Burundi

Malaria Operational Plan FY 2022

This FY 2022 Malaria Operational Plan has been approved by the USAID Malaria Division and reflects collaborative discussions with national malaria control programs and other partners. Funding available to support outlined plans relies on the final FY 2022 appropriation from the U.S. Congress. Any updates will be reflected in revised postings.

This document was prepared in the early months of 2021 as the COVID-19 pandemic continued to evolve worldwide, including in Burundi. The effects of the pandemic on malaria control and elimination work in 2022 are difficult to predict. However, because U.S. Congressional appropriations for USAID malaria funding are specific to work against malaria and any appropriations for work against the COVID-19 are specific for that purpose and planned through separate future U.S. Government planning processes, this FY 2022 MOP will not address the malaria-COVID-19 interface and will reassess any complementary work through timely reprogramming in countries.

CONTENTS

ABBREVIATIONS

ABREMA	Autorité Burundaise de Régulation des Médicaments à usage humain et des Aliments
ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
ANC	Antenatal care
ASAQ	Artesunate-amodiaquine
CAMEBU	Central des Achats des Médicaments Essentiels du Burundi
CDC	U.S. Centers for Disease Control and Prevention
CHW	Community health worker
CY	Calendar year
DHIS2	District Health Information Software 2
DHS	Demographic and Health Survey
DOT	Directly observed therapy
DPML	Direction de la Pharmacies, des Médicaments, et des Laboratoires
DSNIS	Direction Système National d'Information Sanitaire
eLMIS	electronic Logistic Management Information System
EPI	Expanded Program on Immunization
EUV	End-use Verification Survey
FY	Fiscal year
GASC	Groupement d'agents de santé communautaire (community health worker group)
Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
HD	Health district
HMIS	Health Management Information System
HSS	Health systems strengthening
iCCM	Integrated Community Case Management
IG2	Interceptor G2 nets
IPTp	Intermittent preventive treatment for pregnant women
IRS	Indoor residual spraying
ISTEEBU	Institut de Statistiques et d'Etudes Economiques du Burundi
ITN	Insecticide-treated mosquito net
KAP	Knowledge, attitudes, and practice
LMIS	Logistic Management Information System
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MOH	Ministry of Health
MOP	Malaria Operational Plan
MSF	Médecins sans Frontières
NMCP	National Malaria Control Program
NMCSP	National Malaria Control Strategic Plan
PBO	Piperonyl butoxide
PECADOM	Prise en charge à domicile

PMI	U.S. President's Malaria Initiative
RDT	Rapid diagnostic test
RMNCAH	Reproductive, Maternal, Neonatal, Child, and Adolescent Health
SBC	Social and behavior change
SM&E	Surveillance, monitoring, and evaluation
SMC	Seasonal malaria chemoprevention
SOP	Standard operating procedures
SP	Sulfadoxine-pyrimethamine
TA	Technical assistance
TWG	Technical working group
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

EXECUTIVE SUMMARY

The U.S. Agency for International Development (USAID) delivers cost-effective, lifesaving malaria interventions alongside catalytic technical and operational assistance to support Burundi to end malaria. USAID has been a proud partner of Burundi since 2010, helping to decrease malaria-related child death rates by 19 percent and through investments totaling almost $97 million.

The proposed fiscal year (FY) 2022 malaria budget for Burundi is $8 million. This Malaria Operational Plan (MOP) outlines planned malaria activities in Burundi using FY 2022 funds. Developed in consultation with the National Malaria Control Program (NMCP) and key malaria stakeholders, proposed activities reflect national and USAID strategies, draw on best-available data, and align with the country context and health system. Proposed USAID investments support and build on those made by the Government of Burundi as well as other donors and partners.

Country Background

Burundi is a resource-poor country in Central Africa with an estimated 2020 population of 11,215,578 (Source: Institut de Statistiques et d'Etudes Economiques du Burundi [ISTEEBU] Projection). Burundi's population is young, with 49 percent of the population under 15 years of age.

Malaria is the leading cause of morbidity and mortality in Burundi with 9,637,929 malaria cases reported in 2019, an incidence rate of 808 per 1,000 inhabitants (Source: National Health Information System [DSNIS], 2019). Malaria incidence generally peaks from March to June and October to December, associated with annual rainy seasons. Malaria is responsible for 59 percent of in-hospital deaths, with case fatality among hospitalized patients remaining at 1.4 percent in 2019 and 2020. The most vulnerable population are children under five years of age and pregnant women. Twenty-five high-burden districts out of the 47 health districts of Burundi, contributors to the epidemic, are located mostly in the north (eight), in the northwest (five), and in the center (seven) of the country.

USAID will support investments in the following intervention areas with FY 2022 funds:

Vector Control

USAID supports the Burundi vector control strategy through the routine distribution of Insecticide treated nets (ITNs) at antenatal care (ANC) clinics and immunization services and entomological monitoring. Burundi's entomological monitoring has provided evidence for decision-making since 2013 through data collection and analysis in insectary and sentinel sites.

Summary of progress and key results to-date: In FY 2020, USAID actively participated in the development of the 2019 Burundi National Guideline for Vector Control and Insecticide Resistance Management, provided technical support for implementation of ITN durability monitoring for the first time in Burundi following the 2019 mass distribution campaign, and procured and distributed 749,050 nets via routine distribution channels to pregnant women and children under five year of age.

