

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 2013 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.



PRESIDENT'S MALARIA INITIATIVE



PRESIDENT'S MALARIA INITIATIVE

Nigeria

Malaria Operational Plan FY 2013

Table of Contents

ABBREVIATIONS	3
I. EXECUTIVE SUMMARY	5
II. STRATEGY	9
1. Introduction	9
2. Malaria situation in Nigeria	10
3. Country health system delivery structure and MOH organization	12
4. National malaria control strategy	13
5. Integration, collaboration, and coordination	15
6. PMI goals, targets, and indicators	19
7. Progress on coverage/impact indicators	19
8. Challenges, opportunities, and threats	22
9. PMI support strategy	23
III. OPERATIONAL PLAN	24
PREVENTION	24
1. Insecticide-treated nets (ITNs)	24
2. Indoor residual spraying (IRS)	28
3. Intermittent preventive treatment for pregnant women (IPTp)	30
CASE MANAGEMENT	33
4. Diagnosis	33
5. Pharmaceutical and commodity management	37
6. Treatment	39
7. Advocacy, communication, and social mobilization	43
8. Monitoring and evaluation/Operations research	46
9. Health system strengthening/Capacity building	49
10. Staffing and Administration	51
IV. Tables	52

ABBREVIATIONS

ACSM	Advocacy, communication, and social mobilization
ACT	Artemisinin-based combination therapy
AMFm	Affordable Medicines Facility for malaria
ANC	Antenatal care
BCC	Behavior change communication
CDC	U.S. Centers for Disease Control and Prevention
DfID	United Kingdom Department for International Development
DHS	Demographic and Health Survey
DOD	U.S. Department of Defense
ESMPIN	Expanded Social Marketing Program in Nigeria
FANC	Focused antenatal care
FELTP	Field Epidemiology and Laboratory Training Program
FMoH	Federal Ministry of Health
GHI	Global Health Initiative
Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
HIV/AIDS	Human immunodeficiency virus/Acquired immunodeficiency syndrome
HMIS	Health management information system
IEC	Information, education, and communication
IPC	Interpersonal communication
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated net
LGA	Local government authority
LLIN	Long-lasting insecticide-treated net
MAPS	Malaria Action Program for States
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MDG	Millennium Development Goal
NMCP	National Malaria Control Program
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PMI	U.S. President's Malaria Initiative
PMV	Patent medicine vendor
QA	Quality assurance
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
SFH	Society for Family Health
SMCP	State Malaria Control Program
SP	Sulfadoxine-pyrimethamine
TDY	Temporary duty
TSHIP	Targeted State High Impact Project
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
USG	U.S. Government

WHO

World Health Organization

I. EXECUTIVE SUMMARY

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

Malaria is a core component of GHI, along with Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS), and tuberculosis. The President's Malaria Initiative (PMI) was launched in June 2005 as a five-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY 2014 and, now that it is part of GHI, PMI's goal has been adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. Under the Lantos-Hyde Act, PMI expanded in 2010 to two additional countries, the Democratic Republic of the Congo and Nigeria, and in 2011 to the Greater Mekong Subregion, Guinea, and Zimbabwe. The goal for any new countries added after the initial 15 will be to achieve a 50% reduction in malaria-related mortality in at-risk populations by 2015 compared with 2009-2010 baseline levels. These goals will be achieved by reaching 85% coverage of the most vulnerable groups – children under five years of age and pregnant women – with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), insecticide-treated nets (ITNs), intermittent preventive treatment for pregnant women (IPTp), and indoor residual spraying (IRS).

With a population of about 170 million and more reported deaths due to malaria than any other country in the world, Nigeria became the seventeenth PMI country. Malaria accounts for 60% of outpatient visits and 30% of hospitalizations among children under five years of age... The 2008 Demographic and Health Survey (DHS) reported an infant mortality of 75 per 1000 live births and an under-five mortality of 157 per 1000 live births in the preceding five-year period. Impressive progress has been made in malaria control efforts in recent years. The proportion of households owning one or more ITNs increased from only 8% in the 2008 DHS to 42% in the 2010 Malaria Indicator Survey (MIS), and the proportion of children under five years of age reported to have slept under an ITN the night before the survey increased from 6% in the 2008 DHS to 29% in the 2010 MIS.

Donor support to malaria control in Nigeria has increased dramatically in recent years. Nigeria was the recipient of a \$600 million Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) Round 8 award that was signed in 2008. In 2009, a second phase of the World Bank Malaria Booster Program provided \$100 million in addition to the original commitment of \$180 million to support a broad set of malaria interventions in seven states. The United Kingdom Department for International Development launched a five-year £50 million (about \$80 million) malaria program in 2008.

Nigeria was also selected as one of nine countries to pilot the Affordable Medicines Facility-malaria. The Affordable Medicines Facility-malaria, which receives financial support from UNITAID, Department for International Development, and the Bill and Melinda Gates

Foundation, is managed by the Global Fund. Its goal is to reduce the retail price of ACTs to a point that they are as affordable as many of the cheapest antimalarial monotherapies.

Nigeria's large population and decentralized system of government make it virtually impossible for one donor to provide meaningful assistance to the entire population. The National Malaria Control Program (NMCP) works with donors to ensure that the six geopolitical zones, 36 states, and the Federal Capital Territory receive support proportional to the burden of malaria and the level of donor assistance, and that assistance is spread to reach as many states as possible. The United States Agency for International Development has funded malaria activities in Nigeria over the past decade. Nigeria became a PMI country with FY 2011 funding, receiving \$43.6 million that year. The original FY 2012 budget of \$43.2 million was increased after approval of the FY 2012 Malaria Operational Plan to \$60.1 million.

The FY 2013 PMI Operational Plan for Nigeria was developed during a planning visit carried out in June 2012 with U.S. Agency for International Development and U.S. Centers for Disease Control and Prevention headquarters and field staff and leadership of the NMCP. The team obtained input from all key national and international partners involved in malaria prevention and control in the country. This plan supports the NMCP Strategic Plan 2009-2013 (also called the National Malaria Strategic Plan 2009-2013) and is coordinated with national and international partners to complement overall funding and resources. The FY 2013 planning level is \$43.2 million, the same as the original figure for FY 2012. In FY 2013 the program will focus on 9 of Nigeria's 36 states: Benue, Bauchi, Cross River, Ebonyi, Kogi, Nasarawa, Oyo, Sokoto, and Zamfara. With FY 2013 funding, PMI will support a comprehensive package of malaria interventions to reach an estimated population of 38.9 million in those states.

Insecticide-Treated Nets: The National Malaria Strategic Plan 2009-2013 calls for universal coverage of ITNs, defined as two ITNs per household, by the end of 2010. The plan was reviewed in 2011 by the in-country Roll Back Malaria team and changed to align with the World Health Organization recommendation of one long-lasting insecticide-treated net (LLIN) for every two persons, using a 1:1.8 ratio for quantification of needs to reach the 1:2 target. Nigeria required about 64 million LLINs to reach the original universal coverage goal of two LLINs per household nationwide, and as of June 2012, 46.9 million LLINs had been distributed through mass campaigns to 28 states, and almost 18 million were distributed in 2011 and early 2012. Major contributors to this national effort include Global Fund, World Bank, UNITAID, United Nations Children's Fund, Department for International Development, U.S. Agency for International Development, and Canadian Red Cross.

The 2010 MIS revealed significant improvement in net coverage and use following these mass campaigns. The 2010 MIS found that 59% of children under five in households with at least one ITN slept under a net compared with 50% in the 2008. The increase among pregnant women was greater, to 34% in 2010 from 5% in 2008 among all pregnant women and to 66% in 2010 from 45% in 2008 among those in households with at least one ITN. A comparison of results for areas with and without campaigns showed that greater than 70% of households in states with campaigns had at least one ITN compared to 22% in states without a campaign. Campaigns for the eight states where a campaign has not taken place will be completed by the end of 2013.

In FY 2013, PMI will focus on providing LLINs through various channels to maintain high coverage in the nine PMI focus states, or to at least prevent further declines. To ensure

continuous high coverage with FY 2013 funding, PMI will distribute approximately 2.5 million LLINs through routine systems, including antenatal and vaccination clinics, and possibly through additional channels such as schools or community-based distribution. PMI will provide limited support to an existing social marketing program that promotes LLINs at modestly subsidized prices. PMI's goal is to maintain 80% ownership of LLINs in the focus states.

Indoor Residual Spraying (IRS): The Nigerian National Malaria Strategic Plan 2009-2013 calls for scale-up of IRS to cover 20% of all households in Nigeria, or about 7 million households, by the end of 2013. Currently, the World Bank supports IRS in seven states, with PMI participating in two local government authorities of one state (Nasarawa), covering approximately 65,000 structures and protecting a population of over 300,000. With FY 2013 funding, PMI will divert its IRS resources to assist with LLIN plus-ups or behavior change communication. PMI will still provide needed entomological monitoring and management of insecticide resistance and technical assistance and training to Nigerian personnel involved in host-nation IRS programs. PMI's objective is to transfer the IRS program to Nasarawa State for FY 2013 and move PMI's training and capacity building to the national level. With this approach, the states will assume responsibility for the IRS programs, with PMI staff available for technical consultation and assistance, as needed.

Intermittent Preventive Treatment for Pregnant Women: Scale-up of IPTp continues to be a challenge in Nigeria. According to the 2008 DHS, only 58% of pregnant women had access to antenatal care from a skilled provider, and 62% of pregnant women delivered at home. The 2008 DHS reported that 5% of pregnant women received two or more of the recommended doses of IPTp, with an increase to 13% in the 2010 MIS. A number of factors contribute to the low uptake of IPTp including sporadic availability of sulfadoxine-pyrimethamine, low antenatal care attendance, and poor quality of antenatal care service delivery. To address these issues, with FY 2013 funding, PMI will procure sulfadoxine-pyrimethamine for the nine focus states while also providing technical assistance at the federal and state levels to update the malaria in pregnancy policy and strategic plan, review and update training manuals, train health workers, and provide job aids on IPTp.

Case Management: Malaria case management in Nigeria is weak, suffering from a general absence of diagnostics, a weak supply chain system, and poor delivery of services at the public health facility level. The 2010 MIS revealed that of those children who received malaria treatment, only 12% took an ACT (26% urban versus 8% rural residents) while 57% took chloroquine and 22% took sulfadoxine-pyrimethamine. The 2010 MIS also reported that only 5.4% of children under five with fever had blood taken for a test.

The NMCP has updated the National Guidelines for Diagnosis and Treatment of Malaria with support from partners. This guideline is aligned with the revised World Health Organization recommendations on universal diagnostic testing for malaria that were drafted in 2010. The NMCP is working with the states to improve the delivery of malaria case management by implementing new guidelines and improving supportive supervision. However, the rollout of malaria diagnostics has been delayed by the lack of rapid diagnostic tests.

In addition to the challenge of limited diagnostic capacity, case management is hampered by the disjointed public sector procurement, supply, and distribution system that leads to stockouts of

essential commodities including first-line ACTs. With these problems in the public sector's health service delivery, it is not surprising to note that a minority (30%) of Nigerians seek care for fever from these facilities.

With FY 2013 funds, PMI will support expansion of malaria diagnostics by improving microscopy and use of rapid diagnostic tests through state and local government authority training and supervision and help develop a QA/control framework. Additionally, PMI will procure approximately 4 million rapid diagnostic tests, as well as ACTs and drugs for severe malaria and train and supervise health workers to ensure that malaria cases are accurately diagnosed and treated appropriately. Strengthening pharmaceutical and commodity management systems at the state level and below, ideally to the facility level, is a priority of PMI.

Advocacy, Communication, and Social Mobilization: Advocacy, communication, and social mobilization efforts are guided by an updated National Malaria Advocacy, Communication, and Social Mobilization Strategic Framework and Implementation Plan, which recommends various channels of communication based on specific attributes of the target audiences. It recommends that households and families should be reached using radio, community drama, printed materials, community and religious leaders, and interpersonal communication (community support groups and household visits by volunteers). PMI supports information, education, communication/behavior change communication as a cross-cutting activity focusing on all interventions: case management including diagnostics, ITNs, and IPTp. Implementation is principally through the PMI implementing partners Malaria Action Program for States and Targeted State High Impact Project across the nine focus states and through local language broadcasts that include messages on malaria prevention and treatment.

Monitoring and Evaluation: This PMI plan includes a strong monitoring and evaluation component to identify and correct problems in program implementation and measure progress against goals and targets. In the focus states, PMI will strengthen the harmonized Health Management Information System so that routine malaria data are more accurate and reliable from the health facility level to the state level and this information is analyzed and used for planning and decision making. PMI will support the national MIS planned for 2014 and will work at the federal and state levels to build capacity for monitoring and evaluation within the NMCP and the state malaria programs through participation in Center for Disease Control and Prevention's Field Epidemiology and Laboratory Training Program.

II. STRATEGY

1. Introduction

The U.S. Agency for International Development (USAID) has been supporting malaria control efforts in Nigeria for more than ten years. The level of USAID malaria funding increased to about \$7 million annually in FY 2007 and FY 2008, and then more than doubled to about \$16 million in FY 2009 and FY 2010. In FY 2011, Nigeria's first year as a President's Malaria Initiative (PMI) country, the funding for Nigeria was \$43.5 million and in FY 2012, the original budget figure of \$43.2 million was increased to \$60.1 million.

This FY 2013 Malaria Operational Plan presents a detailed implementation plan for Nigeria's third year as a PMI country and is aligned with the National Malaria Control Program's (NMCP) Strategic Plan 2009-2013 (also called the National Malaria Strategic Plan 2009-2013). This plan was developed in close consultation with NMCP leadership and with input from all key national and international partners for malaria control and prevention in Nigeria. The plan briefly reviews the current status of malaria control and prevention policies and interventions and identifies challenges and unmet needs to achieve PMI goals. This document was developed during a visit to Nigeria by USAID and Centers for Disease Control and Prevention (CDC) staff in June 2012.

Due to the large population at risk of malaria in Nigeria and the strong support of other donors, PMI focuses activities on nine states selected in consultation with the NMCP, reaching an estimated population of 38.9 million at risk of malaria. PMI's FY 2013 budget for Nigeria is \$43.2 million.

Global Health Initiative

Malaria prevention and control is a major foreign assistance objective of the U.S. Government (USG). In May 2009, President Barack Obama announced the Global Health Initiative (GHI), a six-year, comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States will invest \$63 billion over six years to help partner countries improve health outcomes, with a particular focus on improving the health of women, newborns and children. The GHI is a global commitment to invest in healthy and productive lives, building upon and expanding the USG's successes in addressing specific diseases and issues.

The GHI aims to maximize the impact the United States achieves for every health dollar it invests, in a sustainable way. The GHI's business model is based on: implementing a woman and girl-centered approach; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; encouraging country ownership and investing in country-led plans and health systems; improving metrics, monitoring and evaluation; and promoting research and innovation. The GHI will build on the USG's accomplishments in global health, accelerating progress in health delivery and investing in a more lasting and shared approach through the strengthening of health systems. Framed within the larger context of the GHI and consistent with the GHI's overall principles and planning processes, BEST (Best practices at scale in the home, community and facilities) is a USAID planning and review process that draws on our best experience in Family Planning, Mother and Child Health and

Nutrition to base our programs on the best practices in order to achieve the best impact.

