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 2017 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.

USAID
FROM THE AMERICAN PEOPLE

U.S. PRESIDENT'S MALARIA INITIATIVE

PRESIDENT'S MALARIA INITIATIVE

CÔTE D'IVOIRE

Malaria Operational Plan FY 2017

TABLE OF CONTENTS

ABBREVIATIONS and ACRONYMS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
ANC	Antenatal care
AS/AQ	Artesunate-amodiaquine
CDC	Centers for Disease Control and Prevention
CHW	Community health worker
CNCAM	*Commission Nationale pour la Coordination des Approvisionnements en Médicaments* (National Commission to Coordinate Supply Chain Commodities)
CY	Calendar year
DHS	Demographic and Health Survey
DPML	*Direction de la Pharmacie, du Médicament et des Laboratoires* (National medicines authority)
ESPC	*Établissement sanitaire de premier contact* (primary healthcare facility)
FY	Fiscal year
GHI	Global Health Initiative
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GOCI	Government of Côte d'Ivoire
iCCM	Integrated community case management
IEC	Information, education, communication
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
LMIS	Logistics management information system
LNSP	*Laboratoire National de la Santé Publique* (National Public Health Laboratory)
MSHP	*Ministère de la Santé et de l'Hygiène Publique* (Department of Health and Public Hygiene)
MICS	Multiple Indicator Cluster Survey
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MoH	Ministry of Health
MOP	Malaria Operational Plan
NMCP	National Malaria Control Program
NMSP	National Malaria Strategic Plan
NPSP	*Nouvelle Pharmacie de Santé Publique* (Central Medical Store)
PMI	President's Malaria Initiative
PNDAP	*Programme National de Développement de l'activité Pharmaceutique* (National Pharmaceutical Agency)
RASS	*Rapport Annuel sur la Situation Sanitaire* (Annual Health Situation Report)
RDT	Rapid diagnostic test
SBCC	Social and behavior change communication
SM&E	Surveillance, monitoring, and evaluation
SP	Sulfadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

I. EXECUTIVE SUMMARY

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

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

Côte d'Ivoire was selected as a PMI focus country in fiscal year (FY) 2017.

This first FY 2017 Malaria Operational Plan presents a detailed implementation plan for Côte d'Ivoire, based on the strategies of PMI and the National Malaria Control Program (NMCP). It was developed in consultation with the NMCP and with the participation of national and international partners involved in malaria prevention and control in the country. The activities that PMI is proposing to support fit in well with the National Malaria Control strategy and plan and build on prior investments by 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 Côte d'Ivoire, describes progress to date, identifies challenges and unmet needs to achieving the targets of the NMCP and PMI, and provides a description of activities that are planned with FY 2017 funding.

The proposed FY 2017 PMI budget for Côte d'Ivoire is $20 million. PMI will support the following intervention areas with these funds:

Entomological monitoring and insecticide resistance management:
The primary vectors of malaria in Côte d'Ivoire are *Anopheles gambiae* s.s., *Anopheles coluzzii*, and *Anopheles funestus* s.l. Considerable use of agricultural insecticides combined with scaling up of ITNs has resulted in widespread insecticide resistance, sometimes at high levels, although the distribution of

resistance to specific insecticides is heterogeneous. The NMCP has established six sentinel sites throughout the country for entomological monitoring (Yamoussoukro, Abengourou, Man, Korhogo, San Pedro, and Abidjan), and aims to add six more. The NMCP is also in the process of developing an insecticide resistance management plan. With FY 2017 funds, PMI will support entomological monitoring in six collection sites, as well as supporting monitoring in districts where IRS may be conducted.

Insecticide-treated nets (ITNs):
The primary vector control intervention in Côte d'Ivoire is the distribution of ITNs. The ITNs are distributed in mass campaigns and also through routine channels (ANC and EPI). The net coverage in Côte d'Ivoire was 67% in 2012, but it is expected that the coverage is higher after the most recent mass campaign in 2014/2015. The next mass campaign is planned for 2017/2018, and procurement of all ITNs will be done by the Global Fund. However, there is a gap for the distribution of these ITNs. With FY 2017 funds, PMI will support the distribution of these ITNs, as well as supporting the procurement and distribution of ITNs for routine distribution during EPI and ANC visits.

Indoor residual spraying (IRS):
The NMCP is not supporting IRS at this time, however, it is a part of the National Strategy and can be supported by PMI in the future. To ensure selection of appropriate districts, entomological monitoring will be conducted in districts chosen by the NMCP, taking into consideration malaria incidence and morbidity, population density, and other factors. The entomological monitoring will ensure that appropriate insecticides are chosen for IRS. Simultaneously, environmental and logistical assessments will be conducted. Budgeting exercises will also ensure that when the decision to begin spraying is taken, the program will not be delayed. FY 2017 funds will support the preparatory work for IRS in selected districts.

Malaria in pregnancy (MIP):
In 2013 the NMCP updated their national strategy to reflect the 2012 revised policy guidance from WHO regarding IPTp and issued a national guidance directive that SP be administered to women at their first ANC visit as long as the visit occurs at16 weeks or after quickening; a second dose of SP be administered at the next ANC visit that is a least 4 weeks after the first does and that a third dose of SP be administered at the next ANC visit that is a least 4 weeks after the second dose. With FY 2017 funding, PMI will procure SP to meet nationwide needs and provide support to strengthen IPTp implementation in public and private facilities in 35 districts, including training, supervision, and provision of supplies to allow SP to be delivered under direct observation.

Case management:
The NMCP has prioritized achieving universal coverage for diagnostic confirmation of suspected cases of malaria within public health facilities. Likewise, achieving universal coverage for diagnostic confirmation of suspected cases of malaria among children under five years of age at the community level has also been prioritized. Côte d'Ivoire's malaria diagnostic guidelines are in line with WHO recommendations that require every suspect malaria case to be laboratory confirmed before administering ACTs. With FY 2017 funding, PMI will procure ACTs, RDTs, and treatments for severe malaria to fill the nationwide needs. FY 2017 funding will support direct technical assistance and support to strengthen malaria case management in public and private NGO not-for-profit health facilities in 35 districts. PMI will also provide direct implementation support for integrated community case management (iCCM) in 35 districts, including supporting training and supervision of community health workers in iCCM including reporting. In accordance with WHO-recommended study protocol, PMI will

support therapeutic efficacy studies at two sites to monitor susceptibility of *P. falciparum* to first-line ACTs.

With FY 2017 funds, PMI will leverage ongoing and future support provided by the U.S. Government (primarily PEPFAR) to strengthen the overall supply chain system in Côte d'Ivoire ensuring that quality health commodities, including malaria inputs, are delivered in a timely fashion to service delivery points. Assistance will be targeted to the agencies and regulatory bodies who intervene in this field at the national level, as well as regional pharmacists, and health and supply chain staff at the district and health facility levels. PMI will work to expand the use of eLMIS to all health staff through training and support and help build capacity for in-country drug quality monitoring to test quality and legitimacy of drugs in private marketplace.

Health systems strengthening and capacity building:
Strengthening health systems is a fundamental objective of the NMCP in Côte d'Ivoire. The NMCP supports expansion of efforts to train, supervise, and overall capacitate healthcare workers to effectively deliver malaria prevention and control interventions at all levels of the health care system in Côte d'Ivoire. PMI will also provide support to the NMCP to convene different malaria technical working groups on a routine basis with the goal of ensuring effective coordination and technical support of all stakeholders active in malaria control efforts. In addition, PMI will provide support to hire and second four regional advisors each to one of four health zones and continue support for two long-term technical advisors seconded to the NMCP.

Social and behavior change communication (SBCC):
One of the strategic orientations listed in the National Malaria Strategic Plan 2012-2017 is the "strengthening of social mobilization and communication on preventive measures and case management of malaria", with activities aimed at correct and consistent use of ITNs, uptake of SP during ANC visits and correct treatment of fever. In addition to supporting the revision of the communications strategy, PMI, with FY 2017 funding, will support the development of messages and materials for SBCC of ITN use, IPTp, and case management at the health facility and community levels. PMI will also support training of community health workers in interpersonal communication and community mobilization.

Surveillance, monitoring and evaluation (SM&E):
The NMCP SM&E strategy calls for strengthening surveillance, monitoring, and evaluation at all levels of the health system to ensure timely and quality data as a means to assess progress of malaria interventions and measure reductions in malaria burden. With FY 2017 funding, in addition to contributing to the next household survey to measure malaria coverage indicators, PMI will support key data collection and analysis activities, including quarterly end-use verification surveys (EUVs) to monitor the availability and utilization of key antimalarial commodities at the health facility level. PMI will support efforts to strengthen routine data collection and use through training and supervision at the district level, as well as data review and validation meetings in the 35 districts and 7 regions covered by PMI.

II. STRATEGY

1. Introduction

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

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

Côte d'Ivoire was selected as a PMI focus country in fiscal year (FY) 2017.

This first FY 2017 Malaria Operational Plan presents a detailed implementation plan for Côte d'Ivoire, based on the strategies of PMI and the National Malaria Control Program (NMCP). It was developed in consultation with the NMCP and with the participation of national and international partners involved in malaria prevention and control in the country. The activities that PMI is proposing to support fit in well with the National Malaria Control strategy and plan and build on prior investments by 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 Côte d'Ivoire, describes progress to date, identifies challenges and unmet needs to achieving the targets of the NMCP and PMI, and provides a description of activities that are planned with FY 2017 funding.

2. Malaria situation in Côte d'Ivoire

Côte d'Ivoire is located in West Africa, encompassing an area of 322 462 km^2. It borders Mali and Burkina Faso to the north, the Gulf of Guinea to the south, Ghana to the east, and Liberia and Guinea to

the west. The political capital is Yamoussoukro, situated 248 km north of the economic capital of Abidjan. According to the 2014 General Population and Housing Census, Côte d'Ivoire's population was 22,671,331, with half located in urban areas (11,276,646, or 49.7%), and the remaining population situated in rural areas (11,394,685 or 51.3%). The population density is 74 habitants/ $km^{2.}$ Forty-three percent of the total population is less than 15 years of age, and 49% of the population is female. Women of childbearing age represent 24% of the population, while children under 5 years of age comprise 16%. The annual population growth rate is estimated at 2.6%, resulting in the proportion of children less than five years old continuously growing[1].

Malaria is endemic throughout Côte d'Ivoire the whole year, with peaks during the rainy season. The rains occur in line with a subequatorial climate between May and July for the main season and between October and November for the secondary season, and with a tropical climate from March to May. Côte d'Ivoire has a tropical climate with four seasons in the coastal and central regions and two seasons in the northern savannah region. The coastal and central region has (1) a long dry season from December to May and (2) a short dry season from July to October as well as (3) a long rainy season from May to July and (4) a short rainy season from October to November. The savannah region has a long dry season from November to May and a wet season from June to October.

Plasmodium falciparum (98 to 99 percent of cases) is the strain that causes most of the uncomplicated and severe cases found, followed by *Plasmodium malariae* (3 to 4 percent). Total parasitic prevalence for all strains varies from 64 to 75 percent.[2] The main vectors in Côte d'Ivoire are *Anopheles gambiae* s.s., *An. coluzzii*, and *An. funestus* s.s. The resistance level of the major vector, *Anopheles gambiae* s.l., to the insecticides used to impregnate mosquito nets varies depending on the study area, with mortality in susceptibility bioassays ranging from 39 to 95 percent for permethrin, 75 to 100 percent for deltamethrin and 50 to 100 percent for alpha-cypermethrin.[3]

Malaria continues to be a major public health problem and is responsible for approximately 2.3 million presumed and confirmed cases reported annually in children under five years old from health facilities.[4] Figure 1 illustrates a variable distribution by district of malaria incidence in children under five. It should be noted that 58 of the country's 82 districts, or 71 percent, have a high level of endemicity of 300 to 499 cases per 1,000. The national incidence is 291.79 cases per 1,000 amongst children under the age of five and 155.49 cases per 1,000 in the general population. Malaria parasite prevalence amongst children under that age of five by RDT was 48% nationally as reported by the 2016 Malaria Parasite and Anemia Prevalence Survey.

