use.

### Proposed activities with FY 2016 funding (\$0):

PMI/Nigeria will identify up to four topics from the above OR priority areas for future PMI funding. PMI/Nigeria will develop concept notes which will form background material for a request to reprogram some FY 2016 funds to support the identified OR activities. The concept notes will thereafter be submitted to the OR committee for approval but before developing the full study protocols for these activities.

## **9. Staffing and administration**

Two health professionals serve as resident advisors to oversee PMI in Nigeria, one representing CDC and one representing USAID. In addition, three Foreign Service Nationals (FSNs) work as part of the PMI team. One PMI FSN position for social and behavior change communication is under recruitment. Three additional FSNs dedicate 40-50% of their level of effort to the PMI/Nigeria team to provide budgeting, monitoring and evaluation, and logistics support. All PMI staff members are part of a single interagency 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 resident advisor positions (whether initial hires or replacements) will be

evaluated and/or interviewed jointly by USAID and CDC, and both agencies will be involved in hiring decisions, with the final decision made by the individual hiring agency.

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

The PMI lead in country is the USAID Mission Director. The day-to-day lead for PMI is delegated to the USAID Health Office Director and thus the two PMI resident advisors, one from USAID and one from CDC, report to the USAID Health Office Director for day-to-day leadership, and work together as part of a single interagency team. The technical expertise housed in Atlanta and Washington guides PMI programmatic efforts.

The two PMI resident advisors 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 and state level 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 US Global Malaria Coordinator.

*Proposed activities with FY 2016 funding (\$3,433,975):*

1. *USAID in-country staff and administrative costs:* FY 2016 funding will be used to provide oversight to PMI malaria activities and technical assistance to the NMEP, and Mission-wide Administration & Oversight (A&O). Allocations for O&A are made based on the funding level and administrative/management burden to the Mission. USAID A&O costs cover salaries, benefits, and associated costs of training and field visits for: five full-time PMI staff (1 resident advisor, 3 technical FSNs, 1 program assistant); partial salaries and benefits for four USPSC staff working on PMI from HPN and contracting office; and partial salaries and benefits for nine FSNs that contribute to the PMI program from HPN (M&E specialist, Commodities and Logistics Manager, Budget/Operations Manager, Administrative Assistant), the Office of Finance Management, and the Executive Office.

The total budget for PMI full-time staff (4 FSNs, 1 USAID resident advisor) is \$1,118,278 (1.6%). The USAID budget for Oversight and Administration includes partial salaries of staff from OAA, OFM, EXO, and the Program Office that support the PMI program is \$1,508,697 (2.2%). The total Staffing and Administration budget is \$2,626,975 (\$1,118,278+\$1,508,697) and is 3.8% of total FY 2016 MOP budget. The Mission O&A budget of \$1,508,697 is 0.2% above the recommended 2% and is discussing with PMI leadership to make Nigeria an exception to this rule. This is because Nigeria has the largest PMI program, requiring a higher level of effort from the support offices. The security situation, diversity, and complexity also render Nigeria an expensive country in which to conduct business. (\$2,626,975)

2. *CDC staff and administrative costs:* FY 2016 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. (\$787,000)
3. *CDC TDY costs for mid-year PMI/Nigeria program progress review:* FY 2016 funding will be used to support a mid-year progress review of the PMI/Nigeria program. Funds are to support the travel costs of two US-based CDC-PMI staff. (\$20,000)

**Table 1: Budget Breakdown by Mechanism****President's Malaria Initiative – NIGERIA****Planned Malaria Obligations for FY 2016**

<b>Mechanism</b>	<b>Geographic Area</b>	<b>Activity</b>	<b>Budget (\$)</b>	<b>%</b>
TBD/Supply Chain Contract	11 PMI focus states	Procure and deliver ITNs, ACTs, drugs for severe malaria, RDTs, SP for IPTp. Also includes support for ITN mass campaigns in Sokoto State and distribution of ITNs via continuous distribution channels.	\$38,623,000	55.2%
IRS 2 TO6	Six sentinel sites	Strengthen entomological monitoring and capacity at federal and state levels.	\$1,080,000	1.5%
TBD/Case Management	9 PMI focus states	Support malaria service delivery; increase diagnostic and treatment capacity of health workers at facility and community level, including private sector Proprietary Patent Medicine Vendors; strengthen HMIS reporting. Includes support to the NMEP to strengthen capacity and leadership role.	\$14,550,000	20.8%
TBD/RHMCH	2 PMI focus states	Support malaria service delivery; increase diagnostic and treatment capacity of health workers at facility and community level, including private sector Proprietary Patent Medicine Vendors; strengthen HMIS reporting. Includes support to the NMEP to strengthen capacity and leadership role.	\$2,800,000	4.0%
Vector Works	Five sites	ITN physical integrity monitoring in five monitoring sites.	\$300,000	0.4%
Voice of America (VOA)	Nationwide	Support for mass media for malaria prevention and control, including working with journalists to improve coverage of malaria issues.	\$150,000	0.2%
Health Communication Capacity Collaborative (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).	\$6,000,000	8.6%