President's Malaria Initiative

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS, and tuberculosis. The PMI was launched in June 2005 as a 5-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY2014 and, as part of the GHI, the goal of the PMI has been adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. This will be achieved by continuing to scale up coverage of the most vulnerable groups — children under five years of age and pregnant women — with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), insecticide-treated nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

This FY 2013 Malaria Operational Plan presents a detailed implementation plan for Nigeria, based on the PMI Multi-Year Strategy and Plan and the National Malaria Control Program's (NMCP's) 5-Year Strategy. It was developed in consultation with the NMCP, with participation of national and international partners involved with 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 and 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 if the targets of the NMCP and PMI are to be achieved, and provides a description of planned FY 2013 activities.

2. Malaria situation in Nigeria

Nigeria is the most populous country in Africa with an estimated annual growth rate of about 2.6% and an estimated total population of approximately 170 million for 2013. It is made up of six geopolitical zones, 36 states (plus the Federal Capital Territory of Abuja), and 774 local government authorities (LGAs), each with an average population of about 200,000 residents. (Figure 1) Each state has an elected governor, an executive council, and a house of assembly with the power to make state laws. State governments have substantial autonomy and exercise considerable authority over the allocation and utilization of their resources, limiting the influence of the federal government over state and local government affairs.

Figure 1: Map of Nigeria with geopolitical zones



Nigeria is ranked 142 out of 169 countries in the 2010 United Nations Development Program Human Development Index. Under-five mortality is estimated at 157 per 1000 live births and maternal mortality is estimated at 545 per 100,000 live births, according to the 2008 Demographic and Health Survey (DHS). For nearly all 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 as in the rest of the country. The south west zone has the lowest under-five mortality. The country's gross domestic product has increased during the past decade with oil revenues as the main driver of the economy. In spite of a high income from crude oil sales, the economic growth has not improved the welfare of the majority of the population and there is a 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 gambiae s. l.* and *An. funestus*. Within the *An. gambiae* complex, *An. arabiensis* predominates in the north and *An. melas* in the mangrove coastal zones.

Malaria accounts for about 60% of outpatient visits and 30% of hospitalizations in Nigeria. It is a leading cause of mortality in children under five and is responsible for an estimated 225,000 deaths annually. It also contributes to an estimated 11% of maternal mortality and 10% of low birth weight (NMCP Strategic Plan 2009-2013). Results from the 2010 Malaria Indicator Survey (MIS) showed that more than half of patients with fever first seek treatment in the private sector. Overall, the 2010 MIS estimated that 26% of household members with fever first sought treatment at a government facility. This varied by geopolitical zone (highest in the northwest at 42% and the lowest in the southeast at 7%), by age (highest for children under five at 32%; by residence (urban 22% and rural 27%), and by wealth quintile (lowest quintile 30% and highest quintile 20%).

3. Country health system delivery structure and 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. The 774 LGAs are the constitutionally-designated providers of primary health care. However, they are the weakest arm of the health system. There are more than 13,000 primary health care facilities nationwide. In addition to the Federal Ministry of Health (FMoH), another centrally-funded agency, the National Primary Health Care Development Agency, has the mandate to support the promotion and implementation of high-quality and sustainable primary health care. This agency is particularly active in development of community-based systems and functional infrastructure as well as ensuring that infants are fully immunized against vaccine-preventable diseases.

The federal budget covers tertiary care and disease control programs, including malaria control; state budgets pay for secondary care; and LGA budgets cover primary care. The amount of government spending on health and malaria is difficult to determine, as funding levels vary and actual spending does not always match the original budget. Health accounts have not yet been established, but it is believed that less than 5% of the national budget is spent on health.

The public health system in Nigeria is quite weak. Problems include:

- Inadequate decentralization of services where most primary health care facilities offer only a limited package of services
- Weak 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
- dilapidated health infrastructure with many buildings and equipment in need of repair and/or maintenance
- Weak institutional capacity with inadequate supervision of health services

The NMCP coordinator is the leader of National Malaria Control Program. There are six branches in the program – Program Management, Procurement and Supply Management, Integrated Vector Management, Case Management, Monitoring and Evaluation, and Advocacy, Communication and Social Mobilization – with a total of about 80 staff members. At the national

level, the NMCP is responsible for establishing policies, guidelines, and norms. Each state and LGA has an RBM malaria officer (local civil service) who is responsible for overseeing 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 patent medicine vendors (PMVs) and drug sellers. More than 70% of all secondary facilities and about 35% of primary health care facilities in Nigeria are private, and an estimated 60% of all fever cases seek treatment first in the private sector. 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 than in rural areas. In rural areas, about two-thirds of the population lives within five kilometers of a primary health care clinic. It is estimated that there are more than 36,000 PMVs nationwide, and they are fairly evenly distributed between urban and rural areas.

4. National malaria control strategy

The NMCP Strategic Plan 2009-2013 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 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), PMVs, and the traditional health providers.

The overall objectives of the strategic plan for the period 2009-2013 are to:

- Provide rapid, national scale-up of a package of high-impact interventions, which include appropriate measures to promote positive behavior change, prevention and treatment of malaria
- Sustain and consolidate gains through a strengthened health system that establishes the basis for the future elimination of malaria in the country

The plan has a goal of reducing malaria-related mortality in Nigeria by 50% by the end of 2013. This will be accomplished by reaching the following coverage targets by 2013:

- At least 80% of households have two or more ITNs
- At least 80% of pregnant women and children under five sleep under an ITN
- Twenty percent of households nationwide are covered by IRS as a complementary strategy to ITNs, and where conducted, at least 85% of targeted structures are adequately sprayed
- At least 80% of pregnant women receive two doses of IPTp
- At least 80% of patients with fever attending a health facility receive an appropriate malaria diagnostic test, and those testing positive are effectively treated according to the national treatment guidelines

An underlying principle for the malaria reduction strategy in Nigeria is the federal government's support for the provision of free long-lasting insecticide-treated nets (LLINs), IPTp, IRS, and diagnosis and treatment of uncomplicated and severe malaria.

Vector control prevention interventions have the goal of rapidly reducing transmission of malaria to the lowest possible level in the various ecological settings by reducing vector-human contact and longevity and abundance of adult vectors, as well as providing insecticidal treatment of breeding sites wherever feasible. The key interventions are a) universal access to and use of LLINs by all individuals in all parts of the country; b) technical guidance to the Nigerian IRS program to complement LLINs in selected areas, particularly where LLINs cannot make sufficient impact or cannot easily be implemented; c) use of environmental management to reduce breeding sites; and d) establishing sustainable public-private mix mechanisms for promotion and replacement of LLINs.

Malaria in pregnancy interventions include prevention of malaria infections through ITNs and/or IRS, prompt treatment of clinical malaria episodes with antimalarial drugs adequate for the stage of pregnancy, and IPTp with sulfadoxine-pyrimethamine (SP).

Case management includes the scaling up of accurate malaria diagnosis and appropriate treatment of malaria cases in both public and private health facilities, including chemists and PMVs. Increasing diagnostic capacity for malaria consists of two elements: diagnosis by microscopy in health centers and hospitals with laboratory facilities and diagnosis by rapid diagnostic tests (RDTs) in other suitable settings. This allows for the provision of appropriate, efficient, safe, and cost-effective laboratory services at all levels of health care delivery. The strategy also calls for the introduction and strengthening of quality control measures for microscopy and RDTs.

Appropriate malaria treatments include ACTs for uncomplicated cases and injectable artesunate, artemether, or quinine for severe cases. The drugs will be combined with improvements in health worker performance through providing job aids, trainings, and enhanced supportive supervision to properly manage uncomplicated malaria at all levels and severe malaria at secondary and tertiary levels. The strategy also calls for the use of role model mothers, a community-based approach to malaria treatment in children, to expand the reach of the public sector.

PMI's advocacy and communication strategy includes advocacy for significant political and financial commitments from states and LGAs for malaria control; implementation of information, education, and communication (IEC)/BCC campaigns that utilize multiple communication channels, and social mobilization involving communities and community structures such as the Community Development Committees. The goal is to reach at least 80% of the population (communities, families, care providers, and health workers) through BCC for awareness and appropriate actions on malaria prevention and treatment by 2013 and to sustain this through 2015.

The Monitoring and Evaluation (M&E) strategy is to establish a harmonized M&E system that can be used by all partners to monitor progress towards agreed-on targets and is used to manage and adjust interventions based on evidence. This will be accomplished through three components: improving the collection, quality, and utilization of routine malaria data from the harmonized health management information system (HMIS); periodic population-based surveys,

such as MIS, to evaluate the progress of malaria control with respect to outcome and impact indicators; and strengthening operational research in order to provide the necessary evidence to continuously improve interventions for malaria control.

5. Integration, collaboration, and coordination

Key International Partners

Nigeria has benefited from increasing support from various partners for malaria control. Currently, the largest partners in terms of funding are the Global Fund, including the Affordable Medicines Facility - malaria (AMFm) program, the World Bank, PMI, and the United Kingdom Department for International Development (DfID). Other key partners include the Clinton Health Access Initiative, the United Nations Children's Fund (UNICEF), and the World Health Organization (WHO).

The Global Fund Round 8 malaria grant funds the scale-up of prevention and case management activities in line with the National Malaria Control Strategic Plan. The key interventions for the Round 8 grant are to contribute to universal coverage of LLINs for disease prevention through mass campaigns and routine distribution (21 states); to increase ACT rollout in the public and private sector (public in 30 states and private sector in all 36 states); and to increase malaria diagnosis using microscopy at referral centers and rollout of RDTs at primary health facilities (public and private sectors each in six states). In 2010, the AMFm component was added to facilitate more rapid achievement of universal access to high-quality, affordable ACTs in all sectors. Phase II of the Round 8 grant, which started in August 2012, has a total approved amount of \$150 million. However, including the last six months of funds in the Global Fund Phase I grant, the total budget for the full three-year period of Phase II, from 1 November 2011 until 31 October 2014, is \$225 million. Of the \$150 million Phase II funds, \$50 million has been set aside for additional nets. These funds will be accessible through an innovative co-financing agreement between the Global Fund and the Nigerian government. For every \$1 the Nigerian government contributes, the Global Fund will match with \$5, up to a total of \$50 million.

In Global Fund Round 8 Phase II, approximately 7 million nets will be purchased for routine distribution in addition to 50 million ACT treatments and 16.5 million RDTs. These commodities will be split between the public and private sector. This plan will include a pilot for use of RDTs by PMVs. The grant will also support IEC/BCC; fiduciary management strengthening; Logistical Management Information System strengthening; M&E strengthening; training on integrated management of malaria for health workers; support to revitalize home-based management of fever; support for IEC/BCC on case management; and pharmacovigilance.

The AMFm pilot provides subsidized ACTs to the private sector. A large number of “first-line buyers,” who are mostly Nigerian pharmaceutical importers and distributors are allowed to order ACTs—either arthemether/lumefantrine or artesunate-amodiaquine—from a small number of pre-qualified international manufacturers. The AMFm provides a 95% subsidy on the price and supports the cost of shipping and importation. First-line buyers are thus able to obtain the ACTs for a small fraction of their ordinary price. They agree to small mark-ups as they sell to wholesalers and distributors, who in turn sell the product to private providers and retailers (although many public facilities buy their own drugs and so could benefit from this system as

well). Orders under AMFm started in late 2011 and shipments began arriving in January 2012. In 2012 about 65 million treatments were imported under AMFm. The private sector principal recipient, Society for Family Health (SFH), was also allowed to import AMFm-subsidized ACTs. It directly sold these to wholesalers in the states and also set up a network of about 120 retailers per state with whom it had agreements to supply subsidized ACTs if they agreed to sell them at the AMFm target prices. This was done to help reach more remote areas with inexpensive ACTs and to provide a check on the purely private distribution system to discourage excessive mark-ups. In practice, orders exceeded expectations and global capacity, so in mid-2012 first-line buyers were instructed to reduce orders (they have leveled off at about 5 million treatments per month) and both SFH and the public sector under the Global Fund grant have had to switch to using grant funds for ACTs rather than obtaining the AMFm subsidy. The SFH was not able to keep ACTs in stock and so this portion of the system did not perform as expected. Although retail prices dropped substantially (to a median of about 200 naira or ~\$1.30 per adult treatment), they did not reach the AMFm targets.

The World Bank Booster Program in 2007 started supporting Nigeria at the state (seven states) and national levels with a budget of \$180 million. In 2009, \$100 million of additional financing was added to this project. Project funds were administered through the government at the NMCP and State Malaria Control Program (SMCP) levels. The project fully supported the LLIN campaigns in target states and purchases of ACTs, RDTs, and SP for malaria control, although there were gaps in timing of procurements, making supplies irregular. The project also supports training, supervision, and monitoring activities, including two rounds of lot quality assurance sampling surveys, to assess the impact of the program. In 2011 and 2012 it was noted that many states outside the World Bank program were not able to distribute their Global Fund-donated LLINs due to lack of operational funds for campaigns. The World Bank allowed the Booster program funds to be reprogrammed to support these campaigns. However, due to financial management issues, the funds for the remaining mass LLIN campaigns have been on hold since September 2011. The Booster program is scheduled to end in 2013, but this may depend on the speed with which the remaining funds are dispersed.

DfID supports a five-year, £50 million project (about \$80 million) called SuNMaP (Support for the National Malaria Program), which started in 2009. This program provides substantial support for the NMCP and selected states. The number of states covered has increased to ten, and SuNMaP focuses on those which have complementary DfID projects. (SuNMaP states include three of the seven World Bank-supported states.). In selected states, SuNMaP supports malaria prevention, diagnosis, and treatment. SuNMaP has been piloting social marketing of LLINs, but this has been hampered by the substantial quantities of diverted LLIN campaign nets on the market. DfID also supplies limited quantities of commodities for routine LLIN distribution and other activities in its target states. In the World Bank-supported states, SuNMaP coordinates with the SMCP office administering this program to arrange for commodities. DfID intends to substantially increase its commitment to malaria control in Nigeria in future years, although the mechanism and size of this commitment is not yet clear.

WHO supports a national malaria program officer in each of the six geopolitical zones of Nigeria who assist the states in their zones with malaria program planning and management.

WHO also leads the RBM partnership and is supporting a malaria program review. All of these efforts are coordinated with PMI activities.

CHAI worked closely with the NMCP in the preparation for and management of the AMFm program, particularly in terms of relations with private sector manufacturers and distributors. They have also taken a special interest in promoting the use of injectable artemether as the first-line treatment for severe malaria. National policy has been changed to reflect this improvement and work is being done to encourage hospitals to purchase this drug. PMI is purchasing injectable artemether for use in two of its focus states and may expand this practice based on results.

UNICEF supported, through UNITAID, a substantial portion of the nets used in the national LLIN distribution campaigns and supported a number of states with the operational costs. Most recently UNICEF collaborated with PMI's Malaria Action Program for States (MAPS) to complete the Nasarawa campaign in December 2011. UNICEF works on malaria case management through its support for the Integrated Management of Childhood Illness.

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. A number of entities are known which may allow for collaboration with PMI in the future.

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. The most well-known example is a grant from Exxon to JHPIEGO to carry out a study of extending IPTp and other malaria interventions to community-directed distributors in Akwa Ibom State. This study demonstrated the potential of using community-directed distributors and, along with other experience using this approach, has helped inform PMI plans for LLIN upkeep and other activities in its operating areas.

