

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 2018 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

DEMOCRATIC REPUBLIC OF THE CONGO

Malaria Operational Plan FY 2018

Table of Contents

ABBREVIATIONS AND ACRONYMS	3
I. EXECUTIVE SUMMARY	5
II. STRATEGY	9
Introduction	9
Malaria situation in the DRC.....	10
Country health system delivery structure and MOH organization.....	13
National malaria control strategy	14
Updates in the strategy	15
Integration, collaboration, and coordination	15
PMI goals, objectives, strategic areas, and key indicators	19
III. OPERATIONAL PLAN	24
1. Vector monitoring and control	24
2. Malaria in pregnancy.....	31
3. Case management.....	36
4. Health system strengthening and capacity building.....	49
5. Social and behavior change communication	53
6. Surveillance, monitoring, and evaluation.....	56
7. Operational Research.....	62
8. Staffing and administration	63
Table 1: Budget Breakdown by Mechanism	65
Table 2: Budget Breakdown by Activity	66

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
CDR	<i>Centrales de distribution régionales</i> (Regional distribution centers)
CHW	Community health worker
DFID	Department for International Development
DHIS 2	District Health Information System 2
DHS	Demographic and Health Survey
DP	Dihydroartemisinin-piperaquine
DPS	<i>Division provinciale de la santé</i> (Provincial health division)
DRC	Democratic Republic of the Congo
EPI	Expanded program on immunization
EUV	End-use verification survey
FETP	Field Epidemiology Training Program
FY	Fiscal year
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HMIS	Health management information system
HSS	Health systems strengthening
iCCM	Integrated community case management
IPTp	Intermittent preventive treatment of malaria for pregnant women
INRB	<i>Institut National de Recherche Bio-Médicale</i>
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
LLIN	Long-lasting insecticide-treated mosquito net
LMIS	Logistics management information system
M&E	Monitoring and evaluation
MICS	Multi-Indicator Cluster Survey
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MOH	Ministry of Health
MOP	Malaria Operational Plan
NGO	Non-governmental organization
NAMS	National archive of malaria slides
NMCP	National Malaria Control Program
NSP	National Malaria Control Strategic Plan
OR	Operational research
OTSS	Outreach Training and Supportive Supervision
PCR	Polymerase chain reaction
PMI	President's Malaria Initiative
RDT	Rapid diagnostic test
RHIS	Routine health information system
SBCC	Social and behavior change communication
SMC	Seasonal malaria chemoprevention
SM&E	Surveillance, monitoring, and evaluation

SMS	Short message service
SP	Sulfadoxine-pyrimethamine
TES	Therapeutic efficacy study
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

I. EXECUTIVE SUMMARY

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 for 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) 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.

The Democratic Republic of the Congo (DRC) was selected as a PMI focus country in fiscal year (FY) 2011.

This FY 2018 Malaria Operational Plan presents a detailed implementation plan for the DRC, 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 investments made by PMI and other partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) malaria grants. This document briefly reviews the current status of malaria control policies and interventions in the DRC, 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 2018 funding.

The proposed FY 2018 PMI budget for the DRC is \$35 million. PMI will support the following intervention areas with these funds:

Entomological monitoring and insecticide resistance management:

Entomological monitoring has been conducted in seven sites over the past two years with the aim of understanding mosquito behavior and insecticide resistance. There was no indication of resistance to pirimiphos-methyl or bendiocarb, but permethrin resistance was present in all sites. Deltamethrin resistance was present in two sites. In 2017, 4 new entomological monitoring sites were added, bringing the total to 11. PMI will continue to support the NMCP in entomological monitoring and support national and provincial staff in training in field entomology, with a focus on quality assurance.

Insecticide-treated nets (ITNs):

The NMCP promotes a four-pronged strategy for distributing ITNs: through mass campaigns, routine distribution via antenatal care (ANC) and child vaccination clinics, continuous distribution in provinces with hyperendemic transmission via schools and the community, and through private sector sales of full-cost and/or subsidized nets. Although logistical difficulties hinder the routine system, PMI distributed 254,495 ITNs through ANC and child vaccination clinics in 178 health zones from October 2016 to September 2017. Implementation of ITN durability monitoring continues in Mongala and Sud Ubangi provinces following the mass campaigns in July and August 2016.

With FY 2018 funding, PMI will support the operational costs for a mass campaign to distribute 1.45 million nets scheduled for 2019 in the province of Kwango. PMI will continue to support routine distribution through procurement and distribution of 2.6 million nets for ANC and vaccination clinics in all 178 supported health zones. PMI will also continue to support durability monitoring in Mongala and Sud Ubangi provinces.

Indoor residual spraying (IRS):

At this time PMI does not support IRS in the DRC.

Malaria in pregnancy (MIP):

The most recent Demographic and Health Survey (DHS) showed some evidence of improvement in the coverage of MIP interventions in the DRC. Use of ANC services remained relatively stable between the 2007 and 2013-14 DHS surveys, with 79% and 86% of women having at least two ANC visits, respectively. However, IPTp coverage only improved slightly over that same period, increasing from 5% in 2007 to 14% in 2013 for women receiving at least two doses of SP. Over the same period, use of bed nets among pregnant women increased substantially, from 7% in 2007 to 60% in 2013.

Last year PMI supported the implementation of MIP interventions in 178 health zones in 9 provinces. In the past 12 months, 492,174 treatments of SP were distributed to service delivery points. With FY 2018 funds, PMI will continue to supply ITNs and SP and to support training and supervision to ensure that providers are aware of and implementing the current guidelines regarding IPTp dosing and timing. SBCC activities will continue at both health facility and community levels and include counseling strategies on the use of ITNs during pregnancy, the importance of early attendance at ANC and obtaining SP at each visit after quickening, as well as correct diagnosis and treatment of malaria in pregnant women.

Case management and pharmaceutical management:

PMI has continued to focus case management support at various levels of the health service delivery structure. PMI has supported revision of national case management guidelines and training materials and continued to develop a national archive of malaria slides to strengthen microscopy training and

supervision and establish a cadre of national and regional microscopy experts. In the 9 provinces supported by PMI, outreach training and supportive supervision has been targeted to 57 peripheral health facilities. In addition, nearly 2,000 health workers received training in case management and 1,577 community care sites have been supported. A therapeutic efficacy study (TES) is ongoing, and the results of a pilot study on the use of rectal artesunate have been disseminated.

With FY 2018 funding, PMI will focus on maintaining progress in establishing a core cadre of microscopy experts for the PMI target areas. PMI will procure RDTs, ACTs, injectable artesunate, and rectal artesunate to diagnose and treat uncomplicated and severe malaria cases at reference hospitals, health centers, and community care sites in 178 zones. Training and supervision of facility-based and community-based health workers will continue to be a case management priority. Special emphasis will be placed on supporting expansion of community care sites, strengthening supportive supervision, and training for pre-referral treatment with rectal artesunate. PMI will also support the next round of TES together with the NMCP and other donors.

PMI supports supply chain management interventions in the DRC to complement its efforts to improve malaria case management. With FY 2018 funds, PMI will provide technical assistance to improve stock management, support transportation and storage of all commodities procured for its 178 health zones, and provide training and supervision to improve supply chain management at 8 regional warehouses.

Health systems strengthening and capacity building:

PMI has invested extensively in supporting various capacity building activities designed to assist the NMCP achieve its overarching goal of reducing mortality and morbidity due to malaria. In addition to training and supervising health workers at the health facility and community levels, PMI has also supported activities to build capacity and expertise in critical areas. PMI helped build entomological capacity by supporting initial and refresher field entomology training and implementation of an entomology monitoring system with the National Institute for Biomedical Research. Since 2013, PMI has helped build epidemiology and surveillance capacity within the Ministry of Health (MOH) and specifically the NMCP by funding two fellows per year in the Field Epidemiology Training Program (FETP).

PMI will continue its focus on building technical and managerial capacity for malaria prevention and control at all levels of the health system. Support will continue for coordination mechanisms, capacity building and professional development, and NMCP supervision in PMI supported provinces. Support to the nine PMI provincial malaria advisors will focus especially on monitoring and evaluation and coordination of malaria activities at the provincial level. PMI will continue to support the FETP program focusing on malaria activities.

Social and behavior change communication (SBCC):

Since 2011, PMI has supported SBCC activities in targeted health zones in line with the national strategy to promote use of malaria preventive measures and treatment services. Activities have included community sensitization around routine preventive services for malaria in pregnancy and immunization to deliver IPTp and ITNs, as well as community mobilization via the community health promoters (*relais promotionnels*) to ensure correct and timely use of ITNs and to improve care-seeking behavior.

During the past 12 months, 1,136 *relais communautaires* were trained on SBCC and they performed 14,349 home visits reaching 42,487 people. In addition, 310,977 pregnant women were sensitized during

ANC visits, while 249,851 people were reached at child vaccination clinics. Furthermore, PMI assisted the NMCP to develop its new malaria communication strategy based on the new National Malaria Control Strategic Plan 2016-2020. PMI also increased the capacity of the NMCP and provincial malaria control units to coordinate SBCC activities at the national and provincial levels, respectively. Using FY 2018 funds, PMI will continue to support the production and distribution of communication materials and the implementation of the national malaria communication strategy in all PMI-supported health zones.

Surveillance, monitoring, and evaluation (SM&E):

PMI has supported various monitoring and evaluation activities in the DRC, including the DHS, development of M&E guidelines, the FETP, end-use verification (EUV) surveys, and strengthening routine health information systems (RHIS). The evaluation of the impact of malaria control interventions on morbidity and all-cause child mortality got underway in 2016, and PMI is supporting the implementation of the 2017 MICS/MIS.

PMI will continue to provide M&E technical assistance to the NMCP at both national and provincial levels. PMI will also support strengthening of the RHIS at national, provincial, and health zone levels, and build capacity to use these data. At the health zone level, support will include training and supportive supervision for monitoring and reporting activities, printing and distribution of standardized registers and data collection forms, as well as technical assistance to support data use at the health zone level.

Operational research (OR):

The PMI/DRC team is working with the NMCP and local subject experts to conduct well designed studies that meet the needs of decision makers. In 2017, PMI completed a core-funded study that assessed an appropriate follow up strategy for non-malaria fevers in the province of Tanganyika (results pending). PMI/DRC also continued support for a study to inform vector strategies by determining the degree to which mass distribution of ITNs increases pyrethroid resistance.

II. STRATEGY

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 for 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 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.

The Democratic Republic of the Congo (DRC) was selected as a PMI focus country in fiscal year (FY) 2011.

This FY 2018 Malaria Operational Plan presents a detailed implementation plan for the DRC, 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 Strategic Plan and build on investments made by PMI and other partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) malaria grants. This document briefly reviews the current status of malaria control policies and interventions in the DRC, 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 2018 funding.

Malaria situation in the DRC

The DRC is the second largest country by area in Africa (after Algeria) and the third most populated. A national census has not been conducted since 1984, but the Ministry of Health estimates the population to be 89,284,658 in 2017 and 91,873,913 in 2018¹, with the majority living in rural areas. The annual population growth rate is 3.2%.² It shares borders with nine countries—Republic of Congo (Brazzaville), Central African Republic, Burundi, South Sudan, Uganda, Rwanda, Tanzania, Zambia, and Angola—the last five of which are also PMI focus countries. The DRC sits on over 25 trillion dollars of minerals, which has the potential to significantly improve the economic situation of its residents, but this benefits only a small number of people and companies. The country ranks 176 out of 188 countries in the world on the 2016 Human Development Index; an estimated 63% of the population lives on less than \$1 per day. According to the 2013-14 Demographic and Health Survey (DHS), the under-five mortality rate is 104/1,000 live births, a substantial reduction from the previous rate of 158/1,000 (Multiple Indicator Cluster Survey 2010).

There is still much to learn about the epidemiological stratification of malaria in the DRC, but generally the country can be divided into three epidemiological zones.

- The **mountainous zones** of North Kivu are at an altitude of 1,000 to 1,500 meters. In this zone, malaria is hypoendemic. The transmission season is very short and there can sometimes be no transmission for years. Malaria premunity is difficult to acquire, thus malaria occurs in the form of an epidemic and severe malaria affects all age groups.
- In the **tropical zone**, transmission is seasonal and highest during the rainy season, which lasts five to eight months. Malaria mortality is also highest during the rainy season. Populations living in this zone are exposed to 60 to 400 infectious bites per person per year. Malaria premunity starts building up around 10 years old, and severe malaria mostly affects younger and older children.
- In the **equatorial zone**, transmission is intense and occurs year round. People are exposed to up to 100 infectious bites per person per year and start building up premunity at an earlier age. Thirty to fifty percent of fevers in children under five years of age are due to malaria, and severe malaria is mainly observed in this age group.

An estimated 97% of the population lives in zones with stable malaria transmission lasting 8 to 12 months per year. The highest levels of transmission occur in zones situated in the north and west of the country. As is the case throughout tropical Africa, the greatest burden of malaria morbidity and mortality falls on pregnant women and children under five years of age. Malaria is among the principal causes of morbidity and mortality in the DRC, accounting for 39% of all outpatient visits and for 39% of deaths in 2014.³ Given that the majority of the population lives in high transmission zones, it has been estimated that the DRC accounts for 9% of all malaria cases and 10% of all malaria deaths in sub-Saharan Africa.⁴

¹ Source: National Malaria Control Strategic Plan (2016-2020), p. 3 Table 1.

² Source: <http://data.un.org/CountryProfile.aspx?crName=democratic%20republic%20of%20the%20congo>

³ Source: NMCP 2015 Annual Report

⁴ WHO World Malaria Report 2015: <http://www.who.int/malaria/publications/world-malaria-report-2015/report/en/>

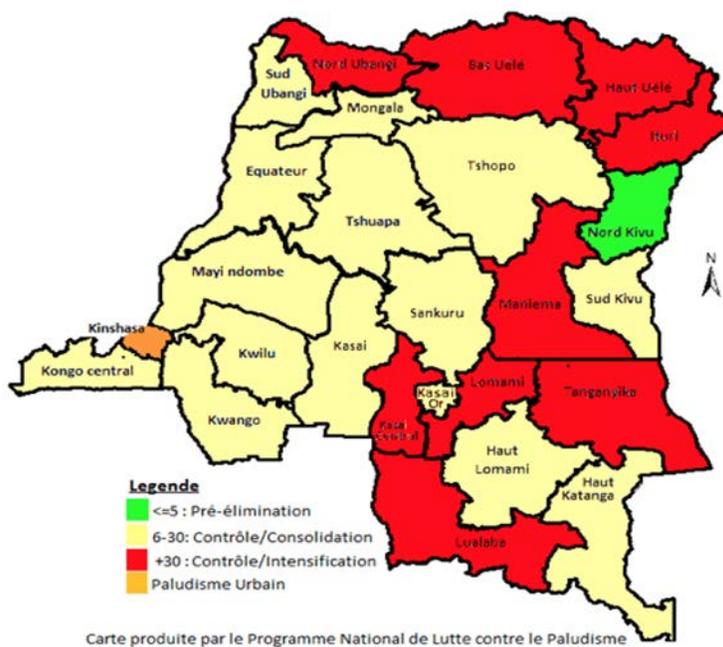
The 2013-14 DHS, which was sampled to be representative for the 11 old provinces,⁵ showed national malaria parasite prevalence in children 6-59 months to be between 23% and 34% depending upon the diagnostic test used: 22.7% for microscopy, 30.9% for RDTs, and 34.1% for polymerase chain reaction (PCR). Prevalence was found to be higher for those living in rural areas compared to urban; prevalence was highest in Orientale province and lowest in North Kivu (for all diagnostic methods). Comparison of the PCR and microscopy results in the DHS supplemental malaria report shows that prevalence using PCR is approximately 50% higher than with microscopy because it detects much lower levels of parasitemia; these findings are consistent with other studies. Molecular analyses suggest that mono-infection with *P. ovale* or *P. malariae* is rare (estimated at 0.6-1.7%). The survey also showed that 6.2% of Congolese children aged 6-59 months had severe anemia that could be associated with malaria (8.0 g/dl or less).

The National Malaria Control Strategic Plan for 2016-2020 divides the country into four strata based on parasite prevalence (Figure 1).

⁵ Note that the 2013-2014 DHS was conducted prior to the territorial reform that sub-divided the former 11 provinces into 26 new provinces.

Figure 1: Provincial stratification based on malaria parasite prevalence, DRC-DHS II 2013-14

Strata	Parasite prevalence	Main determinant	Provinces	% Population
I.	≤5%	Mountain zone - hypo endemic	Nord Kivu	8%
II.	6-30%	Equatorial and tropical zones - meso endemic	Kwango, Kwilu, Sud Kivu, Mongala, Sud Ubangi, Mai Ndombe, Equateur, Tshuapa, Kongo Central, Tshopo, Haut Katanga, Haut Lomami, Kasai, Kasai Orientale, and Sankuru	55%
III.	> 30%	Tropical zone - hyper endemic	Nord Ubangi, Bas Uele, Haut Uele, Ituri, Maniema, Lualaba, Kasai Central, Tanganyika, and Lomami	27%
IV.	8.1%	Urban context, with variations from the city center to the periphery	Kinshasa	10%



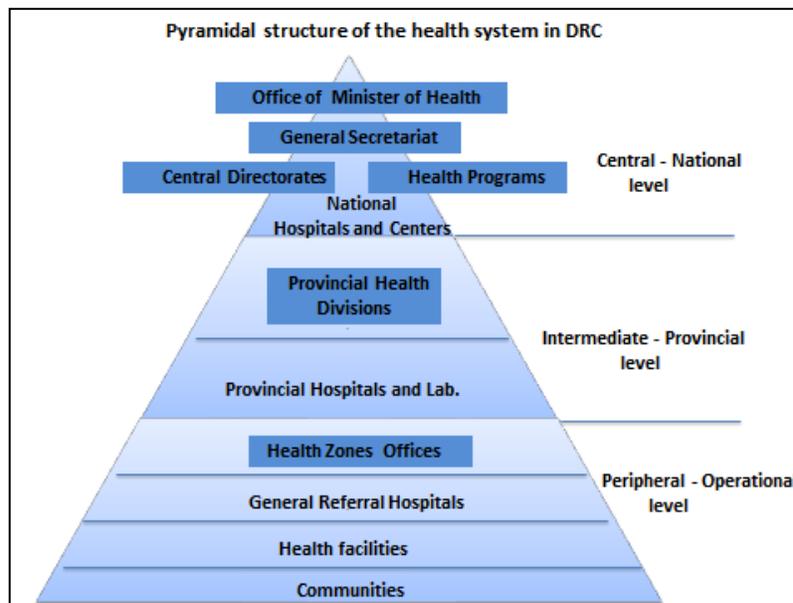
The primary vectors of malaria in the DRC are *Anopheles gambiae*, *An. coluzzii*, and *An. funestus*. There are several secondary vectors present in different parts of the country including *An. moucheti*, *An. paludis*, and *An. nili*. Resistance to dichloro-diphenyl-trichloroethane (DDT) and permethrin has been found, as well as increasing resistance to deltamethrin. As of yet, little resistance to organophosphates and carbamates has been detected.