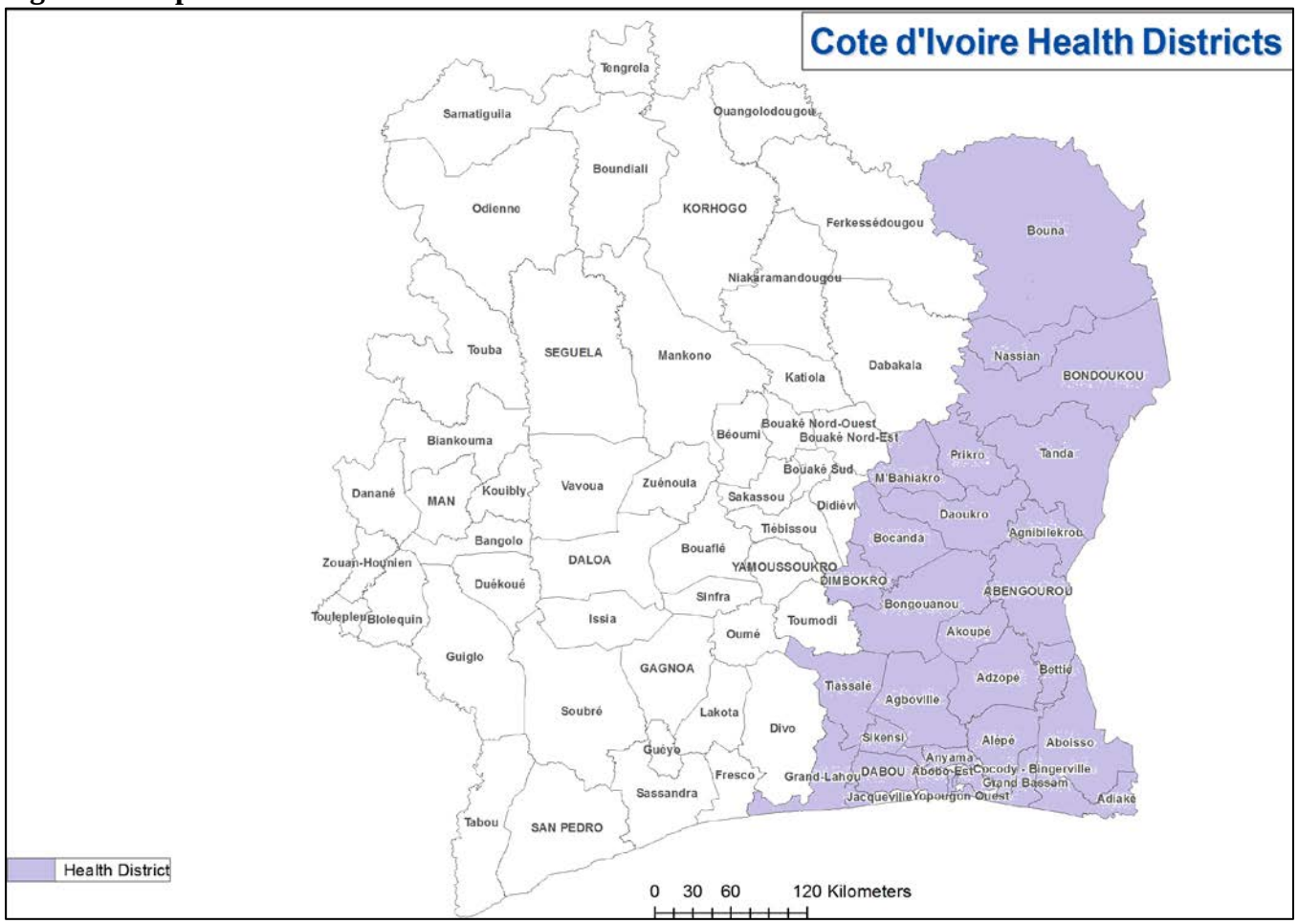
[1] *Institut National de la Statistique (http://www.ins.ci/n/)*
[2] Assi SB, Henry MC, Rogier C, Dossou-Yovo J, Audibert M, Mathonnat J, et al. Inland valley rice production systems and malaria infection and disease in the forest region of western Côte d'Ivoire. Malar J. 2013;12:233-246
[3] Koffi AA, Ahoua Alou LP, Kabran JPK, N'Guessan RN, Pennetier C. 2013. Re-visiting insecticide resistance status in *Anopheles gambiae* from Côte d'Ivoire: A nation-wide informative study. PLoS One 8(12): e82387.
[4] Annual Health Situation Report (*Rapport Annuel sur la Situation Sanitaire, (RASS))*, 2015

Figure 1. Malaria Incidence in children under five years of age, Côte d'Ivoire, 2015

*Rapport Annuel sur la Situation Sanitaire, 2015

Côte d'Ivoire is divided into 20 regional health departments, and 82 health districts. With FY 2017 funding, PMI will support national malaria interventions, but aim to focus technical assistance and distribution of commodities in seven eastern regions. Currently, the seven regions may include: Boukani-Gontougo, N'Zi-Ifou, Indenie-Djuablin, Sud-Comoe, Agneby-Tiassa-Me, Abidjan 1-Grands Ponts, and Abidjan 2. These seven regions include 35 districts (Figure 2), and cover over 45% of the population. PMI will work collaboratively with the Government of Côte d'Ivoire (GOCI), the Global Fund and other donors to ensure there is continued support of malaria interventions in the remaining 13 regions and 47 health districts. Given the strategic continuation of the Global Fund resources, redistribution and implementation of malaria activities within the aforementioned regions may not be feasible and specified amounts could change. PMI will remain engaged as country discussions ensue.

Figure 2. Proposed PMI-covered Health Districts in Côte d'Ivoire



3. Country health system delivery structure and Ministry of Health (MoH) organization

The health system in Côte d'Ivoire comprises an administrative element and a care element, which are interdependent. Each has three levels, which play specific roles in malaria control. The central level, which is overseen by the Minister of Health, comprises the Cabinet, two General Directorates, nine Central Directorates, 14 National Public Health Institutes and 24 Coordination Departments for the national health programs, including the NMCP. This level is responsible for defining health policy, general coordination of the healthcare system, resource mobilization, monitoring and evaluation, and operational research. In terms of care services, the central level is made up of four University Hospitals, five specialized institutions, five National Public Institutes, and the Medical Emergency Hospital. These care services provide not only treatment for severe malaria cases but also IPTp, routine distribution of ITNs, and conduct malaria-related operational research.

The intermediate level represents 20 regional health departments, each of which covers several health districts, which oversee all private, public and community-level health services within their respective health region. It comprises 18 regional hospitals, 81 general hospitals, and 2 specialized hospitals, which also provide treatment for both uncomplicated and severe malaria cases, IPTp and routine distribution of ITNs. Amongst its responsibilities are coordination of the implementation of the national health policy and monitoring and evaluation of health activities, including malaria control interventions. The regional

level hospitals serve as the first referral site for medical services that are unavailable at district level hospitals.

The peripheral level consists of 82 Health Districts, which are responsible for all the public, and private health services within the area it covers. Each Health District is administered by a District Management Team (*Equipe Cadre de District* (ECD)) led by the Departmental Director. The ECDs are responsible for the operational implementation of the national health policy. They monitor and supervise providers' application of malaria control guidelines and are responsible for collecting and submitting health data on malaria from the health facilities to the central level. The public sector is comprised of 1,945 health facilities *(établissements sanitaires de premier contact (ESPC)).* Each ESPC is managed by a qualified health professional (i.e. a medical doctor, specialized nurse or mid-wife). The ESPCs provide routine case management for uncomplicated malaria, IPTp, routine distribution of ITNs to pregnant women during their first antenatal care visit and to children under one year of age. Severe malaria cases are referred to district-level hospitals. The public sector consists of 3,215 doctors, 7,989 nurses, and 2,814 midwives. Based on the total population in 2015 of an estimated 23.2 million, the ratio of public-sector healthcare workers to the population is as follows: one doctor per 7,232 inhabitants, one nurse per 2,910 inhabitants, and one midwife per 1,990 women of childbearing age. An estimated 67% of the population lives at least 5km from the nearest health facility[5].

The community sector helps to support the public sector, although it does not yet have valid institutional and organizational frameworks. The status of community health workers (CHWs), who are its main operational actors, has yet to be defined. However, the GOCI is working to reinforce community case management for home-based case management in children under five years of age, which is primarily led by NGOs. The 2012 enumeration of health care workers reported a total of 14,520 health volunteers, comprising 12,933 CHWs and 1,587 health aides. Nationally, there are more than 8,500 traditional medicine workers (*tradipraticiens de santé (TPS)).*

In 2011, the private health sector consisted of 2,036 institutions (554 registered and 1,482 non-registered facilities), and included 13 private hospitals, 964 private health centers, and 463 company health centers[6]. These facilities provide a range of services including treatment of malaria. Within the company health centers, the NMCP collaborates with 100 not-for-profit enterprises, referred to as *Coalition des Entreprises de Côte d'Ivoire (CECI),* to provide a package of malaria prevention activities that include free SP to pregnant women, ITNs during ANC and to children under one year of age, improved diagnosis and treatment through trainings, and social, behavior change and communication activities among patients and healthcare workers. The NMCP also collaborates with 60 for-profit health facilities, *l'Association des Cliniques Privées de Côte d'Ivoire,* for the distribution of free ITNs and SP.

4. National malaria control strategy

The NMCP in Côte d'Ivoire was established in 1996. The NMCP revised its National Strategic Plan 2012-2015, however, due to the non-existence of a National Health Development Plan for the period after 2015, an agreement was reached with regional WHO experts to keep the title of the National Malaria Strategic Plan, 2012-2015, amended as follows: the National Malaria Strategic Plan 2012-2015, revised with additional planning for 2015 to 2017 (referred to throughout as: the National Malaria Strategic Plan, 2012-2017).

[5] Annual Health Situation Report (*Rapport Annuel sur la Situation Sanitaire, (RASS)),* 2015
[6] The National Malaria Strategic Plan, 2012-2017, Côte d'Ivoire

Key aims, objectives, and priority areas for the revised National Strategic Plan

According to the National Malaria Strategic Plan, 2012-2017, the program's aim, objectives and priority areas are:

Aims:

- Reduce malaria-related mortality to below one death per 100,000 inhabitants by the end of 2015 and maintain it at this level until 2017;
- Reduce the number of malaria cases by 75 percent by the end of 2015 compared with 2008 and maintain it at this level until 2017.

Objectives:

- Increase the proportion of the population (specifically children and pregnant women) sleeping under a long-lasting insecticidal net from 33 percent in 2012 (DHS) to 80 percent by the end of 2015 and maintain it at this level until 2017;
- Increase the proportion of pregnant women taking at least two doses of SP from 40 percent in 2012 (SNIS) to 80 percent by the end of 2015 and maintain it at this level until 2017;
- Ensure that 80 percent of malaria cases are confirmed and treated in accordance with national guidelines in public and private sector health care facilities and in the community by the end of 2015 and maintain it at this level until 2017.

Priority areas:

The country's strategic directions and priorities for malaria control as expressed in the National Malaria Plan, 2012-2017 are: (i) Achieve and maintain universal coverage of malaria prevention measures and their use, in particular vector control (ITNs) amongst the general population and IPTp; (ii) Achieve universal coverage for biological confirmation of suspected cases of malaria seen in public-sector health care facilities; (iii) Achieve universal coverage for biological confirmation of suspected cases of malaria at the community level amongst children under five years of age; (iv) Achieve universal coverage for correct treatment of cases seen in integrated public sector and not-for-profit private health care facilities; (v) Aim for universal coverage for correct treatment of cases of uncomplicated malaria in the community amongst children under five years of age; (vi) Strengthen social mobilization and communications on measures to prevent and treat malaria; (vii) Strengthen the program's management, coordination and leadership capacities at all levels; (viii) Develop an effective mechanism to mobilize resources for control activities.

The strategic plan introduces a number of new key interventions, as follows:

- an integrated approach to community interventions (malaria, pneumonia, and diarrhea) for a greater impact on mortality amongst children under five years of age;
- intensification of outreach strategy consultations where there are vulnerable populations (pregnant women and children under five years of age) in places located more than 5 km from a health center and disadvantaged or poor populations living in vulnerable neighborhoods and shanty towns;
- a more participative and inclusive role for the private sector in combating malaria, in particular in preventing malaria through introducing the distribution of ITNs and free dispensing of SP in private for-profit and not-for-profit private health care facilities, as well as collecting and incorporating data from this sector into the program data;
- greater involvement of faith-based organizations and women's associations, community leaders,

and local administrative authorities in advocacy and behavior change communications;
- assistance in respect of malaria prevention and treatment amongst populations in an emergency or disaster situation;
- extension and functionality of sentinel sites in order to establish a proper surveillance system for cases and deaths;
- creation of a stock of antimalarial supplies to assist populations in emergency and disaster situations.

Implementation of the National Malaria Strategic Plan 2012-2017 will be based on five operational areas of intervention and will cover (i) districts with a high population density, which will implement a package of activities for treating malaria and diarrhea, (ii) districts with a full integrated community case management (iCCM) package, and (iii) vulnerable neighborhoods situated on the outskirts of major cities. Activities will be implemented at an operational level based on contributions from all stakeholders, in particular women's and young people's associations, community-based organizations, religious leaders, the private sector, local authorities, and civil society. In addition to these groups, the advocacy framework will involve parliamentarians and the highest state authorities.

5. Integration, collaboration, and coordination

The NMCP prioritizes efforts to coordinate all partners that are active in malaria control. Key donor and technical partners supporting the NMCP include the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), WHO, and the United Nations Children's Fund (UNICEF).

The **Global Fund to Fight AIDS, Tuberculosis and Malaria** has been the major donor supporting malaria control efforts in Côte d'Ivoire over the last decade. Côte d'Ivoire's previous Global Fund malaria grant covered the seven-year period of 2009 – 2015 with the NMCP and the NGO CARE as the two Principal Recipients; the total grant amount for both components was $186 million (approximately $30 million/year). The current Global Fund grant covers the period of January 2015 through December 31, 2017, contributing support for case management in public and private sectors, ITNs, entomological surveillance, IPTp, SBCC, supply chain logistics, and monitoring and evaluation. The NMCP and NGO Save the Children are the two Principal Recipients with Save the Children implementing community level malaria control efforts in collaboration with four local NGOs as sub-recipients. The total funding granted to Côte d'Ivoire for the three-year 2015 – 2017 period is almost $120 million with the NMCP grant three-year total budget of $105 million and the Save the Children three-year grant total of $14.67 million. The Global Fund board allocated $111,117,115 funds for malaria resources for implementation during calendar year 2018-2020.

The **World Health Organization** provides technical support to the NMCP for the development and updating of malaria control policy and strategy documents for Côte d'Ivoire assisting the country to ensure consistency of these documents with global malaria strategic and policy normative guidance. WHO's country office is also engaged in supporting the Ministry of Health to develop key policy documents for the health sector that have a broader focus than malaria but that impact malaria service delivery and program implementation. For example, WHO is working with health sector partners to support the community health framework that will guide all community-based public health programming in Côte d'Ivoire.

The **United Nations Children's Fund** is an active member of the development partners' coordination group in which the U.S. Government is actively engaged. UNICEF Côte d'Ivoire provides support to four main areas within the health sector including support to the expanded program of immunizations,

maternal and neonatal health, integrated management of childhood illness and support to health systems and emergencies. Thus UNICEF supports the NMCP's efforts to implement effective diagnosis and treatment of malaria in the context of effective fever management among children at health facilities and at the community level. UNICEF has provided support for the implementation of iCCM in nine districts with the limitation for expansion being the lack of sufficient non-malaria iCCM commodities.