The AMFm program, managed by the Global Fund, has worked with a large number of private importers as "first-line buyers" of subsidized ACTs. This program began importing in January 2011 and resulted in the import of about 65 million treatments by the end of the year. Most of this has passed through purely private sector channels and has dramatically increased the supply of ACTs in the Nigerian market. The future of AMFm in Nigeria is unknown. If AMFm subsidies end, an alternative mechanism to help maintain a high-volume, low mark-up approach to private sector ACTs, even in the absence of a subsidy, is needed. PMI is engaged in discussions to explore such mechanisms. .

The Private Sector Alliance for Millennium Development Goals (MDGs) includes polio and malaria as target areas for attention. This alliance is co-chaired by the state minister for health and the former chief executive officer of a Nigerian bank, and the secretariat is supported by Aliku Dangote, one of Nigeria's most prominent businessmen. The NMCP created a committee to seek private sector support and decided to invite Mr. Dangote to be a malaria ambassador for Nigeria. What role the private sector will play through these actions remains unclear. There has been discussion of local production of LLINs and ACTs, but it is unlikely that they could be competitively priced. PMI staff will remain engaged to look for emerging opportunities.

Within USG

The PMI program in Nigeria has been designed to take advantage of opportunities to integrate its work with other activities within the USAID Health Population and Nutrition team, and with other USAID, CDC, U.S. Department of Defense (DOD), and President's Emergency Plan for AIDS Relief (PEPFAR) activities. The overarching strategic document for this integration, the United States Global Health Initiative Strategy Document, was completed in September 2011 and took into account the expanding PMI program in Nigeria. At this time, September 2012, PMI is working with the PEPFAR program to identify further areas of collaboration. Examples of malaria as an integrated programming element in USG-supported health programming in Nigeria are listed below.

Malaria is fully integrated into primary health care supported under the bilateral Targeted State High Impact Project (TSHIP) project, which is active in 2 of Nigeria's 36 states. In those states all PMI-supported public sector malaria work is channeled through this project.

Malaria was included in the Expanded Social Marketing Program in Nigeria (ESMPIN). This inclusion leverages this project's large presence in terms of mass media BCC (national radio drama, spots/jingles, and a weekly radio magazine), and interpersonal approaches (community-based interpersonal communication in 15 priority states). Malaria messaging is included at low additional costs. This program also provides a link to detailing of drug vendors and private sector providers since the prime company on this project, SFH, is also a principal recipient of the Global Fund Round 8 malaria grant. Drug detailing staff are able to combine malaria, family planning and maternal/child health messages and product promotion efficiently. Malaria funds also leverage the large reach of the Voice of America Hausa language service in northern Nigeria.

Support for improved diagnostics has built on the base provided by the PEPFAR DOD-Walter Reed Program to improve HIV-related laboratory services. This program included improved malaria microscopy and RDT use under PEPFAR as management of an opportunistic infection. PMI is expanding on this base to support PMI activities.

PMI, as is PEPFAR, is working to support Nigeria's integrated HMIS. This is requiring a shift from the NMCP's old 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 is expected to eventually replace the older systems.

Logistics support for PEPFAR-, PMI- and USAID-supported family planning programs all fall under John Snow Inc. projects, and steps are being taken to integrate approaches when this makes sense. This is particularly promising in terms of warehousing, which is a challenge in Nigeria. In two states family planning and malaria funds are jointly supporting an innovative model to top up delivery trucks to improve distribution within states.

The PMI team is in discussion with PEPFAR to identify states that have a PMI presence and are a priority for HIV control in which the two programs can cooperate more intensively. This cooperation will take care of PEPFAR's existing malaria control measures for its target populations.

6. Goal and Targets of the President's Malaria Initiative

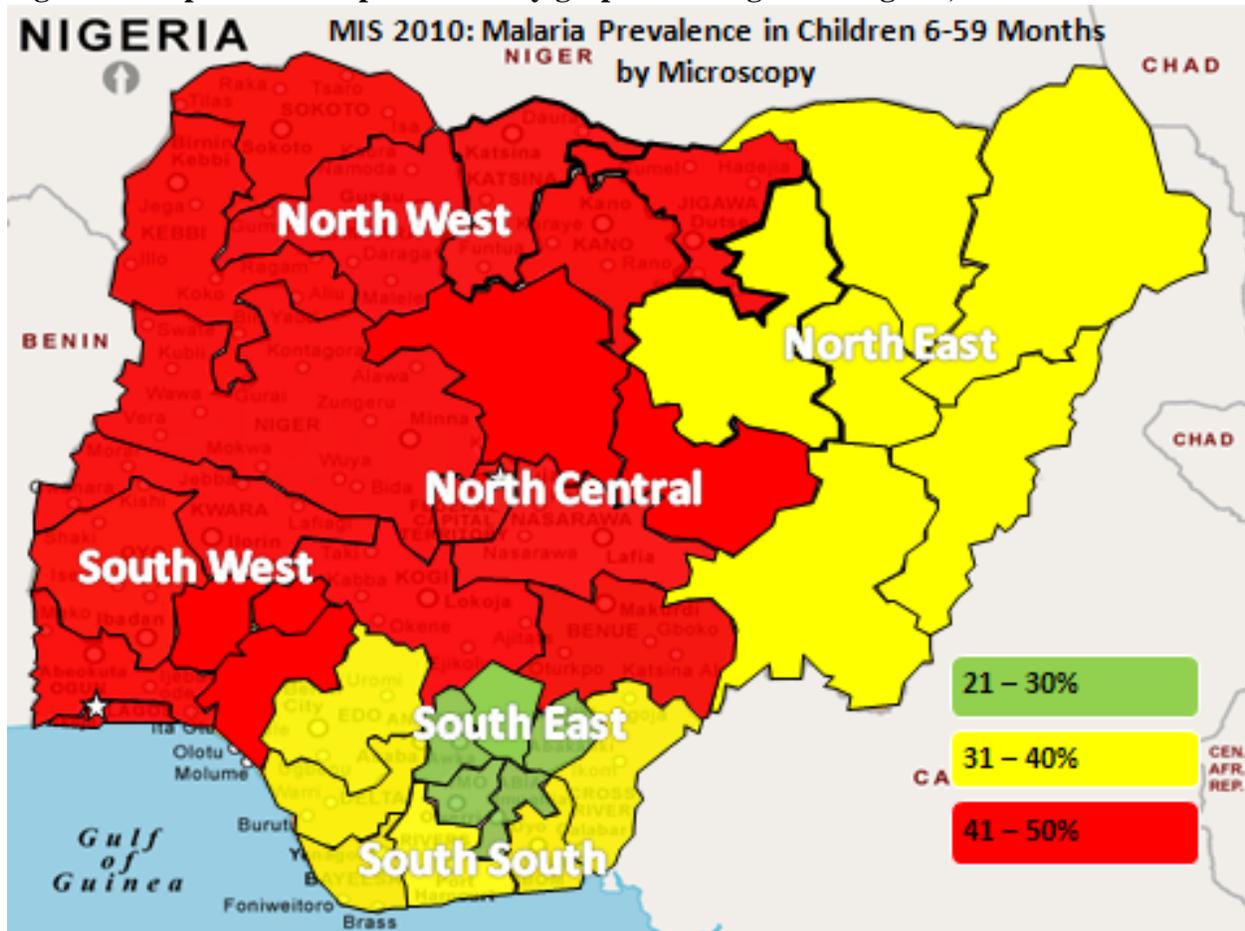
The goal of PMI is to reduce malaria-associated mortality by 70% compared to pre-Initiative levels in the 15 original PMI countries and to reduce malaria-associated mortality by 50% in new countries added to the PMI in FY2010 and later. By the end of 2014, PMI will assist Nigeria to achieve the following targets in populations at risk for malaria:

- >90% of households with a pregnant woman and/or children under five will own at least one ITN;
- 85% of children under five will have slept under an ITN the previous night;
- 85% of pregnant women will have slept under an ITN the previous night;
- 85% of houses in geographic areas targeted for IRS will have been sprayed;
- 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been sprayed with IRS in the last 6 months;
- 85% of women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy; and
- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria.

7. Progress on coverage/impact indicators

The most up-to-date information on the status of malaria control efforts in Nigeria comes from the 2010 Nigeria MIS, which was completed in December 2010. The survey included interviews with 6,344 women aged 15-49 and captured information on 6,234 children under the age of five years. Selected national level results are shown in Table A. Malaria prevalence based on microscopy indicated that 42% of children aged 6-59 months had malaria parasites. Parasitemia was higher in rural areas (48%) than in urban areas (22%) and decreased as a mother's education level improved. Variation in indicators by geopolitical zone was reported. (Figure 2) The highest malaria prevalence zones were southwest (50%), north central (49%), and northwest (48%), while the lowest prevalence zones were southeast (28%), northeast (31%), and south south (32%).

Figure 2: Map of malaria prevalence by geopolitical region in Nigeria, 2010



ITN ownership increased from 8% in 2008 to 42% in 2010. Ownership of this type of net was highest in the North East (63%) and lowest in the South West (20%). Overall under-five LLIN utilization in 2010 was 29%; however, the level was 59% in those households that owned a net. The MIS analysis also compared states that had completed universal LLIN campaigns and those that had not. The level of coverage with one ITN per household was greater than 70% in campaign states compared with 22% in non-campaign states. The proportion of children under five sleeping under an ITN the previous night was 50% in the campaign states and only 14% in non-campaign states.

The 2010 MIS reported that nationally, 33.7% of pregnant women slept under an ITN the previous night, up from 4.8% in 2008. In those households with an ITN, the percentage of pregnant women that slept under an ITN the previous night was 65.6% in 2010 compared with 44.4% in 2008. The proportion of women who received two or more doses of SP during their last pregnancy at an antenatal visit was 13.2% in 2010 versus 4.9% in 2008.

The 2010 MIS reports that, of children under five with fever, only about 49% received any antimalarial treatment. Of those children who received malaria treatment, only 12% took an ACT (26% urban versus 8% rural residents). In contrast, 57% took chloroquine and 22% took SP. The 2010 MIS also reported that only 5.4% of children under five with fever had a blood test taken.

A sub-analysis of the MIS that aggregated the data from PMI focus states has been completed. These results are also included in the table below and will be used as a baseline. Note that at the end of 2010, all of the ITN indicators were worse in the PMI focus states than they were nationally. This is due to a larger proportion of PMI focus states not having completed ITN universal campaigns compared with the national coverage. Results for PMI focus states show that ITN ownership of at least one net was only 30%; under-five ITN use was 21%, and malaria prevalence among children under five by microscopy stood at 47%.

Table A: Malaria Indicators, Nigeria, 2008-2010

	Est. National Coverage (2008 DHS)	Est. National Coverage (2010 MIS)	PMI-Supported States (2010 MIS)
Proportion of households with at least one ITN	8.0%	41.5%	30.0%
Proportion of children under five years old who slept under an ITN the previous night	5.5%	29.1%	20.7%
Proportion of children under five years old who slept under an ITN the previous night in a household with an ITN	49.8%	59.0%	51.2%
Proportion of pregnant women who slept under an ITN the previous night	4.8%	33.7%	20.0%
Proportion of pregnant women who slept under an ITN the previous night in a household with an ITN	44.4%	65.6%	48.4%
Proportion of children under five years old with fever in the last two weeks who received treatment with ACTs within 24 hours	1.1%	3.2%	2.5%
Proportion of children under five years old with fever in the last two weeks given any antimalarial within 24 hours that received an ACT	7.0%	12.0%	16.0%
Proportion of women who received an antimalarial drug during their last pregnancy leading to a live birth within the previous two years	18.4%	29.6%	23.3%
Proportion of women who received two or more doses of IPTp during their last pregnancy leading to a live birth within the previous two years (IPTp)	4.9%*	13.2%*	9.7%*
Percentage of children aged 6-59 months with malaria infection detected by microscopy	na	42.0	47.2
Percentage of children aged 6-59 months with hemoglobin lower than 8.0 g/dL	na	12.6	9.7
*during an antenatal visit			

8. Challenges, opportunities, and threats

The challenges and opportunities for malaria control are often the opposite sides of a particular issue and will be presented as such below.

Commodity procurement and supply management

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

Opportunities: Working at state level, PMI has the opportunity to develop new innovative approaches that can be expanded nationally.

Private sector delivery of malaria prevention and treatment

Challenges: Neither the federal nor state governments have the capacity to regulate the private sector, creating a particular problem around delivery of antimalarial drugs. A high proportion of caregivers first seek treatment for fever in children in the private sector, particularly the informal private sector, by a PMV. The typical PMV is poorly trained, if at all, and prescribes drugs based more on what the patient can afford than on the best choices for treatment. For malaria treatment, there remains a large source of chloroquine, which the 2010 MIS found is being taken by children under five (28% of the time for fever) more than twice as often as any other treatment.

Opportunities: Studies have shown that working with PMVs and chemists to improve their performance can be successful. PMI sees an opportunity to work with PMVs to improve access to quality ACTs, and possibly diagnostics using RDTs as well.

Highly decentralized governance structure

Challenges: The relatively strong power vested at the state level means that to be successful, a program must work intensely at the state level. This adds to the cost and time required for implementation of programs.

Opportunities: Working at the state level provides opportunities to have greater influence at local government levels that more likely translate into changes at the community level.

Insecurity and civil unrest

Challenges: Violent attacks, particularly in the north of the country, are a threat to the government and various government- and donor-funded programs. Travel restrictions were put in place in 2012, restricting movement of USG staff to the south of the country. The two TSHIP states, Bauchi and Sokoto, and one MAPS state, Zamfara, are under the ban. Implementing partner staff continues to work, but this issue places a strain on the program.

9. PMI support strategy

The approach PMI is taking in Nigeria is influenced by three important factors. A key factor is Nigeria's size and the burden of malaria in the country. Nigeria is by far the most populous country in Africa (with a 2012 population of 170 million), and almost the entire country suffers from high levels of endemic malaria. PMI focuses on nine states with a population of at least 39 million, or about 25% of the total Nigerian population. On a per capita basis, the available PMI funds (about \$43 million for FY 2013) amount to only about \$1.10 per individual even for this limited target population, and this covers only a fraction of the commodity and operational needs for that population. Second, the government in Nigeria is highly decentralized. About half of Nigeria's government revenues go directly to the 36 states and 774 local governments. The federal level has relatively little say about how these funds are used or whether states have to follow national policies. The federal level is mostly responsible for referral hospitals, while primary health care, including malaria, is much more a state and local responsibility. Public health systems expend a great deal of their funds on staffing, but support for commodities tends to be very low and uneven. State-level management of programs, such as for malaria, tends to be very weak. Third, significant support from other donors, such as the Global Fund, World Bank, and DfID, combined with decentralized governance, has led the NMCP and the Government of Nigeria to pair donors with specific states across the country.

Within this context, PMI's strategy is to work with the national level on policy, forecasting, and state support activities, while selecting specific states to receive more intensive support for a broad range of malaria control activities.

States are chosen to avoid overlap, as much as possible, with the large World Bank- and DfID-supported programs. For FY 2013, PMI intends to support 9 of Nigeria's 36 states, covering about a quarter of the national population. In each state, project teams support the SMCP office and assist with planning and implementation of preventive, diagnostic, and treatment programs. Even in the nine states, PMI is unlikely to be able to support all commodity needs and is lobbying both the states and national government to take on a larger role in purchasing malaria-related commodities.