Country health system delivery structure and MOH organization

The health system in the DRC has three levels (Figure 2):

- The **central level**, which includes the Minister of Health, the Secretary General, Central Directorates, disease-specific programs such as HIV/AIDS, tuberculosis, and malaria, as well as national hospitals and reference centers. The current restructuring of the MOH will result in the following configuration: Secretary General, General Health Inspectorate, and two general directorates: one for technical directions and one for Administrative directions. The NMCP, along with other technical directorates and programs, will be under the General Directorate of Organization and Management of Health Services and Care. At the provincial level the NMCP will be integrated in the provincial division of health instead of being a stand-alone program.
- The **intermediate level**, composed of 26 provincial health divisions (*Division Provinciale de la Santé, DPS*), 26 provincial health inspection offices, provincial level hospitals and laboratories, and regional drug distribution warehouses (*Centrales de Distribution Régionales (CDR)*). The disaggregation from the previous 11 to current 26 provinces is not yet complete, and some structures, including the NMCP, do not yet have offices and representatives in all the new provincial capitals;
- The **peripheral level**, comprised of 516 health zones, general referral hospitals, and 8,504 health areas, 8,266 of which have a government health center (health facility) where clinical services are provided (approximately 15-20 health centers per health zone).

Figure 2: Structure of the health system in the Democratic Republic of the Congo



At the community level there are two types of volunteer/unpaid health workers called *relais communautaire*. Community health promoters (*relais communautaire promotionnel*) carry out health behavior change communication and community mobilization activities. Community treatment workers (*relais des sites de soins communautaires*) provide integrated community case management (iCCM) for diarrhea, fever, and acute respiratory infection. The community treatment workers also refer

malnourished children to health facilities, and distribute a limited package of family planning commodities. Community treatment workers are selected based on a higher level of education and having an established source of remuneration, independent of their health work. At this time, there are 7,300 community care sites and 5440 iCCM sites within the country, of which about 65% offer an integrated CCM package.

Only 393 of the 516 health zones have a general reference hospital. Faith-based organizations run 34% of these hospitals, which are integrated into the public health system. In most health zones supported by faith-based/non-governmental organizations, the MOH pays the salaries of government staff, which are extremely low, and provides additional incentives called *primes*. In those facilities, additional *primes* are paid to health workers and essential drugs, laboratory equipment, and in-service training are provided.

The National Essential Medicine Supply Program (PNAM) is responsible for implementing the National Essential Medicine Supply System (SNAM) that consists of a centralized pharmaceutical procurement system through a nonprofit association (*Fédération des Centrales d'Achat des Médicaments Essentiels, FEDECAME*) combined with a decentralized warehousing and distribution system through 14 CDRs. Each health zone has a central depot, but storage capacity and conditions are often lacking; staff capacity and motivation at all levels of the supply chain remain challenges. The DRC uses primarily a pull system, whereby health facilities submit orders to the health zone, which then submits a consolidated order to the regional warehouse. These orders are validated by the CDR staff along with provincial health authorities and partners.

National malaria control strategy

The NMCP dedicated the last several months of 2015 to assessing progress made under the previous strategy (2013-2015) and developing a new one. The new National Malaria Control Strategic Plan (NSP) covers the period 2016-2020 and guides the support of PMI and other donors. It introduced the stratification of health zones based on parasite prevalence as measured by the 2013-14 DHS (see Figure 1 above). While high-impact interventions are still delivered in a uniform approach across the four strata, this approach will help monitor progress, as more health zones should start shifting to lower prevalence strata moving forward.

The overall objective of the new strategy is to reduce malaria morbidity and mortality by 40% compared to 2015 levels. Specific objectives to be achieved by 2020 are:

- protect at least 80% of the at-risk population with preventive measures;
- test at least 80% of fever cases suspected as malaria and treat 100% of confirmed cases;
- strengthen the surveillance, monitoring, and evaluation system;
- assure that at least 75% of the at-risk population knows modes of malaria transmission, prevention, and treatment; and
- strengthen management of the malaria program

The 2016-2020 National Malaria Control Strategic Plan focuses on the following strategies:

- **Vector control**, including distribution of long-lasting insecticide-treated nets (LLINs) through phased mass campaigns every three years, and continuous distribution through routine ANC and EPI systems to pregnant women at their first ANC visit and children at the time of the measles vaccine. To maintain high LLIN coverage between campaigns, the strategy recommends school-

and community-based distribution of LLINs in high endemic provinces. In addition the strategy includes environmental clean-up activities for vector control strategy.

- **Targeted indoor residual spraying.** This is currently conducted at a very small scale in two health zones supported by mining companies.
- **IPTp with SP** is provided to pregnant women after the first trimester of pregnancy at the four recommended ANC visits.
- **IPTi and Seasonal Malaria Chemoprevention (SMC)** are both included in the DRC National Malaria Control Strategic Plan as potential interventions, but currently not implemented. The NMCP is first planning to conduct feasibility assessments before considering these approaches. *Médecins sans Frontières* is currently supporting such an assessment for SMC in some high altitude/low prevalence areas of North Kivu. In 2016 the Global Fund supported the NMCP to conduct a study in Kinshasa and Kongo Central to evaluate SP resistance. The results were not judged sufficient to inform a policy decision. A national survey is now needed.
- **Case management of malaria** using diagnostic testing of suspected malaria cases by rapid diagnostic test (RDT) or microscopy. Confirmed cases are to be treated with artemisinin based combination therapies (ACT): artesunate-amodiaquine (AS/AQ) or artemether-lumefantrine (AL) for uncomplicated cases and injectable artesunate or quinine for severe malaria cases. The strategy also includes rectal artesunate for pre-referral treatment at community care sites and at the first-level health centers. Malaria tests and drugs are free for all age groups in DRC according to national guidelines.
- **Monitoring and evaluation** through routine HMIS with the DHIS2 software, weekly integrated disease surveillance and response, and sentinel surveillance including both epidemiological and entomological surveillance. In addition, household surveys, ad hoc studies, and operational research are to be conducted to respond to specific program gaps and needs.
- **Behavior change communication** implemented through interpersonal and mass communication, in collaboration with the national health communication program, the national school health program, and community based organizations.
- **Strengthening management** of the malaria program through institutional, organizational and managerial capacity building.

Updates in the strategy

- The rationalization process initiated in 2016 by the NMCP and major malaria donors to focus efforts in concentrated areas is now completed and operational. PMI is now covering nine contiguous provinces located in the southeast on the country (see page 16).
- In 2017, the DRC submitted to the Global Fund an application for a program continuation grant, requesting \$347,651,023 for the period 2018-2020 to support the same interventions the country has been implementing under the current grant (see page 16).
- The DRC's Ministry of Health is in a process to change its organizational structure called the new health reform (see page 13).

Integration, collaboration, and coordination

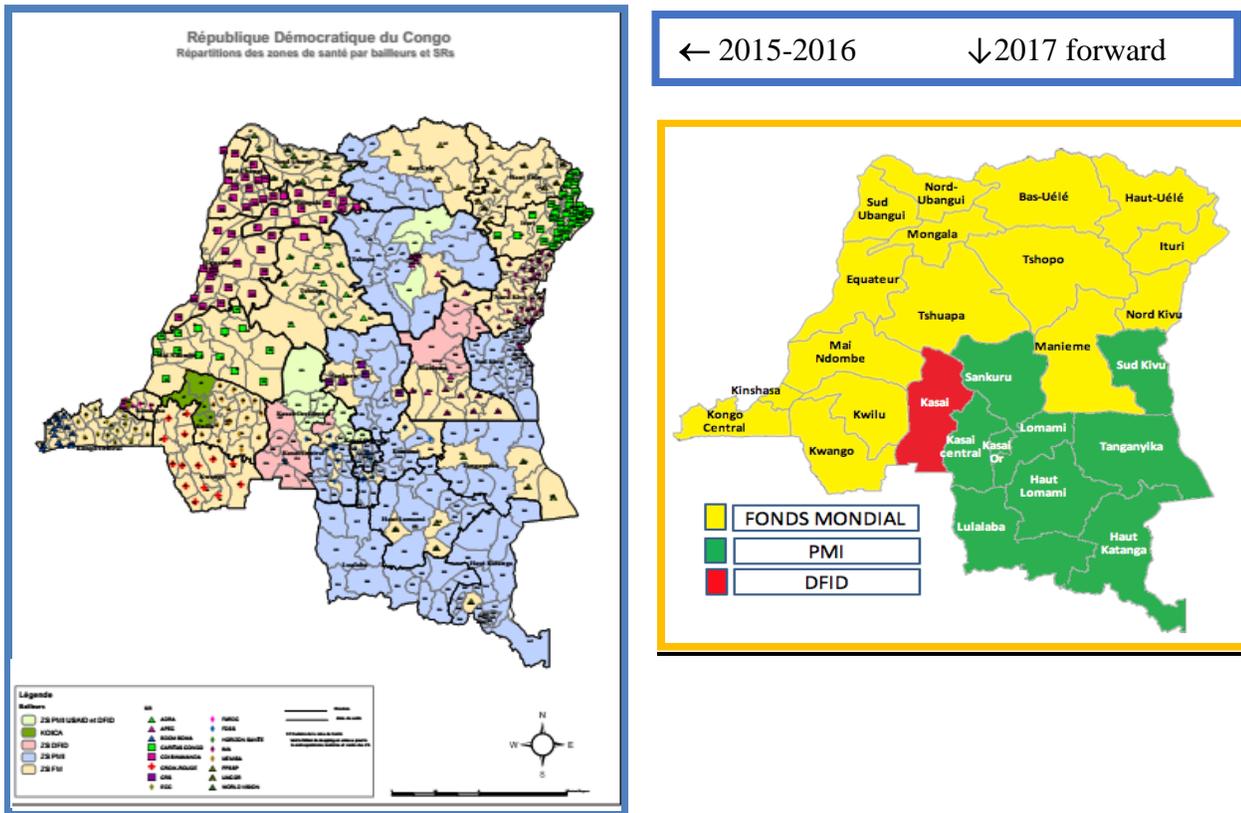
Many donors contribute to malaria control efforts in the DRC, the largest of which are:

The Global Fund to Fight AIDS, Tuberculosis, and Malaria: The major donor for malaria control activities in the DRC is the Global Fund. The current grant, valued at \$341.5 million, expires in December 2017. Through this grant, the number of health zones covered by the Global Fund increased from 219 to 322. The program continuation grant application, for \$347,651,023, which was submitted in March 2017, will continue investments in the following main interventions: 1) ITNs for mass campaigns and distribution through routine systems; 2) support for diagnostic testing, case management, and IPTp; 3) health promotion activities; and 4) strengthening of the national health information system, the pharmaceutical supply chain, and monitoring and evaluation through selected sentinel sites. The concept note for this application was already approved by the Technical Review Panel. In addition, the Global Fund and the Department for International Development (DFID) are co-financing a pilot project in Kinshasa to introduce subsidized ACTs in the private sector.

The British Department for International Development (DFID) is funding a 5-year £185 million Access to Primary Health Care Project in 56 health zones that contains a malaria component; this project will end in March 2018. Additionally, a £39.8 million (\$51.5 million) Defeat Malaria project is being implemented from 2013 to 2019. The project includes three components: 1) ITN distribution through mass campaigns and continuous channels (health services, schools, and community-based) in Kasai and Kasai Central provinces (former Kasai Occidental), 2) improved availability and accessibility of quality-assured ACTs in the private sector in Kinshasa, and 3) increased capacity of the NMCP to generate and use data through the establishment of ten sentinel surveillance sites and the placement of technical assistants at the NMCP, working in the areas of operational research, information technology, and finance. DFID's objective through this support is to enable the NMCP to more effectively manage data and resources. DFID also funded the distribution of 670,000 ITNs donated by the **Against Malaria Foundation** for a mass distribution campaigns implemented by IMA in 2016.

Figure 3 shows the geographic coverage for the three major malaria donors – the Global Fund, PMI, and DFID. During 2016, PMI worked closely with the NMCP and these partners on a “rationalization” process to better focus the efforts of each donor in concentrated geographic areas and eliminate overlap within provinces. The result is the malaria donor map shown in Figure 3, where each major donor covers a province in its entirety and covers geographically contiguous areas.

Figure 3: Changes in Malaria Donors Map



For PMI, rationalization means leaving health zones in the northern part of the country (Bas-Uélé and Tshopo) and in Kinshasa to concentrate efforts in the Kasais, Katanga, and Eastern Congo provinces. This brings PMI’s interventions into line with USAID/DRC’s Country Development Cooperation Strategy, which focuses on these same geographic areas. The number of health zones supported decreased slightly from 181 in 2016 to 178 in 2017, but the population covered increased from approximately 29.8 million to 33.4 million due to moving into more urban areas.

The World Bank: The World Bank does not currently fund any malaria-specific projects in the DRC, but it has two health programs that impact malaria. The *Health System Strengthening for Better Maternal and Child Health Results Project* (2015-2019, \$229 million) supports performance-based financing in 140 health zones as well as at provincial and central levels. This project is implemented in 16 health zones that PMI also covers. Quality antenatal care and malaria case management for children are among indicators that serve as the basis for bonus payments, as well as the availability of tracer drugs including ACTs and SP. The *Human Development Systems Strengthening Project* (2015-2020, \$55 million) includes activities to strengthen the health management information system, the pharmaceutical regulatory system, and the public supply chain management system.

The **Korean International Cooperation Agency** has funded malaria activities in Bandundu Province since 2009 but its project ended in 2016. Other donors such as **UNICEF**, the **Swedish International Development Agency**, and the **Canadian International Development Agency** support broader maternal and child health programs that include malaria.

World Health Organization (WHO) provides technical assistance and has been implementing the Rapid Access Expansion (RACe) project in Tanganyika Province to scale up integrated community case management. The four-year project, which ends in late 2017, supports 1,559 community care sites across all 11 health zones.

Médecins sans Frontières implements both routine and emergency health interventions in the DRC. Routine programs focus on community case management and health facility services. In 2016, they treated more than 1 million malaria cases, including 84,000 as part of their response to a malaria outbreak in Haut-Uélé Province.

The **government of the DRC** has, since 2006, provided approximately \$2 million annually to the NMCP for staffing costs, infrastructure, and some commodities. It also is implementing an \$80 million phase 1 *Projet d'Équipement des Structures Sanitaires* to build and equip reference hospitals and health centers in targeted, underserved areas. In addition, the government of the DRC has recently contributed \$1,500,000 in cost share funds to the Global Fund.

Tenke Fungurume Mining is a major malaria control partner in the Fungurume health zone of Lualaba Province. The company has conducted yearly rounds of IRS in 12 of 18 health areas since 2008. It also distributes ITNs, supports community care sites, and has a significant M&E component, including entomological monitoring and semi-annual school-based malaria prevalence surveys. Their efforts achieved a 60% reduction in malaria incidence in their workforce and a 62% reduction of malaria prevalence in school age children in the areas covered by their program.

USG Health Sector Funding: In addition to PMI, USG's support of the DRC health sector includes investments in HIV/AIDS through multiple agencies under PEPFAR, and support of the Global Health Security Agenda through a partnership between USAID, CDC, and DOD. The USAID Health Office manages programs in malaria, HIV/AIDS, maternal and child health, family planning and reproductive health, water, sanitation and hygiene, nutrition, and tuberculosis, with an FY 2016 budget of \$147 million. The PMI program is an essential part of the USAID Health Office, and leverages the different USAID funding streams to support the DRC's health system in a holistic manner. Key areas of collaboration within the Health Office include supply chain management, monitoring and evaluation, and integrated community case management.

The DRC has various coordination mechanisms for the health sector:

- The **Steering Committee for the Coordination of the National Health Development Plan** (*Comité National de Pilotage*) is the highest level coordination mechanism established by the MOH to oversee the implementation of the five-year National Health Development Plan (2016-2020).
- The **Health Donors Group** (*Group Inter Bailleurs Santé*) meets monthly to coordinate activities and monitor implementation of the National Health Development Plan. Several sub-groups address specific topics such as supply chain management, human resources, service delivery, and governance. The USG is represented on all of the groups and works to improve harmonization and promote strategic approaches.
- The **Global Fund Country Coordinating Mechanism** meets regularly with health sector stakeholders to keep abreast of progress with grant implementation and to provide administrative and financial oversight of the principal recipients. Until September 2016, USAID co-chaired the Country Coordinating Mechanism as the first vice-president; USAID is now the alternate First Vice President, participates in most executive committee meetings, and continues to provide

technical assistance through a Global Fund Liaison. The PMI staff and the USAID Global Fund Liaison have participated in developing and reviewing country proposal submissions.

- The **Malaria Technical Working Group – Task Force**: This open forum is chaired by the Disease Control Directorate and meets quarterly for coordination and technical discussions at the national level; meetings are also held at the provincial level where donor support is available. The working group includes representatives of civil society and, more recently, the private sector. A Task Force meeting was held during the development of the PMI FY 2018 Malaria Operational Plan (MOP) and the NMCP presented the proposed interventions.

PMI goals, objectives, strategic areas, and key indicators

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

1. Reduce malaria mortality by one-third from 2015 levels in PMI-supported countries, achieving a greater than 80% reduction from PMI’s original 2000 baseline levels.
2. Reduce malaria morbidity in PMI-supported countries by 40% from 2015 levels.
3. Assist at least five PMI-supported countries to meet the World Health Organization’s (WHO) criteria for national or sub-national pre-elimination.⁶

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

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

To track progress toward achieving and sustaining scale of proven interventions (area of strategic focus #1), PMI will continue to track the key indicators recommended by the Roll Back Malaria Monitoring and Evaluation Reference Group 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 of age 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 of age with fever in the last two weeks for whom advice or treatment was sought

⁶ http://whqlibdoc.who.int/publications/2007/9789241596084_eng.pdf

- Proportion of children under five years of age with fever in the last two weeks who had a finger or heel stick
- Proportion receiving an ACT among children under five years of age 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

Progress on coverage/impact indicators to date

The 2013-14 DHS provides the most up-to-date information on the status of malaria prevention and control interventions in the DRC. Progress to date and the NMCP targets for the 2016-2020 National Malaria Control Strategic Plan are summarized in Table 1 below.

The 2013-14 DHS report showed that the DRC is making significant progress, with very promising trends in malaria indicators and all-cause child mortality compared to the 2010 Multiple Indicator Cluster Survey (MICS). From 2010 to 2013, improvements include: 1) the increase in the use of ITNs by children under five years of age, from 38% to 56%; 2) the increase of ITN use by pregnant women, from 43% to 60%; 3) the increase of households owning at least one ITN, from 51% to 70%; and 4) the decrease in the all-cause child mortality rate from 158/1,000 live births to 104/1,000 live births. Further gains in ITN access and use, as well as uptake of IPTp, are still a priority. Treatment-seeking for febrile children under five years of age was 55% in the 2013 DHS, with testing and treatment with an ACT at only 19% each—a key case management and SBCC challenge for the DRC to address.