U.S. Government Programs

The **President's Emergency Program for AIDS Relief (PEPFAR)** supports investments to combat HIV/AIDS in Côte d'Ivoire, which contribute to strengthening health care worker capacity and the health care delivery system overall. With an annual budget of over $138 million, Côte d'Ivoire's PEPFAR program has significant investments in HIV prevention, treatment, care, and support for people infected and affected by the virus. Currently, the PEPFAR program supports 376 health facilities and 117 community sites in the seven regions under consideration for PMI support (Boukani-Gontougo, N'Zi-Ifou, Indenie-Djuablin, Sud-Comoe, Agneby-Tiassa-Me, Abidjan 1-Grands Ponts, and Abidjan 2). PEPFAR invests in the health facility and community level through relationship building, training, capacity building, and a decentralized supply chain system which focuses on the last-mile delivery model, all of which are opportunities that can be leveraged by the PMI program.

Over the last five years, PEPFAR has invested more than $5 million in the implementation and deployment of Côte d'Ivoire's District Health Information System (DHIS2) as the new national health data reporting system. DHIS2 is now operational in all 82 health districts as well as in 17 regional hospitals and 84 general hospitals. PEPFAR's investment in the Health Management Information System (HMIS), coupled with a successful implementation of an electronic logistics management information system (e-LMIS) for health commodities through health facilities, health districts pharmacies, and the central medical store, may create opportunities for collaboration with PMI.

Côte d'Ivoire is a recipient of **Global Health Security Agenda (GHSA)** funding aimed at strengthening the capacity of the health system to prevent and detect public health threats with program implementation at country level by USAID and CDC. PMI will work closely with the GHSA program to leverage GHSA's investments in laboratory strengthening including coordinating assessments and microscope procurement, disease surveillance including implementation of the DHIS2 platform, and strengthening public health skills among the health workforce through the CDC Field Epidemiology and Laboratory Training Program (FELTP).

At the present time, the United States Peace Corps does not have a program in Côte d'Ivoire.

Domestic Investments

The Government of Côte d'Ivoire projected within their Global Fund concept note proposal that their domestic budget for malaria primarily composed of salary support for health workforce involved in diagnosing and treating malaria is approximately $12.5 million per year. The Ministry of Health is also supporting the cost of 200,000 ITNs for the 2017-2018 mass campaign.

6. PMI goal, objectives, strategic areas, and key indicators

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

- Reduce malaria mortality by one-third from 2015 levels in PMI-supported countries, achieving a greater than 80% reduction from PMI's original 2000 baseline levels;
- Reduce malaria morbidity in PMI-supported countries by 40% from 2015 levels;
- Assist at least five PMI-supported countries to meet the World Health Organization's (WHO) criteria for national or sub-national pre-elimination.[7]

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

- Achieving and sustaining scale of proven interventions
- Adapting to changing epidemiology and incorporating new tools
- Improving countries' capacity to collect and use information
- Mitigating risk against the current malaria control gains
- Building capacity and health systems towards full country ownership

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

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

[7] http://whqlibdoc.who.int/publications/2007/9789241596084_eng.pdf

7. Progress on coverage/impact indicators to date

Table 1: Evolution of Key Malaria Indicators in Côte d'Ivoire from 2012 to 2016

Indicator	2012 DHS	2016 MICS /MIS*
% Households with at least one ITN	67%	76%
% Households with at least one ITN for every two people	32%	47%
% Children under five who slept under an ITN the previous night	37%	58%
% Pregnant women who slept under an ITN the previous night	40%	40%
% Households in targeted districts protected by IRS	NA	NA
% Children under five years old with fever in the last two weeks for whom advice or treatment was sought	43%	45%
% Children under five with fever in the last two weeks who had a finger or heel stick	11%	26%
% Children receiving an ACT among children under five years old with fever in the last two weeks who received any antimalarial drugs	17%	64%
% Women who received two or more doses of IPTp during their last pregnancy in the last two years	18%	NA
% Women who received three or more doses of IPTp during their last pregnancy in the last two years	NA	23%
Malaria prevalence in children 6-59 months (RDT; microscopy)	42% 18%	48% 37%
% Children under five years old with hemoglobin <8.0 g/dL	11%	NA
All-cause under five mortality	108/1,000	NA

* Preliminary results available as of March 2017

III. OPERATIONAL PLAN

PMI will support the NMCP to implement their national strategic plan aimed at reducing the burden of malaria in Côte d'Ivoire. PMI will prioritize investments across key proven interventions including vector control, malaria in pregnancy, case management and provide support to strengthen key aspects of the health system including supply chain logistics, drug quality monitoring and regulation, surveillance, monitoring and evaluation, and social behavior change communication. Consistent with PMI guidance, PMI will not provide support for larviciding or to support epidemiologic sentinel surveillance, both of which are components of the NMCP's current strategy. PMI will work at the national level with the NMCP and malaria partners to ensure technical assistance and support is available across all interventions. This national level support will include needed technical assistance for Global Fund financed implementation districts. PMI will also provide direct support for implementation in 35 contiguous districts that comprise over forty percent of the total population.

1. Vector monitoring and control

NMCP/PMI objectives

The current objective is 90% universal coverage (one ITN for two people) of the population at risk of malaria with insecticide-treated nets (ITNs), with 80% utilization among those with nets. The strategy for reaching this objective includes universal coverage campaigns and routine distribution for pregnant women through antenatal care (ANC) and children less than one year old through the Expanded Program on Immunization (EPI). The next universal coverage campaign, planned for 2017-2018, will be the third such campaign in Côte d'Ivoire, after a first campaign in 2011, and a second in 2014-2015. The current national malaria strategic plan also recommends indoor residual spraying (IRS) and larval control activities in the areas with the highest levels of malaria transmission, but due to a lack of funding, neither activity has been implemented to date.

A. Entomological Monitoring and Insecticide Resistance Management

The primary vectors of malaria in Côte d'Ivoire are *Anopheles gambiae* s.s., *Anopheles coluzzii*, and *Anopheles funestus* s.l. Considerable use of agricultural insecticides combined with scaling up of ITNs has resulted in widespread insecticide resistance, although the distribution of resistance to specific insecticides is heterogeneous. Control of malaria vectors in Côte d'Ivoire is through the mass distribution of ITNs and routine distribution during antenatal consultations and vaccination of children under one year of age.

Intervention overview/Current status

Six sentinel sites have been designated in Côte d'Ivoire for entomological monitoring. Some of these comprise multiple sites within a specific area. The sites chosen by the national program are: Yamoussoukro, Abengourou, Man (and the rural site Zele), Korhogo (and the rural site Kaforo), San Pedro, and Abidjan (comprised of Yopougon and Port-Bouët). Insecticide susceptibility studies were conducted in these sites in 2012 and the results have since been published.[8] The key bioassays results from this study are shown in Table 2 below.

[8] Koffi AA, Ahoua Alou LP, Kabran JPK, N'Guessan RN, Pennetier C. 2013. Re-visiting insecticide resistance status in *Anopheles gambiae* from Côte d'Ivoire: A nation-wide informative study. PLoS One 8(12): e82387.

Table 2: Percentage mortality (and numbers tested) of *Anopheles gambiae* s.l. exposed to diagnostic doses of insecticides in WHO susceptibility tests in sentinel sites in Côte d'Ivoire

	Organochlorine	Pyrethroid			Carbamate	Organophosphate
	DDT	Permethrin	Deltamethrin	Alpha-cypermethrin	Carbosulfan	Pirimiphos methyl
Site	**4%**	**0.75%**	**0.05%**	**0.05%**	**0.40%**	**1%**
Yamoussoukro	35 (101)	75 (124)	89 (123)	50 (100)	28 (106)	88 (102)
Abengourou	70 (106)	62 (101)	98 (101)	85 (105)	15 (98)	100 (75)
Zele	45 (53)	75 (77)		84 (25)		
Man	42 (101)	95 (94)	75 (88)	75 (99)	53 (100)	99 (100)
Kaforo		44 (78)	100 (51)			
Korhogo	10 (105)	39 (97)	97 (101)	70 (70)	17 (54)	85 (52)
San Pedro	58 (53)	85 (89)	97 (98)		35 (78)	
Yopougon	30 (102)	94 (98)	90 (104)	100 (99)	25 (100)	66 (98)
Port-Bouët	9 (101)	50 (98)	94 (96)	75 (97)		70 (98)

Plans and justification

Entomological monitoring will be conducted in six sentinel sites (in addition to the six already supported by the NMCP). The primary monitoring that will be conducted is annual susceptibility testing in each site, but this will involve molecular work to determine the species collected and the resistance mechanisms present (Ace1, kdr, N1575Y). In the past, these surveys have involved the transport of larvae to a central location, where they were reared for susceptibility tests using adult mosquitoes. That model will be used for these surveys.

Entomological monitoring will also be conducted in sites where IRS is under consideration. Again, insecticide susceptibility monitoring, species identification, and detection of resistance mechanisms will be conducted. Additionally, collections will be made monthly during the rainy season to determine the appropriate time to spray.

A vector control/insecticide resistance management plan, in addition to the national malaria control strategic plan, is currently in preparation. This plan will focus on collecting data to make informed decisions on vector control activities to be undertaken in Côte d'Ivoire. Additionally, the long-term strategy for IRS use in Côte d'Ivoire will be considered by the NMCP in collaboration with PMI, and in particular the Vector Control Working Group.

Proposed activities with FY 2017 funding: **($329,000)**

- **Support to six insecticide resistance monitoring sites:** Support will be provided to conduct entomological monitoring in six insecticide resistance monitoring sites. Activities will include insecticide bioassays and monitoring of insecticide resistance mechanisms ($100,000)
- **Entomological monitoring in potential IRS districts:** Entomological monitoring, including susceptibility testing, vector species identification and behavior, and testing for infectivity will be conducted in districts where IRS may be implemented. The results from these studies will be used to determine which districts to spray ($200,000)
- **CDC technical assistance visit:** Funding for two technical assistance visits from CDC to help develop entomological capacity at the national and prefectural level ($29,000)

B. ITNs

Intervention overview/Current status

The current policy of the NMCP in Côte d'Ivoire is to support the scaling up of ITNs through distribution in mass campaigns and distribution at ANC and EPI (0-12 months) visits. The most recent estimates of net use (MICS 2016) indicate that further work is needed both to increase access to ITNs, as well as increasing use by those who have access to nets. When only considering households that possessed a treated net, only 51% had slept under the net the previous night.

Two mass ITN distribution campaigns have been organized in Côte d'Ivoire. The first was conducted in 2011, which distributed 8,093,869 nets nationally. The second was conducted in 2014-2015, which distributed 14,667,718 nets. As a result of these campaigns, the net coverage in Côte d'Ivoire has gone from 10% in 2006 (MICS), to 67% in 2012 (DHS 2012), to 76% in 2016 (MICS 2016).

The next campaign is being planned for 2017-2018. This campaign will occur in three phases. The first two phases will cover the vast majority of the country in 2017, while the third and final phase will cover Abidjan in 2018.

Routine distribution of ITNs is currently being supported through funding from the Global Fund and the Ivoirian government. This provides mosquito nets for women attending antenatal consultations and those attending EPI for children aged 0-12 months. The distribution of ITNs through these activities provide an opportunity to ensure vulnerable populations maintain access to ITNs between mass campaigns as well as providing opportunities for sensitization on ITN use and care practices.

Distribution of nets from their arrival in country to the health districts is assured by the Central Medical Store (*Nouvelle Pharmacie de Santé Publique (NPSP))*. The NPSP has a central warehouse in Abidjan, and is constructing a regional warehouse in Bouaké.

Commodity gap analysis

Table 3: ITN Gap Analysis

Calendar Year	2016	2017	2018
Total targeted population	23,865,566	24,486,071	25,122,709
Continuous distribution needs			
Channel #1: ANC	1,026,219	1,025,901	1,080,276
Channel #2: EPI (0-1)	664,990	682,280	700,019
Estimated total need for continuous	1,619,209	1,735,181	1,780,296
Mass Distribution Needs			
2017 mass distribution campaign	0	13,603,373	0
Estimated total need for campaigns	0	13,603,373	0
Total ITN Need: Routine and Campaign	**1,691,209**	**15,338,554**	**1,780,296**
Partner Contributions			
ITNs carried over from previous year	0	0	0
ITNs from MOH	200,000	200,000	200,000
ITNs from Global Fund grant	1,469,889	15,018,123	0†
ITNs from other donors	0	0	0
ITNs planned with PMI funding	0	0	1,175,000
Total ITNs Available	**1,669,889**	**15,218,123**	**1,375,000†**
Total ITN Surplus (Gap)	**(21,320)**	**(120,431)**	**(405,296)†**

Assumptions: Pregnant women are 5% of the total population. Children under 1 are 3.24% of the population. Coverage of pregnant women by ANC (ie. first visit) and EPI coverage is estimated at 86%. The universal campaign need is the total population divided by 1.8.

†Global fund contribution has not been decided yet.

Plans and justification

FY 2017 funds will be applied to the continued scale-up of ITNs in Côte d'Ivoire, both through support to the mass campaign of 2017-2018 and the routine distribution through ANC and EPI.

The procurement of ITNs for the 2017-2018 campaign has been assured through support from the Global Fund and the GOCI. This support will cover the costs of procuring the nets and distributing them to health centers for the first two phases of the campaign. However, only the procurement costs have been supported for the 2018 third phase of the campaign, which includes Abidjan and surrounding areas. While the area targeted by the third phase is considerably less than that of the first two, it includes the most densely populated area of the country. A total of 3,353,433 ITNs will be distributed through this phase in 2018. PMI proposes to fund the distribution costs of the nets to the health districts for this third phase. There is a gap for the procurement and distribution of the ITNs for continuous distribution in 2017, but PMI will not be able to address this gap as the ITNs are needed before PMI activities will begin in 2018.