Within seven of the target states, first-year activities in terms of diagnostics and treatment will be limited to the local government hospital and three of the larger primary health care units, per local government requests. This is being done to gain experience with setting up the logistics system, to learn whether practitioners actually use and follow RDT/microscopy results, and to see whether utilization increases rapidly when facilities' stocks and services are provided for very low prices. Starting with a limited set of facilities will allow lessons learned to guide expansion and protect against PMI stockouts of ACTs and RDTs, in case of stronger than expected demand. Depending on results, the project may then rapidly expand to cover more public facilities.

PMI identifies areas of comparative advantage among partners and focuses support to the most appropriate interventions. For example, based on its comparative advantage, PMI funds the DELIVER project to support malaria logistics systems and to provide technical assistance to mass LLIN distribution campaigns nationally. On the other hand, PMI chose to limit IRS activities in Nigeria to two local governments that have protected a population of about 300,000 in the previous two years. This was done to provide good quality IRS and IRS training that

others could learn from. It was based on the observation that a number of states in Nigeria are willing to fund IRS themselves but have not had good mentoring from state agencies. In the case of ACTs in the private sector, the large AMFm and Global Fund programs are supporting increased availability and use of ACTs, so PMI has limited its work in this area to supporting generic communications and using FY 2012 funds to provide technical assistance for drug quality control.

III. OPERATIONAL PLAN

PREVENTION

1. Insecticide-treated nets

NMCP and PMI Objectives

The NMCP Strategic Plan 2009-2013 sets universal coverage of all population groups as its goal, which is a shift from the previous goal to protect vulnerable groups only. The Strategic Plan calls for 80% coverage of all households with two or more LLINs by 2010, sustained through 2013. The strategy sets a target of at least 80% of children under five and pregnant women sleeping under an LLIN. It calls for an initial phase of rapid scale-up of free LLINs through mass campaigns followed by a second phase which focuses on the replacement of torn or worn-out nets through routine services, free or subsidized distribution from community-based organizations, and subsidized or full-cost nets distributed through the commercial sector. In 2011, the Government of Nigeria, in consultation with WHO and RBM partners, adopted universal coverage, which was defined as one LLIN for every two persons---a change from the previous target of two LLINs per household. The Government also adopted using a 1:1.8 ratio of LLINs to population for quantification, as recommended by WHO.

PMI's goal is to support the NMCP in achieving and maintaining its coverage and use targets with a particular emphasis and responsibility in the nine PMI focus states. PMI and partners will need to use a mix of approaches. Little effort has gone into sustaining the gains made as a result of the mass campaigns, and for states that had campaigns in 2009 and 2010, new campaigns will be needed to once again reach high coverage. During the past campaigns, 12 million LLINs were distributed to seven states in 2009, and 16.8 million to ten states in 2010. For states with recent campaigns, a vigorous effort to push nets through various channels is needed to keep coverage high. PMI is trying to address this issue through continuous delivery mechanisms. A first step is to strengthen the delivery of LLINs through antenatal and vaccination clinics. There was some success in the past with social marketing, and SFH has sold modest quantities of LLINs, nearly 1 million in 2009 but only about 78,000 in 2011. SFH has used its own institutional funds and Global Fund's to support this activity. Nigeria is looking at additional means of making LLINs available on a continuous or intermittent basis.

Global Fund Phase II sets a target of procuring 7 million LLINs between November 2011 and October 2014, with a co-funding option for about 10 million additional LLINs during this time frame.

Progress during the past 12 months

A total of 64 million LLINs are needed to reach the target of two LLINs for all households nationwide. Mass campaigns, made possible by large donations of LLINs through Global Fund Round 8, the World Bank, and UNITAID, as well as smaller donations from PMI, DfID, UNICEF, and others, began in 2009. As of June 2012, 46.9 million LLINs had been distributed to 28 of Nigeria's 36 states, representing 73% of the total number of LLINs planned for universal coverage distribution. Of these, almost 18 million were distributed in 2011 and early 2012. Of the nine states that have yet to have campaigns, seven have gaps of 3% or less and are in the process of distributing LLINs or will soon begin distribution. The NMCP and donors are working on solutions to fill gaps of about 50% for Osun and Delta States.

To date, seven of the nine PMI focus states have completed mass campaigns to reach universal coverage. In late 2011 and early 2012, PMI completed a fill-in campaign in Cross River State with an additional 600,000 LLINs, bringing the total to over 1.2 million LLINs reaching over 450,000 households. In early 2011, PMI provided logistic support for the distribution in Zamfara of about 1.4 million and in Benue for the distribution of about 1.9 million Global Fund-procured LLINs. These three states are the most recent to complete universal coverage campaigns based on a target of two LLINs per household. With FY 2012 funds, PMI is procuring about 1.8 million LLINs to fill gaps in Oyo and Kogi and will continue to provide logistical support for distribution to complete their universal campaigns. Those two states will stick to the original target set for all states in 2010 of two LLINs per household. PMI will use the definition of one LLIN per two persons for all future mass campaigns and for determining needs to sustain universal coverage. In addition, with FY 2012 funds, PMI will procure and distribute an additional 1.2 million LLINs for continuous distribution across the PMI focus states.

Sokoto completed its first universal campaign in 2009, and Bauchi and Nasarawa completed theirs in 2010. No significant input of LLINs has occurred in these three states since their universal campaigns, and achieving high coverage again will require a second mass campaign in each state. With FY 2012 funds, PMI will support a mass campaign in Sokoto to achieve the new universal coverage target of one LLIN for every two persons. PMI will also support continuous distribution to keep coverage levels high in those states with recent campaigns.

PMI supported operations research activities across three states investigating two key issues that are highly relevant for Nigeria and more broadly for the malaria community. Knowing that even robust delivery of LLINs through routine channels can only partially keep pace with the attrition of nets following universal coverage campaigns, PMI, through the NetWorks project, is looking into other channels for continuous distribution that can be included in a package of approaches that will sustain high, equitable coverage between campaigns, with the goal of potentially replacing campaigns. Distribution through schools and community level outlets, perhaps using community health workers, has been designed and will be implemented during the coming year. Extending the life of LLINs could greatly reduce the cost of the ambitious goals of achieving and maintaining universal net coverage. One approach is to improve the care and repair of LLINs. NetWorks will investigate the impact of BCC to improve care and repair of nets and determine to what degree appropriate care and repair can extend the life of a LLIN under field conditions.

Challenges, opportunities and threats

Nigeria has made significant gains in LLIN coverage; however, the target of two LLINs per household has left the country short of the new goal of one LLIN per every two persons now adopted by the NMCP. Also, too few LLINs have been distributed in the years following the first mass campaign to maintain high coverage. Only those states with campaigns in the last year are in a position to use continuous distribution strategies to maintain high coverage.

Some studies indicate that the attrition rate for LLINs in Nigeria is high.¹ PMI is promoting care and repair to extend the life of nets and will work with partners to improve net use in areas where surveys have indicated net life is low.²

Commodity gap analysis

The projected need for continuous distribution in the PMI focus states is presented below in Table B.

¹ Toju Maleghemi S, Erskine M: CROSS RIVER Qualitative survey to account for missing nets; AMP Annual Meeting, February 2011.

² Zegers de Beyl C, Opawale A, Adegbe E, Baba E, Kilian A: Evaluation of the distribution campaign of Long-Lasting Insecticidal Nets in December 2009, Niger State, Nigeria, March 2011.

Table B: LLIN gap analysis for nine PMI focus states, Nigeria, 2014

PMI States	Estimated Population – 2014 and (universal coverage target) *	Old LLINs available 2013	LLIN need 2013	Expected donor contribution in 2013	2013 Gap	Old LLINs available 2014	LLIN need 2014	Expected LLIN distribution in 2014	2014 Gap
(in millions)									
Bauchi	5.7 (3.17)	1.00	2.17 #	3.17 **	0	2.92	0.25	0.25	0.0
Benue	5.2 (2.89)	1.66	1.23	0.31	0.92	1.35	1.54	0.42	1.12
Cross River	3.6 (2.00)	0.87	1.13	0.21	0.91	0.58	1.42	0.29	1.14
Ebonyi	2.7 (1.50)	0.81	0.69	0.16	0.53	0.68	0.82	0.22	0.61
Kogi	4.1 (2.78)	1.47	0.81	0.24	0.56	1.50	0.77	0.33	0.45
Nasarawa	2.3 (1.28)	0.63	0.65	0.14	0.51	0.33	0.95	0.18	0.77
Oyo	6.8 (3.78)	2.39	1.39	0.40	0.98	2.45	1.33	0.54	0.78
Sokoto	4.5 (2.50)	0.28	2.22	2.50	0	2.54	0	0.20	-0.24
Zamfara	4.0 (2.22)	1.38	0.84	0.24	0.60	1.13	1.09	0.32	0.77
Total	38.9 (21.6)	10.50	11.12	7.37 (4.20 PMI)	5.03	13.47	8.14	2.75 (2.5 PMI)	5.6
<p>* Population extrapolated from 2006 census; ITNs needed for universal coverage target calculated at 1 LLIN:1.8 persons for the entire population of each state.</p> <p>** World Bank will provide LLINs for a universal coverage campaign and continuous distribution.</p>									

Plans and Justification

The estimated LLIN gap for Nigeria is between 30 to 40 million. There are current commitments for about 13 million LLINs from various partners in the coming two years. In addition, Global Fund Round 8 Phase II will provide an additional 7 to 12 million LLINs by November 2014.

Bauchi, the only PMI state supported by the World Bank, is expected to receive sufficient LLINs to maintain high coverage. With FY 2013 funds, PMI will divide the approximately 2.5 million LLINs proportionally across the remaining eight focus states, leaving a still very large gap or 5.6

million LLINs. Based on results of ongoing operations research, PMI will determine the most appropriate mix of continuous distribution approaches for each of the focus states.

Description and budget for proposed activities with FY 2013 funding (\$14,759,000):

1. *Procure approximately about 2.5 million LLINs* for a distribution through continuous approaches to eight PMI focus states, excluding Bauchi, which will receive LLINs from the World Bank. (\$10,259,000)
2. *Logistic and operational support for distribution of LLINs* for sustaining gains following mass campaigns PMI focus states. This will entail delivery through routine services, as well as innovative approaches to reach vulnerable populations and to maintain high population coverage. This also includes the development of systems for regular distribution, storage, supervision, and reporting in each of nine PMI focus states. (\$4,200,000)
3. *Operations research to assess the effectiveness and costs of innovative strategies for sustaining gains* will be carried out in three PMI focus states and will assess school-based and community- based delivery approaches. PMI will also look to expand and take to scale best practices around net care and repair. (\$300,000)
4. *Support for IEC/BCC for malaria prevention and treatment.* Four PMI implementing partners are engaged in IEC/BCC activities, including interpersonal communication and mass media and social mobilization, to promote LLIN ownership and use, as well as other key aspects of malaria control and prevention. (Costs covered under the Advocacy, Communication and Social Mobilization [ACSM] section.)
5. *Technical assistance to PMI ITN activities.* One USAID technical assistance visit to support federal and state level LLIN activities. (No additional funds needed)

2. Indoor residual spraying (IRS)

NMCP and PMI Objectives

Nigeria's NMCP Strategic Plan 2009-2013 calls for vector control as part of an integrated vector management strategy and includes universal access to LLINs; increased IRS in targeted areas where ITNs alone are not impacting malaria transmission; environmental management to reduce available mosquito breeding sites in urban and peri-urban areas; and larval control using larvicides, predators, or growth inhibitors. In 2006-2007, several IRS trials using four pyrethroids and a carbamate (bendiocarb) were conducted in five LGAs, one in each of five states, in collaboration with insecticide manufacturing companies. This was expanded to seven states (Akwa Ibom, Anambra, Bauchi, Gombe, Jigawa, Kano, and Rivers) in 2009 with financial assistance from the World Bank. WHO vector control staff evaluated these trials and concluded that IRS is feasible and should be scaled up in Nigeria.

According to the Strategic Plan 2009-2013, spraying would be focused on areas with a short transmission season where the addition of IRS might make local elimination feasible; on areas where ITN implementation is difficult and use is low; and on areas where IRS may have a greater impact, such as in and around more densely populated municipalities. The objective of the IRS Strategic Plan is to increasingly scale up IRS to cover 7 million households by 2013, or 20% nationwide.

Progress during the past 12 months

PMI collaborated with the NMCP and other partners to establish Nigeria's capacity to conduct an IRS program in Nasarawa State. This included technical, strategic, managerial, and operational support to implement IRS in two LGAs, Doma and Nasarawa Eggon. In each of the last two years, PMI-supported IRS protected 300,000 people in 65,000 structures in those two LGAs. These locations were selected as part of the IRS capacity building process, based on malaria transmission rates, rainfall patterns, suitability for IRS, and government commitment.

Ongoing activities supported with PMI funding included a supplemental environmental assessment to comply with Nigerian and U.S. environmental regulations, geographical reconnaissance (including basic mapping and enumeration of structures in the spray area), and a logistics assessment to quantify needed commodities. Vector-related activities supported by PMI included testing to establish baseline vector susceptibility to different classes of IRS-approved insecticides (with input from NMCP and WHO), species identification, procurement of insecticide and other IRS commodities, IRS operations in Nasarawa State, and core IRS training of Nigerian public health officers. PMI gave a bottle bioassay training set and lectures in insecticide resistance detection, assessment, and management to representatives from all over Nigeria in Lafia, Nasarawa State as part of a two-week training course in vector biology. PMI's major objective is ongoing: coordination with the NMCP to provide IRS advocacy and training with partner organizations; appropriate national, state, and local government officials; and private organizations to position them to continue IRS activities once PMI funding is withdrawn.

Challenges, opportunities and threats

Nationwide, IRS is lagging behind the targeted goals of the NMCP Strategic Plan 2009-2013 to scale up IRS to cover 20% of all households in Nigeria, or about 7 million households, by the end of 2013. At present, the World Bank, in collaboration with insecticide manufacturing companies, RBM, and PMI, are the only donors supporting IRS. Support encompasses spray operations in seven states, four in the north and three in the south. A total of 250,000 houses were to be sprayed among these states, but fewer than 38,000 houses were actually sprayed. Pyrethroid insecticides were used with a high level of community acceptance, but a final report has not been released. The World Bank will support IRS in two LGAs in each of six states in 2013 and 2014. A draft implementation plan for IRS has been developed and is awaiting finalization. The NMCP is now seeking comprehensive technical and financial support to help them scale up IRS in line with their NMCP Strategic Plan 2009-2013. Significant in-country funds exist that can support IRS, especially the Nigerian MDG Debt Relief Fund, which has approximately \$1 billion in annual funding, part of which has been used to purchase LLINs. The MDG Debt Relief Fund has indicated a willingness to fund IRS if suitable proposals are received. However, it remains to be seen if funding will be obtained from MDG Debt Relief

Fund, to what degree, and how far IRS will expand nationally in one of the world's most malarious countries.³

Plans and Justification

PMI-supported IRS for Nigeria is costly – over \$3,000,000 to protect 300,000 people in a nation with a population of 170,000,000. PMI feels that resources expended on IRS operations can be better used in support of other interventions such as ITNs or BCC, with the Government of Nigeria taking control of all IRS spray operations. Thus, PMI will transfer IRS funds from the two LGAs of Nasarawa State to support BCC or assist in filling ITN gaps in FY 2013. PMI will withdraw funding from IRS spray operations and transition this intervention to the Government and their IRS public and private partners so that they can effectively conduct an IRS program independently. With this approach, the Nigerian states will assume responsibility for the IRS programs, with PMI available for technical consultation and assistance, as needed. PMI will continue to work with the NMCP to strengthen the national IRS strategy and plan by providing training in spray operations and other educational opportunities in 2013. The vision is to provide state-of-the-art IRS training and operations to strengthen the national strategy and influence states to adopt these practices. PMI sees monitoring of insecticide resistance as vital to Nigeria, and will provide training for NMCP staff and other entomologists on the CDC bottle bioassay and WHO adult mosquito diagnostic test.