Table 1: Evolution of Key Malaria Indicators in the DRC from 2007 to 2014

Indicator	2007 DHS	2010 MICS	2013-14 DHS	NMCP 2020 Targets
% Households with at least one ITN	9%	51%	70%	>80%
% Households with at least one ITN for every two people	N/A	N/A	25%	N/A
% Children under five who slept under an ITN the previous night	6%	38%	56%	>80%
% Pregnant women who slept under an ITN the previous night	7%	43%	60%	>80%
% Households in targeted districts protected by IRS	N/A	N/A	N/A	N/A
% Children under five years old with fever in the last two weeks for whom advice or treatment was sought	N/A	N/A	55%	N/A
% Children under five with fever in the last two weeks who had a finger or heel stick	N/A	17%	19%	>80%
% Children receiving an ACT among children under five years old with fever in the last two weeks who received any antimalarial drugs*	N/A	N/A	N/A	>80%
% Women who received two or more doses of IPTp during their last pregnancy in the last two years	5%	21%	14%	>60%
Under-five mortality rate per 1,000 live births	148	158	104	N/A
% children under five with parasitemia (by microscopy)	N/A	N/A	23%	N/A
% children under five with parasitemia (by RDT)	N/A	N/A	31%	N/A

*This specific indicator was added subsequent to the DRC's national surveys.

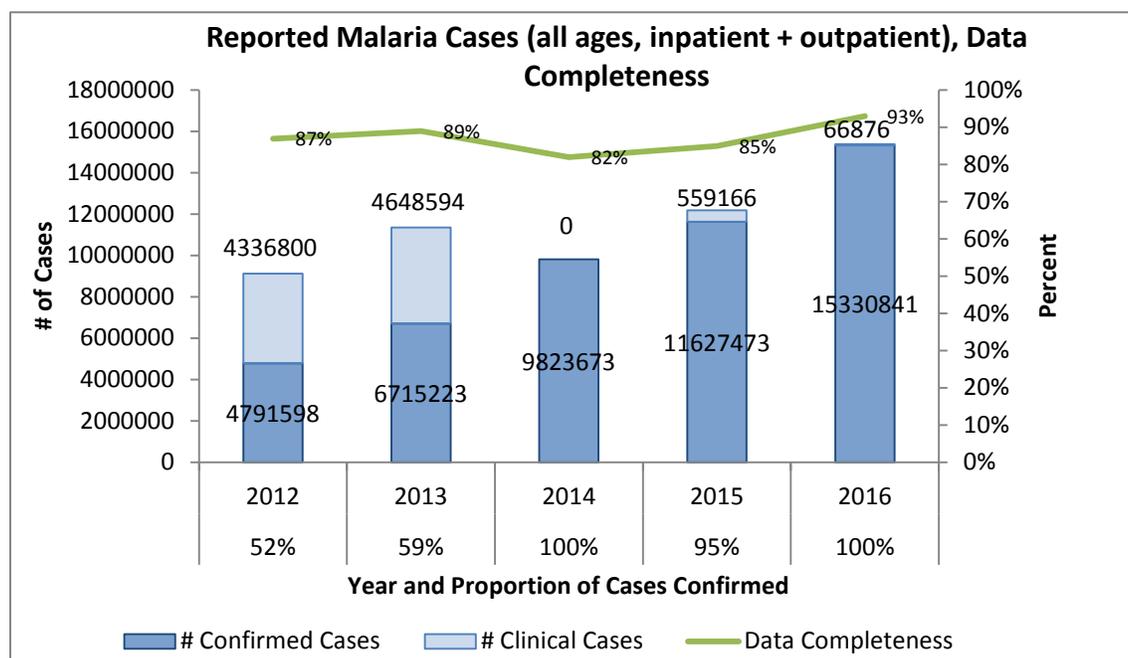
Table 2: Evolution of Key Malaria Indicators reported through routine surveillance systems in DRC from 2012 to 2016

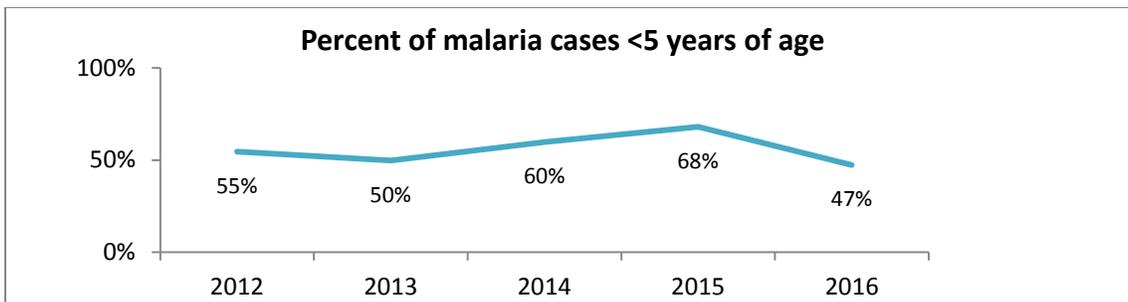
Indicator	2012	2013	2014	2015	2016
Total # Cases[†]	9,128,398	11,363,817	9,749,369	12,186,639	15,397,717
Total # Confirmed Cases	4,791,598	6,715,223	9,823,673*	11,627,473	15,330,841
Total # Clinical Cases	4,336,800	4,648,594	-	559,166	66,876
Total # <5 Cases	4,978,042	5,651,553	5,877,247	8,294,504	7,292,929
Total # inpatient malaria deaths	21,601	30,918	25,502	39,054	33,997
Data Completeness (%)	87%	89%	82%	85%	93%
Test Positivity Rate	63%	66%	68%	71%	72%

[†]According to the NMCP, the increase in cases in 2015 and 2016 is due to an increase in the coverage of case management interventions and to the utilization of health services, as well as to improved reporting rates.

*The number of confirmed cases is superior to the number of cases reported due to the fact that several tests were performed per patient and the number of positive tests was reported in lieu of the number of confirmed cases.

Figure 4: Trends in Key Routine Based Malaria Indicators





Other relevant evidence on progress

The DRC malaria impact evaluation report, expected by the end of 2017, will assess the achievements of all malaria interventions in the DRC from 2005 to 2015.

A recent national study that evaluated inpatient mortality rates and their causes from 2005 to 2014 found that the proportion of hospitalizations due to malaria increased from 46.3% in the period 2005 - 2007, to 50.5% in 2008-2010, to 54.8% in 2011 - 2014. Nevertheless, the number of inpatient deaths attributable to malaria went from 25.1%, to 24.2%, to 24.8%, and the case fatality rate for malaria decreased from 5.4 to 4.8 to 4.2 in the same periods.

The results of a PMI core-funded study to assess the non-inferiority of community health worker (CHW)-advised conditional follow up, compared to the systematic follow-up on day three for non-severe febrile illness are expected by the end of 2017, and will inform future community case management guidelines.

Data collection for a MICS-combined with a Malaria Indicator Survey (MIS) will begin in October 2017.

III. OPERATIONAL PLAN

1. Vector monitoring and control

NMCP/PMI objectives

Under the NMCP Strategic Plan 2016-2020, the DRC seeks to achieve high ownership and use of ITNs among the general population, targeting at least 80% of persons at risk of malaria. The NMCP promotes a four-pronged strategy for distributing ITNs: 1) distribution of free ITNs through large-scale integrated or stand-alone campaigns; 2) routine distribution of free nets to pregnant women during ANC clinics, and to children under one year of age at Expanded Program on Immunization (EPI) clinics; 3) continuous distribution in provinces with hyperendemic transmission via schools and the community; and 4) private sector sales of full-cost and/or subsidized nets.

The campaign strategy for achieving universal coverage—quantified as one ITN per 1.8 persons, in accordance with WHO guidelines—is to distribute nets as follows: 1) one net to a household of one to two persons, two nets for three to five persons, three nets for six to eight persons, and four to a household of greater than nine; and 2) one net per bed or sleeping space for hospitals and boarding schools. In the absence of information on ITN durability, the NMCP recommends replacing nets every three years.

To sustain ITN coverage post-campaign, the national strategy includes distribution through routine ANC and EPI clinics. Each pregnant woman should receive an ITN during her first ANC visit, and each child under one year of age should receive an ITN after completing the vaccination series (generally at nine months with measles vaccination).

The NMCP's national strategy lists IRS as a key vector control method that can be progressively implemented in areas with high levels of malaria (parasite prevalence of 31-55%) or in Kinshasa, where parasite prevalence is approximately 8%. While IRS is limited, entomological monitoring is important to better understand the distribution of malaria vectors in the DRC and their behavior.

a. Entomological monitoring and insecticide resistance management

Progress since PMI was launched

Entomological training has been a priority in order to assure the quality of entomological monitoring in DRC. In 2012, PMI supported the training of 24 entomologists, including personnel from the central and provincial levels, in mosquito identification, collection techniques, and insecticide susceptibility testing, as well as an overview of vector control methods. A second training was carried out in June 2013 with 12 participants. In 2016, two supervisors of PMI entomological monitoring activities were sent for one-week training in Dakar, Senegal, organized by PMI. Additionally, two field supervisors from the entomological collection sites in Lodja and Kapolowe, and one member of the NMCP were sent to the *Centre de Recherche Entomologique de Cotonou*, in Benin, for a three-month training on field and laboratory techniques.

Entomological monitoring began in four sites (Lodja, Tshikaji, Kabondo, and Kapolowe) in 2013, and three additional sites (Mikalayi, Fungurume, and Kingasani) were added in 2015. This monitoring was previously only conducted at specific points during the year, but monthly monitoring has now begun in two sites: Lodja, which began monthly monitoring in 2015, the year of a mass ITN distribution

campaign, and Kapolowe, which had a campaign in August 2016. Similarly, an operational research project in Kinshasa Province has begun to monitor the effect of a bednet distribution campaign on insecticide resistance intensity. Susceptibility to insecticides (especially pyrethroids) is monitored in all entomological collection sites supported by PMI (seven sites in 2016).

In 2015, synergist bioassays were conducted to see if the permethrin resistance noted in the entomological monitoring sites is mediated by oxidases. Mosquitoes were tested in WHO susceptibility tests with permethrin and these results were compared with mosquitoes that had been exposed to piperonyl butoxide for one hour prior to the tests. The results of these tests indicated that, in some sites, oxidases play a major role in resistance to permethrin, while in others, oxidases play a much less important role.

As high numbers of *Anopheles paludis* were collected in Lodja in 2014, and as *An. paludis* had been reported to be a vector in DRC previously, PMI conducted monthly monitoring in 2015 in Lodja. Mosquitoes were collected in human landing catches and pyrethrum spray catches each month. Circumsporozoite enzyme linked immunosorbent assays were conducted with mosquitoes from Lodja (2015) to determine the proportion of infective mosquitoes. No *An. paludis*, of over 1,400 samples tested, was positive.

An evaluation of the Suna trap was conducted in early 2016 to determine whether this trap could replace human landing catches or light traps for collection of mosquitoes. Data are still being compiled and cleaned, but it appears that the Suna trap collected similar numbers of mosquitoes to light traps, but considerably less than a human landing catch.

Progress during the last 12-18 months

Four new entomological monitoring sites were added for 2017 - Karawa (Sud Ubangi), Pawa (Haut Uele), Inongo (Mai Ndombe), and Kimpese (Kongo Central) – bringing the total to 11. Entomological monitoring teams visited each site three times during the year and conducted human landing catches and pyrethrum spray catches. *Anopheles gambiae* s.l. was the most commonly collected malaria vector in all sites, with the exception of Katana and Mikalayi, where *Anopheles funestus* was the most commonly collected.

Insecticide susceptibility tests were conducted to evaluate the susceptibility of *Anopheles gambiae* s.l. to permethrin, deltamethrin, and bendiocarb. As shown below, there was susceptibility to bendiocarb in all sites, with the exception of Kabondo (Table 3). Deltamethrin resistance was present in two sites (Mikalayi and Kabondo). Permethrin resistance was widespread, with susceptibility only found in Kapolowe and Katana.

Table 3: Percentage mortality (and number tested) of *An. gambiae* s.l.in WHO tube bioassays, 2016.

Site	Province	Bendiocarb (1%)	Deltamethrin (0.05%)	Permethrin (0.75%)
Kabondo	Tshopo	96 (100)	76 (100)	12 (100)
Kalemie	Tanganyika	100 (100)	100 (100)	40 (100)
Kapolowe	Haut Katanga	100 (80)	100 (80)	100 (80)
Katana	Sud Kivu	100 (100)	100 (100)	100 (100)
Kingasani	Kinshasa	100 (80)	100 (80)	21 (80)
Lodja	Sankuru	100 (100)	100 (100)	69 (100)
Mikalayi	Kasai- Central	100 (100)	88 (100)	36 (100)

Monthly collections were continued in Lodja, and were also initiated in Kapolowe (Haut Katanga), providing seasonal abundance data for *Anopheles gambiae* s.l., *Anopheles funestus* s.l., and *Anopheles paludis*. One *Anopheles paludis* from Kapolowe was collected with sporozoites, but further analysis is underway.

PMI, in collaboration with WHO, supported the development of an insecticide resistance management plan to help maintain the effectiveness of insecticide based interventions. This document, which is expected to be validated and finalized in September 2017, will outline how the NMCP will use combination and rotation policies in its interventions. Rotation of IRS insecticides is a relatively straightforward operation, and combination treatments for both IRS and ITNs are expected to be available for use in the near future.

Plans and justification

Eleven entomological monitoring sites will be maintained using FY 2018 funds. Activities will focus on monitoring for insecticide resistance, using innovative, cost-effective approaches such as the forced oviposition technique to bring eggs back to the central laboratory for bioassays rather than spending weeks in the field waiting for larvae to develop, as well as the aspiration technique and CDC light traps to capture mosquitoes. Molecular analysis of samples will allow identification of species and resistance mechanisms. In addition, PMI will support training in field entomology for national and provincial staff, with a special emphasis on quality assurance.

Monthly monitoring has been found to be extremely informative for understanding the seasonality and behavior of several malaria vector species in Lodja and Kapolowe and this activity can be conducted in other sites to understand the species present throughout the year. Resistance testing will be done using standard WHO susceptibility tests, and CDC intensity assays in some sites.

Proposed activities with FY 2018 funding: (\$344,000)

- Conduct insecticide resistance assessments at 11 entomological monitoring sites. Monthly entomological monitoring in two sites (to be determined). (\$300,000)
- Support training in entomology for national/provincial staff, with a special emphasis on quality assurance. (\$15,000)
- Provide two technical assistance visits from CDC/Atlanta for training, planning, and monitoring entomological activities given the expansion of entomological surveillance up to the national level. (\$29,000)

b. Insecticide-treated nets

Progress since PMI was launched

The National Malaria Control Program's objective for ITNs is to achieve and maintain at least 80% coverage and use of ITNs in the general population. To achieve this objective, the country distributes ITNs through phased mass distribution campaigns every three years and continuous distribution through routine ANC and EPI services to pregnant women at their first ANC visit and children at their measles vaccine. To maintain high ITN coverage between campaigns, the country recently adopted school-based distribution targeting school children in the first, third, and fifth grades, as well as a community-based distribution in highly malarious provinces.

Since 2011, the NMCP with support from partners (PMI, Global Fund, the World Bank, and DFID) has distributed more than 70 million ITNs through mass campaigns, including 20 million with support from PMI. The 2013-14 DHS showed that 70% of households reported owning at least one ITN, a substantial increase from 9% and 51%, as reported by the 2007 DHS and 2010 MICS, respectively. In addition, 56% of children under five years of age and 60% of pregnant women slept under an ITN the night before the survey, dramatic increases from 6% and 7% reported in 2007, respectively. Ownership of at least one ITN facilitates net use by children under five years of age; in households with an ITN, 76% of children under five years of age slept under a net the previous night, compared to 56% in all households. While indicators improved, a quarter of children under five years of age in households that possessed an ITN did not sleep under one the night prior to the survey. Furthermore, less than half of the population had access to an ITN—i.e., only 47% of persons present in households could have slept under an ITN, if two persons at most used each ITN. These data illustrate the need to increase net ownership to protect all household occupants, and to reinforce communication strategies to ensure that nets are used consistently.

Progress during the last 12-18 months

Mass distribution campaigns: In early 2017 the NMCP, with support from PMI and Global Fund, and technical assistance from the Alliance for Malaria Prevention, conducted a review of all mass distribution campaigns completed during 2015 and 2016. The review identified a lack of harmonization in quantification approaches, late validation of macroplanning, and non-respect of timelines for technical activities at all levels. The following norms were adopted to improve harmonized planning:

- 8-12 months before the campaign: develop macroplan that includes a logistics plan, an implementation plan, quantification, and a detailed budget; provincial staff be included in the early stages of planning.
- 6 months before the campaign: develop microplan with more detailed information from the provincial level, after which 80% of the nets are pre-positioned in the province;
- 45 days before the distribution: implement census including household registration, door marking and voucher distribution, followed by the delivery of the remaining nets to the province;
- 4-5 days for the distribution phase.

In 2016, 16.8 million ITNs were distributed as part of mass campaigns in 6 provinces, including 3.4 million ITNs with support from PMI in 3 provinces. In 2017, the NMCP is planning mass distribution

campaigns in eight provinces, including three with support from PMI. PMI procured 6,250,000 ITNs for mass campaigns in Kasai Central, Kasai, and Bas Uele⁷ provinces covering an estimated 11 million people. Donors follow the national campaign schedule based on the three-year cycle for ITN renewal, not limiting their resources to only the provinces where they support routine activities

Continuous distribution: During FY 2017, PMI distributed 254,495 ITNs through ANC and child vaccination clinics in 178 health zones.

In 2015 and 2016, DFID funded a school-based distribution pilot in two health zones of Kasai Province. As a result, the NMCP requested expansion of the school-based distribution approach. In 2017, PMI provided technical assistance to the NMCP and partners to develop guidelines for school-based distribution that will serve as standard planning, implementation, and evaluation guides for this activity. In addition, PMI is preparing to support school-based distribution in the provinces of Lomami, Lualaba, and Tanganyika during the 2017-2018 school year. These provinces were selected based on having hyperendemic malaria transmission, and moderately high primary school attendance (66% - 77%). This activity will include an evaluation component to assess the process and outcomes of the school-based distribution, including ITN ownership and use. The NMCP will also use the evaluation results to inform decisions about further scale up of the school-based approach.

ITN durability monitoring: PMI initiated the DRC's first national program to monitor net durability linked to the mass distributions in Mongala and Sud Ubangi provinces in 2016. The NMCP and PMI decided to monitor two brands of ITNs distributed in two provinces that have similar environmental and cultural contexts. The neighboring provinces of Mongala (Dawa Plus 2.0®) and Sud Ubangi (Duranet®), which both had their mass campaigns in July/August 2016, were selected and the first round of data collection was conducted in January 2017. The ITNs will be monitored for durability and bioefficacy over the three years of their expected lifespan according to the following schedule: 6 months, 12 months, 24 months, and 36 months.

⁷ The campaigns in Kasai Central and Bas Uele will be pushed into 2018 due to procurement delays.