United States Pharmacopeia	Federal	Strengthen NAFDAC capacity for drug quality control including support for Minilabs® to perform drug quality testing in the field.	\$1,000,000	1.4%
Walter Reed Army Institute of Research (WRAIR)	11 PMI focus states	Scale up interventions to 11 PMI focus states. Greater focus on supportive supervision.	\$500,000	0.7%
ICF Intl	Nationwide	Secondary data analysis using data sources such as MIS, MIA, MICS, and other available data.	\$200,000	0.3%
TBD/M&E	Nationwide	Mission-wide M&E services contract, HMIS assessment, and endline evaluation for a PMI-funded project.	\$729,025	1%
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 \$630,000.	\$1,441,000	2.1%
USAID	Nationwide	Support for USAID annual staffing and administration costs.	\$2,626,975	3.8%
<b>Total</b>			<b>\$70,000,000</b>	<b>100%</b>

**Table 2: Budget Breakdown by Activity**

**President's Malaria Initiative – NIGERIA**

**Planned Malaria Obligations for FY 2016**

Proposed Activity	Mechanism	Budget		Geographic Area	Description
		Total \$	Commodity \$		
<b>PREVENTIVE ACTIVITIES</b>					
<b>Insecticide-treated Nets</b>					
Procurement of ITNs	TBD/Supply Chain Contract	\$16,815,800	\$16,815,800	11 PMI-supported states	Procure approximately 5,111,000 ITNs for distribution in 11 PMI-supported states. Distribute nearly 3 million ITNs through campaign in Sokoto and 2,111,000 for routine continuous distribution in PMI-supported states.
Distribution of ITNs from state warehouses to service delivery points	TBD/Supply Chain Contract	\$2,510,000	\$0	11 PMI-supported states	Deliver approximately 5,020,000 ITNs for distribution in 11 PMI-supported states from state warehouses to service delivery points.
Logistics and operational costs for ITN distribution	TBD/Supply Chain Contract	\$2,980,520	\$0	11 PMI-supported states	Costs include technical assistance, training, microplanning, and registration. BCC/social mobilization costs are reflected separately in the BCC section.
<b>SUBTOTAL ITNs</b>		<b>\$22,306,320</b>	<b>\$16,815,800</b>		
<b>Indoor Residual Spraying</b>					
Provide support for vector surveillance and susceptibility monitoring in four ecological zones around Nigeria and	IRS 2 TO6	\$680,000	\$0	Six sentinel sites	Provide support for vector surveillance and susceptibility monitoring in six sites across four ecological zones in Nigeria. In addition to two existing sites, establish four new surveillance sites to align with PMI-supported states.

establish four new surveillance sites.					
Strengthen capacity for entomological expertise at federal and state levels.	IRS 2 TO6	\$400,000	\$0	Six sentinel sites	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 Nasarawa State.
Technical assistance to NMEP IRS activities	CDC IAA	\$29,000	\$0	Federal and state level	Two trips to provide insecticide resistance training for Nigerian IRS staff, resistance test kits, and insecticide for Nigerian vector control officers attending training.
Supplies for entomological TA	CDC IAA	\$15,000	\$15,000	Federal and state level	Bioassays and test kits to supplement insecticide resistance and vector surveillance monitoring
<b>SUBTOTAL IRS</b>		\$1,124,000	\$15,000		
<b>Malaria in Pregnancy</b>					
Scale-up of MIP activities	TBD/Case Management	\$1,300,000	\$0	9 PMI-supported states	Support implementation of MIP and IPTp as part of FANC across nine PMI focus states. PMI support will include the roll-out of the new IPTp policy, introducing new IPTp guidelines in medical training institutions and professional associations, and piloting a “supervised” community-based IPTp-DOT in three states in Northern Nigeria with low ANC attendance.
Scale-up of MIP activities	TBD/RMNC H program	\$500,000	\$0	2 PMI-supported states	Support implementation of MIP and IPTp as part of FANC across two PMI focus states. PMI support will include the roll-out of the new IPTp policy, introducing new IPTp guidelines in medical training institutions and professional associations, and piloting a “supervised” community-based IPTp-DOT in three states in Northern Nigeria with low ANC attendance.
<b>SUBTOTAL MIP</b>		\$1,800,000	\$0		
<b>SUBTOTAL PREVENTIVE ACTIVITIES</b>		\$25,230,320	\$16,830,800		
<b>CASE MANAGEMENT</b>					