Description and budget for proposed activities with FY 2013 funding (\$920,000):

1. *Strengthen capacity at federal and state level on IRS strategy and implementation.* With direction from NMCP and interested states, PMI will develop capacity and appropriate strategies for IRS in targeted sites at national and state levels. (\$500,000)
2. *Strengthen capacity for entomological monitoring at federal and state levels.* This activity includes assistance with field surveillance activities (human landing catch studies, WHO cone wall bioassays, pyrethrum spray collections) by providing labor costs, equipment, and materials to perform these activities. Support is also needed for entomological training for national- and state-level personnel. (\$365,000)
3. *Provide technical assistance to PMI IRS activities.* This will include three temporary duty (TDY) trips to provide insecticide resistance training for Nigerian IRS staff, resistance test kits, and insecticide for Nigerian staff attending training. (\$55,000)

3. Intermittent preventive treatment for pregnant women (IPTp)

NMCP and PMI Objectives

Each year, Nigeria has an estimated 7.5 million pregnant women, almost all of whom are at risk of malaria. The burden of malaria in pregnancy (MIP) is high with enormous health and economic impact.

3. Malaria – Nigeria. ProMED mail post, 2 May, 2012. <http://www.promedmail.org/direct.php?id=20120502.1120714>

To reduce negative consequences of malaria, low birth weight, preterm deliveries, spontaneous abortions, in-utero growth retardation, and maternal anemia, the Nigeria National Malaria Strategy (2005) provided for the scale-up of IPTp with SP; use of LLINs; and prompt, effective treatment of clinical malaria episodes. The IPTp policy calls for IPTp to be administered as a one-dose preventive treatment course after quickening as directly observed treatment and the second dose not earlier than one month after the first dose. The two doses are to be taken as a directly observed treatment in antenatal clinics. The revised NMCP Strategic Plan 2009-2013 emphasizes that the above-mentioned malaria in pregnancy interventions are a component of the focused antenatal care (FANC) services delivered by Reproductive Health/Maternal Child Health Units. The USAID/Nigeria Mission's efforts to strengthen collaboration and integration among interventions that impact women and children is consistent with the strategic plan.

Per the 2010 MIS, the proportion of women who received two or more doses of SP during their last pregnancy at an antenatal visit was 13.2%, up from 4.9% in 2008. The key indicator and target for IPTp, listed in the National Malaria Strategic Plan 2009-2013, is for 100% of pregnant women attending antenatal care (ANC) services, representing 60% of all pregnant women, to receive at least two doses of IPTp by 2010, and increasing to 80% of all pregnant women by 2013. The latter will be achieved when ANC clinic utilization rises to 80% and 100% of those women receive at least two doses of IPTp. The 2010 MIS reported that nationally 33.5% of pregnant women slept under an ITN the previous night, up from 4.8% in 2008. However, for those living in households with an ITN, the percentage of pregnant women that slept under an ITN the previous night was 66% (44.4% in 2008). The malaria target in this current national malaria strategic plan is for at least 80% of pregnant women to sleep under an ITN by 2010 and sustain coverage until 2013.

Progress during the past 12 months

To boost performance of MIP interventions in Nigeria, in FY 2012, PMI supported capacity building of service providers to improve delivery of FANC services in the nine PMI focus states. To improve access to critical commodities, PMI procured 2,082,000 doses of SP, which is expected to meet the needs of the nine PMI focus states in addition to supporting IPTp at some PEPFAR sites with prevention of mother-to-child-transmission interventions. While public-sector SP supplies continue to be erratic, some states and local governments are known to procure small amounts to improve access. There were no other major procurements through the MDG Debt Relief Fund or FMOH in 2011-2012, though efforts to improve coordination between NMCP and the Family Health Division of the FMOH continue to show signs of improvement. Some states were also able to provide a limited number of LLINs to antenatal clinic sites over the reporting period. Some progress is being made in the studies commissioned in Nasarawa and Cross River States toward better understanding the Nigeria MIP program.

Challenges, opportunities, and threats

SP is an inexpensive drug that is easily procured in Nigeria. Unfortunately, SP continues to be used for treatment of uncomplicated malaria. It can be found in the private sector PMVs for 40 naira, or about \$0.32. Public health facilities in some states can order SP from state medical stores for the same price, and then charge the client for the drug. Since the goal is to provide IPTp free of charge in the public health facilities, PMI is planning to procure sufficient SP to

cover FANC services in the PMI focus states. At the same time, PMI is advocating for focus states to use their own budgets to procure enough SP to cover their IPTp needs.

Serious delays are being experienced in the procurement and thus delivery of SP to Nigeria. It cannot be imported into Nigeria without a waiver, and USG regulations do not allow local procurement. PMI has just received an SP waiver through the National Agency for Food and Drug Administration and Control, allowing SP procurement to proceed.

Table C: Sulfadoxine-pyrimethamine gap analysis for nine PMI focus states, Nigeria, 2014

States	Estimated Pop in 2014 (millions)	Crude birth rate (per 1000)	ANC Attendance	Public Sector ANC use	Public sector ANC patients	SP needs (two SP doses per patient)	PMI Support (SP doses)
Bauchi	5.7	50	15%	95%	40,612	83,255	84,000
Sokoto	4.5	50	15%	95%	32,062	65,727	66,000
Cross River	3.6	39.5	68%	80%	77,356	158,580	159,000
Nasarawa	2.3	33.1	73%	77%	42,793	87,726	88,000
Zamfara	4	48.5	13%	95%	23,959	49,116	50,000
Ebonyi	2.7	40	76%	55%	45,144	92,545	93,000
Benue	5.2	41.3	63%	50%	67,649	138,680	139,000
Oyo	6.8	33.3	88%	58%	115,574	236,927	237,000
Kogi	4.1	38	65%	60%	60,762	124,562	125,000
Total	38.9				505,911	1,037,118	1,041,000

Plans and Justification

PMI will continue to support IPTp capacity building of service providers to implement FANC using directly observed treatment in all facilities in Bauchi and Sokoto and selected facilities in seven states. PMI will continue to build on the gains made in improving access to IPTp among the pregnant women who attend ANC clinics in order to reach the 2013 target of 80%. PMI will continue to strengthen quality of services through improving pre-service training and expanding community approaches through a community-based health volunteer program that will be rolled out in 2013. To expand demand for and access to IPTp services, with FY 2013 funding, PMI will support mass media campaigns, innovative interpersonal communication interventions at the local government facilities and ward levels, and regular integrated supportive supervision to all

facilities offering ANC services, with an increased focus on rural and hard-to-reach communities.

Description and budget for proposed activities with FY 2013 funding (\$2,080,000):

1. *Procure adequate quantities of SP for health facilities in the PMI focus states and provide other resources such as disposable cups and possibly clean water for health facilities to deliver direct observation of IPTp. (\$100,000)*
2. *Provide support for implementation of IPTp as part of FANC across all nine PMI focus states, which will include support for the review and update of the MIP policy document, implementation guidelines, and the training materials of the NMCP in collaboration with the Division of Reproductive Health, as well as improved delivery of IPTp and LLINs during pregnancy. (\$1,980,000)*
3. *Create awareness and demand for IPTp services through IEC/BCC with behavior change communication intervention, in collaboration with print and electronic media. Four PMI implementing partners are engaged in IEC/BCC activities, including interpersonal communication, mass media, and social mobilization, to promote IPTp, as well as other key aspects of malaria control and prevention. (Costs covered under the ACSM section)*

CASE MANAGEMENT

4. Diagnosis

NMCP and PMI Objectives

The Nigerian National Guidelines for Diagnosis and Treatment of Malaria are aligned with the revised 2010 WHO recommendations on universal diagnostic testing for malaria. The NMCP Strategic Plan 2009-2013 describes the general objective of achieving “timely and equitable access to malaria diagnosis and treatment by all sections of the population and as close to the home as possible.” Prompt parasitological diagnosis, either by microscopy or RDT, is strongly recommended in all suspected cases of malaria.

Biological diagnosis is not feasible at most health facilities in Nigeria at this time and rapid scale-up will be difficult. The NMCP plans to scale up diagnostic tools gradually. The target for parasitological diagnosis is 40% by 2013 and 60% by 2014. Microscopy should be available in health facilities with a high malaria case load and a need for parasite quantification. It is also needed for facilities that manage other diseases needing microscopic diagnosis. The NMCP considers hospitals, large health centers that include inpatient beds, and tertiary care facilities as the facilities where microscopy should be available. The NMCP plans to use RDTs at all facilities where microscopy is not available or not possible due to lack of personnel available to complement microscopy in secondary facilities and in certain outpatient clinics of tertiary facilities.

The 2010 MIS reported that only 5.4% of children under five with fever had blood taken for a test. There was no difference between urban (5.4%) and rural (5.5%) residents. The highest level was in the North Central Zone (9.1%), while the lowest was in the North East (3.5%).

Progress during the past 12 months

The NMCP and SFH, as Global Fund Round 8 Principal Recipients, are working in 12 states to improve malaria diagnostic capacity in the public and private sectors. Laboratory technicians and microscopists are being trained at tertiary and secondary health facilities. The NMCP and SFH were planning to pilot the rollout of RDTs in six states each, but progress has been slow due to the lack of commodities. DfID, through its six-state SuNMaP project, and World Bank, through the seven-state Booster Program, are striving to improve diagnostics.

The NMCP, with support from partners such as SuNMaP, is in the process of finalizing harmonized training manuals on malaria. Separate workshops to harmonize the training manuals were held on malaria program management and malaria service delivery. Within the service delivery component, there is a training manual on malaria diagnostics using RDTs. The SuNMaP supported the NMCP to organize the workshops, and both RBM as well as PMI implementing partners participated.

In collaboration with the Nigerian Ministry of Defense and the DOD-Walter Reed Program, 40 state-level laboratory technicians were trained on malaria diagnosis (microscopy and malaria RDT) at the Reference Laboratory-Nigerian Air Force Hospitals, Lagos. Participants were assessed for competence after the two-week training. The most competent technicians were then used for the state-level diagnostics cascade training. MAPS has trained 228 medical laboratory technicians in six states to date. Primary health care diagnostic training using RDTs has been delayed due to the lack of commodities. The first 1 million PMI-procured RDTs arrived in Nigeria in July and an additional 1.7 million are en route. With these RDTs available, malaria diagnostics at the primary health care level has moved forward. Many health-care providers in the two TSHIP states have been trained to use RDTs, but have faced long-term stockouts.

Partners are supporting the NMCP in the development of a framework for a diagnostic quality assurance (QA) system for malaria parasite diagnosis. This is expected to be finalized this year and then used to pilot QA systems at the zonal and state levels.

A majority of Nigerians seek treatment for malaria initially through the private sector. The 2010 MIS reports that 57% of those with fever first seek treatment at a chemist's or PMV's. SFH had planned to study the introduction of RDTs among PMVs this past year, but the study was delayed. This study, as well as one by SuNMaP, will begin this year to test approaches that will make it advantageous for these informal providers to use RDTs, both in terms of improving relations with patients and finances. PMI Nigeria recognizes the critical role the private sector plays in the treatment of malaria in Nigeria and will follow developments in this area and be prepared to support diagnostic work with the private sector in the future.

Challenges, opportunities, and threats

The biggest challenge to date has been the lack of RDTs. Many health facility personnel have never received RDTs, despite having been through Global Fund training. In PMI focus states, a

delay in RDT procurement has slowed diagnostics training, because MAPS wanted to ensure RDTs were available before fully rolling out RDT training at priority primary health care facilities. With PMI-procured RDTs available since July 2012, malaria diagnostics training has since accelerated. With the plus-up funding for FY 2012, there is an opportunity to keep priority primary care health care facilities in PMI focus states at near full supply for the upcoming year. This will hopefully encourage states and LGAs to start procuring RDTs for the remaining health facilities.

As noted in the PMI strategy section, MAPS is implementing strategies in every LGA in seven states. However, within the LGA, MAPS does not reach every primary health care facility. In the first year of diagnostics activities, MAPS supported the local government hospital and three of the larger primary health care facilities. This was done to gain experience with setting up the logistics system, to see whether practitioners actually use and follow RDT/microscopy results, and to see whether utilization increases rapidly when facilities' stocks and services are provided. One looming threat is the possibility that states will insist on distributing PMI-procured RDTs to all public health facilities in the states, thus eventually leading to stockouts in PMI's priority primary health care facilities. The hope is to maintain a full supply of both ACTs and RDTs at these priority primary health care facilities in order to demonstrate well-functioning facilities and collect consumption data. The threat for 2014 is that the funding for commodities will decrease just as priority primary health care facilities are expanding.

Commodity gap analysis

Forecasting and quantifying RDT needs for Nigeria is difficult, while case reporting through the HMIS and the parallel management information system remains poor. There are an estimated 110 million fever cases per year, with about 30% of these seeking care at public health facilities. The availability of accurate microscopy is not known, and the NMCP estimates that 50-60 million RDTs will be needed annually to achieve universal access to malaria diagnosis in the public sector.

The table below shows the RDT needs and gaps for 2014.

Table D: RDT gap analysis for nine PMI focus states, Nigeria, 2014

States	Estimated Pop. In 2014	Fevers/ year - 0.9 fevers/ person	Public HF* utilization (from 2010 MIS)	Est. RDT Need	60% RDT Roll Out	RDTs Avail-able	PMI Support	RDT Gap
(in millions)								
Bauchi	5.7	5.1	0.3	1.5	0.92	0.92**	0.00	0.00
Sokoto	4.5	4.1	0.5	2.0	1.22	0.00	0.92	0.30
Cross River	3.6	3.2	0.25	0.8	0.49	0.10	0.29	0.10
Nasarawa	2.3	2.1	0.3	0.6	0.37	0.10	0.17	0.10
Zamfara	4.0	3.6	0.5	1.8	1.08	0.00	0.78	0.30
Ebonyi	2.7	2.4	0.2	0.5	0.29	0.00	0.19	0.10
Benue	5.2	4.7	0.3	1.4	0.84	0.00	0.54	0.30
Oyo	6.8	6.1	0.25	1.5	0.92	0.00	0.62	0.30
Kogi	4.1	3.7	0.3	1.1	0.66	0.00	0.49	0.17
Total	38.9	35.0		11.3	6.79	1.12	4.00	1.67
<p>* HF – health facility **RDT quantification assumes that World Bank will continue to cover malaria commodities in Bauchi through 2014.</p>								

Plans and Justification

PMI is working to develop the appropriate diagnostics package that builds capacity among health and lab personnel and supervisors. The package includes not only the routine use of the tests, but also procurement, distribution, quality control, and BCC. The plan is to eventually extend diagnostics to the community level; but as volunteers need supervision and supplies from the primary health care facility, diagnostics at the health facility level remains the priority.