Commodity Gap Analysis

Table 4: ITN Gap Analysis

National Estimates

Calendar Year	2017	2018	2019
Total Targeted Population	90,029,015	92,639,856	95,326,412
Targeted general population for school based distribution	9,778,150	20,233,374	20,871,558
Continuous Distribution Needs			
Channel #1: ANC	3,529,137	3,631,482	3,736,795
Channel #2: EPI	2,199,409	3,006,812	3,094,009
Channel #3: School-based distribution	916,702	1,896,879	1,956,709
Channel #4: Community	0	0	0
Estimated Total Need for Continuous	6,645,248	8,535,173	8,787,513
Mass Distribution Needs			
Targeted general population for mass distribution campaign	28,364,246	21,303,906	60,644,999
Estimated Total Need for Campaigns	15,757,914	11,835,503	33,691,666
Total Calculated Need: Continuous and Campaign	22,403,162	20,370,676	42,479,179
Partner Contributions			
ITNs carried over from previous year	1,111,340	0	0
ITNs from Government	0	0	0
ITNs from Global Fund	10,278,718	6,571,201	22,810,669
ITNs from Other Donors: AMF	0	2,271,159	7,927,055
ITNs planned with PMI funding	9,120,000	4,553,386	4,057,517
Total ITNs Available	20,510,058	13,395,746	34,508,748
Total ITN Surplus (Gap)	(1,893,104)	(6,974,930)	(7,683,939)

PMI Health Zones Estimates

Calendar Year	2017	2018	2019
Total Population PMI Zones	33,707,700	34,685,223	35,691,095
Targeted PMI population for school-based distribution	8,409,012	9,534,810	8,413,037
Continuous Distribution Needs			
Channel #1: ANC - PMI Zones	1,321,342	1,359,661	1,399,091
Channel #2: EPI - PMI Zones	823,479	1,125,778	1,158,426
Channel #3: School-based distribution	788,345	893,888	788,722
Channel #4: Community distribution	0	0	0
Estimated Total Need for Continuous	2,933,166	3,379,327	3,346,239
Mass Distribution Needs			
PMI Population targeted for mass campaign	9,862,554	5,387,658	5,720,367
Estimated PMI Need for Campaigns	5,479,197	2,993,143	3,177,982
Total Calculated Need:	8,412,362	6,372,471	6,524,221
Partner Contributions			
ITNs carried over from previous years – PMI	1,111,310	1,818,948	0
ITNs planned with PMI funding	9,120,000	4,553,386	4,057,517
Total ITNs Available - PMI	10,231,310	6,372,334	4,057,517
Total ITNs Surplus (Gap) - PMI	1,818,948	(136)	(2,466,704)

Gap analysis table assumptions (applicable to national needs and PMI zones)

- Population from 2016-2020 National Health Development Plan with annual 3% population growth.
- ANC needs: Pregnant women = 4% of total population, 85% of pregnant women complete at least one ANC visit (2013-14 DHS)
- EPI needs: Children eligible for EPI = 3.5% of the total population, measles vaccine coverage = 70%; EPI usage rate 98% (NMCP Strategic plan)
- School-based distribution – provinces supported by PMI: 2017- Lualaba Tanganyika and Lomami; 2018 - Kasai Oriental, Lomami, Sankuru; 2019 – Tanganyika, Haut Katanga, Haut Lomami, Lualaba, Sud Kivu.
- Mass campaign needs are calculated based on the population divided by 1.8. The schedule of ITN mass campaigns is:
 2017: PMI will cover Bas Uélé, Kasai, and Kasai Central; other provinces targeted are Haut Uélé, Ituri, Kongo Central, Maniema, and Tshopo.
 2018: PMI will cover Kasai Oriental; other provinces targeted are Equateur, Lomami, Kasai Oriental, Kwilu, Nord Ubangi, and Sankuru.
 2019: PMI will cover Lualaba and Kwango; other provinces targeted are Mai Ndombe, Kwango, Sud Ubangi, Tshuapa, Mongala, Kinshasa, Nord Kivu, Tanganyika, Haut Katanga, Haut Lomami, Lualaba and Sud Kivu.

Plans and justification

With the Global Fund and other donors, PMI will continue to assist the NMCP to achieve and maintain universal coverage of ITNs through mass campaigns and continuous distribution channels. With FY 2018 funds, PMI plans to support only the operational costs for a mass campaign in Kwango province. If additional funds become available, PMI will also procure the ITNs for the Kwango campaign, if not, PMI will work with the NMCP to find another partner to procure the nets. The 2019 campaign in Lualaba will be funded with FY 2017 funds.

PMI will continue to support routine distribution of ITNs through ANC and EPI clinics in all 178 health zones in the 9 provinces it supports. With the limitation in the FY 2018 MOP planning budget, PMI does not plan to support school-based distribution in 2019. Should additional funds become available, PMI will resume this activity in the provinces of Lomami and Kasai Central as planned under the national gap analysis. Finally, PMI will continue to support durability monitoring in Mongala and Sud Ubangi provinces.

Proposed activities with FY 2018 funding: (\$14,118,943)

- Support the operational cost for distribution of 1.45 million ITNs for the universal coverage campaign in the province of Kwango. The funding includes planning at all levels of the health system, household registration, transportation, training, supervision, and social mobilization/communications. (\$2,181,543)
- Procure and deliver 2.6 million ITNs to regional warehouses for free distribution through routine antenatal and EPI clinics in 178 health zones of nine provinces. (\$7,488,000)
- Support the operational costs for 2.6 million ITNs for free distribution through routine services in the 178 target health zones. The funding includes transportation from regional warehouses to distribution points in target health zones, storage in zones, and supervision. (\$3,900,000)
- Support the storage costs for routine ITNs at regional warehouses (\$374,400)
- Continue to support ITN durability monitoring in Mongala and Sud Ubangi provinces. (\$175,000)

c. Indoor residual spraying

Very little IRS is currently being implemented in the DRC. Tenke Fungurume Mining company conducts IRS as part of their malaria control program targeting approximately 36,000 houses in 9 health areas in the Fungurume Health Zone in Lualaba Province. The Kibali Gold mining company in Bas Uele and the Barnet Pretoria Portland Cement company in Kongo Central also conduct IRS in limited locations around their factory sites. PMI has no plan to support IRS activities at this time. Despite the lack of widespread IRS, PMI supported the development of an insecticide resistance management plan to ensure that when insecticides are used, they are used with an aim of maintaining the effectiveness of insecticides through insecticide resistance management such as combination or rotation.

2. Malaria in pregnancy

NMCP/PMI objectives

The national strategy for prevention and treatment of malaria in pregnancy in the DRC follows the three WHO recommended components: prevention with an ITN, IPTp (with sulfadoxine-pyrimethamine

(SP)), and prompt and effective treatment of malaria cases among pregnant women. In 2003, the MOH adopted IPTp with SP for prevention of malaria in pregnant women and their newborns. National guidelines for IPTp were revised in 2013 and now reflect the WHO recommendations for treatment at every ANC visit after the first trimester. Given the challenges in determining gestational age by clinical examination, especially early in pregnancy, the DRC guidelines recommend that the first dose of IPTp be given early in the second trimester (between the 13th and 16th weeks). These guidelines are now also explicit about providing a daily dose of 0.4 mg of folic acid to pregnant women, and do not recommend the use of high dose folic acid (> 5mg daily) with IPTp.

The NMCP collaborates with MOH maternal and child health programs through the case management working group, where MIP is also discussed.

The National Malaria Control Strategic Plan (2016-2020) identifies the following objectives that correspond to the three prongs of the prevention and treatment of malaria in pregnancy program:

- At least 90% of pregnant women receive an ITN during their first ANC visit
- At least 80% of pregnant women sleep under an ITN
- At least 60% of pregnant women receive IPTp2 and 30% receive IPTp3 according to national guidelines.
- At least 80% of fever cases suspected as malaria tested and 100% of confirmed cases treated according to national standards.

In 2017, the DRC revised its guidelines for the treatment of malaria, including for pregnant women. The revised guidelines specify the use of quinine tablets plus clindamycine for uncomplicated malaria and IV quinine for severe malaria in the first trimester. In the second and third trimesters, ACTs (for uncomplicated malaria) and injectable artesunate (for complicated malaria) are recommended. In the case of contraindications or stockout of artesunate, IV quinine should be used.

The revised treatment guidelines state that intermittent preventive treatment with SP is prohibited in HIV-infected patients who receive cotrimoxazole (trimethoprim + sulfamethoxazole) on a prophylactic basis.

Progress since PMI was launched

The last DHS showed some evidence of improvement in the coverage of MIP interventions in the DRC. Use of ANC services remained relatively stable between the 2007 and 2013-14 surveys, with 79% and 86% of women having at least two ANC visits, respectively. However, IPTp coverage still remains low and only improved slightly over the same period, increasing from 5% in 2007 to 14% in 2013 for women receiving at least two doses of SP at an ANC facility. The 2013-14 DHS also reported that 60% had slept under ITN, with no discernable difference between rural (61%) and urban (57%) sites. Among households with ITNs, the proportion of pregnant women having slept under an ITN is higher than all households (83% against 60%). Currently no data are available about adherence to treatment protocols for pregnant women with malaria.

Since the launch of PMI in the DRC in FY 2011, the geographic coverage of MIP interventions has increased considerably from 68 to 178 health zones in 2017. PMI activities have ensured the availability of both ITNs for routine distribution and SP in antenatal clinics, training health providers in PMI-supported health zones on MIP interventions aligned with international standards, and SBCC activities to improve knowledge among beneficiaries on the importance of sleeping under an ITN and proper

antenatal care during pregnancy. PMI has also provided technical and supervisory support to the NMCP and the National Reproductive Health Program to revise, update, and coordinate guidelines for IPTp based on international recommendations.

Progress during the last 12-18 months

PMI supported the implementation of MIP interventions in 178 health zones in 9 provinces. In the past 12 months, 492,174 treatments of SP were distributed to service delivery points. Between 65% and 70% of pregnant women attending antenatal care in PMI-supported health zones received at least two doses of SP during their most recent pregnancy in the past 12 months while about 56% to 65% received three doses. These data are substantially higher than the national estimate for IPTp2 of 14% as reported by the 2013-14 DHS, but are in line with the most recent national average for IPTp2 of 63%, as estimated by service statistics. Due to greater availability of ITNs in country, the distribution of routine ITNs has been on target in PMI-supported health zones, a substantial improvement compared to the previous year. However, the findings of the last EUV study show that overall stockout in clinics of at least three days during the three months preceding the survey was high for LLINs (41%). The community relays (*relais promotionnels*) encourage women to attend ANC visits for IPTp and sleep under ITNs, while the “champion community” approach fosters social support for women to practice these behaviors. To ensure continued progress in this critical intervention area, 2,330 health professionals were trained on MIP, including SP administration, ITN distribution and use, and treatment of malaria in pregnant women. In addition, efforts to improve case management and treatment across all populations remain a priority. Details pertaining to this are covered in the case management section.

Table 5. Status of training on updated IPTp policy in DRC

Status of training on updated IPTp policy	Not completed
Date completion expected	2018
Number and proportion of health care workers trained on new policy in the last year	1,043 (approximately 17%)
Are the revised guidelines available at the facility level?	Yes
ANC registers updated to capture three doses of IPTp-SP?	Yes
HMIS/ DHIS updated to capture three doses of IPTp-SP?	Yes

Commodity Gap Analysis

Each donor procures SP to cover the population of pregnant women in the health zones that it supports. For 2017-2019, the estimated number of pregnant women in PMI zones attending ANC is just under one million, resulting in a need of between 2.7 and 2.9 million SP treatments. PMI will procure 2 million treatments of SP as there is a surplus in previous years.

Table 6: SP Gap Analysis**National Estimates**

Calendar Year	2017	2018	2019
Total Population*	90,029,015	92,639,856	95,326,412
SP Needs			
Total number of pregnant women**	3,601,161	3,705,594	3,813,056
Total number of pregnant women attending ANC 2-4***	2,844,917	2,927,419	3,012,315
Total number of pregnant women covered by IPTp****	2,418,179	2,488,307	2,560,467
Total SP Need (in treatments)	7,254,538	7,464,920	7,681,402
Partner Contributions			
SP carried over from previous year	2,110,000	2,620,752	2,059,316
SP from Government	0	0	0
SP from Global Fund	4,482,934	4,612,939	4,746,714
SP from DFID	282,356	290,544	298,970
SP planned with PMI funding	3,000,000	2,000,000	2,000,000
Total SP Available	9,875,290	9,524,236	9,105,000
Total SP Surplus (Gap)	2,620,752	2,059,316	1,423,598

Footnotes (applicable to national needs)

*Population obtained from 2016-2020 National Health Development Plan with annual 3% population growth.

**Pregnant women = 4% of total population

***79% of pregnant women attend ANC 2-4

****85% ITP coverage rate (NMCP table)

NMCP IPTp Guidance: 3 treatments for each pregnant woman

PMI Health Zones Estimates

Calendar Year	2017	2018	2019
PMI-targeted population*	33,707,700	34,685,223	35,691,095
SP Needs			
Total number of pregnant women**	1,348,308	1,387,409	1,427,644
Total number of pregnant women attending ANC 2-4***	1,065,163	1,096,053	1,127,839
Total number of pregnant women covered by IPTp****	905,389	931,645	958,663
Total SP Need (in treatments) - PMI zones	2,716,166	2,794,935	2,875,988
Partner Contributions			

SP carried over from previous year	1,402,333	1,686,167	891,232
SP planned with PMI funding	3,000,000	2,000,000	2,000,000
Total SP Available	4,402,333	3,686,167	2,891,232
Total SP Surplus (Gap)	1,686,167	891,232	15,243

Footnotes: applicable to PMI zones

*Population obtained from 2016-2020 National Health Development Plan with annual 3% population growth.

**Pregnant women = 4% of total population

***79% of pregnant women attend ANC 2-4

- ****85% ITP coverage rate (NMCP table)

- NMCP IPTp Guidance: 3 treatments for each pregnant woman

Plan and justification

Within its 178 health zones, PMI will be supporting MIP services to 37% of pregnant women in the DRC. The NMCP program target is to cover 85% of all women attending to ANC2-4

To improve the uptake of MIP interventions in health facilities, PMI will continue to supply ITNs and SP at routine ANC services, and to support refresher training to ensure providers are aware of the current guidelines regarding IPTp dosing and timing.

PMI will procure 2 million treatments of SP to ensure an adequate supply to the estimated 959,000 pregnant women attending ANC clinics. In addition, PMI will support the procurement and distribution of water filters and cups to allow health workers to directly observe adherence to IPTp.

PMI will procure 2.6 million ITNs for distribution through routine services, including 1.4 million for ANC, in PMI intervention areas (quantified under the ITN section). PMI will also procure RDTs and ACTs (quantified under the case management section) to ensure that pregnant women have access to appropriate diagnostic and treatment services.

SBCC activities with both health facility staff and CHWs will include counseling strategies on the use of ITNs during pregnancy, the importance of early attendance at ANC and obtaining SP at each visit starting early in the second trimester, as well as correct diagnosis and treatment of malaria in pregnant women (costs covered in the SBCC section).

Proposed activities with FY 2018 funding: (\$624,960)

- Procure 2 million SP treatments (6 million SP tablets) to meet the needs of 959,000 pregnant women in the 178 PMI-targeted health zones. (\$240,000)
- Support the distribution costs for SP, as well as ANC cups, and water filters, from the regional warehouses to health zones. (\$150,000)
- Support storage costs for SP at regional warehouses. (\$24,960)
- Replace cups and water filters to facilitate directly observed IPTp. (\$10,000)
- Support training and supervision for approximately 200 health workers in PMI-supported health zones to implement all three elements of the MIP program: ITN, IPTp, and case management for pregnant women. (\$200,000)

- Procure 1.4 million ITNs for distribution through routine ANC services to ensure that pregnant women are protected by ITNs. (costs included in ITN section)
- Procure RDTs and ACTs for diagnosis and treatment of malaria in pregnant women. (costs included in the case management section)

3. Case Management

a. Diagnosis and Treatment

NMCP/PMI objectives

The DRC National Malaria Control Strategic Plan states that by the end of 2020, 80% of fever cases should be tested for malaria, and 100% of those who test positive should receive appropriate treatment according to national guidelines. The national malaria case management guidelines and accompanying training package were revised and validated in April 2017 by the Disease Control Directorate. These updated guidelines largely conformed to WHO guidelines and standards, with the exception of age groups for pre-referral treatment with rectal artesunate. For diagnosis, the guidelines state that all febrile patients should be tested for malaria by either microscopy or RDT. Microscopy is to be used at reference hospitals, primarily to monitor patients undergoing treatment for severe malaria and to monitor for treatment failure. RDTs are to be used in peripheral health centers and at the community level; they may also be used at reference hospitals as needed. The guidelines state that each provincial hospital and each general reference hospital should have a functioning laboratory to conduct microscopy. Currently, all 26 provincial hospitals have a functioning laboratory. For health zones, 393 of the 516 health zones have government-run (i.e., public) general reference hospitals and the remaining 123 health zones have either a faith-based hospital or a private health facility that serves as the reference hospital for the zone. In theory, all health zone general hospitals have at least one microscope, but current information about whether or not they are functional is not available, including in the PMI zones.

For uncomplicated malaria, the country supports two first-line ACT treatments: artesunate-amodiaquine (AS/AQ) and artemether-lumefantrine (AL). If one of the two first-line ACTs is not available or is poorly tolerated by the patient, the other can be used. In practice, AL tends to be primarily used in urban areas because patients have more options to obtain it from private pharmacies, while AS/AQ is used in rural areas. In case of confirmed treatment failure by microscopy to both first-line ACTs, the patient should be given dual therapy of quinine plus clindamycin. In case of a one-time epidemic, the national guidelines state that dihydroartemisinin-piperaquine (DP) could be used; for this reason, DP is included in the ongoing therapeutic efficacy study (details below).

For treatment of severe malaria, injectable artesunate should be the first treatment option, followed by injectable artemether or IV quinine. At peripheral levels, including lower-level health facilities and community care sites, pre-referral treatment with rectal artesunate is national policy, although roll out of training and commodities for pre-referral treatment is still underway. The national guidelines did not specify eligible age groups for rectal artesunate (e.g., less than 6 years old per WHO guidelines) but do provided dosing guidelines for age groups of 6-13 years and 14 years and older in addition to children under 6 years old. With PMI support, the NMCP reviewed this guideline to align with the WHO, but decided to limit the use of rectal artesunate to children under 5 years of age to line up with the information captured by current data collection tools and remain coherent with other strategic approaches that target this age group.