Additionally, nets for routine distribution through ANC and EPI will be procured and distributed. The current policy is to distribute ITNs to pregnant women attending ANC and to children under one year of age attending EPI sessions.

Insecticide-treated net durability will not be monitored for the 2017-2018 campaign, as the funding will not arrive in time for all necessary arrangements to be made. However, this activity is planned for the next mass distribution campaign, and it is expected that this activity will benefit from the experience of durability studies currently underway in neighboring countries.

Proposed activities with FY 2017 funding: **($6,235,725**)

- **Procurement of ITNs (routine):** Funding for procurement of approximately 1,175,000 nets to meet estimated needs in 35 health districts (and possibly beyond, Global Fund and Government of Côte d'Ivoire are expected to fund ITNs for remaining 46 health districts). ($3,384,000)

- **Distribution of ITNs (routine):** Funding for the routine distribution of nets to 35 health districts (Global Fund and Government of Côte d'Ivoire to fund distribution costs for remaining 46 health districts). ($1,175,000)

- **Distribution of ITNs (mass campaign):** Funding for the distribution of Global Fund procured 3,353,433 nets for the third phase of the mass campaign (2017-2018). ($1,676,725)

C. IRS

Intervention overview/Current status
The NMCP is not implementing IRS in Côte d'Ivoire at present. However, in the 2012 DHS survey, 1.5% of respondents stated that their house had been sprayed in the past 12 months. This is likely to have been done by non-governmental organizations or private operators.

As IRS is one of the primary malaria control strategies of PMI and is also an explicit strategy of the NMCP of Côte d'Ivoire, this intervention can be planned for implementation in Côte d'Ivoire. However, in order to ensure that the intervention is conducted appropriately, a year of preparation will precede this work in Côte d'Ivoire.

Plans and justification
While IRS will not be implemented with FY 2017 funding, there are several preparatory activities that will be conducted with FY 2017 funding. These include selection of appropriate districts for IRS, environmental assessments, budgeting/microplanning, susceptibility testing to determine appropriate insecticides, and procurement of these insecticides.

The choice of districts for spraying involves many factors, including susceptibility of vectors to a WHO-approved insecticide, sufficient human population density, and significant malaria incidence and morbidity. The National Malaria Strategic Plan 2012-2017 prioritizes these areas for IRS, which is consistent with PMI policies. PMI proposes to deploy IRS in 2-3 districts to be chosen from among the NMCPs IRS target districts as outlined in their national strategy. All of their IRS target districts record the highest level of malaria transmission in Côte d'Ivoire. IRS will be used primarily as a tool to rapidly drive down morbidity and mortality consistent with PMI guidance.

It is essential that the insecticides used for IRS be managed in a way to reduce their environmental impact, before, during, and after spraying. To this effect, an environmental assessment will be undertaken to ensure that facilities in the potential spray areas meet minimum safety requirements, and that the standard procedures for transporting, storing, applying, and disposing of insecticides can be met

in the targeted areas. Similarly, budgeting and microplanning exercises will be conducted to provide logistical information on the practicality of the different potential spray zones. Susceptibility testing will be conducted as described above (see Entomological monitoring and insecticide resistance management section). Once suitable insecticides have been determined, these insecticides and the necessary equipment can be procured in preparation for IRS activity implementation in 2019.

Proposed activities with FY 2017 funding: ($**1,849,525**)

- **IRS planning:** Funding for reconnaissance, environmental assessment, and budgeting/microplanning prior to targeting districts for future IRS and initial insecticide procurement ($1,849,525)

2. Malaria in pregnancy

NMCP/PMI objectives
The National Malaria Strategic Plan 2012-2017 emphasizes the protection of pregnant women from malaria as a key intervention due to the health risks malaria poses to pregnant women and their unborn child. The specific objectives outlined in the NMCP strategy include:

- At least 80% of pregnant women will be administered IPTp3 according to national guidelines
- At least 85% of pregnant women will sleep under an ITN
- 100% of malaria cases in pregnant women diagnosed at health facilities will be treated according to national guidelines

The NMCP supports the implementation of intermittent preventive treatment of pregnant women (IPTp) with sulfadoxine-pyrimethamine (SP) under direct observation and provided free of charge in both public and private health facilities. In 2013, the NMCP updated their national strategy to reflect the 2012 revised policy guidance from WHO regarding IPTp and issued a national guidance directive that specifies: a) SP be administered to women at their first ANC visit as long as this visit takes place at 16 weeks or after quickening, b) a second dose of SP be administered at the next ANC visit that is at least 4 weeks after the first dose of SP, and c) that a third does of SP be administered at the next ANC visit that is at least 4 weeks after the second dose. The 2013 revised guidance does not specify direction to health providers beyond three doses. In addition, the revised guidance reiterated previous guidance that specified SP should not be administered to women receiving cotrimoxazole.

In order to improve ITN coverage among pregnant women, the NMCP supports the provision of long-lasting ITNs free of charge to pregnant women at their first ANC visit in both public and private sectors.

According to national treatment guidelines, pregnant women diagnosed with symptomatic malaria are treated with quinine regardless of trimester of pregnancy. Guidelines only recommend ACTs for treatment of symptomatic malaria in pregnant women if quinine is contraindicated for them. Furthermore, national guidelines recommend that pregnant women receive iron-folate (150mg ferrous sulphate + 0.5mg folic acid daily) administered free of charge.

Intervention overview/Current status
According to the most recent MICS/MIS household survey, 93% of women attended ANC at least once during their most recent pregnancy, with attendance dropping off sharply for subsequent visits. According to health facility records 54% of all women attending ANC received two doses of IPTp with SP (431,765 out of 801,514 women attending ANC). According to the 2016 MICS, only 23% of all women attending ANC received at least three doses of ITPp during their most recent pregnancy (IPTp3

coverage). Over the last three years, with Global Fund support, the NMCP has worked closely with the Ministry of Health Department of Reproductive Health to update the IPTp policy with the aim of at least three doses of SP during pregnancy, to train health care providers in both public and targeted private sector facilities in the revised policy, and to update facility registers to capture IPTp3. The NMCP reports that over 1,700 health care workers have been trained in IPTp in the last year. As described previously, the NMCP supports the MOH's efforts to deliver defined health care services through an outreach strategy to communities that are located five kilometers or further from a health facility. Malaria prevention and treatment services offered during outreach clinics include IPTp and provision of ITNs to pregnant women and diagnosis (with RDT) and treatment of malaria for anyone presenting with fever (all ages).

Table 4: Status of IPTp policy in Côte d'Ivoire

WHO policy updated to reflect 2012 guidance	2013
Status of training on updated IPTp policy	Finalized
Number of health care workers trained on new policy in the last year	3,792 in public sector 70 in private sector
Are the revised guidelines available at the facility level?	Yes
ANC registers updated to capture 3 doses of IPTp-SP?	Yes
HMIS/ DHIS updated to capture 3 doses of IPTp-SP?	Yes

Commodity gap analysis

National level needs for SP have been supported through the Global Fund grant, sourced through quality-assured international suppliers. Procurement of antimalarial drugs by the Global Fund, including SP, are delivered to the new quasi-governmental national public health pharmacy which is then responsible for warehousing and distribution to health facilities nationwide. Despite efforts to ensure a stable supply of SP, national-level stockouts of SP have been frequently documented.

Table 5: SP Gap Analysis for Malaria in Pregnancy

Calendar Year	2016	2017	2018
Total population	23,865,566	24,486,071	25,122,709
Proportion of pregnant women from total population	5%	5%	5%
Total estimated number of pregnant women	1,193,278	1,224,304	1,256,135
ANC coverage rate of at least one visit*	86%	(assume same - 86%)	(assume same - 86%)
ANC1 target	923,597 (90%)	947,611 (90%)	972,249 (90%)
ANC2 target	820,975 (80%)	842,321 (80%)	864,221 (80%)
ANC3 target (20%)	205,244 (20%)	315,870 (30%)	540,138 (50%)
ANC4 target	0	0	216,055 (20%)
SP Needs			
Total number of pregnant women attending ANC (ANC1 + ANC2 + ANC3 + ANC4)	1,949,817	2,105,802	2,592,664
Total SP Need (in treatments)	**1,949,817**	**2,105,802**	**2,592,664**
Partner Contributions			
SP carried over from previous year	0	0	0
SP from MOH	0	0	0
SP from Global Fund	1,910,140	2,062,951	TBD
SP from other donors	0	0	0
SP planned with PMI funding	0	0	2,592,664†
Total SP Available	**1,910,140**	**2,062,951**	**2,592,664**
Total SP Surplus (Gap)	**(39,677)**	**(42,851)**	**0**

*Source: Annual Health Situation Report (*Rapport Annuel sur la Situation Sanitaire*, (RASS)), 2015;
† This assumes PMI will procure 100% of the need for the country in 2018.

Plans and justification

With FY 2017 funding, PMI will support activities to strengthen IPTp implementation in public and private health facilities. Implementation support will be provided directly to 35 districts including training, supervision, and provision of supplies to allow SP to be delivered under direct observation. PMI will also provide technical assistance for IPTp at the national level with the objective of impacting strengthened IPTp implementation in the remaining districts countrywide. In these remaining districts, support for implementation activities (i.e., training, supervision) will be financed by the Global Fund. In addition, PMI will provide technical assistance at the national level to review current policy and implementation guidelines to ensure that the national policy and guidelines are fully consistent with

WHO's revised global guidance. PMI's proposed investments in partnership with those of the Global Fund are aimed at supporting the NMCP to ensure SP administration at every ANC contact at least four weeks apart with every pregnant woman receiving at least three doses during pregnancy. Furthermore, PMI will support the NMCP to make ITNs available free of charge to pregnant women at their first ANC visit in both public and private health facilities. As detailed in the SBCC section, PMI will support the NMCP to implement SBCC activities that promote early and regular ANC attendance and consistent use of ITNs during pregnancy. Finally, PMI will procure SP to meet nationwide needs and provide technical assistance to ensure consistent SP availability at health facilities. As noted, nationwide SP needs have been recently covered by the Global Fund. The NMCP has asked PMI to take over this support in order to ensure that quantification and distribution of SP supplies are closely aligned with the technical assistance and overall IPTp implementation support that PMI will be providing. Previous support from the Global Fund will be directed to fill another malaria priority gap.

Proposed activities with FY 2017 funding: **($662,500)**

- **Strengthening IPTp Implementation:** Support implementation of IPTp at fixed health care facilities and during outreach service delivery including training, supervision, provision of supplies for DOT in 35 districts, and technical assistance at the national level to strengthen IPTp policy and effective IPTp implementation in all 82 districts nationwide ($300,000)

- **Procurement and distribution of SP:** Support procurement and nationwide distribution of SP for IPTp covering the needs in both public and private sectors in all 82 health districts ($362,500)
    - Procure approximately 2,500,000 million SP treatments to meet national needs during 2018
    - Support fee required for distribution of SP through the national public health pharmacy

3. Case management

A. Diagnosis and Treatment

NMCP/PMI objectives

One of the two goals of the NMCP's National Malaria Strategic Plan 2012 – 2017 is "to reduce the number of malaria cases by 75 percent as compared to 2008 levels." One of three NMCP strategic plan objectives is "to ensure that 80 percent of malaria cases are confirmed and treated in accordance with national guidelines in public and private sector health care facilities and in the community by the end of 2017. The NMCP has several stated case management priorities they aim to achieve under their current strategy. First, specifically within public health facilities, the NMCP has prioritized achieving universal coverage for diagnostic confirmation of suspected cases of malaria. Similarly, achieving universal coverage for diagnostic confirmation of suspected cases of malaria among children under five years of age at the community level has been prioritized.

Intervention Overview/Current status

Côte d'Ivoire's malaria diagnostic guidelines are in line with WHO recommendations that require every suspect malaria case to be laboratory confirmed before administering ACTs. Per national guidelines, microscopy is used to confirm malaria diagnosis in the public and private-not-for-profit (faith-based operated) sectors at all regional and district reference hospitals while RDTs are used to confirm malaria diagnosis at health centers and at the community level and in any health care facility whenever

microscopy is unavailable. The total number of district and regional reference hospitals with functioning microscopes and trained microscopists is currently unknown. The NMCP aims to carry out a rapid assessment of availability of microscopy and numbers of trained microscopists across all regions of Côte d'Ivoire and based on the results of the assessment develop a capacity building plan. Although the NMCP has developed guidelines for quality control of malaria microscopy, implementation has not formally started.

The introduction and scale-up of RDTs to all health centers nationwide was implemented in 2011. The NMCP has reported a steady increase in the rate of malaria case confirmation in public health care facilities. They reported just 66% case confirmation in 2012, but reported that case confirmation had increased to 92% in public health facilities by 2015.

In 2012, Côte d'Ivoire revised their national malaria treatment policy to make both artemether-lumefantrine (AL) and artesunate-amodiaquine (AS/AQ) as their two first-line drugs for treatment of uncomplicated malaria for patients of all ages other than pregnant women. Pregnant women are treated with quinine regardless of trimester of pregnancy. As per national directive, there is no fee to receive an RDT or ACTs in public and private not-not-for-profit health facilities for children under five years of age and pregnant women. Emergency diagnosis and treatment (which includes severe malaria) is free of charge for patients of all ages. Severe malaria cases are treated with injectable artesunate with intravenous quinine as the alternative treatment.

Although use of microscopy and/or RDTs in private-for-profit health care facilities to confirm malaria diagnosis varies greatly, the NMCP is partnering with an association of 60 for-profit health facilities for IPTp and ITN administration during ANC. In the context of this partnership, the NMCP is aiming to improve private sector provider adherence to malaria diagnostic guidelines even though malaria case management services are not provided free of charge by these providers. The NMCP does not intend to supply these private-for-profit facilities with RDTs or ACTs.