PMI will support expansion of malaria diagnostics by improving microscopy and use of RDTs through state- and LGA-level training. PMI is working with the NMCP and other partners to develop a QA/quality control framework at the national level that will then be piloted for both microscopy and RDTs at the zonal/state levels. PMI will procure RDTs, though it will not be

sufficient to cover the need in the seven MAPS states and two TSHIP states. Delivery of RDTs will be coordinated with laboratory training and ACT stocks. With FY 2013 funding, PMI will support the following activities:

Description and budget for proposed activities with FY 2013 funding (\$4,322,000):

1. *Procure an estimated 4 million RDTs.* In FY 2013 PMI will procure a sufficient number of RDTs to support the scale-up of malaria laboratory diagnosis in eight of the nine focus states. (\$2,000,000)
2. *Improve the quality of parasitological diagnosis through the training of health and lab personnel in nine states.* PMI will work at the state and LGA level to improve the appropriate use of diagnostics including interpreting laboratory results and managing patients based on results. Support will include in-service training and supervisory visits for both laboratory workers and health-care providers as part of a comprehensive program for laboratory diagnostics. This activity began in selected health facilities in all LGAs in PMI focus states with FY 2012 funding. With FY 2013 funding, the diagnostics package will expand to other primary health care facilities in targeted states. (\$2,160,000)
3. *Continue DOD-Walter Reed Program support for malaria diagnostic training (microscopy and RDTs) in PMI focus states.* These training activities will focus on training of trainers in each state, who will then roll out training to the health facilities. Additionally, there is a need to strengthen QA for diagnostics at the national, zonal, and state levels. (\$150,000)
4. *Provide technical assistance in malaria diagnostics.* CDC will provide technical support for microscopic and RDT diagnosis. (\$12,000)
5. *Support to BCC to improve patient demand for diagnostics through activities at the community level that promote awareness of appropriate testing and treatment for malaria; and improve health-care provider adherence to test results through activities directed at health facilities.* (Costs covered under the ACSM section)

5. Pharmaceutical and commodity management

NMCP and PMI Objectives

The public sector procurement and supply chain management of essential medicines is very weak and fragmented. Consequently, frequent stockouts of all commodities, including ACTs, occurs. Supplies of malaria-related commodities, including ACTs, 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 purchasing more using revolving drug funds and/or oil and tax revenues. Not only are the sources of commodities varied, the distribution systems are as well. In principle, donor and government-procured essential medicines flow either through the national Central Medical Stores (CMS) to the state CMS or directly to the states. The supply of World Bank- and Global Fund-procured ACTs has varied and resulted in stockouts in some facilities

and the acquisition of medicines from local pharmacies—which are not always in line with national policy—by others.

The National Agency for Food and Drug Administration and Control is responsible for the registration of antimalarials and quality control at the point of entry for internationally procured drugs or at the factory gate for locally produced ones. This agency and the NMCP collaborate to conduct post-marketing surveillance of drugs.

Progress during the past 12 months

Despite the challenges, opportunities have emerged to help ameliorate some of the problems. The implementing partner, DELIVER, has made plans to assist the national and state malaria control programs by conducting a state-level quantification and gap analysis. The results will provide a better estimate of the needs and may show that PMI's procurements are meeting more than the estimated 22-35% of states' requirements. Abuja and Lagos lack warehouses capable of storing the malaria commodities according to standard pharm-grade guidelines, i.e., ample space, acceptable storage conditions and standard storage procedures, explicit QA mechanisms, and adequate product security. Consequently, DELIVER will secure access to two warehouses in other locations in 2013. While access will improve, the need for training personnel in warehouse management will continue and is being addressed.

In Ebonyi and Bauchi States, PMI and partners have designed a pilot system to top up delivery trucks. Trucks will deliver ACTs, SP, and RDTs to approximately 200 facilities in Ebonyi and 230 in Bauchi. This model is expected to be a push system that is based on regular data collection, bimonthly distribution, and reporting. The goal is to aim for full supply of facilities based on the data reported.

Challenges, opportunities, and threats

Supply chain capacity and processes, including secure warehouse space and management operations, vary by state with each having its own system for managing malaria commodities in its own CMS. With multiple procurers, variable supply chains between and within states, lack of reliable consumption data from all levels in the system, and weak logistics management systems in general, it is a challenge to establish a management system to track supply and develop a rational forecasting, ordering, and distribution system for malaria commodities.

There are also opportunities and challenges with private sector pharmaceutical producers and vendors. Various partners, including the World Bank and AMFm, have been resources for ACTs in the private sectors. It was hoped that PMVs, of which 49 were registered first-line buyers for AMFm, would increase the number of end-of-the-line distributors of ACTs. However, PMVs have not proven to be as effective in increasing the supply of ACTs as had been hoped, in part because there were not enough ACTs available in the market.

While there are almost 40 registered ACTs that are manufactured in Nigeria, to date there is only one producer that is WHO-prequalified for ACTs. Additionally, there are products from nonqualified foreign manufacturers, as well as artemisinin monotherapies, SP, and chloroquine in the private sector. Given the scope and size of the private sector market and its common use by many Nigerians, the NMCP has a difficult task when providing quality control measures in this sector.

A threat to the availability and affordability of ACTs in the private sector exists should AMFm end and no other subsidy program replace it. It is possible that fewer ACTs will be available and that they will become cost-prohibitive for some private sectors users.

Plans and Justification

Given the numerous challenges with the disjointed procurement, supply, and distribution system, PMI remains committed to strengthening pharmaceutical and commodity management systems at the state level and below, ideally to the facility level. The plan is to continue to train facility staff on the logistical management information system and provide technical assistance to support it becoming fully operational. In this way, facilities and states will improve their ability to generate reliable data on consumption, supply, needs, and distribution of pharmaceuticals and commodities.

Description and budget for proposed activities with FY 2013 funding (\$1,400,000):

1. *Strengthen the pharmaceutical management system* by improving forecasting, management, and distribution of pharmaceuticals and RDTs. This activity will help mitigate the risk of stockouts of malaria commodities and the improper disposal of expired drugs. (\$1,400,000)

6. Treatment

NMCP and PMI Objectives

The Nigerian National Guidelines for Diagnosis and Treatment of Malaria state that the objective of treating uncomplicated malaria is to rapidly cure the patient in order to prevent progression to severe disease and reduce morbidity and mortality. In addition, prompt appropriate treatment decreases transmission and can prevent or delay the emergence of drug resistance.

In 2004 the FMoH changed the drug policy to ACTs with artemether-lumefantrine as the first-line treatment for uncomplicated *P. falciparum*, and artesunate–amodiaquine as the alternate first-line drug. The NMCP has established 14 sentinel sites throughout the country to monitor the efficacy of the first-line treatment. The sites utilize the WHO standardized protocol and are scheduled to conduct the studies biannually. Drug therapeutic and efficacy trials were completed at seven of these sites in 2009. The study demonstrated that adequate clinical and parasitological response on day 28 was similar for both artemether-lumefantrine (96.3) and artesunate-amodiaquine (95.1%). The trials were planned for the other seven sites in 2011 but were postponed until 2012. The World Bank and Global Fund are supporting the 2012 drug trials.

The recommended treatment of uncomplicated malaria for children weighing less than 5 kg is oral quinine. Clinical malaria during pregnancy is to be treated with quinine as well, although ACTs may be used after the first trimester. For severe malaria, the Nigerian guidelines recommend intravenous (IV) or intramuscular (IM) artesunate, IV or IM quinine, or IM artemether. The recommended pre-referral treatment of severe malaria is IM or intra-rectal artesunate, quinine, or artemether.

The management of malaria in Nigeria may occur at home, in the community, or at the health facility. Initial malaria treatment is frequently sought in the private sector. The 2010 MIS found

that 57% of household members first sought treatment for fever at a chemist's or PMV's, including 56% of children under five. Most PMVs receive some informal on-the-job training as an apprentice on the recognition of basic symptoms of uncomplicated malaria and are empowered to provide treatment. The NMCP is also planning to expand community case management in the public sector through a community--oriented resource person. A guideline document on community case management of malaria is being finalized.

The 2010 MIS reports that of children under age five with fever, only about 49% received any antimalarial treatment. Of those children who received malaria treatment, only 12% took an ACT (26% urban vs. 8% rural residents). In contrast, 57% took chloroquine, and 22% took SP.

Contributing factors to the poor uptake of ACTs include low awareness of ACT treatment by health workers and patients; frequent stockouts in public sector health facilities; and the high cost of ACTs in the private sector.

Nigeria was selected as one of nine countries to pilot the AMFm. The AMFm, which receives financial support from UNITAID, DfID, and the Bill and Melinda Gates Foundation, is managed by the Global Fund. The goal of AMFm is to reduce the retail price of ACTs to a point that they are as affordable as many of the cheapest antimalarial monotherapies. Since the AMFm grant was signed in September 2010, Nigeria has placed orders for a large numbers of subsidized ACTs through first-line buyers. As of February 2012, over 85 million AMFm ACTs had been ordered for the private, private not-for-profit, and public sectors, and 68 million had arrived in country. The AMFm ACT price in the private sector has dropped to about 200 naira (\$1.27) per adult dose. However, numerous antimalarial monotherapies remain on the market, including chloroquine and SP.

The AMFm Phase 1 draws to a close in December 2012 and the future of the AMFm is uncertain. Therefore, an ACT Sustainability Working Group was established by Country Coordinating Mechanism for which CHAI was elected chair. The ACT Access Sustainability Sub-Committee is responsible for facilitating discussions around the development of an ACT access strategy to take effect in 2013.

Progress during the past 12 months

The NMCP as Global Fund Principal Recipient for the public sector added the 19 Yakuba Gowon Center states to its 18 states after the Yakuba Gowon Center was suspended from receiving Global Fund monies. Despite this change, stockouts continue throughout the public sector. In addition to ongoing procurement issues, the amount of malaria commodities to be brought in through Global Fund is not sufficient to meet the needs. Despite Global Fund Round 8 Phase 2 having been approved, the funding for commodities over the next three years through this mechanism falls considerably short of the estimated need.

World Bank funding for malaria has been administratively blocked since September 2011. Thus plans for commodity procurements in World Bank-supported states have been delayed. This has a direct impact on one PMI focus state – Bauchi. Previous commodity need estimates were based on the World Bank's covering Bauchi (population 5.6 million). If PMI must procure malaria commodities for Bauchi as well, there will be fewer commodities for the other PMI focus states.

The NMCP, with support from partners, particularly SuNMaP, is in the process of finalizing a harmonized training manual on malaria. Separate workshops were held on malaria program management and malaria service delivery. Within the service delivery component, there are training manuals on malaria case management in the hospital, malaria case management at the primary health care center, and malaria case management for patent medical vendors.

Over the past few years, partners within the two TSHIP states have increased the capacity of over 3,500 service providers for malaria case management. MAPS trained 271 health-care providers in case management during the first two quarters of FY 2012. The lack of ACTs is having an impact on case management training. Without adequate ACT supplies, the effectiveness of training to improve case management performance, supervision, and pharmaceutical management practices is limited. In addition, it is hard to justify rolling out community-based treatment to underserved rural populations when the associated health facilities have not been trained and sufficiently supplied with ACTs. Delays in ACT procurement and delivery have had an effect on PMI focus states as well. The first PMI-procured ACTs (1.3 million) finally arrived in country in May 2012. They were quickly transported to four states – Sokoto, Zamfara, Nasarawa, and Cross River. There are 3 million more ACTs in the pipeline to arrive this calendar year. Given that training in case management has taken place for health-care workers, the provision of ACTs and RDTs will greatly facilitate the rollout of case management in the PMI focus states.

CHAI is taking the lead in advocating at the national level for injectable artesunate. PMI is procuring 10,000 vials of injectable artesunate to support implementation in Cross River and Oyo States.

Within the private sector, PMVs provide very good geographical access to many rural communities. SFH, through Global Fund Round 8, introduced subsidized ACTs through pre-selected PMVs. These PMVs had agreed to a predetermined mark-up price for the ACTs. However, SFH was never able to fully supply the subsidized ACTs to the PMVs and could not evaluate this pilot due to stockouts.

Challenges, opportunities, and threats

The biggest challenge to date has been the lack of ACTs. Many health facility personnel have been trained in malaria case management through Global Fund, but there have been long-term ACT stockouts. In PMI focus states, a delay in ACT procurement has slowed case management trainings. MAPS wanted to ensure that ACTs were available before fully rolling out case management training at priority primary health care facilities. As PMI-procured ACTs began arriving in May 2012, malaria case management training accelerated. With the plus-up funding for FY 2012, there is an opportunity to keep priority primary health care facilities in PMI focus states at near full supply for the upcoming year. This will hopefully encourage states and LGAs to start procuring ACTs for the remaining health facilities.

One threat is that states may insist on distributing PMI-procured ACTs to all public health facilities in the states, eventually leading to stockouts in PMI priority primary health care facilities. The hope is to maintain a full supply of both ACTs and RDTs at these priority health facilities to demonstrate well-functioning facilities and collect consumption data. The threat for 2014 is that the funding for commodities will decrease just as priority primary health care

facilities are expanding. Another looming threat is the end to AMFm. Although AMFm did not reach its targets, the program did greatly increase the availability of WHO-approved ACTs in the private sector.⁴ As noted above, discussions are already underway to develop a plan to fill the void.

Commodity gap analysis

The table below shows the estimated public sector ACT gap in PMI focus states for 2014.

Table E: ACT gap analysis for nine PMI focus states, Nigeria, 2014

State	Estimated Pop. in 2014	Fevers per Year (0.9 fevers/person)	Public HF* utilization (from 2010 MIS)	Est. ACT Need	80 % ACT need Roll Out	After RDT Reduction [#]	ACTs Available	PMI Support (FY13)	ACT Gap
	(in millions)								
Bauchi	5.7	5.1	0.3	1.5	1.2	1.0	1.0**	0	0.0
Sokoto	4.5	4.1	0.5	2.0	1.6	1.3	0	0.7	0.6
Cross River	3.6	3.2	0.3	0.8	0.6	0.5	0.2	0.3	0.0
Nasarawa	2.3	2.1	0.3	0.6	0.5	0.4	0.2	0.2	0.0
Zamfara	4.0	3.6	0.5	1.8	1.4	1.1	0	0.6	0.5
Ebonyi	2.7	2.4	0.2	0.5	0.4	0.3	0	0.3	0.0
Benue	5.2	4.7	0.3	1.4	1.1	0.9	0	0.6	0.3
Oyo	6.8	6.1	0.3	1.5	1.2	0.9	0	0.8	0.1
Kogi	4.1	3.7	0.3	1.1	0.9	0.7	0	0.5	0.2
Total	38.9	35.0		11.3	9.1	7.0	1.4	4	1.6
* HF – health facility # Based on 60% fevers tested, 50% positive for malaria, and 75% adherence to test results ** The ACT quantification assumes that World Bank will continue to cover malaria commodities in Bauchi through 2014.									