Care-seeking and treatment in the private sector (including non-profit and faith-based facilities, for-profit clinics, pharmacies, and drug shops) is widespread. According to the 2013-2014 DHS, among children with fever, 49% report seeking care in the public sector and 47% in the private sector. The non-profit/faith-based facilities often function much like the public-sector facilities in that they report into the routine health information system and abide by the national policies. But there are important differences in treatment availability in public and private outlets. A research project supported by ACTwatch from 2013 to 2015 in Kinshasa and Katanga provinces included representative “outlet surveys” that assessed availability of malaria diagnostics and treatment at service delivery points, including public facilities and CHWs, private non-profit and for-profit facilities, regulated pharmacies, and unregulated drug shops and retailers. The last survey in 2015 found that drug shops represented 69% of outlets in Kinshasa and 59% in Katanga. In Kinshasa, 87% of public sector outlets stocked quality-assured ACTs; in Katanga 92% did. In the private sector, however, only 22% of private outlets stocked quality-assured ACTs in Kinshasa while 53% stocked them in Katanga.⁸

At the community level, integrated community case management (iCCM) is provided at community care sites (*sites de soin communautaire*). According to national guidelines, two volunteer community health workers (*relais communautaire*) are identified for each community care site. One CHW is responsible for providing diagnosis, treatment, and referral services while the other focuses on health promotion and community mobilization. CHWs are unpaid. Criteria for selection include a minimum level of education as well as having an established source of income, separate from their unpaid health activities. Both CHWs are to be trained approximately every two to three years in malaria, pneumonia, and diarrhea diagnosis and treatment; this includes administration of RDTs, ACTs, and rectal artesunate for severe cases.

According to national guidelines, diagnosis with RDTs and malaria treatment is free for patients of all ages. Microscopy incurs a fee and other service provision fees may be applicable for malaria patients (e.g., consultation fees, paracetamol).

Table 7. Status of Case Management Policy in DRC

Status of Case Management Policy in DRC according to the National Directives for Malaria Case Management (February 2017)	
What is the first-line treatment for uncomplicated <i>P. falciparum</i> malaria?	Artesunate-amodiaquine (AS/AQ) and artemether-lumefantrine (AL)
What is the second-line treatment for uncomplicated <i>P. falciparum</i> malaria?	N/A-the second-line ACT is essentially the other first-line (DP may be administered during epidemics)
What is the first-line treatment for severe malaria?	Injectable artesunate
In pregnancy, what is the first-line treatment for uncomplicated <i>P. falciparum</i> malaria in the first trimester?	Oral quinine with clindamycin

⁸ ACTwatch DRC 2015 Outlet Survey Findings in Katanga and Kinshasa. (2017) ACTwatch Research Brief. Population Services International and ACTwatch. Washington DC: USA.

http://www.actwatch.info/sites/default/files/content/publications/attachments/DRC_OS%202015_Brief.pdf

Status of Case Management Policy in DRC according to the National Directives for Malaria Case Management (February 2017)

In pregnancy, what is the first-line treatment for uncomplicated <i>P. falciparum</i> malaria in the second and third trimesters?	ACTs (AS/AQ or AL)
In pregnancy, what is the first-line treatment for severe malaria?	IV quinine in first trimester and injectable artesunate (or IV quinine) in 2 nd /3 rd trimesters
Is pre-referral treatment of severe disease recommended at peripheral health facilities? If so, with what drug(s)?	Yes, rectal artesunate
Is pre-referral treatment of severe disease recommended for community health workers? If so, with what drug(s)?	Yes, rectal artesunate
If pre-referral rectal artesunate is recommended, for what age group? (note: current international guidelines do not recommend administering to those ≥ 6 years)	Age group is not explicitly stated but dosing guidelines are provided for all ages/weights

Progress since PMI was launched

PMI has supported malaria case management activities in DRC at multiple levels of the health system. For diagnostics, training and technical assistance for microscopy has been focused primarily at the national and provincial levels, including laboratory staff at diagnostics reference labs in Kinshasa (*Institut National de Recherche Bio-Médicale* [INRB]) and Lubumbashi (*Grand Labo*). PMI has contributed to the development of the national archive of malaria slides (NAMS), procuring microscopes and laboratory supplies, and supporting the two diagnostic reference labs in an internationally-recognized accreditation process called Strengthening Laboratory Management Toward Accreditation. The slide archive is being used for training of laboratory technicians, outreach training and supportive supervision (OTSS), and quality assurance.

The diagnostics strengthening strategy has been to ensure capacity at higher level reference labs to lay the groundwork for a strong cadre of supervisors and mentors who then support the peripheral levels with supportive supervision, outreach, and training. In PMI-supported health zones, training on diagnostics (including use of RDTs), proper treatment, and malaria in pregnancy has been ongoing since PMI was launched.

Under the leadership of the MOH and with the support of USAID, the DRC began implementing iCCM of uncomplicated malaria, pneumonia, diarrhea, and malnutrition in limited areas in December 2005. In 2010, the NMCP approved community-level case management with RDTs and ACTs; implementation began in 2012. At present, there is an estimated need of 4,340 community care sites in the 178 PMI zones; to date, roughly 1,577 of these sites have been established where CHWs have been trained and regularly use RDTs and ACTs.

Use of rectal artesunate for pre-referral treatment is included in the national guidelines, and training and commodities have been rolled out to peripheral health centers and community care sites, including in PMI zones. On the ground, however, there are indications of gaps in health worker capacity to implement this intervention – whether due to training gaps, lack of suppositories, or both. There are also

some indications that patients age six and over may be treated with rectal artesunate despite WHO guidelines stating that this intervention be used only for those under age six.

Progress during the last 12-18 months

Since October 2016, PMI has continued to focus case management support to various levels of the health service delivery structure. At the national level, PMI and partners contributed to the revision of national case management guidelines and the accompanying training package and continued to develop the NAMS for training and supervision. An assessment is underway to provide an accurate assessment of the needs for integrated community case management. USAID is also supporting the development of the revised iCCM strategy, both of which will be completed by September 2017 and will help inform PMI's approach to supporting the scale up of iCCM.

In the nine provinces supported by PMI, diagnostics strengthening has taken place in the provincial-level hospitals and reference laboratories, as well as training of supervisors to provide OTSS to the peripheral levels at 57 sites. In each of the nine PMI supported provinces, PMI partners identified two laboratory technicians, as well as two from the INRB (total 20), to act as laboratory supervisors in their respective provinces. An additional 54 clinical supervisors were identified across the nine provinces to provide case management supportive supervision. All 74 of these OTSS supervisors received refresher training in malaria diagnostics and clinical case management. As a result of targeted high-level lab training, four of the top performers were sent for WHO accreditation at the External Competency Assessment for Malaria Microscopy; two participants obtained WHO Level 1 accreditation, one received Level 2, and the fourth attained Level 4 competency. PMI has also procured microscopes and laboratory supplies, and has supported revitalization of the national malaria case management technical working group.

At the peripheral levels, PMI supported additional case management efforts in its 178 target zones:

- In health facilities, 1,835 head nurses were identified and trained to provide on-the-job training for diagnosis with RDTs and appropriate treatment in their facilities.
- In communities, 18 community care sites were created.

Table 8: Summary of case management training and supervision in PMI-supported provinces

Training/ Supervision Activity	Nbr targeted:	Nbr reached:	Comment
Technicians in reference labs trained in microscopy (national and provincial levels)	20	20	Target to train 2 for each of the 9 provinces plus 2 from INRB
OTSS supervisors identified/trained to provide quality assurance	74	74	Includes 20 laboratory supervisors (above) plus 54 clinical supervisors
OTSS sites with regular supervision	57	57	57 sites identified in nine health zones in Haut Katanga province.
Health workers trained in case management at health facility and community levels (diagnostics with RDTs and treatment)	<i>[Targets are still being considered as part of the rationalization process]</i>	5,910	Number of health facility staff and CHWs trained in case management across three implementing partners in 178 health zones
Community care sites supported		1,580	These sites are supported by three implementing partners across all 178 health zones

During FY 2017, with PMI support:

- 9,000,000 RDTs were procured and 6,042,777 RDTs were distributed
- 2,699,990 ACTs were procured and 8,478,371 ACTs were distributed

A pilot study on rectal artesunate was recently completed. This study assessed 1) CHW and population perceptions of pre-referral rectal artesunate administration, 2) the capacity of CHWs to correctly identify danger signs of malaria and administer rectal artesunate as a pre-referral treatment, and 3) adherence of caregivers to the referral. The intervention consisted of CHW training, supervision, and provision of rectal artesunate. Key findings from the study include:

- Caregivers demonstrated a high level of acceptability of pre-referral treatment with a suppository by a CHW if their child was very sick (78%).
- CHWs improved in their knowledge of danger signs. Initially none of the CHWs knew the five danger signs; this increased to 41% after the intervention.
- Caregiver adherence to referrals was not significantly negatively affected by the introduction of pre-referral suppository treatment (adherence was 94% pre-intervention and 84% post-intervention).

PMI is also working with the NMCP and Medicine for Malaria Venture to landscape the situation for severe malaria case management in the DRC, as part of a global assessment.

PMI is supporting the NMCP's current efforts to conduct a therapeutic efficacy study (TES) in DRC. The last study was conducted from October 2012-August 2013 in six sites and demonstrated a day 28 clearance rate of 97-100% with PCR correction for AL and 98-100% for AS/AQ. The current study follows the standard WHO protocol for 42-day follow-up and includes three arms to assess AS/AQ, AL, and dihydroartemisinin-piperaquine (DP) in six different study sites across the country. PMI is supporting the study in two of these sites. Surveyors at two sites (Kapolowe and Rutshuru) began recruiting participants in March 2017 and recruitment is projected to end in August 2017. Each site will

recruit 264 patients (88 per study arm) for a total of 1,584 patients for the six sites. The TES investigators plan to collaborate with the PARMA network for assistance and potential training/capacity building for the characterization of antimalarial resistance molecular markers.

Table 9. Therapeutic Efficacy Studies

Completed TESs		
Year	Site name	Treatment arm(s)
2012-2013	Six sites (not PMI-funded)	AS/AQ
		AL
Ongoing TESs		
Year	Site name	Treatment arm(s)
2017	Six sites: Kabondo (Kisangani, Tshopo), Kapolowe (Haut Katanga), Rutshuru (Nord Kivu), Mikalayi (Kasai Central), Bolenge (Equateur), Kimpese (Kongo Central)	AS/AQ
		AL
		DP
Planned TESs FY 2018		
Year	Site name	Treatment arm(s)
2019	Six sites (TBD)	AS/AQ
		AL
		DP

Commodity gap analysis

PMI is responsible for providing commodities in the 178 health zones it supports and the gap analysis tables below reflect this geographic focus in addition to the overall national needs; however, coordination with the NMCP, the Global Fund, and other partners via a signed Memoranda of Understanding enables redistribution of stocks as needed to avoid stockouts or oversupply.

a. RDTs

Table 10: RDT Gap Analysis

National RDT Needs

Calendar Year	2017	2018	2019
Total country population	90,029,015	92,639,856	95,326,412
Population at risk for malaria	90,029,015	92,639,856	95,326,412
Total number of projected fever cases	29,494,550	28,832,397	28,107,035
Expected number of fever cases tested with RDT	26,279,644	25,689,666	25,043,368
Total RDT needs	26,279,644	25,689,666	25,043,368
Partner contribution			
RDTs carried over from previous year	2,395,581	2,116,659	1,068,499
RDTs from Government	0	0	0
RDTs from Global Fund	15,311,060	14,967,327	14,934,093
RDTs from DFID	689,662	674,179	672,682
RDTs planned with PMI funding	10,000,000	9,000,000	9,100,000
Total RDTs available	28,396,303	26,758,165	25,775,274
Total RDT surplus (gap)	2,116,659	1,068,499	731,906

Footnotes:

- Population from 2016-2020 National Health Development Plan with annual 3% population growth.
- Total national projected fever cases obtained from total number of fever episodes with 16% annual growth, as per NMCP table
- NCMP assumes 90% of cases are tested for malaria using RDTs (vs 10% by microscopy)
- The proportion of fevers tested for malaria is 99% , NMCP 2015 annual report
- The total number of cases seeking care is reduced by 0% in 2017, 5% in 2018 and 10% in 2019 due to vector control (this assumption only applied to national analysis)

PMI Health Zone RDT Needs

Calendar Year	2017	2018	2019
Total country population	33,707,700	34,685,223	35,691,095
Population at risk for malaria	33,707,700	34,685,223	35,691,095
Total number of projected fever cases	10,113,467	10,619,140	10,937,714
Expected number of fever cases tested with RDT	9,011,099	9,461,654	9,745,504
Total RDT needs in PMI health zones	9,011,099	9,461,654	9,745,504
Partner contributions			
RDTs carried over from previous year	129,857	1,118,758	657,104
RDTs planned with PMI funding	10,000,000	9,000,000	9,100,000
Total RDTs available	10,129,857	10,118,758	9,757,104
Total RDT surplus (gap)	1,118,758	657,104	11,600

Footnotes:

- Population from 2016-2020 National Health Development Plan with annual 3% population growth.

- The total PMI zones projected fever cases in 2017 is obtained from number of fever episodes in PMI targeted zones in 2016 as per NMCP Report with 9% annual growth
- The total PMI zones projected fever cases in 2018 and 2019 are obtained from previous years number of fever episodes with 5% annual increase in 2018 and 3% in 2019
- NCMP assumes 90% of cases are tested for malaria using RDTs (vs 10% by microscopy)
- The proportion of fevers tested for malaria is 99% , NMCP 2015 annual report

b. ACTs

Table 11: ACT Gap Analysis

National ACT Needs

Calendar Year	2017	2018	2019
Total country population	90,029,015	92,639,856	95,326,412
Population at risk for malaria	90,029,015	92,639,856	95,326,412
Total projected number of fever cases seeking care and tested with an RDT	26,279,644	25,689,666	25,043,368
Total cases testing positive and needing treatment	18,658,547	18,239,663	17,780,791
Total ACT needs	18,658,547	18,239,663	17,780,791
Partner contributions			
ACTs carried over from previous year	13,315,463	10,056,499	6,510,592
ACTs from Government	0	0	0
ACTs from Global Fund	11,155,031	11,476,724	10,742,112
ACTs from DFID	494,552	517,032	482,868
ACTs planned with PMI funding	3,750,000	2,700,000	8,000,000
Total ACTs available	28,715,046	24,750,255	25,735,572
Total ACT surplus (gap)	10,056,499	6,510,592	7,954,780

Footnotes:

- Population from 2016-2020 National Health Development Plan with annual 3% population growth
- 90% are tested for malaria using RDTs (vs microscopy)
- Malaria positivity rate is 71%
- The proportion of fevers tested for malaria is 99% , NMCP 2015 annual report
- The total number of cases seeking care is reduced by 0% in 2017, 10% in 2018 and 20% in 2019 due to vector control (this assumption is only applied to the national analysis)

PMI Health Zone ACT Needs

Calendar Year	2017	2018	2019
Total country population	33,707,700	34,685,223	35,691,095
Population at risk for malaria	33,707,700	34,685,223	35,691,095
Total projected number of fever cases seeking care	9,011,099	9,461,654	7,745,504
Total seeking care and tested positive for malaria	6,397,880	6,717,774	6,919,308
Total ACT needs in PMI health	6,397,880	6,717,774	6,919,308

zones			
Partner contributions			
ACTs carried over from previous year	8,349,952	4,919,391	79,801
ACTs planned with PMI funding	3,750,000	2,700,000	8,000,000
Total ACTs available	12,099,952	7,619,391	8,079,801
Total ACT surplus (gap)	5,702,072	1,684,297	2,764,990

Footnotes:

- Population from 2016-2020 National Health Development Plan with annual 3% population growth.
- The total PMI zones projected fever cases in 2017 is obtained from number of fever episodes in PMI targeted zones in 2016 as per NMCP Report with 9% increase
- The total PMI zones projected fever cases in 2018 and 2019 are obtained from previous year's number of fever episodes in PMI targeted zones with 5% increase in 2018 and 3% in 2019
- 90% are tested for malaria using RDTs
- Malaria positivity rate is 71%
- The proportion of fevers tested for malaria is 99%, NMCP report
- The total number of cases seeking care is reduced by 0% in 2017, 5% in 2018 and 10% in 2019 due to vector control *
- * Assumptions only applied to NMCP table

PMI also plans to procure 150,000 suppositories to provide about 103,360 pre-referral treatments of rectal artesunate to meet severe malaria needs in PMI zones for children under six years of age at community care sites and peripheral health facilities. PMI also plans to procure roughly 286,000 treatments of injectable artesunate to treat severe malaria at reference health centers and hospitals for children under six years of age (207,000 treatments) and for a portion of children six to thirteen years of age (79,000 treatments).

Plans and justification

PMI will continue to support training and supervision for all levels of the health system in PMI target zones, procurement of diagnostic testing materials and treatments for uncomplicated and severe malaria, and will also contribute to NMCP efforts to monitor therapeutic efficacy of ACTs in DRC.

Support for microscopy at national- and provincial-level reference laboratories will continue, but will be focused on maintaining progress already made in establishing a core cadre of microscopy experts for the PMI target areas. To this end, PMI will continue to support the laboratory training and supervision for the 20 targeted lab technicians in the nine PMI-supported provinces. These experts will in turn provide the necessary training and supportive supervision to reference hospitals in their respective provinces to carry out QA/QC for microscopy. PMI will procure microscopy supplies (e.g., slides, reagent) but does not anticipate needing to procure additional microscopes given procurements in previous years.

PMI will procure RDTs, ACTs, injectable artesunate, and rectal artesunate to diagnose and treat uncomplicated and severe malaria cases at reference hospitals, health centers, and community care sites. Quantification of projected needs accounts for existing pipeline and anticipated cases derived from routine data on malaria cases and consumption levels. PMI will procure injectable artesunate for use in its targeted health zones, procuring treatments for all projected severe malaria cases in children under 6 years of age, and to the extent possible, treatments for children aged 6 to 13. PMI will closely monitor commodity usage to adjust procurements in case of unexpected needs or overstocks.

Training and supervision of facility-based health workers, as well as community-based health workers will continue to be a case management priority. In the PMI target zones, the MOH has estimated the need for 4,340 community care sites; to date, roughly 1,577 have been established. PMI will negotiate with partners and the NMCP to prioritize expansion of community care sites to areas with the greatest need in terms of malaria burden and distance to existing service delivery points. PMI proposes to target approximately 2,500 facility-based health workers and 2,000 community-based health workers for training and supervision support (the number of community workers/sites to be targeted may change based on the results of the ongoing iCCM needs assessment). Accounting for training provided in previous years, support activities for diagnosis (primarily with RDTs in peripheral facilities) and treatment will emphasize routine supportive supervision, expanding upon the OTSS model. At peripheral health facilities and in the community care sites, particular attention will be paid to pre-referral treatment with rectal artesunate, while ensuring patient adherence to referral to higher-level care.

The NMCP plans to implement the next therapeutic efficacy study in 2019 and PMI will again join other donors to support this important activity by funding two of the six study sites. CDC will provide technical assistance for case management activities, including one in-country TDY to collaborate with implementing partners and the NMCP on key activities.