The NMCP is also partnering with a coalition of 29 private industries to reach their industry-managed not-for-profit health facilities. The NMCP, in collaboration with health district staff in the districts where these health centers are located, has provided training in malaria case management including recording and reporting data to health center staff. The NMCP has supplied these health centers with RDTs and ACTs (alongside SP and ITNs) which are provided free of charge to patients. There are approximately 100 health facilities currently engaged in this partnership.

Community level: Côte d'Ivoire's community health policy and implementation framework is currently evolving. There has not yet been a holistic guiding policy framework under which development partners operate. The absence of a policy framework has resulted in project-driven assistance and lack of harmonization among the delivery strategies and approaches deployed at the community level. There has not yet been a defined package of health services to be delivered by CHWs. For example, there are HIV, neglected tropical diseases, nutrition, malaria, etc. programs being implemented. Each program is different in terms of level of training and supervision and importantly in terms of compensation or incentives for CHWs. The MOH, with technical assistance from UNICEF, USAID and others, is in the process of finalizing a community health framework that is intended to define the package of services to be delivered by CHWs, specify the training and supervision required, commodity supply processes, health data reporting.

Community-based management of malaria by CHWs is currently implemented in 51 out of the 82 health districts in Côte d'Ivoire. In the past year, 5,128 CHWs have been trained in malaria diagnosis and treatment (AS-AQ is the only antimalarial used by CHWs). In 42 of these 51 districts malaria and diarrhea diagnosis and treatment are jointly available (*PECADOM plus*). Integrated case management of malaria, pneumonia, and diarrhea (iCCM) is implemented in just nine districts at the present time with UNICEF supplying the antibiotics needed for iCCM in these districts. Thirty-one health districts do not have any CHWs implementing either malaria or iCCM case management. It is the NMCP and the MOH Community Health Division's shared vision to implement iCCM in all communities greater than five kilometers from a health facility nationwide but the availability of the needed non-malaria commodities (antibiotics, ORS, and zinc) and support for training and supervision has remained insufficient to date.

Currently, CHWs are identified by the health district authorities and the community. After selection, CHWs are trained by nurses who have been trained by the health district team (*équipe cadre de district*). At the end of the training, each CHW receives a first supply of drugs corresponding to a kit of 25 treatments for children (2-60 months). This kit corresponds to one month's supply (based on the pilot experience). A nurse supervises the CHWs on-site once a month to i) validate and collect epidemiologic and logistic data, and ii) resupply the CHWs with commodities.

Antimalarial resistance testing: Côte d'Ivoire follows WHO recommendations and systematically monitors for antimalarial resistance. Therapeutic efficacy studies (TES) were last conducted in 2016 in six of Côte d'Ivoire's epidemiologic and entomologic sentinel sites carried out with Global Fund support. Both first-line ACTs were evaluated, and preliminary results of clinical and parasitological response are expected in February 2017. The NMCP's Scientific Support Group (*Groupe Scientifique d'Appui*) consisting of 18 technical experts from academia and the scientific research community reviews, verifies, and assists with interpretation of TES results. The NMCP plans to conduct the next TES in 2017-2018 in six additional sentinel surveillance sites, but has not yet confirmed financial support.

Commodity gap analysis

Imperfect health system data, including malaria commodity quantification and consumption data, make analyzing and projecting malaria commodity needs challenging for this initial year of PMI support. The quantification methods used by the NMCP with support from the Roll Back Malaria Partnership appear to rely on estimated numbers of overall cases and assumptions regarding use of health facilities in both public and private sectors with assumed reductions over time with intervention scale-up. Estimates based on consumption might provide a useful comparison but are not easily available at this time. As soon as PMI's program gets underway, PMI will work closely with the NMCP and the National Commission to Coordinate Supply Chain Commodities (CNCAM) to carry out a thorough annual quantification of need for all essential malaria commodities to validate the current estimates and/or assist with revising the estimates and overall quantification methodology used by the program. CNCAM was created in 2015 to work with programs to conduct commodity forecasts and quantifications, in addition to monitoring stock levels and system performance. Also, given the planned nationwide scale-up of iCCM, estimated need and consumption at the community level will evolve rapidly and will need to be closely monitored to ensure availability and prevent stockouts.

Table 6: RDT Gap Analysis

Calendar Year	2016	2017	2018
RDT Needs			
Total country population	23,865,566	24,486,071	25,122,709
Population at risk for malaria[1]	23,865,566	24,486,071	25,122,709
PMI-targeted at-risk population[2]	23,865,566	24,486,071	25,122,709
Total number of projected fever cases[3]	15,018,481	15,408,154	15,808,766
Percent of fever cases tested with an RDT [4]	7,764,987	8,264,946	8,545,731
Total RDT Needs	**7,764,987**	**8,264,946**	**8,545,731**
Partner Contributions (to PMI target population if not entire area at risk)*			
RDTs carried over from previous year	0	0	0
RDTs from Government	0	0	0
RDTs from Global Fund	7,764,987	8,264,946	6,409,298
RDTs from other donors	0	0	0
RDTs planned with PMI funding	0	0	2,136,433
Total RDTs Available	**7,764,987**	**8,264,946**	**8,545,731**
Total RDT Surplus (Gap)	**0**	**0**	**0**

[1] 100% of the population in Côte d'Ivoire is at risk for malaria.
[2] PMI will contribute to the national RDT need and thus gap calculations assume 100% geographic coverage.
[3] Total projected malaria cases is estimated from total number of recorded cases in public and private health facilities, and at community level in 2015 nationwide.
[4] 76% of all fever cases that seek care are tested with an RDT.

Table 7: ACT Gap Analysis

Calendar Year	2016	2017	2018
ACT Needs			
Total country population	23,865,566	24,486,071	25,122,709
Population at risk for malaria[1]	23,865,566	24,486,071	25,122,709
PMI-targeted at-risk population	23,865,566	24,486,071	25,122,709
Total projected number of malaria cases[2]	4,658,992	4,658,992	4,658,992
Total ACT Needs[3]	**4,658,992**	**4,658,992**	**4,658,992**
Partner Contributions			
ACTs carried over from previous year	0	0	0
ACTs from Government	0	0	0
ACTs from Global Fund	3,914,546	3,352,366	3,494,244
ACTs from other donors	0	0	0
ACTs planned with PMI funding	0	0	1,164,748
Total ACTs Available	**3,914,546**	**3,352,366**	**4,658,992**
Total ACT Surplus (Gap)	**(744,446)**	**(1,306,626)**	**0**

[1] 100% of the population in Côte d'Ivoire is at risk for malaria.
[2] Total projected malaria cases is estimated from total number of recorded cases in public and private facilities, and at community level in 2015 nationwide. The estimate will be kept stable through 2018 despite population growth as malaria control scale-up is anticipated to reduce actual recorded cases in out years and even maintaining a stable estimate is anticipated to still be an over-estimate.
[3] Total ACT needs assumes all projected malaria cases will be treated. PMI will contribute to the national annual ACT total need. ACT needs do not assume any buffer stock.

Plans and justification

With FY 2017 funds, PMI will support the NMCP to strengthen implementation of core components of effective malaria case management. PMI will work closely with the NMCP to carefully coordinate all PMI planned investments with investments planned by the Global Fund. PMI will provide support for procurement of approximately twenty-five percent of the nationwide annual need of ACTs and RDTs and will procure needed treatments for severe malaria. PMI will monitor RDT and ACT need and consumption closely and will adjust planned PMI procurements as needed.

With FY 2017 funding, PMI will also provide direct technical assistance and support to strengthen malaria case management in public NGO not-for-profit health facilities and 60 private sector for-profit companies in 35 districts representing over forty percent of the population. Technical assistance and support will include training and supportive supervision for health care providers in diagnosis and treatment of malaria at fixed health facility sites as well as during outreach services.

Given significant distance and/or inaccessibility of a considerable portion of the population to health facilities, with FY 2017 funding PMI will work with the NMCP, the Community Health Division of the MOH, UNICEF, and others to support scale-up of iCCM with the longer-term vision of reaching nationwide coverage in communities greater than five kilometers from a health facility. Support for start-up of iCCM in Côte d'Ivoire is insufficient; PMI leadership will engage leadership at UNICEF headquarters to advocate for provision of needed non-malaria iCCM commodities. However, PMI will support malaria-focused CCM investments. PMI will provide direct implementation support for iCCM in 35 districts, including supporting training and supervision of CHWs in iCCM including reporting.

Proposed activities with FY 2017 funding: **($4,887,750***)*

- **Procurement of RDTs:** PMI will procure approximately 2.15 million RDTs to contribute to the nationwide RDT needs in the public and private NGO not-for-profit sector; plus distribution costs ($1,193,250)
- **Procurement of ACTs:** PMI will procure approximately 1.2 million ACT treatments (AL) to contribute to the nationwide ACT needs in the public and private NGO not-for-profit sector, plus distribution costs. This will meet approximately twenty-five percent of the need with the Global Fund meeting the remaining seventy-five percent ($1,230,000)
- **Procurement of severe malaria treatments:** PMI will procure approximately 100,000 treatments of injectable artesunate for treatment of severe malaria by regional hospitals / referral level health facilities plus distribution costs. This represents approximately fifty percent of the annual estimated number of severe malaria cases ($254,500)
- **Microscopy assessment:** PMI will carry out a rapid microscopy needs assessment to determine availability of functioning microscopes and trained microscopists at all reference hospitals in Côte d'Ivoire and will procure needed microscopes and related consumables as determined by the assessment results ($50,000)
- **Malaria case management at health facilities:** PMI will provide direct technical assistance and support to strengthen malaria case management in public and private NGO not-for-profit health facilities and 60 for-profit companies in 35 districts representing over forty percent of the population. Technical assistance and support will include training and supportive supervision for health care providers in diagnosis and treatment of malaria. Technical assistance will also be provided for malaria microscopy quality control ($1,000,000)
- **Integrated community case management:** PMI will provide direct technical assistance and support to strengthen integrated community case management of malaria, pneumonia, and diarrhea (iCCM) in 35 districts with technical support also provided at the national level to impact country-wide iCCM implementation ($1,000,000)
- **Therapeutic efficacy studies:** PMI will provide support for therapeutic efficacy studies (TES) at two sites to monitor the susceptibility of *P.falciparum* to first-line ACTs used in Côte d'Ivoire (artesunate-amodiaquine and artemether-lumefantrine) according to WHO-recommended study protocol ($150,000)
- **CDC technical assistance visit:** PMI will support a visit by a PMI CDC/Atlanta malaria expert to provide technical assistance for case management quality assurance/control and to support TES implementation ($10,000)

B. Pharmaceutical management

NMCP/PMI objectives

The overarching strategy for the management of the supply chain in Côte d'Ivoire is presented in the National Plan for Health Commodity Security, which was updated in 2015 and covers the 2016-2020 period. Its main objective is to improve the availability of and access to medicines, vaccines, and other essential commodities at service delivery points.

Although cost recovery is practiced at all levels of the health system, antimalarial inputs (ACTs, RDTs, and SP) have been free of charge since 2010 to remove any financial barrier to access for treatment of malaria.

To strengthen supply chain and stock management, the National Malaria Strategic Plan calls for:

- The development of stock management guidelines for health facilities and districts.
- Training of health workers in stock management.
- Contracting with the NPSP for storage, management, and supplying of health care facilities with antimalarial inputs.

Current status

The National Health Commodity Supply Chain

Following concerted assistance to various aspects of the pharmaceutical management system over the past 10 years, especially from the U.S. Government, Côte d'Ivoire now possesses stronger supply chain capabilities, especially at the national level. A number of other recent factors have also contributed to achievements at the national level as to breakthroughs at other levels of the system (regional, district, facility levels). These factors include strong economic growth, political stability, and firm commitment on the part of donors and other stakeholders to collaboratively achieve a reliable, efficient and effective decentralized supply chain system.

The national health commodity supply chain system is led by three entities. The GOCI National Pharmaceutical Agency (*Programme National de Développement de l'Activité Pharmaceutique (PNDAP)*) develops and enforces health commodity policy, and designs standard operation procedures (SOPs) for the health supply chain. The GOCI National Medicines Authority (*Direction de la Pharmacie du Medicament et des Laboratoires (DPML)*) is responsible for the registration of pharmaceuticals and for the approval of health commodities. The Central Medical Store (NPSP) is a nonprofit, nongovernmental organization (NGO) under contract with the GOCI to manage all implementation aspects of the national public health commodity supply chain system. In this regard, NPSP functions as the primary procurement agency for the GOCI health commodity supply chain.

Other important agencies involved in the supply chain include the National Public Health Laboratory (*Laboratoire National de la Santé Publique* (*LNSP)*), which is the main government entity responsible for quality assurance of pharmaceutical and other health commodities, and the National Commission to Coordinate Supply Chain Commodities (*Commission Nationale pour la Coordination des Approvisionnements en Médicaments (CNCAM)*). The latter was created in 2015 by the Ministry of Health and Public Hygiene *(Ministère de la Santé et de l'Hygiène Publique (MSHP))* to act as a

coordinating body for the supply planning and procurement of commodities for the different national health programs, including malaria. CNCAM is also charged with working with the programs to conduct commodity forecasts and quantifications, and to monitor stock levels and system performance.

The national supply chain system mirrors the healthcare system's three-tiered pyramidal structure, with offices and infrastructure at each of the healthcare system levels: central, regional, and district levels. Thus the national health commodity supply chain system includes the NPSP at the central level; regional pharmacists at the regional level; and district pharmacists, and 82 district pharmaceutical depots, at the district level. There are no storage facilities at the regional level (although a regional depot of NPSP will soon be opened in Bouaké in central Côte d'Ivoire). Commodities are moved from the NPSP and are delivered directly to district pharmacies. In the Abidjan area, NPSP may deliver health commodities directly to primary health care facilities as well.