⁴ AMFm Evaluation Results presentation, August 2012, Abuja, Nigeria

Plans and Justification

PMI will support training and supportive supervision for case management of malaria at public health facilities in seven MAPS and two TSHIP states. With FY 2013 funding, MAPS will continue to expand beyond the original four health facilities per LGA. The FY 2012 plus-up funding will allow PMI to procure sufficient ACTs to cover priority health facilities within PMI focus states. However, even with Global Fund Round 8 Phase 2 funding, there will be large ACT gaps throughout the country including PMI focus states. A key to sustaining progress will be getting states to invest their own resources in malaria commodity procurement. With FY 2013 funding, PMI will support the following activities:

Description and budget for proposed activities with FY 2013 funding (\$10,040,000):

1. *Procure ACTs and severe malaria drugs in quantities to be determined.* The primary aim of the procurements will be to help prevent stockouts and fill gaps of antimalarial medications at public health facilities in eight of nine PMI focus states (Bauchi's commodities are supplied by World Bank). (\$5,000,000)
2. *Train and provide supportive supervision for case management at public health facilities in seven MAPS and two TSHIP states with some effort at the community level.* Improvement of malaria case management in the public sector will focus on increasing training and motivation of the health workers. At the community level, PMI will work with the NMCP and relevant partners to explore the use of innovative strategies to improve the rollout of integrated community case management of childhood illnesses. PMI will also investigate possibilities with partners and the NMCP to improve case management in the private sector. (\$5,040,000)
3. *Provide technical support for case management of malaria with one USAID TDY.* (\$0)
4. *Support BCC activities to improve treatment-seeking behavior and treatment adherence through interpersonal communication, community awareness and mobilization, and radio messaging.* (Costs covered under the ACSM section)

CROSS CUTTING

7. Advocacy, Communication, and Social Mobilization

NMCP and PMI Objectives

The RBM partners, under the leadership of the NMCP, have revised and updated the National Malaria ACSM Strategic Framework and Implementation Plan. The framework and plan are consistent with the NMCP Strategic Plan 2009-2013. The strategic framework is designed to provide an integrated communication plan that standardizes messages and tools for all partners with the understanding that states may need to adapt it to their particular situation. The strategic

framework recommends various channels of communication based on specific attributes of the target audiences, such as literacy levels, access to television or radio, and other social and economic characteristics. The objective of these interventions is to increase and/or improve LLIN ownership and net care, repair, and use; patient demand for diagnostics by promoting awareness of appropriate testing and treatment for malaria; health-care provider adherence to test results through activities directed at health facilities; delivery of IPTp at the facility level; and treatment seeking behavior and treatment adherence. In general, households and families are reached using radio, community drama, printed materials, community and religious leaders, and through community support groups and household visits of volunteers as interpersonal communication.

The National Malaria ACSM branch is one of the six branches of the NMCP and is supported by the ACSM technical sub-committee. Members of the technical committee are drawn from RBM partners including PMI. The ACSM technical sub-committee plays critical roles in the revision of the strategic framework, supports development of tools, and assists in coordination of activities across RBM partners. It is also responsible for reviewing the technical content of all IEC/BCC messages pertaining to malaria to ensure accuracy and harmonization of messages.

At the state level the IEC/BCC program liaises with the state malaria focal person. In PMI focus states, the state malaria focal persons are supported by states' ACSM technical committees, which were recently established through the MAPS project.

Progress during the past 12 months

PMI supports IEC/BCC as a cross-cutting activity focusing on all interventions: case management, including diagnostics, ITNs, and IPTp. Implementation is principally through PMI implementing partners MAPS and TSHIP, which work in the nine PMI focus states, and ESMPIN, which has interpersonal communication (IPC) activities in four of the nine focus states and nationwide through mass media. Activities include increasing and improving the information delivered by facility-based and community health workers, use of local language radio transmission to diffuse malaria messages on malaria control and treatment, and use of IPC through volunteers at the community level. PMI also supports radio shows in Hausa through Voice of America, which covers many of these same issues and reach a large listenership across much of northern Nigeria. Voice of America also works with journalists to identify and develop appropriate malaria news.

PMI projects have supported creation of six state ACSM committees 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.

PMI supports the update of the National Advocacy Kits, which were inaugurated by the Honorable Minister of Health during World Malaria Day 2012 to harmonize malaria messages. PMI also supports operations research on approaches to promote net care and repair through the NetWorks project and potentially through International Federation of the Red Cross. PMI supported a study on the social and ecological barriers to completion of IPTp in Nigeria through C-Change.

Challenges, opportunities, and threats

Challenges: Misperceptions, lack of knowledge, and poor practices among the population are a major challenge. While awareness about malaria transmission has increased in Nigeria, many misconceptions persist. Although 82% of women interviewed in the 2010 MIS identified mosquitoes as a source of malaria, common misconceptions persist as other causes cited include dirty surroundings (27%), the presence of stagnant water (12%), and eating certain foods (6%). Among children under five treated for malaria in the two weeks preceding the survey, only 6% took an ACT, while 29% took chloroquine. Antenatal clinic attendance is low, only 58% of women received ANC from a skilled provider, and overall only 17% received two doses of IPTp. All of these data point to the need for increased and better IEC/BCC for malaria prevention and control.

Opportunities: The vibrant and independent media in Nigeria provides opportunities to reach the public. Over 120 local radio stations are distributed throughout the country and can be found in all states, with heavier concentrations in the urbanized areas. Local radio stations broadcast in the range of local languages, providing opportunity for targeted communications. According to the 2010 MIS, 63% of women heard malaria messages on the radio while 39% reported seeing them on television.

Various types of community structures provide opportunities to promote BCC in the communities. The robust local, cultural, traditional, and religious gatherings provide opportunities to reach rural communities. PMI will take advantage of community structures to promote malaria messages.

Plans and Justification

PMI will continue to support the BCC efforts of the NMCP to create demand for malaria diagnosis before treatment, treatment with ACTs as the drug of choice, IPTp for pregnant women, and nightly use of ITNs for prevention of malaria. The 2010 MIS results indicate that mass media is effective in reaching the target population, with 63% of women having received key malaria message through the radio and 39% through television. PMI will continue to support dissemination through these mass media channels as well as interpersonal household-level communication.

Specifically, PMI will support communication on LLIN care and use after mass campaigns, with increasing association with continuous delivery. As PMI scales up improvements to case management and IPTp, health-care workers will increasingly become important agents for promoting LLINs, IPTp, and ACTs. Additionally, PMI will strengthen the integration of BCC messaging in the health-care setting to strengthen the role of community health workers as active promoters of LLINs, IPTp, and ACTs.

Description and budget for proposed activities with FY 2013 funding (\$2,950,000):

1. *PMI will support a combination of IEC/BCC and social marketing through the ESMPIN project.* This will include intense IPC activities in four PMI focus states (Oyo, Zamfara, Bauchi, and Sokoto); mass media nationwide that includes radio spots, drama, and

magazines broadcast in four languages. ESMPIN conducts social marketing for LLINs purchased by SFH and sold at near full cost. (\$1,000,000)

2. *PMI will support IEC/BCC on malaria prevention and treatment* through the two bilateral PMI implementing partners (MAPS and TSHIP) across the nine focus states. (\$1,820,000)
3. *PMI will continue to support advocacy for malaria prevention and control* through the mass media, including collaboration with journalists to identify and develop appropriate malaria news. (\$150,000)

8. Monitoring and evaluation/Operations research

NMCP and PMI Objectives

In 2009, the NMCP developed the National Monitoring and Evaluation Plan for Malaria Control in Nigeria. The process was led by the NMCP's M&E Technical Working Group and was supported by a comprehensive group of partners including Global Fund, WHO, World Bank, UNICEF, USAID, DfID, and local non-governmental organizations. The plan covers three main areas: strengthening routine data systems, strengthening periodic household surveys, and improving operations research to assure new intervention strategies are evidence-based. The plan was updated in 2011 with the M&E Plan for Malaria Control in Nigeria 2011-2013.

PMI's 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, supports regular population-based surveys such as the MIS and the DHS to provide estimates of the status of key malaria indicators, and supports operations research needed to guide programmatic decisions.

The Health Information Unit of the FMOH and the NMCP have established a dual approach to the collection of routine malaria data. The national HMIS to date has included a small number of malaria indicators (number of fever/malaria cases and treatments) that are to be reported monthly from health facilities to the LGA level. The LGA HMIS focus persons collate and summarize these data quarterly and submit reports to their respective states. The state HMIS office is responsible for collating data from the LGAs and reporting to the national HMIS coordinator on a biannual basis. This system is currently being revised by the FMOH. The goal of the new system is to integrate data collection and reporting for malaria, HIV/AIDS, and tuberculosis.

In response to inherent limitations in the routine HMIS data, such as the limited number of malaria indicators, incomplete data, and lack of timeliness, the NMCP established a parallel system for routine malaria reporting in response to Global Fund requirements. This system is now implemented in all 36 states and the Federal Capital Territory of Abuja with varying degrees of success. The malaria-specific information system requires that only ten health facilities per LGA report malaria data on a monthly basis to the LGA, where data are collated and reported to the state on a monthly basis. The state-level malaria office collates data from all LGAs and enters these data into a spreadsheet database that is submitted to the NMCP M&E unit

monthly. A major weakness of the system is reported to be untrained and unmotivated staff at the health facility, LGA, and state levels.

The WHO State Coordinator collects data from the Infectious Disease Surveillance Report on 40 infectious diseases including malaria cases on a monthly basis. Reporting is not 100%, but covers more health facilities than the malaria surveillance system.

Progress during the past 12 months

The USAID PMI Resident Advisor continues to chair the M&E sub-committee. Through this sub-committee, progress has been made in harmonizing the malaria information systems. In April 2012, the Department of Health Planning, Research & Statistics held a four-day stakeholders' workshop to harmonize all data collection and reporting tools into one HMIS. The NMCP and malaria partners participated in the process. The harmonized HMIS tools were finalized in June 2012. The Global Fund supports the harmonized HMIS for the collection of epidemiologic data and expects the Logistics Management Information System to provide data on malaria commodities. With partner support, these new tools are hoped to be in use by January 2013.

The Nigeria 2010 MIS report was finalized in February 2012 with a dissemination workshop on the 28th of the month. With the dataset released, a sub-analysis was undertaken to determine the baseline levels of the malaria indicators in PMI focus states. The results were reported above in the Progress on Coverage/Impact Indicators section.

A Multiple Indicator Cluster Survey was conducted from January to March 2011. The survey collected data at the state level on ITN ownership and use, malaria diagnosis and treatment, and IPTp. After an initial report was released in August 2011, issues with the method of weighting were identified and the report was pulled. The final report release is still pending.

Initial planning has begun on the next national DHS, which is planned for 2013. PMI, along with other USAID health sectors, is providing support. The DHS data will be collected during the months of February and March 2013 and will not include any biomarkers.

The NMCP, with support from WHO, DfID, and PMI, is undergoing a malaria program review. The report of Phase II (internal thematic desk review) of that review is expected in August 2012 and Phase III (joint program field review) in September. The review will eventually result in a new five-year malaria strategic plan based on recommendations from Phase IV (final report).

The NMCP, in collaboration with WHO and with support from the Global Fund, conducted a rapid impact assessment in six states (Ekiti, Rivers, Niger, Osun, Imo, and Kogi) using the WHO protocol to assess and quantify the impact of the scaled-up interventions (ACTs and LLINs) on malaria morbidity and mortality over time. The rapid impact assessment report is still pending. PMI support for operations research in routine LLIN distributions and IPTp is described in the relevant intervention sections above.

PMI supports FMoH staff participation in the CDC Field Epidemiology and Laboratory Training Program (FELTP). Two residents have graduated with one posted at the state level and the other posted at the NMCP Case Management Department. Presently, a second-year resident is posted

at the NMCP M&E unit and two first-year residents are posted at state ministries of health (Oyo and Nasarawa).

Challenges, opportunities, and threats

Malaria data collection and reporting from the health facility to the LGA and then to the state and national level is very poor. The creation of a parallel malaria information system did not improve the situation. Poor reporting at the facility level is the result of several factors: poor training, lack of motivation, confusion over multiple reporting forms, no supportive supervision, and essentially no accountability or feedback. The harmonized HMIS provides an opportunity to greatly improve the availability of consistent malaria information. The transition to the one HMIS will be a lengthy process and success will vary from state to state. PMI has implementing partner M&E personnel on the ground in the nine focus states who will support the harmonization process. However, if malaria partners are the only ones pushing the harmonized HMIS forward, the likelihood of success is low.

Plans and Justification

Monitoring and evaluating PMI's activities will rely on a combination of routine malaria data collection, household surveys, and information from implementing partners. With FY 2013 funds, PMI will provide support to strengthen routine malaria data collection at the health facility, LGA, and state levels. The objective is to achieve 100% on-time reporting of malaria cases by LGAs and 80% by functioning health facilities in PMI focal states. PMI will also support a second MIS in 2014 to measure progress in malaria control in Nigeria. Data collection will commence approximately 18 months after DHS 2013 and include anemia and parasitemia. With FY 2013 funds, PMI will support the following activities:

Description and budget for proposed activities with FY 2013 funding (\$4,409,000):

1. *Strengthen routine M&E systems in nine focus states:* Support to strengthen routine malaria information systems at health facility, LGA, and state levels in seven MAPS and two TSHIP 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 through a harmonized HMIS. Activities will include an assessment of malaria core indicators, and an evaluation of reporting systems at all levels to include a review of completeness and timeliness of malaria reporting. Activities will be conducted in collaboration with WHO and other partners to assure harmonized data indicators and reports are used nationally. Emphasis on data analysis, use, and dissemination at the LGA, state, and national levels will also be a priority. (\$2,600,000)
2. *Monitoring and Evaluation Management System:* Support the collection and reporting of USAID mission-specific performance data from all PMI implementing partners. Data will be collected and reported on an annual basis. (\$185,000)

3. *FELTP*: Support training of three NMCP and/or state-level staff in epidemiologic methods, data analysis techniques, operations research, and strategic information for public health decision making through CDC's FELTP. This program will help build needed expertise and skills in epidemiologic principles and concepts and lead to improvements in data collection and use by NMCP and state-level M&E staff. The FELTP residents will support the monitoring of malaria burden in the PMI focus states and ultimately assist in measuring the impact of program scale-up on malaria morbidity and mortality. (\$300,000)
4. *Provide support to the national MIS planned for 2014*. The planning for the next MIS has not started. The PMI contribution is likely to decrease as other malaria partners in Nigeria (Global Fund, World Bank, DfID) make financial commitments to the survey. (\$1,300,000)
5. *Technical Assistance for M&E strengthening from CDC*: CDC to provide two in-country technical assistance visits to strengthen M&E during FY 2013. (\$24,000)
6. *Entomological monitoring for insecticide resistance*: Although IRS will not continue in Nasarawa, entomologic monitoring is critical to guide the selection of insecticides by others undertaking IRS and to provide information on resistance to pyrethroids used in LLINs. (Costs covered under the IRS section)
7. *Operations research*: Support to operations research on routine LLIN distribution strategies, net care and repair, and community-based LLIN distribution. (Costs covered under the ITN section)

9. Health system strengthening/Capacity building

NMCP and PMI Objectives

Malaria control cannot be effectively conducted in isolation. The Nigerian approach to malaria control is part of the revised and comprehensive health policy founded on strengthening the overall health system to reach the MDGs.