Proposed activities with FY 2018 funding: (\$11,567,660)

- Strengthen malaria microscopy capacity at national- and provincial-level reference laboratories through training of supervisors (i.e., expert microscopists), support for regular supportive supervision to reference hospitals conducting microscopy in the nine PMI-supported provinces, and implementation of quality assurance/quality control activities during supervision. (\$200,000)
- Procure microscopy consumables to support activities in PMI-supported provinces at provincial and health zone reference hospitals. (\$50,000)
- Procure approximately 8 million RDTs for malaria diagnosis in PMI-supported health zones. (\$4,240,000)
- Procure approximately 3 million ACT treatments for management of uncomplicated malaria in PMI-supported health zones (70% AS/AQ for use in rural zones and 30% AL for use in urban zones). (\$2,055,000 for 3 million ACT treatments using FY 2018 funds; the remaining 5 million treatments will be procured using existing pipeline)
- Procure approximately 1,084,389 vials of injectable artesunate for approximately 286,000 treatments for management of severe malaria. For planning purposes, treatments for children 0-5 years of age were estimated at 300 mg of artesunate (5 ampules), which is sufficient for a three-day treatment of a 30-kg child (2.4 mg/kg per doses, 4 doses). (\$2,732,660)
- Procure approximately 103,361 doses of rectal artesunate for pre-referral treatment of malaria. For estimation purposes, a dose is estimated as 100 mg of artesunate, enough for a patient of 10–20 kg. (\$30,000)
- Support in-service training and supervision of approximately 2,500 facility health workers responsible for the management of both uncomplicated and severe malaria. (\$1,100,000)
- Support initial training, refresher training, and supervision of approximately 2,000 health workers that offer integrated case management for malaria, diarrhea and pneumonia, including pre-referral treatment, at community care sites. (\$1,000,000)
- Support implementation of the next therapeutic efficacy study together with the NMCP and other donors to monitor efficacy of DRC's first-line antimalarial treatments. (\$150,000).

- Provide one technical assistance visit by CDC/Atlanta staff to support activities related to case management and diagnostics quality assurance/quality control, in particular, to assist with issues related to training of health providers and community case management of malaria. (\$10,000)

b. Pharmaceutical Management

NMCP/PMI objectives

Achieve the objectives of the PMI strategy is predicated on the continuous availability of high quality antimalarial products. This is consistent with the NMCP's objectives of testing at least 80% of suspected malaria cases and treating 100% of confirmed cases. The 2016-2020 National Malaria Control Strategic Plan lists several strategies for improving commodity supply and stock management at national, regional and health zone levels:

- Hold quarterly meetings of the national supply chain work group
- Assure the availability of quality commodities in all health facilities, including the private sector
- Provide training on stock management
- Accelerate the development of a logistics management information system using SMS
- Advocate with regulatory authorities to consult with specialized programs during the process to provide market authorization for new pharmaceuticals
- Establish mechanisms to assure commodity security.

Maintaining continuous availability of quality pharmaceutical products country wide is a significant challenge in the DRC and the cornerstone of the 2016-2020 National Supply Chain Strategic Plan developed in April 2017, the first of its kind for the country. This is mainly due to the difficulty of obtaining high quality data to conduct consumption-based quantification. The absence of quality stock data from service delivery points, and the lack of a functioning national Logistics Management Information System (LMIS), limit the ability to quantify needs and effectively monitor stock levels. The current LMIS is primarily paper-based, although pilots for electronic systems have been tested in a few health zones. Insufficient storage and logistics capacity also contribute to persistent local stockouts.

Progress since PMI was launched

Since its beginning, PMI has been implementing various activities to support strengthening of the pharmaceutical system at all levels, in collaboration with other USAID health programs and other donors. In 2013, PMI conducted a baseline evaluation of FEDECAME and eight regional warehouses in supported zones with the following objectives:

- To assess whether CDRs will be able to assume PMI project activities in addition to their provincial pharmaceutical management responsibilities,
- To verify whether the information produced by their management information system complies with PMI requirements,
- To determine if the CDR will be able to give pharmaceutical management support to the health zone pharmaceutical facilities, and
- To verify whether the CDR management is transparent and accountable.

In 2015, PMI supported the refurbishment of a regional warehouse in Mbuji-Mayi (Kasai-Oriental Province), and contributed to an audit of ASRAMES (the central procurement agent for eastern DRC),

which received a positive rating. This rating allows USAID implementing partners to procure some health commodities locally, supporting the regional system and saving time and money.

In the past, each donor worked directly with the NMCP to quantify commodity needs for its intervention areas, resulting in overlap of some areas, gaps in others, and an overall lack of harmonization. PMI has supported efforts to improve this situation, including the first national quantification exercise involving all stakeholders in June 2016. Presently all stakeholders are using the results and assumptions of this quantification to develop their own gap analysis for their respective catchment areas.

USAID has provided support to the PNAM to design an integrated supply chain system accompanied by standard operating procedures and a training manual. This system was piloted in one province and this experience was used to inform discussions for the development of a national LMIS. PMI also contributed to efforts to establish national and provincial medicines committees to discuss and find solutions to supply chain related issues.

Progress during the last 12-18 months

Last year, PMI supported semi-annual EUV surveys to monitor the availability of malaria commodities. Table 12 below shows that stockouts and appropriate stock management continue to be a challenge, despite progress made. PMI has also initiated discussions with Global Fund Principal Recipients to co-fund EUV surveys in the provinces that they support and to add more health commodities to the survey. The Global Fund agreed to extend the EUV survey in 201 health zones under its support.

Table 12: EUV results for selected products

	September 2015	March 2016	September 2016
Product	% of health facilities surveyed with stockout the day of the visit		
Infant AS/AQ	35	21	13
SP	29	17	10
RDT	19	12	26
ITN	33	40	27
	% facilities appropriately stocked according to min/max guidelines		
Infant AS/AQ	18	23	28
SP	24	19	32
RDT	23	29	32
ITN	26	29	39

PMI provides support for supply chain strengthening through both formal training and routine supervision and capacity building. In October 2016, PMI supported the PNAM and the Sankuru DPS to train 138 health providers on stock management in seven Sankuru health zones. Various implementing partners work with the CDRs and province/zone management teams to plan commodity deliveries and monitor stocks to prevent expirations or stockouts.

In February 2017, PMI provided technical assistance for the second national quantification workshop during the development of the Global Fund concept note. At this time some of the assumptions used in estimating needs were revised, resulting in more accurate quantification. Due to the lack of quality data on commodity consumption, the quantification is primarily based on morbidity and service utilization

data. In addition, in March 2017, the major donors signed a memorandum of understanding regarding the interchangeability of malaria commodities within and across regional warehouses, thereby allowing the warehouses to manage the commodities provided by different donors according to the “first expire, first out” principle and simplifying the process to redistribute products to different zones or provinces when needed.

The process to develop a strategic plan for the National Supply Chain System (*Système National d’Approvisionnement en Médicaments Essentiels*), which USAID and other donors have been supporting since 2015, is ongoing. The document has been finalized and submitted to the MOH for approval. Stakeholders are now discussing next steps, budget and the implementation plan. PMI also contributed to a three-day national LMIS workshop organized by the PNAM to develop a roadmap towards an operational LMIS for data collection, processing, analysis and dissemination at the central and provincial levels.

Plans and justification

PMI will continue to procure and distribute commodities for the all 178 health zones that it supports in 9 provinces. Given the logistical and capacity challenges of the DRC, a significant portion of the pharmaceutical management budget is dedicated to distribution and storage costs. PMI will continue to support the distribution of malaria commodities at all levels. Products are delivered to CDRs as part of the procurement arrangements, and PMI directly supports transportation from CDRs to health zones. Delivery to health facilities and community care sites is supported in various ways, such as through subsidies to facilities, direct delivery during supervision, or combined with other activities. All of these systems are integrated and are supported by multiple USAID funding streams such as HIV, MCH, and family planning.

Technical assistance activities will continue to focus on critical aspects to a high functioning supply chain such as quantification, supply planning, stock monitoring, and the logistics management information system. Activities will be guided by the new National Supply Chain Strategy. PMI will continue to actively engage in national and provincial fora, in collaboration with other partners investing in this area, such as the World Bank, the European Union, the Global Fund, and the Global Alliance for Vaccine Initiatives.

Proposed activities with FY 2018 funding: (\$1,743,381)

- Provide tailored technical assistance to strengthen the supply chain management of commodities at the national, provincial, health zone, and health facility levels in PMI-supported areas. This includes training, supervision, tool development, data collection, and support for coordination and oversight mechanisms. This will be done in collaboration with other USAID health elements and other donors. PMI’s resources will focus on malaria commodities and systems to the extent possible. (\$600,000)
- Contribute to support the PNAM to strengthen the LMIS to collect, compile, and process commodity data to improve quantification, stock management, and supply planning. This will be done in collaboration with other USAID health elements and other donors. PMI’s resources will focus on malaria commodities and systems to the extent possible. (\$175,000)
- Support logistics and distribution costs for malaria case management commodities (RDTs and medicines) from eight regional warehouses to health zones. (\$678,605)

- Support stock management and storage for malaria case management commodities at regional warehouses. (\$289,776)

4. Health system strengthening and capacity building

NMCP/PMI objectives

The NMCP's NSP 2016-2020 places high priority on capacity building activities, targeting in particular entomological expertise, commodity logistics, procurement and rational use of medicines, and data management. PMI supports strengthening activities in these priority areas, along with training and supervision of health workers, and NCMP operational capacity building.

Progress since PMI was launched

PMI has extensively invested in supporting various training activities designed to assist the NMCP to achieve its overarching goal of reducing mortality and morbidity due to malaria. In addition to training and supervising health workers at the health facility and community levels, PMI has also supported training activities to build capacity and expertise in critical areas. PMI helped build entomologic capacity by supporting initial and refresher field entomology trainings and implementation of an entomology monitoring system with the INRB. PMI has supported training of health workers at all levels on malaria in pregnancy, malariology, case management, and behavior change communication.

Since 2013, PMI has helped build epidemiology and surveillance capacity within the MOH and specifically the NMCP by funding two fellows per year in the Field Epidemiology Training Program (FETP). The PMI in-country team has advised the FETP resident advisor and fellows on epidemiological training needs and operational research in malaria prevention and control. To date, 24 residents have been placed at the NMCP and have received further training in malaria. In 2015-2016, FETP fellows developed three malaria-related operational research abstracts for presentation at the African Field Epidemiology Network conference: one entomological study related to larval pools in Kingasani health zone of Kinshasa; another exploring factors associated with low prescription of NMCP-recommended malaria drugs in children 6-59 months of age in Kinshasa; and an evaluation of ITN use in the Kinshasa neighborhood of Malueka in 2014. In addition to analyzing data and conducting evaluations and outbreak investigations throughout the country, FETP students' theses have covered topics such as "Factors associated with late care seeking behavior among children 0-5 years transfused for severe malaria in the Bandundu health zone," "Factors associated with low ITN usage among pregnant women in Kasai Central", "Entomological profile of malaria transmission in Muanda," and "Evaluation of the susceptibility of Anopheles Gambiae to ITNs in Kinshasa and Kikwit," just to name a few.

Since 2014, PMI and other partners have championed the organization of the National Malaria Task Force at both the central and provincial levels. The Task Force includes the NMCP and other MOH officials (such as those in reproductive health), civil society organizations, private sector organizations, key malaria donors, and members of the academic and research communities. Through meetings and report dissemination, the Task Force has played an important stewardship role in prioritizing NMCP strategies, and addressing critical emerging issues such as malaria outbreaks.

PMI has strengthened the NMCP's management capacity by assigning a monitoring and evaluation specialist to the program at the central level, and embedding advisors at the provincial level. Both cadres of advisors have helped build capacity to plan and implement all aspects of the malaria control program,

with special emphasis on monitoring and evaluation and reporting. The central level specialist helped revive the M&E Working Group, improve gap analyses for commodities and funding, strengthen analysis and use of data generated from the DHIS 2 database, and provide on-the-job mentoring for NMCP staff. This support continues to improve the visibility and effectiveness of the NMCP's monitoring and evaluation unit, especially in coordination of data collection, analysis, processing, and use for decision-making.

PMI supported an organizational assessment of the NMCP in 2014, which found several weaknesses in the program's structure and processes. The report of this assessment provided 11 recommendations to address these weaknesses, including M&E. PMI is now supporting the development of an action plan for the implementation of these recommendations.

Progress during the last 12-18 months

Extensive technical training and supervisory activities in all malaria interventions continue with PMI support. PMI has funded technical training for health workers and community health workers in PMI-supported provinces. Other capacity building activities for NMCP staff include funding quarterly supervision by NMCP staff to each of the nine PMI-supported provinces, with special attention on strengthening data collection and analysis.

PMI continued to support the NMCP's capacity in monitoring and evaluation at national and provincial levels. Given the important role of provincial advisors in the provinces, PMI expanded their number to nine, one for each of the new provinces that PMI targets. The provincial advisors will facilitate coordination between PMI partners and prepare quarterly reports for the PMI team. They will also come to Kinshasa for coordination meetings at least twice each year in order to review progress, address bottlenecks, and strategize for future activities. This will improve communication lines between the advisors and the PMI in-country team and will be especially important for the new provinces that are establishing new public health structures including malaria focal points.

The two-year FETP currently has 50 active residents, 25 in the first year class and 25 in the second year class, with 9 residents posted at the NMCP. PMI plans to work more closely with the FETP and the NMCP to increase opportunities for epidemiological engagement directly with the NMCP in Kinshasa, and to link fellows with NMCP provincial staff and PMI provincial advisors to help improve surveillance capacity and reporting quality.

Plans and justification

PMI will continue its focus on building technical and managerial capacity for malaria prevention and control at all levels of the health system. Support will continue for coordination mechanisms, capacity building and professional development, and NMCP supervision in the provinces. Support from the nine PMI provincial advisors will focus especially on the monitoring and evaluation activities in the newly-created provinces. PMI plans to support NMCP and/or INRB staff to attend key malaria scientific conferences or participate in exchange visits to learn best practices from other countries in the region.

PMI will continue its training and mentoring efforts under FETP and support two new FETP fellows in the upcoming cohort. Engagement in future fever and malaria outbreak responses will complement NMCP and partner efforts while providing training opportunities for fellows. Other opportunities will include data collection for entomological response to outbreaks, and presentation of operational research findings during the annual *Journées Scientifiques*. The selected capacity building activities will

complement support from other donors, including a plan by the Global Fund and DFID to provide a package of trainings and team building to the NMCP.

Proposed activities with FY 2018 funding: (\$870,000)

- Support to malaria coordination mechanisms including quarterly task force meetings at the national and provincial levels and quarterly M&E working group meetings at the national level. (\$45,000)
- Support NMCP capacity building, including attendance of NMCP and INRB staff at a key malaria scientific conference, malariology courses and training that address critical technical needs identified by PMI and the NMCP. May include site visits to observe activities and explore new approaches to supply chain management, community case management, monitoring and evaluation, and other technical areas. (\$40,000)
- Support the costs for nine provincial malaria advisors. Funding will include support for semi-annual meetings of advisors with the national NMCP and PMI/DRC staff to debrief on their programs, receive continuing education, and learn best practices from other provincial staff. (\$585,000)
- Support semi-annual supervision visits by two NMCP staff of malaria activities in PMI-supported provinces. (\$50,000)
- Support malaria-related epidemiology training and mentorship for two new fellows under the FETP. (\$150,000)

Table 13: Health Systems Strengthening (HSS) Activities from Other Technical Areas

HSS Building Block	Technical Area	Description of Activity
Health Services	Case Management	<ul style="list-style-type: none"> • Improve, through training and supervision, QA systems to monitor the quality of laboratory diagnostic services. • Supervise and implement a system for quality control and quality assurance of malaria diagnosis, assist in preparation for accreditation of laboratory technicians and provide equipment. • Provide training and supervision to laboratory staff and health workers performing malaria RDTs and treatment.
Health Workforce	Health Systems Strengthening	<ul style="list-style-type: none"> • Through training and technical assistance, build NMCP managerial and leadership capacity for effective malaria control. • Support in-service training and supervision of facility health workers responsible for the management of both severe and uncomplicated malaria. • Support nine provincial advisors embedded in government offices. • Support in-service training and supervision of CHWs responsible for the management of uncomplicated malaria at the community level. • Support two fellows and malaria epidemiological training in the FETP.
Routine Health Information	Monitoring and Evaluation	<ul style="list-style-type: none"> • Strengthen disease surveillance systems to improve decision-making, planning, forecasting, and program management. • Support surveillance, monitoring, and evaluation advisor in the NMCP. • Conduct periodic EUV surveys.
	Operational Research	<ul style="list-style-type: none"> • Provide facilities, equipment, training, and financial support for in-country malaria operational research.
Essential Medical Products, Vaccines, and Technologies	Case Management	<ul style="list-style-type: none"> • Support improved forecasting, procurement, quality control, storage and distribution of malaria commodities, such as insecticide-treated nets, artemisinin-based combination therapies, injectable artesunate, rectal artesunate and rapid diagnostic tests.
Health Finance	Health Systems Strengthening	<ul style="list-style-type: none"> • Provide technical assistance to NMCP to leverage financial contributions and services from government and private sector partners for malaria prevention and control.
Leadership and Governance	Health Systems Strengthening	<ul style="list-style-type: none"> • Support strengthening of national coordinating and regulatory bodies to direct and manage malaria resources, develop guidelines, and improve quality of services. • Support the development of an action plan to implement the recommendations of the NMCP institutional audit.

5. Social and behavior change communication

NMCP/PMI objectives

The SBCC strategic plan was updated in June 2017 to align with the current 2016-2020 National Malaria Control Strategic Plan. In this plan, the NMCP will ensure at least 75% of the population at risk is knowledgeable about the modes of malaria transmission, malaria prevention, and case management measures by the end of 2020. The overall objective of the new SBCC strategic plan is to have at least 80% of the population at risk of malaria know the modes of transmission, prevention and care of malaria. The specific objectives are to ensure that:

- At least 80% of the population at risk use preventive measures against malaria, specifically, sleeping under an ITN, accepting IRS and using IPTp
- At least 80% of all people with fever seek care and are effectively managed, including receiving appropriate diagnostic and treatment
- SBCC, advocacy and social mobilization activities are carried out at all levels of the health system and at the community level.

To date there has not been an emphasis on strong monitoring and evaluation for SBCC interventions. The new NMCP Communications Strategy includes a performance framework that is in line with objectives of the National Malaria Control Strategic Plan. A number of indicators are proposed for each identified communication objective and partners have committed to reinforcing the use of data from surveys, routine data and operations research to respond to specific issues or bottlenecks encountered during the implementation of the communications strategy and interventions.

Progress since PMI was launched

Since 2011, PMI has supported SBCC activities in targeted health zones in line with the national strategy to promote use of malaria preventive measures and treatment services. Activities have included community sensitization around routine preventive services for malaria in pregnancy and immunization to deliver IPTp and ITNs, as well as community mobilization via the community health promoters (*relais promotionnels*) to ensure correct and timely use of ITNs and to improve care-seeking behavior.

Since 2012, PMI has strengthened the capacity of the NMCP to coordinate SBCC activities among partners and stakeholders, and develop effective and quality materials for SBCC interventions. More specifically, PMI trained NMCP central and provincial coordinators on SBCC in the former provinces of Oriental, Katanga, South Kivu, and Eastern and Western Kasais and facilitated development of the SBCC module for the national malariology course.