<b>Diagnosis and Treatment</b>					
Procure rapid diagnostic tests (RDTs) and microscopy supplies	TBD/Supply chain contract	\$5,000,000	\$5,000,000	11 PMI-supported states	Procure about 10 million RDTs to fill gaps and help prevent stockouts of malaria diagnostic tests in the public sector in 11 states.
Support for malaria diagnostics	Walter Reed Army Institute of Research	\$500,000	\$0	11 PMI-supported states	Support an existing laboratory in Cross River State to serve as a state reference laboratory for malaria diagnostics QA/QC. Conduct training of trainers and quality assurance for malaria diagnosis in 11 states. Expand training and QA for malaria diagnosis in private sector.
Technical assistance	CDC IAA	\$20,000	\$0	Nationwide	Two CDC TDYs to provide technical support to microscopic and RDT diagnosis of malaria.
Procure ACTs and severe malaria drugs	TBD/Supply chain contract	\$7,800,000	\$7,800,000	11 PMI-supported states	Procure 8 million ACTs to fill gaps and help prevent stockouts of antimalarial medications in the public sector in 11 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	\$10,000,000	\$0	9 PMI-supported states	Training of health care workers at all levels on malaria diagnosis (RDT and microscopy) in public health facilities, including training on malaria case management, conducting supportive supervision and on-the-job capacity building, and providing basic tools and job aids for malaria case management.
Train and provide supportive supervision for case management at public health facilities	TBD/RMNC H program	\$2,000,000	\$0	2 PMI-supported states	Training of health care workers at all levels on malaria diagnosis (RDT and microscopy) in public health facilities, including training on malaria case management, conducting supportive supervision and on-the-job capacity building, and providing basic tools and job aids for malaria case management.
<b>Subtotal Diagnosis and Treatment</b>		\$25,320,000	\$12,800,000		
<b>Pharmaceutical Management</b>					
Strengthen the pharmaceutical and	TBD/ supply chain project	\$3,516,680	\$0	11 PMI-supported states	Strengthen the pharmaceutical management system, forecasting, management, and distribution of

commodity management system					pharmaceuticals and RDTs and provide warehousing and distribution of PMI-procured commodities to the facility level.
Provide support to strengthen NAFDAC's capacity	USP	\$1,000,000	\$0	Federal	Strengthen NAFDAC's capacity for drug quality control including the procurement of necessary equipment and supplies. Support will include establishing functional Minilabs® 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.
<b>Subtotal Pharmaceutical Management</b>		\$4,516,680	\$0		
<b>SUBTOTAL CASE MANAGEMENT</b>		\$29,836,680	\$12,800,000		
<b>HEALTH SYSTEM STRENGTHENING / 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. Support will include technical assistance to states and LGAs.
Support for capacity building to the state, and LGAs	TBD/Case management	1,000,000	\$0	11 PMI-supported states	Support the 11 PMI focus states to plan, implement, coordinate, and monitor their malaria control programs.
Support for NFELTP	CDC IAA	\$550,000	\$0	Federal	Support training for five NMEP and SMEP personnel for the two-year FELTP course (\$50,000/year/trainee). Includes \$50,000 in funding for a short malaria course.
<b>SUBTOTAL HSS &amp; CAPACITY BUILDING</b>		\$2,050,000	\$0		
<b>BEHAVIOR CHANGE COMMUNICATION</b>					
National 'malaria-free' campaign	HC3	\$500,000	\$0	Nationwide	PMI will continue to support integrated advocacy and social mobilization for national malaria

					communication activities. These activities will be based around the ‘malaria-free’ campaign and utilize the national malaria song, educational radio and television drama shows. The national-level mass media is targeted to reach 20% of all households, approximately 35 million Nigerians, in one year. The messages will be integrated along the technical areas in the malaria program.
Integrated ‘malaria-free’ campaign	HC3	\$1,500,000	\$0	11 PMI-supported states	Leveraging the standardized messages from the national ‘malaria-free’ campaign, PMI will tailor BCC approaches to the relevant audiences in its focus states. Depending on demographic, socioeconomic, and epidemiological profiles, PMI will devise BCC activities that utilize mass media and appropriate IPC channels to effectively reach target populations and support services provided by PMI, Global Fund, and the state government. This will reach approximately 35 million people.
Hausa language broadcasting service in northern Nigeria	VOA	\$150,000	\$0	Nationwide-Northern States	Continuing to support the Hausa language broadcasting service in northern Nigeria to deliver 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.
Community outreach and engagement through Action Learning Platforms, formal groups’ outreach.	HC3	\$2,500,000	\$0	9 PMI-supported states	Community leadership structures and potential champions such as religious and community leaders, civil society organizations, and opinion leaders will be engaged through group dialogues to mobilize behavior change in communities. Household and community interactive sessions through IPC will be done in communities in PMI focus states. This will reach about 3.5 million people in 9 PMI focus states and focus on delivering messages to promote net