In 2013, the U.S. Government helped the GOCI to further decentralize the health commodity supply chain to increase access to and ensure continuous availability of essential medicines and pharmaceutical products at service delivery points. Decentralization meant that districts would have greater autonomy and authority to determine transport and delivery of health commodities, and to forecast their own commodity needs. The districts were also delegated greater responsibility for storeroom and stock management and organization.

Each of the country's 20 health regions has a pharmacist who is tasked with overall supply chain management for the region. Responsibilities include commodity needs forecasting, inventory, staff training, and logistics management information system (LMIS) reporting. The regional pharmacists also monitor the performance of district pharmacies within their respective regions. Each of the health districts has a district pharmacist who executes similar supply chain management activities within the district, including coordinating the distribution of commodities to health facilities.

The commodities required to support national health programs are either procured by the NPSP or provided by donor organizations, various health partners, and other in-country stakeholders.

The GOCI developed a paper-based LMIS in 2007, which is still in use. The LMIS never reached full functionality and the data that NPSP has on hand does not reflect the actual status of the supply chain. Furthermore, LMIS data vary significantly across disease programs, particularly for HIV, malaria, TB, and essential medicines. In July 2013, the MSHP decided to transition from a paper-based to an electronic LMIS system (eLMIS). Following a successful USAID-supported pilot of eLMIS in 2016 in 14 regions, the system will now be expanded to all regions in Côte d'Ivoire.

Although support from the U.S. Government (primarily through PEPFAR investment) has improved the supply chain in Côte d'Ivoire, beyond major renovation for the Central Medical Stores Warehouse, the investments have targeted HIV-related commodity procurement, distribution, storage, reporting, etc. As in most PMI focus countries, there are significant challenges and needs related to supply chain strengthening. For example, a recent assessment identified a number of continuing shortcomings:

- Low reporting rates on status of stocks and/or delays in reporting
- Weak inventory management systems at district and health facility level
- Ineffective management and recurring stockouts of laboratory commodities
- Inadequate "last mile" commodity distribution planning, leading to transport bottlenecks
- Unsatisfactory storage conditions at most district pharmacies

- Irregular collection and disposal of health commodities waste, e.g. expired, damaged, or unused products
- Lack of rigorous data analysis during annual commodity quantification activities, and during quarterly supply forecasting and planning exercises
- Insufficient capacity of health staff to order and manage commodities at the lower level of the health system
- Irregular and insufficient feedback from higher levels regarding supply chain staff performance and other critical supply chain issues
- No regional storage facilities, distribution of commodities for the entire vast country is done from the central level

With the addition of PMI resources, USAID/Côte d'Ivoire is planning to address the supply chain shortcomings identified in a holistic manner, building on previous work (funded by PEPFAR) and leveraging PEPFAR, PMI, and Family Planning, where appropriate funding streams exist. It is important to note that the strengthening efforts to date have had a primarily HIV focus to ensure that HIV-related commodities reach PEPFAR target facilities. PMI will work to ensure that PMI investments focus on ensuring malaria commodities are routinely supplied to health facilities and that indicators tracked include malaria specific program indicators. The PMI team will work closely with the broader USAID/Côte d'Ivoire health team to ensure that the proposed funding level is appropriate and reasonable vis-à-vis PEPFAR and other funding to be leveraged.

Plans and justification

PMI's investment in pharmaceutical management will leverage ongoing and future support provided by the U.S. Government (primarily PEPFAR) to strengthen the overall supply chain system in Côte d'Ivoire ensuring that quality health commodities, including malaria inputs, are delivered in a timely fashion to service delivery points. Assistance will be targeted to the agencies and regulatory bodies who intervene in this field at the national level, including the MHSP, PNDAP, NPSP, and CNCAM, as well as regional pharmacists, and health and supply chain staff at the district and health facility levels. Additional assistance will be provided directly to the NMCP to strengthen their capacity to oversee the management and procurement of malarial inputs.

Proposed activities with FY 2017 funding: ***($1,000,000****)*

- **Strengthen end-to-end supply chain system:** Support the NPSP, district and health facility staff involved in the management of the supply chain to ensure adequate warehousing and inventory management. This will include support for a computer-based inventory management system. Furthermore, PMI support will contribute to the development of new strategies to improve health commodity distribution and transportation, especially to the service delivery points ($400,000)
- **Improve supply chain management capacity:** Expand the capacity of CNCAM to take the lead in commodity monitoring, forecasting, quantification, and supply planning for malaria inputs. This will include leading, in collaboration with the NMCP, annual quantification activities for malaria inputs ($200,000)
- **Strengthen logistic management information system:** Work with NPSP to expand the use of the eLMIS to all health staff through training and IT support (software and hardware). Support to NPSP and district pharmacists to ensure that the eLMIS is used regularly and that data are complete and of good quality. Strengthen the abilities of NPSP and CNCAM to

analyze eLMIS data and provide technical assistance to staff at district and service delivery points ($250,000)

- **Strengthen DPML and national laboratory for drug quality monitoring:** Support the DPML and national laboratory to build capacity for in-country drug quality monitoring to test quality and legitimacy of drugs in the private marketplace ($150,000)

4. Health system strengthening and capacity building

PMI supports a broad array of activities that strengthen health systems which cut across intervention areas, such as training of health workers, supply chain management and health information systems strengthening, drug quality monitoring, and capacity building of NCMP coordination, management and program oversight.

NMCP/PMI objectives

Strengthening health systems is a fundamental objective of the NMCP in Côte d'Ivoire. The NMCP supports expansion of efforts to train, supervise, and overall capacitate healthcare workers to effectively deliver malaria prevention and control interventions at all levels of the health care system in Côte d'Ivoire. The NMCP partners with the national public health pharmacy to support strengthened warehousing and distribution of essential malaria commodities to all health facilities nationwide. The NMCP also supports improving the quality of malaria data collection and reporting throughout the health system and works to support regional malaria data review meetings at least quarterly to analyze malaria data and identify implications for programming.

Current status

With its counterpart and willingness-to-pay requirements, funding from the Global Fund has prompted the state of Côte d'Ivoire to invest more in public health generally and in malaria control specifically. Program planning, activities, and budget monitoring remain areas that need to be strengthened, as activities are often implemented under urgent conditions because timetables overlap with the Ministry of Health's other activities. These shortcomings are linked to excessive workloads due to a lack of personnel.

The procurement and supply chain management system has been essentially characterized by frequent stock shortages at health care facilities of ACTs and other commodities. The inadequacies in the supply chain are systemic insofar as they are clearly linked to the weakness of the health system; this is why other partners are also being mobilized to contribute to improving the procurement and stock management system through establishing regional pharmacies. A plan to strengthen the supply chain for the National Program for the Development of Pharmaceutical Activities (PNDAP) and a technical support project with USAID/PEPFAR through SCMS are currently being implemented in this regard.

Plans and justification

With FY 2017 funding, PMI will provide support to the NMCP to convene different malaria technical working groups on a routine basis with the goal of ensuring effective coordination and technical support of all stakeholders active in malaria control efforts in Côte d'Ivoire. Each technical working group (i.e., M&E, vector control, research) will be convened at least semi-annually.

The MoH has divided Côte d'Ivoire into four zones, plus Abidjan and the surrounding localities. These include the northwest, northeast, central, and southern zones. There is an integrated health team for each of the zonal "capitals." PMI will provide support to hire and second four zonal advisors, one to each of

the four health zones. The objective is to build capacity of the regional and district level health teams for effective malaria program management and implementation. PMI will support three long-term technical advisors seconded to the NMCP. The focus of these national level technical advisors will continue to be to build capacity of the NMCP staff for effective malaria control program leadership, management, coordination, and oversight of the national program overall.

Proposed activities with FY 2017 funding: **($1,122,500***)*

- **Stakeholder coordination and technical working group meetings:** Support to the NMCP to convene at least semi-annually various malaria technical working groups to ensure effective coordination and technical support by all actors active in malaria control efforts in Côte d'Ivoire ($50,000)
- **Zonal level technical advisors:** Support to hire and second four zonal advisors each to one of four health zones to build capacity of the regional and district level staff for effective malaria program management and implementation, in close coordination with the NMCP, PMI staff, and PMI implementing partners ($120,000)
- **National level technical advisors:** Support three long-term technical advisors seconded to the NMCP to build capacity of the NMCP staff for effective malaria control program leadership, management, coordination and oversight ($952,500)

Table 8: Health Systems Strengthening Activities

HSS Building Block	Technical Area	Description of Activity
Health Services	Case Management	• Build capacity of laboratory staff and health workers to perform malaria diagnosis, including support for training, supervision, and strengthening systems for quality assurance/control. • Build capacity of the health system at regional, district, and community levels to implement effective malaria case management including effective management of fever.
Health Workforce	Health Systems Strengthening	• Through training and technical assistance, build NMCP and regional health leadership staff managerial and leadership capacity for effective malaria control. • Through on-the-job mentorship by seconded technical advisors at national and regional level, build capacity for effective malaria prevention and control. • Strengthen knowledge, skills, and competencies of the health workforce at all levels of the system in effective diagnosis and management of malaria.
Health Information	Monitoring and Evaluation	• Strengthen disease surveillance systems to improve decision-making, planning, forecasting, and program management. • Support national and subnational health surveys at regular intervals to collect data to inform program investments.
Essential Medical Products, Vaccines, and Technologies	Case Management	• Support improved forecasting, procurement, quality control, storage and distribution of malaria commodities, including ITNs, ACTs, severe malaria drug treatments, and RDTs.
Leadership and Governance	Health Systems Strengthening	• Support the NMCP to strengthen overall coordination of malaria control efforts among malaria stakeholders. • Support for technical advisors seconded to NMCP to support capacity building for effective leadership and management of overall national malaria program.

5. Social and behavior change communication

The National Malaria Strategic Plan 2012-2017 lists as one of its strategic orientations the "strengthening of social mobilization and communication on preventive measures and case management of malaria." The Communication and Partnership unit of the NMCP oversaw the revision of the Strategic Communication Plan (2013-2015) to support the new NMSP. The vision of the updated communication plan is that:

> The head of the family, the father, the mother, the pregnant woman, the person caring for the child, and the community are aware and have useful information to adopt actions that protect and save so that Côte d'Ivoire is, by 2015 and beyond, a country where its citizens no longer die from malaria.

Flowing from that vision, the logical framework of the strategy has as its strategic objective:

> By the end of 2015 and beyond, the head of the household, the father, the mother, the pregnant woman, the person caring for the child, and the community have knowledge, attitudes, and practices for prevention, home-based care of malaria, the recognition of danger signs, and the referral to health structures.

The strategic plan lists three strategies to realize the strategic objective:

- Advocacy and partnership
- Social mobilization and community participation
- SBCC

Under each of these strategies, the plan spells out objectives and activities aimed at correct and consistent use of ITNs, uptake of SP at antenatal visits, and prompt and correct treatment of fever.

An analysis of a Global Fund-financed study in 2008[9] showed that there were many misconceptions about malaria transmission and prevention and low usage of malaria prevention and care interventions. The same study also showed that women were not receiving correct information on malaria prevention and care at health centers.

Based on this, the Communications Unit set as its communication objectives in the study to:

- Improve the population's knowledge, attitudes, and practice about malaria, its prevention and care
- Strengthen the capacity of stakeholders in communication techniques for more efficient malaria control

Malaria communication activities are managed by the NMCP through its communications unit. Regional Medical Directors are responsible for managing communication activities at the regional level. The district medical teams, in collaboration with the communications focal persons (if any), manage district-level communication activities.

[9] The only data available at the time; the most recent DHS was in the field in 2011-2012 but the results were only published in June 2013. These results (on practice, no attitude data), although better, still show relatively low usage of malaria prevention and care interventions. A MICS is currently in the field.

There are no working groups or task forces specific to communication, although these topics may be reviewed as part of the biannual malaria task force meetings.

Current status

All malaria SBCC activities are financed under the current Global Fund grant and carried out either by the NMCP or by the other Principal Recipient, Save the Children (community-based activities). These activities, which were developed in line with the Strategic Communication plan, include:

- National mass media campaign (state and private media) on malaria care and prevention during the six months of highest malaria transmission
- Malaria care and prevention messages over local radio throughout the year
- Transmission of TV show aimed at school children
- Over 196,000 household visits and more than 48,000 group sensitizations conducted:
    - Interpersonal communication and community mobilization in villages in 70 districts (out of 82) locate more than five kilometers from at health center
    - Community mobilization through women's group (one per district) in 70 health districts
- Over 1.5 million people reached with malaria control messages
- Over 800 outreach activities to increase uptake of ANC and access to SP
- Development, production and distribution of communication support materials
- 87 malaria focal persons in 87 private enterprises trained in malaria control communication techniques
- 422 peer educators in 100 private enterprises trained in malaria control communication techniques
- Production of song promoting ITN use by local singing star

Plans and justification

Both the current National Malaria Strategy and the Communication Strategy are out of date. The NMCP is planning to update its strategy during calendar year 2017. The NMCP wants to update the Communications Strategy in line with the new overall malaria control strategy. PMI will support the development of this communications strategy, which will benefit from and be based on data from the MICS-MIS that is currently in the field. Once the new strategy is finalized, PMI will support the development of messages and support materials for SBCC at all levels. With the expansion and deepening of support for CHWs in all of the health districts in Côte d'Ivoire, PMI will support training of CHWs in interpersonal communication and community mobilization. In an effort to capitalize on students as drivers of broader household behavior change, NMCP would like to continue its ongoing broadcasts aimed at school children (School Children against Malaria). PMI proposes funding a small evaluation of the program and, if found to be successful, providing support for the intervention.