Global Fund, World Bank, and other donors have been contributing primarily to building capacity at FMoH level. PMI (through the MAPS project), DfID, the SuNMaP project, and Global Fund provide support to the NMCP to organize coordination meetings with partners and conduct trainings. These partners also help build capacity at the state, LGA, and facility levels. Technical expertise varies greatly across states and LGAs as does program management and M&E expertise. PMI focuses on strengthening state and LGA abilities to plan, budget, implement, supervise, monitor, and evaluate their malaria control and prevention efforts in the nine PMI focus states.

Progress during the past 12 months

PMI, through the TSHIP and MAPS projects, has supported training, refresher training, supportive supervision, provision of job aids, and other activities to improve delivery of malaria interventions in 1,456 primary health care and secondary health facilities in nine PMI focus

states. TSHIP has also worked to a lesser extent at community level to establish integrated community case management of childhood illnesses.

Forty state-level laboratory technicians received an intense two-week training-of-trainers course on malaria diagnosis, microscopy, and RDT use, and these trainers have trained 228 medical laboratory technicians in six states. Management and planning skills have been improved through the development, with state ministries of health staff, of state malaria strategies and annual work plans. These activities have been supported by the state malaria partners' coordinating body (state technical working groups for case management, communication, M&E). Other PMI partners working with NMCP and other Nigerian government entities are building capacity for M&E and for operations research, as seen in the government participation in population-based surveys (MIS), and pilot studies (net care and repair, LLINs durability, and innovative LLIN distribution approaches).

PMI has also contributed to strengthened entomological monitoring capabilities, particularly for monitoring insecticide resistance; and trained over 250 personnel in both the techniques of spraying insecticides for IRS and in overall management of an IRS operation in IRS-focus LGAs. PMI supports NMCP in the coordination and harmonizing process of the national HMIS.

Challenges, opportunities and threats

Challenges: A key issue that needs to be addressed in the Nigerian health system is the weakness of the government's primary health care services. Observations by PMI Resident Advisors during field visits and available data indicate that public primary health care facilities have inadequate stocks of pharmaceuticals and support services, are not properly maintained, do not regularly pay their staff's salaries, and have inadequate record keeping.

Opportunities: A dynamic private sector offers an opportunity to fill part of the gap left by a weak primary health care system. The private sector represents an important share of health-care provision in Nigeria. This sector includes pharmacists and PMVs, outpatient clinics, private doctors, and hospitals. There is an opportunity the sector will help to ensure better public/private partnerships in the provision of health care.

Description and budget for proposed activities with FY 2013 funding (\$200,000):

1. *Coordination of NMCP's activities at national, state, and LGA levels to strengthen implementation of malaria control activities.* PMI will support the NMCP's role as the lead coordination body through meeting support, supervision support, and training. PMI will also provide support to nine states to plan, implement, and monitor their malaria control programs. This may include support for workshops, travel, technical assistance to states and other related activities. (\$200,000)
2. *Support the FELTP.* PMI will support three FELTP trainees. (Costs covered under the M&E section)
3. *Technical assistance* through PMI in-country staff for project coordination, programming, partnership and managing of malaria projects, malaria-related policies, and guidelines dissemination. (Costs covered under Staffing and Administration section)

4. *Support to states and LGAs* through implementing partners (MAPS, DELIVER and TSHIP) to strengthen supportive supervision by state and LGA workers. (Costs covered across MAPS and TSHIP activities in various sections above)

10. Staffing and Administration

Two Resident Advisors, one representing CDC and one representing USAID, are in place. In addition, one senior-level Foreign Service National was added to the team in June 2012. All PMI staff members are part of a single interagency team led by the USAID Mission Director or his 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 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, and reporting of results. PMI staff members report to the USAID Mission Director or his designee. The CDC staff person is supervised by CDC both technically and administratively. All technical activities are undertaken in close coordination with the FMOH/NMCP and other national and international partners, including WHO, UNICEF, the Global Fund, World Bank, and the private sector.

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

Description and budget for proposed activities with FY 2013 funding (\$2,354,000):

1. *In-country staff and administrative costs* for oversight to PMI's malaria activities and technical assistance to the NMCP. (\$2,100,000)

IV. Tables

TABLE 1
FY 2013 Budget Breakdown by Partner

Partner Organization	Geographic Area	Activity	Total Budget, by Partner
DELIVER	8 states: 7 MAPS states and 1 TSHIP state	Procurement of commodities for malaria, including LLINs, ACTs, RDTs, and SP.	\$18,759,000
IRS IQC 2 TO 4	Federal and state levels	Strengthen capacity for entomological monitoring at federal and state levels, to include an insecticide resistance surveillance course for 40 Nigerian IRS staff.	\$865,000
TSHIP	2 TSHIP states	Implement all malaria interventions in two northern states, including delivery of LLINs, improved quality and access to diagnosis and treatment, and increase uptake of IPTp; use IEC/BCC to create demand and use of malaria prevention and control products; strengthen and build capacity for routine malaria data at state and LGA level.	\$2,000,000
MAPS	7 MAPS states and Federal NMCP	Implement all malaria interventions in the seven MAPS states, including delivery of LLINs, improved quality and access to diagnosis and treatment, and increase uptake of IPTp; use IEC/BCC to create demand and use of malaria prevention and control products; strengthen and build capacity for routine malaria data at state and LGA level. Provide technical and logistic support to the NMCP	\$16,000,000
CDC/IAA	Federal and state levels	Provide technical assistance for malaria diagnostics, M&E, training and supplies for monitoring insecticide resistance monitoring; support 3 Nigerian NMCP and/or SMCP staff individuals for the FELTP	\$391,000

MEMS	National	Assistance with management of PMI reporting.	\$185,000
NetWorks	Zamfara, Nasarawa and Cross River states	Develop and roll out innovative approaches for LLIN distribution in three MAPS states that can be used as appropriate in other MAPS and TSHIP states.	\$300,000
Voice of America	Nationwide	PMI will support advocacy for malaria prevention and control through the mass media, including working with journalists to identify and develop appropriate malaria news.	\$150,000
ESMPIN	Nationwide	Support to IEC/BCC through IPC and mass media for malaria prevention and treatment, including social marketing of LLINs and ACTs	\$1,000,000
DHS Macro	Federal	Support for 2014 MIS	\$1,300,000
Walter Reed Army Institute of Research (DOD)	9 states: 7 MAPS states and 2 TSHIP states	Support diagnostic TOTs and strengthen and expand QA for microscopy and RDTs.	\$150,000
USAID/ CDC	Nationwide	Support for USAID and CDC annual staffing and administration costs.	\$2,100,000
		TOTAL	\$43,200,000

TABLE 2
FY 2013 Planned Obligations Nigeria

Proposed Activity	Mechanism	Total Budget	Commodities	Geographic area	Description of Activity
ITNs					
Procure approximately two million LLINs	DELIVER	\$10,259,000	\$10,259,000	8 states: 7 MAPS states and 1 TSHIP state	Procure and deliver approximately 2.5 million LLINs to support LLIN continuous delivery approaches in 8 PMI focus states. (Commodities for Bauchi covered by World Bank.)
Logistic and operational support for distribution of about 2.5 million LLINs	MAPS	\$3,800,000	\$0	7 states under the MAPS project	Support for delivery of 2.5 million LLINs through continuous distribution approaches in nine PMI focus states with the goal of maintaining high LLIN coverage.
	TSHIP	\$400,000	\$0	2 TSHIP states	
Provide technical assistance to develop innovative, effective strategies for sustaining high LLIN coverage	NetWorks	\$300,000	\$0	Zamfara, Nasarawa and Cross River states	Develop and roll out innovative approaches for LLIN distribution in three MAPS states that can be used as appropriate in other MAPS and TSHIP states.
Technical assistance to PMI ITN activities	USAID	\$0	\$0	Federal and state level	1 USAID technical assistance visit for routine distribution of LLINs
Subtotal ITNs		\$14,759,000	\$10,259,000		
IRS					
Strengthen capacity at federal and state levels on IRS strategy and implementation	IRS IQC 2 TO 4	\$500,000	\$0	Federal and state level	Work closely with the NMCP and interested States on developing capacity and appropriate strategies for IRS at the national and specific state levels. This will include training of IRS personnel and technical consultation to state-run IRS programs.

Strengthen capacity for entomological monitoring at federal and state levels	IRS IQC 2 TO 4	\$365,000	\$0	Federal and state level	Strengthen capacity for entomological monitoring at federal and state levels, to include an insecticide resistance surveillance course for 40 Nigerian IRS staff.
Technical assistance to PMI IRS activities	CDC IAA	\$55,000	\$19,000	Federal and state level	3 CDC TDYs (\$12,000/each) to provide support for IRS and resistance test kits for 40 Nigerian staff attending training.
Subtotal: IRS		\$920,000	\$19,000		
IPTp					
Procure SP for IPTp for nine states, six MAPS states and two TSHIP states	DELIVER	\$100,000	\$100,000	8 states: 7 MAPS states and 1 TSHIP state	PMI will ensure that adequate quantities of SP are available to meet the needs for IPTp in eight states. (Commodities for Bauchi covered by World Bank.)
Provide support to strengthen policy and implementation of IPTp in seven MAPS and two TSHIP states as an integrated part of FANC	MAPS	\$1,800,000	\$0	7 MAPS states	Strengthen MIP policy and implementation across nine PMI focus states in close collaboration with NMCP and the Division of Reproductive Health, including improved delivery of IPTp and LLINs during pregnancy.
	TSHIP	\$180,000	\$0	2 TSHIP states	
Subtotal: IPTp		\$2,080,000	\$100,000		
Case Management					
Diagnostics					
Procure RDTs for 8 PMI target states	DELIVER	\$2,000,000	\$2,000,000	8 states: 7 MAPS states and 1 TSHIP state	The primary aim of the procurements will be to fill RDT gaps and help prevent stock-outs of antimalarial diagnostic tests in the public sector in eight states. (Commodities for Bauchi covered by World Bank.)

Strengthen and expand malaria diagnostic using microscopy and RDTs, through training and supportive supervision across nine PMI focus states	MAPS	\$1,800,000	\$0	7 MAPS states	Strengthen parasitological diagnosis using microscopy and RDTs in all nine PMI focus states. Principal interventions will be training and supportive supervision at secondary and primary health care facilities.
	TSHIP	\$360,000	\$0	2 TSHIP states	
Support diagnostic TOTs and strengthen QA for diagnostics	Walter Reed Army Institute of Research	\$150,000	\$0	9 states: 7 MAPS states and 2 TSHIP states	Support diagnostic TOTs and strengthen and expand QA for microscopy and RDTs.
Technical assistance to support to biological diagnostics of malaria	CDC IAA	\$12,000	\$0	Nationwide	1 CDC TDY to provide technical support to microscopic and RDT diagnosis of malaria.
<i>Subtotal Diagnostics</i>		<i>\$4,322,000</i>	<i>\$2,000,000</i>		
Pharmaceutical Management					
Support for strengthening pharmaceutical and commodity management system at national and state level	DELIVER	\$1,400,000	\$0	9 states: 7 MAPS states and 2 TSHIP states	Strengthening the pharmaceutical management system, forecasting, management and distribution of pharmaceuticals and RDTs. Prevent stockouts of malaria commodities and ensuring that expired drugs are disposed of properly.
<i>Subtotal: PSM</i>		<i>\$1,400,000</i>	<i>\$0</i>		
Treatment					

Procure ACTs and severe malaria drugs to supply eight PMI focus states.	DELIVER	\$5,000,000	\$5,000,000	8 states: 7 MAPS states and 1 TSHIP state	The primary aim of the procurements will be to fill ACT gaps and help prevent stock-outs of antimalarial medications in the public sector in eight states. (Commodities for Bauchi covered by World Bank.)
Strengthen case management of malaria at facility and community levels, including improved management of malaria negative cases in nine PMI focus states.	MAPS	\$4,500,000	\$0	7 MAPS states	Improve malaria case management in the public sector, with a focus on training and motivation of the health workers. At the community level PMI will work with NMCP and relevant partners to explore the use of innovative strategies to improve the roll out of integrated community case management of childhood illnesses. PMI will also investigate possibilities with partners and the NMCP to improve case management in the private sector.
	TSHIP	\$540,000	\$0	2 TSHIP States	
Technical assistance to support case management of malaria	USAID	\$0	\$0	Nationwide	1 USAID TDY to provide technical support for case management of malaria.
<i>Subtotal Treatment</i>		<i>\$10,040,000</i>	<i>\$5,000,000</i>		
<i>Subtotal Case Management</i>		<i>\$15,762,000</i>	<i>\$7,000,000</i>		
Advocacy, Social Mobilization and Communication					
Support to IEC/BCC through IPC and mass media for malaria prevention and treatment, including social marketing of LLINs and ACTs	ESMPIN	\$1,000,000	\$0	Nationwide	IEC/BCC using IPC and mass media for diagnosis and treatment, LLIN ownership and use, and uptake of IPTp, and social marketing for ACTs and LLINs, as part of a mixed model strategy to increase LLIN availability.
Support to IEC/BCC through IPC and mass	MAPS	\$1,600,000	\$0	7 MAPS states	IEC/BCC using IPC and mass media for diagnosis and treatment, LLIN ownership and

media for malaria prevention and treatment.	TSHIP	\$220,000	\$0	2 TSHIP states	use, and uptake of IPTp.
Support for radio IEC/BCC for malaria prevention and treatment	Voice of America	\$150,000	\$0	Nationwide	PMI will support advocacy for malaria prevention and control through the mass media, including working with journalists to identify and develop appropriate malaria news.
Subtotal ASMC		\$2,970,000	\$0		
M&E					
Strengthen and build capacity for routine malaria data at state and LGA level in nine PMI focus states	MAPS	\$2,300,000	\$0	7 MAPS states	Support training and supervision of data collection and management at selected health facilities, LGAs, and states.
	TSHIP	\$300,000	\$0	2 TSHIP states	
Monitoring and evaluation management system	MEMS	\$185,000	\$0	National	Assistance with management of PMI reporting.
Field Epidemiology and Laboratory training Program	CDC IAA	\$300,000	\$0	Federal	Training three NMCP and/or SMCP personnel in field epidemiology.
Support for 2014 MIS	DHS Macro	\$1,300,000	\$0	Federal	Support for 2014 Malaria Indicator Survey.
Technical assistance for M&E strengthening	CDC IAA	\$24,000	\$0	Federal and state levels	2 CDC TDYs to provide technical support for monitoring and evaluation.
Subtotal: M&E		\$4,409,000	\$0		
Capacity Building					
Provide support for coordination activities at federal level	MAPS	\$200,000	\$0	Federal NMCP	Support to the NMCP to strengthen technical capacity and national level coordination of malaria program.

<i>Subtotal: Capacity Building</i>		<i>\$200,000</i>	<i>\$0</i>		
Staffing and Administration					
In country staffing and administration costs	USAID/ CDC	\$2,100,000	\$0	Nationwide	Support for USAID and CDC annual staffing and administration costs.
<i>Subtotal: Staffing and Administration</i>		<i>\$2,100,000</i>	<i>\$0</i>		
GRAND TOTAL		\$43,200,000	\$17,378,000		