					usage and preventative care, ANC attendance and the risks of malaria in pregnancy and correct care-seeking behavior.
RDT use and compliance	HC3	\$400,000	\$0	11 PMI-supported states	This activity will be carried out in PMI-supported states with the aim to improve service providers' testing of fevers using RDTs and compliance with test results. Service provider engagements and group interactive sessions will aim to improve provider-patient interactions and compliance of service providers with RDT results.
IPTp uptake	HC3	\$350,000	\$0	7 PMI-supported states	In seven PMI focus states, IPC activities will be carried out with ANC health workers to promote IPTp 1, 2 and 3+ uptake. This will leverage the training to health workers on malaria in pregnancy. During community mobilization activities and routine ANC outreach, traditional birth attendants and private midwives will be encouraged to refer clients for IPTp in health facilities. BCC activities will be integrated into the community IPTp campaigns in the three selected states in Nigeria.
School-based BCC campaign	HC3	\$750,000	\$0	11 PMI-supported states	PMI will conduct school-based campaigns to engage primary school students in focus states in order to generate discussions around positive behaviors necessary for malaria prevention, diagnosis, and treatment. This will rely on the theory that young children can drive positive behavior change within household in Nigeria.
<b>SUBTOTAL BCC</b>		<b>\$6,150,000</b>	<b>\$0</b>		
<b>MONITORING AND EVALUATION</b>					
Strengthen routine M&E systems	TBD/Case management	\$1,500,000	\$0	9 PMI-supported states	Strengthen the harmonized HMIS at health facility, LGA, and state levels in 9 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.
Strengthen routine M&E systems	TBD/RMNC H	\$300,000	\$0	2 PMI-supported states	Strengthen the harmonized HMIS at health facility, LGA, and state levels in two PMI-supported states. Implementation activities will include training and supervision of data clerical staff at selected health facilities, LGAs, and states; completing unified data collection formats; and improving collection and reporting of routine malaria indicators.
Drug Therapeutic Efficacy Testing	TBD/Case Management	\$250,000	\$0	Nationwide	Support Drug Therapeutic and Efficacy Testing (DTET) in five sentinel sites to monitor efficacy to first-line antimalarial drugs.
Analysis of available malaria data	ICF Intl	\$200,000	\$0	Nationwide	Secondary data analysis using available data sources such as MIS, MIA, MICS, and other available data.
ITN durability monitoring	Vector Works	\$300,000	\$0	Five sites	Durability monitoring in five monitoring sites.
HMIS Assessment	USAID	209,000	\$0	Nationwide	Assessment of U.S. Government contribution for HMIS. Budget is part of USAID PD&L.
Endline evaluation	USAID	\$300,000	\$0	11 PMI-supported states	Endline evaluation of a PMI-funded activity. Budget is part of USAID PD&L.
Mission-wide M&E services contract	USAID	\$220,025	\$0	Nationwide	PMI contribution to Mission-wide M&E services. Budget is part of USAID PD&L.
Technical assistance for M&E strengthening	CDC IAA	\$20,000	\$0	Federal and State level	Two CDC TDYs to provide technical support for monitoring and evaluation.
<b>SUBTOTAL M&amp;E</b>		\$3,299,025	\$0		
<b>OPERATIONAL RESEARCH</b>					
Operational research	TBD/OR	\$0	\$0	Nationwide	Support four studies on malaria OR priority areas: ITNs, case management, MIP, and M&E.
<b>SUBTOTAL OR</b>		\$0	\$0		
<b>IN-COUNTRY STAFFING AND ADMINISTRATION</b>					

In-country staffing and administration costs	USAID	\$2,626,975	\$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	\$787,000	\$0	Nationwide	Support for CDC annual staffing and administration costs. Also includes A&O and PD&L.
Midyear Program Review	CDC IAA	\$20,000	\$0	Nationwide	Whole interagency team support Mission in midyear review.
<b>SUBTOTAL IN-COUNTRY STAFFING</b>		\$3,433,975	\$0		
<b>GRAND TOTAL</b>		<b>\$70,000,000</b>	<b>\$29,630,800</b>		