Proposed activities with FY 2017 funding: **($800,000)**

- **Support for the development of a new communications strategy:** PMI will provide technical assistance to the NMCP to develop a new communications strategy derived from the new national malaria strategy and based on the results of the MIS/MICS 2016 ($75,000)
- **SBCC for ITNs, IPTp, and case management:**

- *Support for the implementation of the new communications strategy:* Development and diffusion of messages and support materials for SBCC (including mass media, audio-visual, print, etc) based on the new communications strategy ($200,000)
- *Health facility and community level SBCC (includes school-based interventions):* SBCC will be part of a communication package including ITN use, IPTp uptake, and case management at the health facility and community levels. Activities will be focused in PMI districts but will be consistent with the NMCP's national communication plan and national policies, and coordinated with SBCC activities in the rest of the country ($525,000)

6. Surveillance, monitoring, and evaluation

NMCP/PMI objectives

The National Malaria Strategic Plan 2012-2017 calls for strengthening surveillance, monitoring, and evaluation at all levels of the health system by reinforcing the capacity of the *Système National d'Information Sanitaire* (SNIS) to report valid and timely data, and conducting malaria-specific surveys to gather entomological, epidemiologic, and coverage indicator data. This plan follows RBM M&E guidance to provide a comprehensive framework for obtaining reliable and consistent data in order to assess progress toward the achievement of universal coverage of malaria interventions and the reduction of disease burden.

Current status

National household surveys
Population-based surveys currently provide the most accurate data on malaria intervention coverage and malaria biomarkers (i.e. anemia and parasitemia). A Demographic Health Survey (DHS), combined with the Multiple Indicator Cluster Survey (MICS), was conducted from December 2011 – May 2012. Results from this survey documented malaria parasite prevalence as 42% by RDT and 18% by microscopy among children under five years[10]. The most recent MICS/MIS carried out December 2015 – February 2016, will serve as the baseline estimate for PMI coverage indicators. The next national household survey, which will include a malaria module and measure all cause under-five mortality, is scheduled to occur in calendar year 2018. At the time of writing this operational plan, financial commitments to fully fund the DHS from additional donors were not confirmed. However, given historical engagement, support from UNICEF is likely.

Health facility and other surveys
To measure programmatic impact of malaria prevention and control activities, the National Malaria Strategic Plan 2012-2017 encourages periodic special surveys. A 2013 survey conducted by *Le Centre de Recherche pour le Développement,* designed to assess malaria-specific activities in health facilities was conducted in 80 randomly selected public and private health facilities. Fifty-two percent had ITNs available at the time of the survey; 73% of health facilities had RDTs and 72% had any ACT available. The proportion of cases that were correctly diagnosed and treated for malaria was 59%.

[10] RDT rates are typically higher than parastemia rates as they detect antibodies to the parasite, which can last up to 21 days after effective treatment. A child who was recently infected with malaria but was either treated successful or cleared of the infections would expect to test positive for RDTs and negative for microscopy. The large discordance between RDT-microscopy was also found in Mozambique 2007, Zambia 2010, Senegal 2008/9 and Kenya 2007.

CARE International, with funding from the Global Fund, conducted a TRaC survey in November – December, 2013 to assess ITN use and MIP services. The study covered the 20 health regions throughout Côte d'Ivoire, with a total of 4,290 households surveyed: 2,647 head of households, 2,283 mothers or care takers of children under five years of age, and 2,004 pregnant women or women who delivered within the last 12 months. Approximately 79% of those interviewed knew that ITN use was effective at preventing malaria, and roughly 75% knew that fever was a symptom of malaria. Around 40% owned at least one ITN. Consistent with results from the 2016 MICS/MIS, 30% of children under five years of age slept under an ITN the night before the survey; 34% of pregnant women slept under an ITN the previous night. Among women who delivered in the past 12 months, approximately 79% attended ANC at least once, however SP1 and SP2 remained low (34% and 23%, respectively).

From May – July 2016, an assessment of the logistical management system was conducted in 25 health facilities in the region of Gbokle Nawa San Pedro, with the objective of evaluating the inventory management of malaria commodities at the health facility level. The survey mirrored PMI's end-use verification survey (EUV). Final approval of the data are still ongoing, however, preliminary results suggest that 13% of the visited health facilities were stocked out of RDTs the day of the visit, however all facilities had at least one presentation of AL the day of the visit. Malaria treatment guidelines were available at 70% of the health facilities visited. With Global Fund support, a health facility survey was conducted between August – September 2016 to assess the capacity of health workers in a representative sample of public and registered private health facilities to identify and accurately manage malaria cases according to national guidelines. Validation of the results is ongoing, and these should be available in the first quarter of 2017.

Malaria surveillance and routine health information system

From 2009 – 2013, the *Centre Suisse de Recherches Scientifiques* supported a Demographic Surveillance System in south-central Côte d'Ivoire, referred to as the Taabo health and demographic surveillance system (HDSS)[11]. The HDSS was established to serve as a platform for evaluating interventions and health systems strengthening, with the ultimate goal of reducing mortality and morbidity due to malaria and neglected tropical diseases. At the end of 2013, the Taabo HDSS consisted of 13 villages with a total population of 42,480 inhabitants drawn from 6,707 households. Verbal autopsies were conducted in addition to repeated cross-sectional epidemiological surveys. Due to lack of funding, the HDSS was discontinued.

.

As described in the entomological monitoring section, there are six sentinel surveillance sites located in nine health districts throughout the country. In addition to their geographical representation, these sites were strategically selected for entomological monitoring. With support from the Global Fund, these sites also serve as epidemiological sentinel surveillance sites, with the primary objectives of monitoring malaria mortality, determining the correlation between transmission and correct prevention measures, and producing and disseminating quarterly epidemiological bulletins on the progression of malaria morbidity and mortality. Health workers in each sentinel site are tasked with ensuring there are sufficient commodities and reporting forms, in addition to compiling individual-level data and transmitting monthly via paper to the district focal point. Reported data includes the initial diagnosis, type of diagnostic test administered, result of test, final diagnosis, and treatment administered. The district focal point enters the data into a database to electronically transmit to the regional, then central level. On a quarterly basis, the NMCP will report results through a bulletin and various reports. The long-term vision of the sites is to provide trends in malaria incidence, mortality rates, consultation rates,

[11] Koné S, Baikoro N, N'Guessan Y, Jaeger FN, Silué KD, Fürst T, et al. Health and demographic surveillance system profile: the Taabo health and demographic surveillance system, Côte d'Ivoire. Int J Epidemiol.2015;44:87–97

and quality of malaria diagnosis. At the time of writing this operational plan, epidemiological monitoring at the sentinel sites was recently put in place, however the NMCP did not have the resources to convene the quarterly data validation reviews and disseminate the bulletin.

Côte d'Ivoire uses routine HMIS data as the main data source for tracking and measuring programmatic progress. Managed by the *Direction de la Prospective de la Planification et de l'Evaluation et l'Information Sanitaire (DPPEIS),* their objective includes the coordination and implementation of SNIS, the collection, analysis and dissemination of data for RASS, the strengthening of the information health system. Routine malaria data is recorded into standard reporting forms at the health facility level. At the health facility level, malaria data are collated from various registers (consultation, laboratory, antenatal) by the facility health information officer and sent to the district on a monthly basis via paper reporting. However, reporting forms lack the necessary indicators to accurately collect and report community-level malaria indicators. In districts where community case management is implemented, NGOs and community-based organizations report monthly data to the district. Once received by the district, no later than the 5th of the month, the data manager is responsible for validating and sharing the data during monthly meetings. Validated data is then transmitted to the regional level no later than the 10th of the month. Where capacity exists, hospitals and some facilities enter data directly in the District Health Information Software (DHIS2), which was rolled out in 2013 and scaled up nationally by 2015. The surveillance officers at the regional level are charged with transmitting the district-level data via email to the central level. The NMCP does not have access to DHIS2, and must wait for the monthly data to be validated and transmitted to the district and regional levels.

A situational analysis of the HMIS identified various inadequacies, including: incomplete, and inaccurate malaria-related data reporting by healthcare providers at the health facility level; insufficient availability of primary reporting tools (registers, monthly summary report forms); poor integration of community and private sector data; lack of timeliness in passive feedback of data; limited involvement of regional and district management teams in data validation; poor supervisory activities from district level to health facilities; lack of data comprehension due to inadequate understanding of definition of indicators.

Table 9: Surveillance, Monitoring, and Evaluation Data Sources

Data Source	Survey Activities	Year								
		2010	2011	2012	2013	2014	2015	2016	2017	2018
Household surveys	Demographic Health Survey (DHS)			X*						(X)
	Malaria Indicator Survey (MIS)							X*		
	Multiple Indicator Cluster Survey (MICS)							X*		
	TRaC Survey				X*					
Health Facility and Other Surveys	Health facility survey				X*			X*		
	EUV survey							X*		(X)
Malaria Surveillance and Routine System Support	Demographic surveillance sites	X*	X*	X*	X*					
	Sentinel surveillance sites			X*	X*	X*	X*	X*	X*	X*
	Support to HMIS	X*	X*	X*	X*	X*	X*	X*	X*	(X)
Therapeutic efficacy monitoring	*In vivo* efficacy testing			X*	X*			X*	(X)	
Entomology	Entomological surveillance and resistance monitoring			X*	X*	X*	X*	X*	X*	(X)

***Non-PMI funded ; (X) planned**

Table 10: Routine Surveillance Indicators

Indicators	Value	Comments
1. Total number of reported malaria cases Data source: 2015 WHO Report	5,419,047	Includes community-level data
Total diagnostically confirmed cases	4,985,523	Includes outpatient and inpatient confirmed cases
Total clinical/presumed/unconfirmed cases	91,467	
If available, report separately for outpatients and inpatients		
Outpatient number of *suspected* malaria cases	3,713,006	
Diagnostically confirmed	3,621,539	
Clinical/presumed/unconfirmed	91,467	
Inpatient number of reported malaria cases	N/A	
Diagnostically confirmed	1,363,984	
Clinical/presumed/unconfirmed	N/A	
2. Total number of reported malaria deaths Data source: RASS DPPEIS 2015	2,604	
Diagnostically confirmed	2,604	
Clinical/presumed/unconfirmed	N/A	
3. Malaria test positivity rate (outpatients) Data source: 2015 WHO Report	98%	
Numerator: Number of outpatient confirmed malaria cases	3,621,539	
Denominator: Number of outpatients receiving a diagnostic test for malaria (RDT or microscopy)	3,713,006	
4. Completeness of monthly health facility reporting Data source: DPPEIS 2015	99%	
Numerator: Number of monthly reports received from health facilities	23,238	
Denominator: Number of health facility reports expected (i.e., number of facilities expected to report multiplied by the number of months considered)	23,568	The number of facilities expected to report is: 1,964, multiplied by 12

Plans and justification

PMI is committed to working with the NMCP to support monitoring the quality of malaria data collected through HMIS and ensure that programmatic needs of the NMCP are met. There is a need to produce quality routine data to identify trends in malaria burden in Côte d'Ivoire, and improving the quality of data is of importance to the NMCP. In FY 2017, in addition to contributing to the next DHS to measure malaria coverage indicators, PMI will support key data collection and analysis activities, including quarterly end-use verification surveys (EUVs) to monitor the availability and utilization of key antimalarial commodities at the health facility level. Leveraging efforts of PEPFARs investment in strengthening HMIS, PMI will work collaboratively to address various inadequacies, by expanding training and supervision to district health officers in order to strengthen their ability to report quality malaria indicator data on a monthly basis through DHIMS. Funding for this activity will be dedicated to

information system strengthening at the district and regional levels. PMI will also support efforts to strengthen data review and validation meetings in the 35 districts and 7 regions covered by PMI.

Proposed activities with FY 2017 funding: **($1,085,000)**

- **Household survey DHS 2018:** In collaboration with additional donors, support the implementation of the next DHS in 2018 to monitor malaria intervention coverage and malaria biomarkers ($500,000)
- **End-use verification surveys:** Support quarterly monitoring of the availability and utilization of key antimalarial commodities at the health facility level ($75,000)
- **Strengthen routine HMIS at regional and district levels:** Support efforts to strengthen routine data collection and use through training and supervision at the district level, as well as data review and validation meetings at the district and regional levels. ($500,000)
- **CDC technical assistance visit:** Support for a technical assistance visit from the headquarters PMI SM&E team. Technical assistance will include working with the NMCP to support strengthening M&E and health management information system activities ($10,000)

7. Operational research

NMCP/PMI objectives

The National Malaria Strategic Plan 2012 – 2017, calls for strengthening research through the support of local capacity building and the reinforcement of coordination between NMCP and researchers to harmonize and prioritize operational research efforts. Through the collaboration of a multidisciplinary consortium of researchers, the scientific support group meets quarterly to discuss research gaps and priorities to strengthen the NMCP's contribution to scientific evidence of malaria prevention and control activities in Côte d'Ivoire. This group consists of 18 technical experts, which includes medical doctors, microbiologists, nurses, entomologists, and academic researchers in malaria and parasitology from various institutions, such as: University of Félix Houphouët Boigny, Côte d'Ivoire; *Services de Maladies Infectieuses et Tropicales* (SMIT) Abidjan and Bouaké; *Institut Pierre Richet* (IPR), Bouaké; *Centre de Diagnostic et de Recherche sur le Sida et les autres maladies infectieuses* (CeDRes); UFR Biosciences, *Université de Cocody*; *Institut National de Santé Publique*; *Institut Pasteur de Côte d'Ivoire*; *Université Allassane Ouattara*; *Le Centre d'Entomologie Médicale et Vétérinaire* (CEMV); *Centre Suisse de Recherches Scientifiques* (CSRS) *en Côte d'Ivoire*. The current research agenda is focused on implementing studies to measure the durability of long-lasting ITNS, insecticide resistance, the efficacy and tolerance of SP, and therapeutic efficacy studies for first line treatment for malaria. PMI will work with the scientific support group, the NMCP, and the PMI vector control technical work group, to identify operational research studies that identify and help overcome implementation bottlenecks of malaria prevention and control activities.