PMI supported the development of the NMCP's first SBCC strategy that covered the 2009-2013 NSP. This SBCC strategy was updated in 2013 to be aligned with the NMCP strategic plan 2013-2015. Finally, PMI has supported the production of promotional tools for nets distribution, a comic book to support the students at their schools, and supported a malaria day campaign in targeted provinces.

Progress during the last 12-18 months

PMI continued its support for various SBCC approaches to deliver key messages in the 178 supported health zones to raise awareness on key malaria preventive and treatment behaviors during household visits, ANC and EPI clinics. The messages disseminated to target audiences were focused on the

appropriate use of ITNs (especially the fact that they should not be used for fishing), early care-seeking at ANC and completion of the required number of SP doses for pregnant women, and prompt treatment for fever in children less than five years of age. PMI used several channels including trained *relais communautaires*, local radio, SMS messages and clinic based service providers.

PMI supported the broadcast of messages through short message service (SMS), sending out 46,676 SMS messages on malaria-related issues in local languages, targeting all pregnant women in Bukavu (South Kivu). Overall, the messages were culturally acceptable, well received, and reached beyond those with phones as the messages were shared at community meetings and among various church networks. According to feedback from the field, all of those who received SMS messages wanted increased message frequency, from once weekly up to two to three times per week and that the messages included broader topics.

During FY 2017, 1,136 *relais communautaires* were trained on SBCC and they performed 14,349 home visits reaching 42,487 people. In addition, 310,977 pregnant women attending ANC clinics (out of the estimated 660,000 women expected to attend ANC in the catchment area) were sensitized on appropriate use of ITNs and IPTp. As reported in the MIP section, between 65% and 70% of pregnant women attending antenatal care in PMI-supported health zones received at least two doses of SP during their most recent pregnancy in the past 12 months while about 56% to 65% received three doses (project reports). Further, 249,581 mothers/caregivers of children under five attending EPI clinics were reached with messages related to appropriate use of ITNs and early care seeking. During home visits and sensitization meetings at ANC and EPI clinics, the *relais communautaires* and the trained providers used appropriate supportive educational materials developed by the NMCP with PMI support. The new SBCC mechanism will design interventions demonstrating a direct link between SBCC activities and specific results.

PMI and Global Fund are collaborating to design and implement a health facility survey in 2017. This will examine a number of issues related to health worker attitudes and behaviors, including 1) health worker knowledge of national case management guidelines and/or IPTp dosing; 2) confidence in their ability to adhere to these guidelines; 3) the belief that IPTp has a protective effect for mother and baby; 4) the belief that RDTs are effective in diagnosing malaria (i.e., compared to their own clinical judgment and/or microscopy); 5) attitudes towards SP, RDTs, ACTs, etc. in general; and 6) their belief that the majority of their colleagues adhere to national case management and/or IPTp guidelines. Additionally, the health facility survey will include an exit interview, which will assess the client's perspective on services received.

Furthermore, PMI is assisting the NMCP to develop its new malaria communication strategy based on the new National Malaria Control Strategic Plan 2016-2020. There are currently no national or provincial SBCC coordinating committees. Matters relating to behavior change are usually reviewed in the larger malaria Task Force. With the completion of the updated strategy, PMI proposes assisting the NMCP to establish SBCC coordinating committees at the national and provincial levels.

Plans and justification

Using FY 2018 funds, PMI will continue to support the management and coordination of the new national communications strategy at the national and provincial levels and its implementation in PMI-supported health zones. Using the results of formative research carried out using FY 2017 funds, SBCC activities will be focused on addressing the determinants of behavior among health workers, community

leaders, CHWs, community groups, school students, and other malaria stakeholders in order to improve malaria prevention and treatment practices. Key malaria-related communications messages will be integrated into SBCC activities throughout the USAID health portfolio (and possibly other USAID sectors) to leverage the effectiveness and reach of interventions. PMI will also engage government officials, donors, parliamentarians, and private sector to increase attention to malaria, mobilize resources, and foster greater coordination of activities. Understanding that resources are limited, PMI will support the NMCP and other partners to prioritize those audiences that can be reached within the available budget. This prioritization will flow down to the on-the-ground service delivery mechanisms and service providers.

In compliance with PMI SBCC guidance, SBCC support will continue to utilize local communication channels that are culturally sound and familiar to the communities and target populations. These activities will also address the following key issues targeting providers and patients, while supporting advocacy for policies that address other systemic determinants.

- PMI will **promote changes in provider behavior** to use ACTs as the first-line treatment for malaria; improve patient knowledge of malaria services through sensitization at antenatal care and EPI clinics by healthcare providers; advocacy meetings with community leaders; family outreach by CHWs; community and small group discussions; SMS; television and radio spots, posters.
- **Increase the coverage of IPTp** for prevention of malaria in pregnancy: More than 88% of pregnant women attend ANC at least once in the DRC and 79% make two visits. In spite of this, according to the most recent DHS, only 14% of pregnant women received two doses of SP during ANC visits. Again, SBCC efforts will target both providers and patients, supporting the NMCP's efforts to increase IPTp uptake through ANC outreach services (see MIP section). The results of the health facility survey planned for 2017 should shed light on the reasons for the large gap between ANC attendance and IPTp coverage.
- **Stimulate the appropriate use of ITNs** among targeted risk groups: While the use of ITNs has shown improvement, major gaps remain. Only 56% of children less than five years of age and 60% of pregnant women sleep under an ITN. As a recent assessment of the ITN program showed a significant drop in ITN use between campaigns, SBCC activities will reinforce the ongoing universal coverage campaigns and routine distribution of ITNs at health facilities, especially reinforcing SBCC activities between the campaigns. Messages delivered on a routine basis will be strengthened, and will be disseminated both during the campaigns and at the health facilities. PMI will emphasize advocacy activities and messaging to discourage populations located near rivers and lakes from using ITNs for fishing, due to the environmental damage caused by this practice and the loss of those nets for malaria prevention purposes.
- **Continue promoting appropriate caregiver behaviors:** The NMCP communication strategy identifies as a major problem the fact that patients do not use available treatment services. The plan therefore targets mothers and caregivers of children under 5 to ensure that they go to a health center or community care site within 24 hours of the onset of a fever. The plan furthermore targets family members, *relais promotionnels*, community leaders and prayer groups to encourage and support mothers and caregivers to seek prompt treatment. There is also a need to promote the acceptability of three commodities that are not well understood by the population: RDTs for malaria diagnosis, injectable artesunate for treatment of severe cases, and rectal artesunate for pre-referral treatment of severe cases at the community level and at non-referral health centers.

- **Incorporate the results of formative research to address barriers to access and uptake** of malaria prevention and treatment approaches in order to inform SBCC activities across the PMI portfolio.
- PMI will **support NMCP advocacy activities** outlined in its new communication strategy that engage greater involvement with government, donors, parliamentarians, and the private sector through meetings, workshops, and development of materials and media campaigns. PMI together with other donors have been collaborating to support workshops, meetings and other outreach activities to meet the planned objectives.

In the design of the new DRC SBCC mechanism, PMI will ensure that appropriate tools are in place to monitor SBCC activities and the impact of messages on population and provider behavior.

Proposed activities with FY 2018 funding (\$1,500,000)

Health Zones and Communities (\$800,000)

- Support SBCC activities through inter-personal communication at health facilities and within communities. This includes training of health providers and CHWs, printing of educational materials and logistical support to CHWs. This work will be implemented by USAID/DRC's bilateral service delivery project in 178 supported health zones in nine provinces. The objective are to:
 - Raise awareness among the population about ownership and use of bed nets, particularly for vulnerable groups;
 - Promote appropriate care-seeking and treatment adherence among the population and respect of diagnosis and treatment guidelines among healthcare providers;
 - Increase usage of MIP interventions, including ITN use, IPTp, and treatment-seeking behavior for suspected malaria, along with general messages on the importance of antenatal care.

National and Provincial levels (\$700,000)

- Support coordination and management of the Malaria Communication Strategy at the national and provincial levels, including support for national and provincial SBCC coordinating committees;
- Support implementation of the strategy through the design of effective SBCC interventions, production of materials, monitoring of the interventions at various levels, and evaluation. This may also include broadcasting messages through SMS and mass media outreach;
- Build capacity of MOH personnel in SBCC at the national and provincial levels.

6. Surveillance, monitoring, and evaluation

NMCP/PMI objectives

The DRC National Malaria Control Strategic Plan for 2016-2020 outlines several goals and strategies related to malaria surveillance, monitoring, and evaluation. Related SM&E objectives for 2020 as outlined in the national strategy are:

- Measure performance against the goal of reducing malaria morbidity and mortality by 40%, as compared to 2015, through the following four outcome indicators:
 - All-cause mortality rate for children under 5 years old

- Percentage of children under 5 years old with malaria
- Percentage of confirmed malaria cases per 1,000 habitants
- Percentage of hospital deaths due to malaria per 100,000 habitants
- Measure progress of malaria interventions towards strategic objectives through 21 impact indicators such as ITN usage rates, malaria treatment and diagnosis rates, malaria knowledge rates, and SM&E performance measures.
- Strengthen surveillance, monitoring, and evaluation systems to ensure routine availability and data quality of critical indicators to the NMCP.
- Conduct periodic studies such as DHS, MICS, MIS, and EUV surveys to complement routine data and orient strategic decisions.

Progress since PMI was launched

The 2013 institutional audit of the NMCP supported by PMI included an evaluation of the monitoring and evaluation department and its functions. The report recommended that all SM&E and research activities be grouped under a single department in order to streamline resources and integrate data management for all donor-supported activities. Implementing recommendations from this report are awaiting the recruitment of a consultant who will develop a roadmap to guide this process, while PMI is currently implementing recommended actions from a separate assessment of the NMCP's M&E division. PMI also played an essential role in the development of the National Malaria Monitoring and Evaluation Plan that accompanied the 2013-2015 National Malaria Control Strategic Plan, as well as the updated National Strategy.

Household surveys: The DRC has benefited from several nationally representative surveys; the three most recent have reported on key malaria indicators for assessing progress towards the NMCP's targets and objectives. A DHS was conducted in 2007 and again in 2013-14, and a MICS was carried out in 2010. According to the 2013-14 DHS, the under-five mortality rate is 104/1,000 live births, a substantial reduction from the previous rate of 158/1,000 reported in the 2010 MICS. PMI was a primary supporter of the 2013-14 DHS, the first nationally representative survey to collect parasitemia measurements in the DRC.

EUV surveys: In 2013, PMI began supporting EUV surveys of commodity availability in the DRC. These surveys are conducted twice yearly on small convenience samples of health facilities and regional depots and are not intended to be national in scale or representative in nature. However, in a country as large as DRC with comparatively limited infrastructure, these snapshots play a key role in understanding essential malaria commodity availability and case management practices.

Routine surveillance and HMIS: The MOH is in the final stages of a three year transitioning process, moving the National Health Management Information System (HMIS) from a Microsoft Access®-based platform to the District Health Information System 2.0 (DHIS 2) platform. PMI has been a major partner supporting these efforts and overall improvements to the HMIS in the DRC. It was initially envisioned that all 517 health zones would use satellite communications or "VSATs" (Very Small Aperture Terminals) for DHIS 2. However, this has proved challenging given the frequent instability of the internet connection (which can be affected by a slight movement to the VSAT dish) and the limited number of technicians that can service the terminals, most of whom are based in Kinshasa. As a result, consistent internet connection and availability continues to be a challenge to full-scale implementation and use of DHIS 2 in DRC. In response, and given that roughly 80% of DRC health zones have a reliable cell phone network, backup options using modems are being integrated into the standard

operating procedures to ensure reliable data transmission. PMI has supported training on DHIS 2 data entry to over 100 staff from over 30 health zones and supports Internet access to central offices in these health zones.

In addition to the HMIS, there are several other approaches to improving surveillance occurring in DRC. Coinciding with the aforementioned division of provinces, the NMCP expanded its sentinel site system from 11 sites to 26 so that there is one in each province. A sentinel surveillance site is a geographical area within a health zone consisting of a general reference hospital and three health facilities. The system aims to provide clinical, entomological, parasitological and environmental data in various localities of the country, in order to quickly assess trends for a comprehensive set of malaria indicators, which include complementary data that are not collected through the routine HMIS.

The Global Fund and DFID support sentinel sites, but in a few of the sites, PMI supports some of the complementary activities including TES, entomological monitoring, support for regular internet connection, and support for improved M&E skills among healthcare workers. These activities are part of PMI's efforts to support and develop improved data collection and use at the health facility level, through an approach referred to as Centers of Excellence by PMI partners in country. The plan is for each health facility engaged in this approach to be directly supported for three years, with year one focusing on introducing the related concepts of data quality and on building capacity, year two on maintaining support for using the newly acquired skills and approaches, and year three on monitoring and sustaining gains in data quality and use through supervision. Quarterly routine data quality audits are also part of the monitoring plan.

PMI has also supported the development of a central NMCP database (<https://pnlprdc.com/>) that houses all the relevant data collected by the various malaria partners in the DRC. This was done to support the NMCP in managing in-country partner data, and provide a space to report on process, output, and outcome indicators collected by various implementing partners. The central NMCP database is connected to the national HMIS, which uses the DHIS 2 platform. As a result, routine facility-based malaria data captured through the HMIS can be integrated with program data collected through the NMCP database. NMCP M&E staff, including data managers, was trained in the use of this database. Furthermore, this provides a way for key partners working in dispersed geographic regions to collect the various program data in one space.

Progress during the last 12-18 months

PMI is supporting an in-depth impact evaluation to assess the extent to which the roll out of malaria control activities in the DRC has had an impact on morbidity and all-cause child mortality rates. This evaluation should be completed in 2017 and is part of a larger PMI portfolio to document the impact of the scale-up of malaria control interventions on morbidity and mortality in PMI focus countries.

PMI continues to provide SM&E technical assistance at the national level. Two FETP trainees per year also work with the NMCP, as described in the health system strengthening and capacity building section. In 2016 the 11 provinces of DRC were divided into 26 provinces, and as a result, PMI's coverage expanded from five to nine provinces. Coinciding with these actions, PMI expanded provincial level SM&E support from five to nine provincial advisors for malaria-related activities in each province supported by PMI. The advisors are housed at the NMCP or DPS office in the provinces where they are based; there they assist with coordination of malaria control activities, accompany DPS and health zone leadership in supportive supervision by, and implement activities aimed at improving the collection

(completeness and timeliness), compilation, and analysis of data to improve overall reporting and data quality.

The SM&E guidelines that will accompany the 2016 – 2020 National Strategy are in the final stages of development. PMI has also continued to support the implementation of DHIS 2 at the national, provincial, and health zone levels with trainings, ensuring Internet connection, providing data collection tools, and ensuring quarterly monitoring and supervision. At the national level, PMI participates in regular meetings with the Division of HMIS to discuss aspects of DHIS 2 implementation nationwide, including the trainings on navigation and use of DHIS 2, which are currently underway. Overall, PMI supports efforts to maximize DHIS 2 capabilities in data validation and presentation.

In addition, PMI has supported rapid data quality assessments - the main findings were unavailability of data collection tools, and discrepancies between data reported on the DHIS 2 platform and data on paper forms and ledgers at the health zones

As of March 2017, DRC began using a second version of DHIS 2 and all data from January 2017 onward will be available on this new version of the platform. This updated version of DHIS 2 is more streamlined, has fewer overall indicators, and is associated with a scaled down monthly reporting form. This should reduce the monthly burden of data entry, both paper-based as well as electronic, and improve overall reporting completeness and timeliness. PMI supports the printing and distribution of this new data collection form for over 30 health zones, and to avoid stock outs, holds a buffer stock equivalent to 10% of needs for all PMI supported provinces.

In addition, PMI continues to support the expansion of the RHIS strengthening approach at the facility level, and overall data analysis and use at the health zone and provincial levels. PMI has expanded this strengthening approach from four sites in 2016, to 22 sites in 2017, with further expansion planned for 2018. Twenty sites are clustered across four health zones in order to build capacity across an entire health zone. These efforts at the health zone level aim to ensure improved data reporting, quality, and use for an entire health zone.

PMI is working with its implementing partners to develop a long-term malaria surveillance strategy to articulate how the NMCP sentinel sites, as well as RHIS strengthening at the facility, zone, and provincial levels will all complement one another to provide robust, accessible data for district-level decision-making.

The PMI team, in collaboration with the Global Fund, is finalizing the plans for a Service Provision Assessment (SPA) survey in 2017. This survey will cover all DRC provinces except those where the World Bank is implementing its Performance Based Financing program. Moreover, PMI and the Global Fund will support a parasitemia measure, which will be collected in coordination with UNICEF's 2017 MICS.

Table 14: Monitoring and Evaluation Data Sources

Data Source	Survey Activities	Year								
		2010	2011	2012	2013	2014	2015	2016	2017	2018
National-level household surveys	Demographic Health Survey (DHS)				X					
	Combined Multiple Indicator Cluster Survey and Malaria Indicator Survey (MICS-MIS)	X							(X)	
Health facility and other surveys	SPA survey								(X)	
	EUV survey				X	X	X	X	(X)	(X)
Malaria surveillance and routine system support	Support to “centers of excellence”						X	X	(X)	(X)
	Support to NMCP vertical malaria info system		X	X	X	X	X	X		
	Support to routine HMIS			X	X	X	X	X	(X)	(X)
Therapeutic efficacy monitoring	<i>In vivo</i> efficacy testing							X	(X)	(X)
Entomology	Entomological surveillance and resistance monitoring				X	X	X	X	(X)	(X)
Other data sources	Malaria Impact Evaluation							X		

() Planned

Plans and justification

PMI will continue to support SM&E technical assistance to the NMCP at both national and provincial levels to help with the implementation of the newly established provincial structures and the resolution of logistical challenges with DHIS 2. Specifically, PMI will continue to support the development and

use of routine data on the DHIS 2 platform, and support actions to improve the functionality of the system to ensure regular access and data transmission is occurring at all levels. Continued technical assistance is critical to the implementation of the National M&E Strategy for 2016-2020.

There is a need to strengthen routine health facility malaria surveillance and build capacity at the provincial and health zone levels to analyze and use data. PMI will continue to support routine health information systems (RHIS) strengthening at all critical levels (national, provincial, and health zone), but given the vast area being supported by PMI, it is unrealistic to provide the same level of support across all levels. Because of this, PMI will continue to provide focused technical assistance to health zones to strengthen RHIS in facilities. Building capacity across all 516 health zones in DRC demands an approach that is easily scalable. PMI will support a review of this activity in January 2018, after the 12 months of implementation, to identify key elements of a routine health information strengthening package, and develop a more streamlined approach to data use and quality improvements, ultimately reaching more facilities in a shorter time period. The experience from this activity and the initial 12-month review will serve as a basis for a more comprehensive plan to strengthen RHIS in all health facilities within 4 health zones (Lubumbashi and Kapolowe in the Haut Katanga Province, Mikalayi in Kasai Central, and Katana in Sud Kivu) by the end of FY 2019, with the long-term goal of all PMI health zones. In all supported health zones, PMI will provide standard training and supervision for monitoring and reporting activities, technical assistance, support for data quality assessments, necessary equipment, as well as printing and distribution of standardized registers and data collection forms for health facilities and community care sites.