Current status

No PMI-supported OR has been completed, is ongoing or planned.

Plans and justification

There are no OR activities planned with FY 2017 funding.

Proposed activities with FY 2017 funding: **($0)**

No PMI-supported OR activities are planned with FY 2017 funding.

8. Staffing and administration

Two health professionals serve as Resident Advisors (RAs) to oversee PMI in Côte d'Ivoire, one representing CDC and one representing USAID. In addition, one or more Foreign Service Nationals (FSNs) work as part of the PMI team. All PMI staff members are part of a single interagency team led by the USAID Mission Director or his/her designee in country. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, managing collaborating agencies and supervising day-to-day activities. Candidates for RA positions (whether initial hires or replacements) will be evaluated and/or interviewed jointly by USAID and CDC, and both agencies will be involved in hiring decisions, with the final decision made by the individual agency.

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

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

The two PMI RAs are physically based within the USAID health office but are expected to spend approximately half of their time with and providing TA to the NMCPs and implementing partners, including time in the field monitoring program implementation and impact.

The number of locally-hired staff and necessary qualifications to successfully support PMI activities either in Ministries or in USAID will be approved by the USAID Mission Director. Because of the need to adhere to specific country policies and USAID accounting regulations, any transfer of PMI funds directly to Ministries or host governments will need to be approved by the USAID Mission Director and Controller, in addition to the U.S. Global Malaria Coordinator.

Proposed activities with FY 2017 funding: **($2,028,000)**

- Support to CDC for staffing ($920,000); and
- Support to USAID for staffing ($708,000) and administration ($400,000) ($1,108,000)

Table 1: Budget Breakdown by Mechanism

President's Malaria Initiative – CÔTE D'IVOIRE
Planned Malaria Obligations for FY 2017

Mechanism	Geographic Area	Activity	Budget ($)		%
TBD-IRS	Select districts	Entomological and insecticide resistance monitoring	300,000	2,149,525	11
		IRS planning	1,849,525		
CDC IAA	Nationwide	Entomological TA	29,000	969,000	5
		Case management TA	10,000		
		SM&E TA	10,000		
		Staffing and administration	920,000		
GHSC-PSM	Nationwide	Procurement of ITNs	3,384,000	6,424,250	32
		Procurement of SP	362,500		
		Procurement of RDTs	1,193,250		
		Procurement of ACTs	1,230,000		
		Procurement of severe malaria treatment	254,500		
TBD-New Service Delivery Award	Nationwide and select districts	Strengthen IPTp implementation	300,000	2,470,000	12
		Assessment of microscopy needs	50,000		
		Support malaria case management at health facilities	1,000,000		
		Support for training/supervision/ implementation of iCCM	1,000,000		
		Zonal level technical advisors	120,000		
HFG	Nationwide	National level technical advisors	952,500	952,500	5
BCC TBD	Nationwide and select districts	Support for the development of a new communications strategy	75,000	800,000	4

		Support for the implementation of the new communications strategy	200,000		
		Health facility and community level SBCC	525,000		
Measure DHS	Nationwide	Household survey	500,000	500,000	3
Measure Evaluation	Nationwide and select districts	Strengthen routine HMIS at central, regional and district levels	500,000	500,000	3
TBD	Nationwide and select districts	Distribution of ITNs (routine)	1,175,000	4,126,725	21
		Distribution of ITNs (campaign phase 3-Abidjan)	1,676,725		
		Therapeutic efficacy study	150,000		
		Strengthen end-to-end supply chain system	400,000		
		Improve supply chain management capacity	200,000		
		Strengthen logistic management information system	250,000		
		Strengthen DPML and national laboratory for drug quality monitoring	150,000		
		Stakeholder coordination and technical working group meetings	50,000		
		End-use verification surveys	75,000		
USAID/Côte d'Ivoire	Nationwide	Staffing and administration	1,108,000	1,108,000	6
Total			**20,000,000**	**20,000,000**	**100**

Table 2: Budget Breakdown by Activity

President's Malaria Initiative – CÔTE D'IVOIRE
Planned Malaria Obligations for FY 2017

Proposed Activity	Mechanism	Budget		Geographic Area	Description
		Total $	Commodity $		
PREVENTIVE ACTIVITIES					
VECTOR MONITORING AND CONTROL					
Entomologic monitoring and insecticide resistance management					
Support to six insecticide resistance monitoring sites (to complement six existing sites)	TBD-IRS	100,000	0	Select sites	Annual insecticide resistance monitoring in six new sites. Activities will include insecticide bioassays and monitoring of insecticide resistance mechanisms.
Entomological monitoring in potential IRS districts.	TBD-IRS	200,000	0	Select districts	Entomological monitoring including testing for susceptibility, determining vector species, vector behavior, and infectivity will be conducted in IRS districts.
Entomology technical assistance (CDC)	CDC-IAA	29,000	0	Nationwide	Two technical assistance visits from CDC to help develop entomological capacity at the national and prefectural level.
Subtotal Ento monitoring		**329,000**	**0**		
Insecticide-treated Nets					

Procurement of ITNs (routine as per national guidelines, children <1)	GHSC-PSM	3,384,000	3,384,000	35 districts	Procure approximately 1.175 million ITNs to support routine distribution (ANC and EPI) in 35 health districts (and possibly some other districts) to ensure Côte d'Ivoire maintains universal coverage of ITNs. Nets will be treated as common stock to cover the needs of the country.
Distribution of ITNs (routine)	TBD	1,175,000	0	35 districts	Funding for the routine distribution of procured nets.
Distribution of ITNs (campaign phase 3-Abidjan)	TBD	1,676,725	0	Greater Abidjan	Funding for the distribution of nets for the third phase of the 2017-2018 mass campaign. Distribution will cover eight health districts in Greater Abidjan and four bordering health districts.
Subtotal ITNs		**6,235,725**	**3,384,000**		
Indoor Residual Spraying					
IRS planning	TBD-IRS	1,849,525	0	2-3 districts	Funding for reconnaissance, environmental assessment, and budgeting/microplanning prior to targeting districts for future IRS and initial insecticide procurement. Type and cost TBD.
Subtotal IRS		**1,849,525**	**0**		
SUBTOTAL VECTOR MONITORING AND CONTROL		**8,414,250**	**3,384,000**		
Malaria in Pregnancy					

Strengthen IPTp implementation	TBD-New Service Delivery Award	300,000	0	Nationwide and 35 districts	Support implementation of IPTp at fixed health care facilities and during outreach service delivery including training, surpervision, provision of supplies for DOT in 35 districts, and technical assistance at the national level to strengthen IPTp policy and effective IPTp implementation nationwide.
Procurement and distribution of SP	GHSC-PSM	362,500	300,000	Nationwide and 35 districts	Support procurement and nationwide distribution (2.5% fee to NPSP) of SP for IPTp covering the needs of both public and private sectors nationwide (82 health districts).
Subtotal Malaria in Pregnancy		**662,500**	**300,000**		
SUBTOTAL PREVENTIVE		**9,076,750**	**3,684,000**		
CASE MANAGEMENT					
Diagnosis and Treatment					
Procurement and distribution of RDTs	GHSC-PSM	1,193,250	1,139,500	Nationwide	Support procurement and distribution of 2,150,000 RDTs to contribute to the nationwide RDT needs in the public and private NGO not-for-profit sector.
Procurement and distribution of ACTs (AL)	GHSC-PSM	1,230,000	1,200,000	Nationwide	Support procurement and distribution of approximately 1,200,000 AL to contribute to the nationwide ACT needs in the public and private NGO not-for-profit sector.

Procurement of drugs for treatment of severe malaria	GHSC-PSM	254,500	252,000	Nationwide	Support procurement and distribution of approximately 100,000 treatments of injectable artesunate for treatment of severe malaria by regional hospitals/referral level health facilities.
Assessment of microscopy needs	TBD-New Service Delivery Award	50,000	0	Nationwide	PMI will conduct a rapid microscopy needs assessment to determine availability of functioning microscopes and trained microscopists at all reference hospitals and will procure needed microscopes and related consumables as determined by the assessment results.
Support malaria case management at health facilities	TBD-New Service Delivery Award	1,000,000	0	35 districts	Provide direct technical assistance and support to strengthen malaria case management in public and private NGO not-for-profit health facilities, 60 for-profit companies in 35 districts. Technical assistance will include training and supportive supervision for health care providers in diagnosis and treatment of malaria. Technical assistance will also be provided for malaria microscopy quality control.
Support for training/supervision/ implementation of iCCM	TBD-New Service Delivery Award	1,000,000	0	Nationwide and 35 districts	Provide direct technical assistance and support to strengthen integrated community case management of malaria, pneumonia, and diarrhea in 35 districts with technical support also provided at the national level to impact country-wide iCCM implementation.
Therapeutic efficacy studies	TBD	150,000	0	Select sites	Support therapeutic efficacy studies at two sites to monitor the susceptibility of *P.falciparum* to first-line ACTs (AL and AS-AQ) according to WHO recommended guidelines.

CDC technical assistance (case management)	CDC-IAA	10,000	0	Nationwide	One technical assistance visit from CDC for case management quality assurance/control and to support TES implementation.
Subtotal Diagnosis and Treatment		**4,887,750**	**2,591,500**		
Pharmaceutical Management					
Strengthen end-to-end supply chain system	IHSC-TA	400,000	0	Nationwide	Support the NPSP, district, and health facility staff involved in the management of the supply chain to ensure adequate warehousing and inventory management. Includes support to the development of new strategies to improve health commodity distribution and transportation.
Improve supply chain management capacity	IHSC-TA	200,000	0	Nationwide	Expand the capacity of CNCAM to take the lead in commodity monitoring, forecasting, quantification, and supply planning for malaria inputs, including annual quantification activities for malaria inputs.
Strengthen logistic management information system	IHSC-TA	250,000	0	Nationwide	Work with NPSP to expand the use of eLMIS to all health staff through training and IT support. Support to NPSP and district pharmacist to ensure that the eLMIS is used regularly and that data is complete and of good quality. Strengthen the abilities of NPSP and CNCAM to analyze eLMIS data and provide TA to staff at district and service delivery points.

Strengthen DPML and national laboratory for drug quality monitoring	IHSC-TA	150,000	0	Nationwide	Support the DPML and national laboratory to build capacity for in-country drug quality monitoring to test quality and legitimacy of drugs in the private marketplace.
Subtotal Pharmaceutical Management		**1,000,000**	**0**		
SUBTOTAL CASE MANAGEMENT		**5,887,750**	**2,591,500**		
HEALTH SYSTEM STRENGTHENING / CAPACITY BUILDING					
Stakeholder coordination and technical working group meetings	TBD	50,000	0	Nationwide	Support to the NMCP to convene at least semi-annually various malaria technical working groups to ensure effective coordination and technical support by all actors active in malaria control efforts.
Zonal level technical advisors	TBD-New Service Delivery Award	120,000	0	Selected sites	Support to hire and second four zonal advisors each to one of four health zones to build capacity of the regional and district level staff for effective malaria program management and implementation, in close coordination with the NMCP, PMI staff, and PMI implementing partners.
National level technical advisors	HFG or TBD	952,500	0	Nationwide	Continued support for three long-term technical advisors seconded to the NMCP to build capacity of the NMCP staff for effective malaria control program leadership, management, coordination, and oversight.
SUBTOTAL HSS & CAPACITY BUILDING		**1,122,500**	**0**		
SOCIAL AND BEHAVIOR CHANGE COMMUNICATION					

Support for the development of a new communications strategy	BCC-TBD	75,000	0	Nationwide	PMI will provide technical assistance to the NMCP to develop a new communications strategy derived from the new national malaria strategy and based on results of the MIS/MICS 2016.
Support for the implementation of the new communications strategy	BCC-TBD	200,000	0	Nationwide	Development and diffusion of messages and support materials for SBCC (including mass media, audio-visual, print), based on the new communications strategy.
Health facility and community level SBCC	BCC-TBD	525,000	0	Nationwide and 35 districts	Support a communications package including ITN use, IPTp uptake, and case management at the health facility and community levels. Activities will be focused on 35 districts but will be consistent with the NMCP's national policies and coordinated with SBCC activities in the rest of the country.
SUBTOTAL SBCC		**800,000**	**0**		
SURVEILLANCE, MONITORING, AND EVALUATION					
Household survey	Measure DHS	500,000	0	Nationwide	In collaboration with additional donors, support the implementation of a household survey to monitor malaria intervention coverage and malaria biomarkers.
End use verification surveys	TBD	75,000	0	35 districts	Support quarterly monitoring of the availability and utilization of key antimalarial commodities in 35 districts at the health facility level.

Strengthen routine HMIS at central, regional and district levels	Measure Evaluation	500,000	0	Nationwide and 35 districts	Support efforts to strengthen routine data collection and use through training and supervision at the district level, as well as data review and validation meetings at the district and regional levels.
CDC technical assistance (SME)	CDC-IAA	10,000	0	Nationwide	One technical assistance visit from CDC for SM&E to support strengthening HMIS activities.
SUBTOTAL SM&E		**1,085,000**	**0**		
OPERATIONAL RESEARCH					
SUBTOTAL OR		**0**	**0**		
IN-COUNTRY STAFFING AND ADMINISTRATION					
CDC	CDC-IAA	920,000	0		To support the coordination and management of all in-country PMI activities including support for salaries and benefits for two resident advisors and local staff, office equipment and supplies, and routine administration and coordination expenses.
USAID	USAID/Côte d'Ivoire	1,108,000	0		
SUBTOTAL IN-COUNTRY STAFFING		**2,028,000**	**0**		
GRAND TOTAL		**20,000,000**	**6,275,500**		