In summary, the following activities will be supported at the various levels:

- **National:** PMI will continue to build M&E capacity within the NMCP on use of data for program management and regular programmatic evaluation, as well as to supervise provincial advisors and oversee the implementation of relevant activities at the provincial level. PMI's support at this level will focus on analyzing program data to inform decision making, and ensuring a high level of reporting completeness and timeliness, as well as resolving issues related to DHIS 2 implementation and ensuring the appropriate data validations are automated.
- **Provincial:** PMI will support one provincial advisor in each of the PMI provinces. These advisors will provide technical assistance and training to the provincial level NMCP staff with an emphasis on improving the collection, analysis, and use of malaria data at the provincial and health zone level. Support will include hands-on coaching for data collection, analysis, and reporting, as well as resolving remaining issues in DHIS 2 implementation and use.
- **Health Zone / Health Facility:** PMI will continue to support targeted, intensive RHIS strengthening activities in the health zones of Lubumbashi, Kapolowe, Mikalayi, and Katana with the goal of including all facilities in those zones by the end of FY 2019. This activity will include intensive training and coaching on the recording, validation, and use of data. This will be the third year for the initial facilities supported through this approach, and emphasis on this initial cohort of facilities will help ensure that a continuous monitoring plan that leverages the capabilities of DHIS 2 is in place..

Proposed activities with FY 2018 funding (\$1,010,000)

- Support better use of data for program management at the central level and address DHIS 2

implementation issues, to ensure that the NMCP SM&E system is running and fully functional and that staff at the national level has the capacity to continue to perform well without technical support from partners. (\$200,000)

- Continue to support M&E capacity building at the provincial level in order to improve the collection, analysis, and use of malaria data. This provincial level assistance will also support improvements in the data collection and aggregation system in selected health zones, including coordination among partners working on RHIS strengthening, and support supervision for data collection, analysis, and quality control. (\$100,000)
- Support targeted, intensive RHIS strengthening activities in selected zones as part of the ongoing Centers of Excellence scale up, as a complement to the technical assistance provided to the provincial NMCP staff (see above). This support will include training and supportive supervision for monitoring and reporting activities. (\$300,000)
- Support to health facilities and health zones for data use and routine reporting, including provision of forms and registers to health facilities as well as facilitation of data validation meetings. In areas with iCCM activities, this activity will also provide support to the CHWs. (\$250,000)
- Continue to conduct EUV surveys twice annually in selected provinces to monitor the effectiveness of PMI's efforts to improve the supply chain in the DRC and case management practices at the lowest level of the health system. (\$150,000)
- CDC technical assistance. Assist national M&E planning and support capacity building for M&E. (\$10,000)

7. Operational Research

NMCP/PMI objectives

In 2014, the NMCP developed a plan for malaria studies programmed between 2015 and 2020, in line with the national strategy. This plan includes 25 priority studies and aims to fill the gap in malaria operational research and M&E needs. In the recently submitted Global Fund program continuation request, the NMCP also labels six of these priorities and two additional ongoing studies as having the potential to lead to significant strategic changes, depending on their results. PMI supports many of these priority research and M&E activities including monitoring of insecticide resistance, monitoring of the durability of ITNs, end-use verification surveys, therapeutic efficacy studies, and population-based surveys such as the MIS.

Progress since PMI was launched

In 2015, PMI initiated a core budget-funded study in Ethiopia and DRC to assess an appropriate follow up strategy at the community level for non-severe febrile illnesses in children age 2 to 59 months. In DRC, this study was implemented in two health zones in Tanganyika Province. It was designed to compare outcomes for children with no danger signs and no diagnosis of malaria, pneumonia, or diarrhea under two scenarios: 1) when community health workers (CHWs) advised caretakers to follow up in 3 days regardless of symptom resolution (universal follow-up); and 2) when CHWs advised caretakers to follow up in 3 days only if symptoms remain the same or worsen (conditional follow-up). (Results pending)

Progress during the last 12-18 months

The PMI/DRC team is working to prioritize operational research gaps, and is supporting the NMCP and local subject matter experts to conduct well-designed studies that meet the needs of decision-makers.

In 2016, PMI/DRC initiated a study with the NMCP to help inform vector control strategies by determining the degree to which mass distribution of ITNs increases the intensity of pyrethroid resistance. This study, which takes place in Kinshasa where nearly 15% of the Congolese population lives, will further the understanding of resistance buildup which is important in ensuring that the use of ITNs as a primary intervention is not being compromised. Four rounds of intensity assays, two at five and three months before the ITN distribution and two at four and eight months after the distribution have been completed. Data so far shows considerable baseline insecticide resistance for permethrin and some resistance to deltamethrin. Final results are expected in December 2017.

Proposed activities with FY 2018 funding: (\$0)

PMI currently has no studies or other OR activities planned with FY 2018 funding.

Table 15. PMI-funded Operational Research Studies

Completed OR Studies			
Title	Start date	End date	Budget
Universal versus conditional three-day follow-up visit for children with unclassified fever at the community level. (Core budget funded)	April 2015	April 2017	\$749,989
Ongoing/Planned OR Studies			
Title	Start date	End date	Budget
Does a mass-distribution of ITNs increase the intensity of pyrethroid resistance?	January 2016	December 2017	\$100,000
Planned OR Studies FY 2018			
Title	Start date (est.)	End date (est.)	Budget
None planned			

8. Staffing and administration

Two health professionals serve as resident advisors to oversee PMI in the DRC, one representing CDC and one representing USAID. In addition, six Foreign Service Nationals (FSNs) will work as part of the PMI team: two full-time Project Management Specialists and four shared staff who will work on cross-cutting issues of supply chain management and logistics, community case management, monitoring and evaluation, and a program assistant. 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 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 overall leadership for PMI is delegated to the USAID Health Office Director, while the Malaria Team Leader, a Foreign Service Officer, provides day-to-day technical guidance and direction to the RAs and FSNs on the PMI team. The technical expertise housed in Atlanta and Washington complements PMI programmatic efforts.

The two PMI resident advisors are physically based within the USAID Health Office but are expected to spend approximately half their time providing TA to the NMCP and implementing partners, including time in the field monitoring program implementation and impact.

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

Proposed activities with FY 2018 funding: (\$3,221,056)

- Salaries and support costs of one CDC resident advisor, including equipment, ICASS, other Mission taxes and fees, and other associated expenses. (\$701,000)
- Salaries and support costs of one USAID resident advisor, two USAID FSN full-time PMI staff, and four FSNs whose costs are shared across the Health Office. This includes equipment, ICASS, other Mission taxes and fees, and other associated expenses. (\$2,520,056)

Table 1: Budget Breakdown by Mechanism**President's Malaria Initiative – DRC
Planned Malaria Obligations for FY 2018**

Mechanism	Geographic Area	Activity	Budget (\$)	%
CDC/IAA	178 health zones in 9 provinces	FETP and technical assistance for entomological monitoring, case management, and M&E	900,000	2.6%
GHSC/PSM	178 health zones in 9 provinces	Procurement of ITNs, SP, RDTs, ACTs, microscopes, and severe malaria drugs	18,449,796	52.7%
TBD	Kwango Province	Operational costs for ITN mass distribution	2,181,543	6.2%
IHP-DRC	178 health zones in 9 provinces	Support training and supervision on malaria in pregnancy and case management for health facility and community levels; assist with transportation of malaria commodities from regional warehouses to health zones; support NMCP supervision to provincial level; support SBCC activities for malaria prevention and control	8,138,605	23.3%
TBD - IRS	11 sites in 10 provinces	Entomological monitoring and training	315,000	0.9%
Measure Evaluation	178 health zones in 9 provinces	Support malaria coordination mechanisms; support Provincial Malaria Advisors; provide technical assistance for monitoring and evaluation at national and provincial levels; support TES	1,420,000	4.1%
TBD - BCC	178 health zones in 9 provinces	Develop communication campaigns/materials to support malaria BCC activities; support NMCP advocacy activities	700,000	2.0%
TBD Laboratory	178 health zones in 9 provinces	Support reference laboratories at national and provincial levels for microscopy and RDTs; implement a system of quality control for malaria diagnosis	200,000	0.6%
USAID	178 health zones in 9 provinces	In-country staffing and administration	2,520,056	7.2%
VectorWorks	Mongala and Sud Ubangi	ITN durability monitoring in two provinces	175,000	0.5%
Total			35,000,000	100%

Table 2: Budget Breakdown by Activity

**President's Malaria Initiative – DRC
Planned Malaria Obligations for FY 2018**

Proposed Activity	Mechanism	Total \$	Commodity \$	Geographic Area	Description
PREVENTIVE ACTIVITIES					
VECTOR MONITORING AND CONTROL					
Entomologic monitoring and insecticide resistance management					
Entomological surveillance and insecticide resistance monitoring	TBD - IRS	300,000		11 sites in 10 provinces: Kingasani, Kabondo, Mikalayi, Lodja, Kalemie, Kapolowe, Katana, Equateur, Bandundu, and Kongo Central	Improved support for species identification and insecticide resistance monitoring at sentinel sites in supported provinces. Includes increased supervision/support of field and laboratory activities and quality assurance activities.
Support entomological training	TBD - IRS	15,000		11 sites	Support training in field entomology for national and provincial staff, with a special emphasis on quality assurance.
Technical assistance for entomological monitoring	CDC/IAA	29,000		11 sites in 10 provinces	Two technical assistance visits to support activities related to entomological monitoring.

Subtotal Ento monitoring		344,000	0		
Insecticide-treated Nets					
Operational costs for mass campaigns	TBD	2,181,543		Kwango province	1.45 million ITNs @ \$1.50. Includes training, supervision, household census, transportation, and communications.
Procurement of ITNs for continuous distribution through ANC and child health clinics	GHSC/PSM	7,488,000	7,488,000	178 health zones in 9 provinces	Procure 2.6 million ITNs. Includes delivery to regional warehouses.
Operational costs for continuous distribution of ITNs through ANC and EPI	IHP-DRC	3,900,000		178 health zones in 9 provinces	2.6 million ITNs. Includes delivery from regional warehouses to health zones and/or health facilities, storage, and supervision.
Storage costs for ITNs at regional warehouses	GHSC/TA	374,400		8 regional warehouses in 9 provinces	8% of ex-works (factory) cost.
ITN durability monitoring	VectorWorks	175,000		Lualaba and Thuapa provinces	Conduct durability monitoring for ITNs distributed through mass campaigns in two provinces.
Subtotal ITNs		14,118,943	7,488,000		
Indoor Residual Spraying					
Subtotal IRS		0	0		
SUBTOTAL VECTOR MONITORING AND CONTROL		14,462,943	7,488,000		
Malaria in Pregnancy					

Procurement of SP	GHSC/PSM	240,000	240,000	178 health zones in 9 provinces	2 million treatments for 923,000 pregnant women (3 doses each). Includes delivery to regional warehouses.
Distribution costs for SP from regional warehouses to health zones	IHP-DRC	150,000		178 health zones in 9 provinces	\$0.06 per treatment distribution cost.
Storage costs for SP at regional warehouses	GHSC/TA	24,960		10 regional warehouses in 8 provinces	8% of ex-works (factory) cost.
Replace water filters and reusable cups to facilitate directly observed IPTp	IHP-DRC	10,000		178 health zones in 9 provinces	Replace or provide new supplies as needed.
Training and supervision of health facility workers on malaria in pregnancy	IHP-DRC	200,000		178 health zones in 9 provinces	Train health workers with initial or refresher courses and provide supportive supervision.
Subtotal Malaria in Pregnancy		624,960	240,000		
SUBTOTAL PREVENTIVE		15,087,903	7,728,000		
CASE MANAGEMENT					
Diagnosis and Treatment					

Support reference laboratories at national and provincial levels for microscopy and RDTs training of trainers and implement a system of quality control and assurance of malaria diagnosis	TBD Laboratory	200,000		National, provincial, and selected referral hospitals	Supervise and implement a system for quality control and quality assurance of malaria diagnosis, assist in preparation for accreditation of laboratory technicians and provide equipment. Conduct training of trainers at the different levels of the health system.
Procurement of microscopes and supplies to support laboratories at provincial and health facility levels	GHSC/PSM	50,000	50,000	National, provincial and selected referral hospitals	Purchase of 70 microscopes and reagent kits for reference laboratories at the national and provincial levels, as well as selected reference hospitals.
Procurement of RDTs	GHSC/PSM	4,240,000	4,240,000	178 health zones in 9 provinces	Procure 8 million Ag/Pf RDTs for use at hospitals, health centers, and community care sites. Includes delivery to regional warehouses.
Procurement of ACTs	GHSC/PSM	2,055,000	2,055,000	178 health zones in 9 provinces	Procure 3 million total ACT treatments divided as follows: 30% AL for use in urban areas and 70% AS-AQ for use in rural areas. For use at hospitals, health centers, and community care sites. Includes delivery to regional warehouses.

Procurement of injectable artesunate for treatment of severe malaria	GHSC/PSM	2,732,660	2,732,660	178 health zones in 9 provinces	207,000 treatments of injectable artesunate for use in children 0-5 years and 79,000 treatments for children 6-13 years at reference health centers and hospitals (total of 1,084,389 vials). Includes delivery to regional warehouses.
Procurement of rectal artesunate for pre-referral treatment of severe malaria	GHSC/PSM	30,000	30,000	178 health zones in 9 provinces	103,361 treatments of rectal artesunate for use in children 0-5 years at community care sites and health centers (150,000 suppositories of 100 mg). Includes delivery to regional warehouses.
Training and supervision of facility-based health workers on malaria case management	IHP-DRC	1,100,000		178 health zones in 9 provinces	Support in-service training and supervision of facility health workers responsible for the management of both uncomplicated and severe malaria.
Training and supervision of community-based health workers on integrated case management	IHP-DRC	1,000,000		178 health zones in 9 provinces	Support initial and refresher training and supervision of health workers that offer integrated case management for malaria, diarrhea, and pneumonia at community care sites.
Therapeutic Efficacy Study	Measure Evaluation	150,000		Two TBD sites	Support NMCP in conducting therapeutic efficacy studies in two of planned six sites
Technical assistance for case management	CDC/IAA	10,000		National	One visit to support activities related to case management.
Subtotal Diagnosis and Treatment		11,567,660	9,107,660		

Pharmaceutical Management

Tailored technical assistance to strengthen supply chain management	GHSC-TA	600,000		National level and 8 regional warehouses	Strengthen supply chain management for malaria commodities including forecasting, inventory management, training, supervision, and support for oversight mechanisms.
Contribute to strengthening LMIS	GHSC-TA	175,000		National level and 8 regional warehouses	Support PNAM to collect, compile and process commodity data, in collaboration with other USAID programs and other donors
Distribution costs for all case management commodities from provincial warehouses to health zones	IHP-DRC	678,605		178 health zones in 9 provinces	Distribution cost for 8 million RDTs, 3 million ACTs, 103,361 RA treatments, and 206,723 injectable artesunate treatments. From regional warehouses to health zones.
Storage and stock management costs for diagnosis and treatment commodities at CDRs	GHSC-TA	289,776		10 regional warehouses in 8 provinces	8% of ex-works (factory) cost for 8 million RDTs, 3 million ACTs, 150,000 RA suppositories, and 610,000 injectable artesunate vials.
Subtotal Pharmaceutical Management		1,743,381	0		
SUBTOTAL CASE MANAGEMENT		13,311,041	9,107,660		

Support to malaria coordination mechanisms at the national and provincial levels	Measure Evaluation	45,000		National and provincial	Support multi-partner National Malaria Task Force at the central and provincial levels, including meetings, report dissemination, support to technical assistance for coordination, annual review.
Capacity building for NMCP staff	Measure Evaluation	40,000		National	Attendance of NMCP and INRB staff at a key malaria scientific conferences; attendance of NMCP at course(s) that addresses critical technical needs identified by PMI and the NMCP; and/or a site visit to observe activities and explore new approaches.
Support 9 Provincial Malaria Advisors to reinforce coordination and M&E activities at NMCP and Provincial Health Divisions	Measure Evaluation	585,000		9 provinces	Salary for nine advisors and operational costs for supervision and other field-based activities.
Support NMCP to conduct supervision of malaria control activities at provincial level	IHP-DRC	50,000		9 provinces	Two national supervisors conduct semi-annual supervision visits to nine provinces.
Support Field Epidemiology and Laboratory training Program	CDC/IAA	150,000		National	Support two participants for Field Epidemiology and Laboratory Training Program, with malaria focus.

SUBTOTAL HSS & CAPACITY BUILDING		870,000	0		
SOCIAL AND BEHAVIOR CHANGE COMMUNICATION					
SBCC at service delivery points (health facilities and CHWs) and in communities related to routine ITN distribution, malaria case management and malaria in pregnancy.	IHP-DRC	800,000		178 health zones in 9 provinces	Support SBCC activities at the clinic and within communities to: raise awareness among the population about ownership and use of bed nets, particularly for vulnerable groups; promote appropriate care-seeking and treatment adherence among the population and respect of diagnosis and treatment guidelines among healthcare providers; increase usage of MIP interventions, including bednet use, IPTp, and treatment-seeking behavior for suspected malaria, along with general messages on the importance of antenatal care.
Support for national and provincial strategic management of communication campaigns and materials development to support malaria SBCC activities.	TBD BCC	700,000		National and 9 provinces	Management of the implementation of the Malaria Communication Strategy at the national and provincial levels including materials production and monitoring.
SUBTOTAL SBCC		1,500,000	0		

SURVEILLANCE, MONITORING, AND EVALUATION

Support better use of data for program management at the central level and address DHIS 2 implementation issues	Measure Evaluation	200,000		National	Support training on data analysis and use for program management, supervision, coordination. Address challenges identified by DHIS 2 assessment.
Build M&E capacity at provincial level	Measure Evaluation	100,000		9 provinces	Training and coaching on data analysis and use, general M&E support to the NMCP at the provincial level.
Support RHIS strengthening at the zonal level through training and supervision to improve data quality, collection, and use	Measure Evaluation	300,000		Selected health zones (TBD)	Initial phase of RHIS strengthening at the zonal level.
Support collection and transmission of malaria data at health facility and health zone levels	IHP-DRC	250,000		178 health zones in 9 provinces	Includes provision of registers and forms as needed, monthly data validation meetings, and transmission of data to the zone level.
End-use verification surveys	GHSC-TA	150,000		9 provinces	Twice yearly visits at a representative sample of health facilities and warehouses.
Technical assistance	CDC/IAA	10,000			One visit to support activities related to monitoring and evaluation.
SUBTOTAL SM&E		1,010,000	0		

OPERATIONAL RESEARCH

SUBTOTAL OR			0		
IN-COUNTRY STAFFING AND ADMINISTRATION					
CDC	CDC/IAA	701,000			One Resident Advisor
USAID	USAID	2,520,056			One Resident Advisor, two Malaria Program Specialists, one (30%) Malaria Commodities and Logistics Specialist, one (30%) Community Case Management Specialist, one Administrative Assistant, and Program Design and Learning costs.
SUBTOTAL IN-COUNTRY STAFFING		3,221,056	0		
GRAND TOTAL		35,000,000	16,835,660		