Summary of proposed investments: With FY 2022 funds, USAID will procure 995,881 ITNs (including 391,046 standard ITNs, 184,396 piperonyl butoxide [PBO] nets and 420,439 Interceptor G2 [IG2] nets) via routine channels targeting pregnant women attending ANC and children under five years of age, participate in technical discussions to support the ITN mass distribution campaign planned for June 2022, strengthen local capacity in advanced entomology, support insecticide resistance monitoring in the insectary and nine sites, and conduct 36-month ITN durability monitoring or the six-month data collection for net durability monitoring covering the 2022 mass distribution campaign.

Human Health

USAID is contributing to the control of malaria in Burundi at each level of the system. The support includes active participation in the development of national guidelines, policies, and strategies to ensure that they are in line with World Health Organization (WHO) recommendations. The support is provided by both USAID and implementing partners.

Case Management

USAID support is fully aligned with the national strategy on case management.

Summary of progress and key results to-date: USAID supported the NMCP in piloting in six health districts and 26 health facilities, and rolling out the 2019 Malaria Guidelines, through the procurement of commodities and materials, along with refresher training sessions. With FY 2020 funds, 1,994,280 blisters of artemether-lumefantrine (AL), 135,415 rapid diagnostic tests (RDTs), and 132,626 vials of injectable artesunate were procured to leverage commodities provided by Global Fund. USAID supported expansion to 410 supported health facilities; 175 health providers were trained, as well as 350 community health workers from five health districts (Buhiga, Nyabikere, Bururi, Nyanza-Lac, and Rumonge) as of January 2021.

Summary of proposed investments: USAID investments will include providing technical assistance (TA) to improve the quality of malaria services provided at health facilities and at community levels, engaging with private health clinics to offer high-quality malaria services, procuring malaria commodities, expanding integrated community case management (iCCM) sites in the six United States Government (USG)-supported provinces, and rolling out PECADOM (community case management of malaria for all ages) and proactive community case management.

Drug-based Prevention (Malaria in Pregnancy)

In Burundi, drug-based prevention is limited to prevention of malaria in pregnancy (MIP). USAID supports the full package of MIP activities in the national strategy in six provinces.

Summary of progress and key results to-date: In the context of focused antenatal care (ANC), to ensure high-quality maternal and child health with an emphasis on malaria prevention for women and children, USAID supported the training of 75 health providers on essential obstetric and neonatal care, which included malaria prevention (provision of ITNs and sulfadoxine-pyrimethamine [SP]) in collaboration with the national programs.

Summary of proposed investments: With FY 2022 funds, MIP improvement will focus on training, coaching, and supportive supervision for healthcare providers in all USG-supported districts on the ANC core package, with an

emphasis on malaria and service integration for comprehensive care to pregnant women, advocacy toward the Ministry of Health (MOH) for the adoption of WHO 2016 guidelines, and procurement of malaria commodities including 995,881 ITNs for routine distribution and 1,359,644 treatments of SP.

Cross-cutting and Other Health Systems

Supply Chain (with Malaria Focus)

USAID's malaria program has contributed to improved procurement and delivery of malaria commodities through better donor coordination, training and supervision, development of standard operating procedures (SOPs) in pharmaceutical management, and best practices for commodities delivery.

Summary of progress and key results to-date: To ensure uninterrupted supply of health commodities in the country, USAID has supported the procurement of malaria commodities, strengthened the supply chain management support, and provided related TA on forecasting, supply planning, procurement, storage, distribution and inventory management. USAID has also supported the end-user verification (EUV) survey, and electronic Logistic Management Information System (eLMIS) implementation preparedness efforts.

Summary of proposed investments: FY 2022 funds will serve to support the supply chain logistics and pharmaceutical management systems at the national, district, and health facility levels, supervision, and capacity-building at all levels to coordinate efforts with NMCP to improve stock availability at health facility and community levels, and technical support to improve the logistics management information system (LMIS) and EUV survey to inform quantification.

Surveillance, Monitoring, and Evaluation (SM&E)

USAID is supporting the NMCP efforts to coordinate the production and use of accurate data at all levels.

Summary of progress and key results to-date: USAID supported a capacity-building needs assessment for the NMCP in April 2021, using a Monitoring and Evaluation Capacity Assessment Tool, leading to a tailored capacity-building plan and the SM&E technical working group (TWG), and issuing the Malaria Epidemiology Quarterly Bulletin. USAID supported monthly data validation sessions, quarterly data review meetings, routine reporting to provincial/national levels, training and mentoring on Health Management Information System (HMIS)-related data collection, a Health Facility Assessment in March 2020, and quarterly coaching sessions to community health worker groups.

Summary of proposed investments: USAID will contribute to the 2022–2023 DHS, and will provide technical support to continue to build capacity at central, district, and health facility levels including data review meetings, training, coaching on HMIS-related data collection, establishing quality improvement teams, maintaining the SM&E TWG, targeting high-risk provinces to strengthen surveillance efforts, and providing supportive supervision to increase accuracy and promptness of data collection, analysis, reporting, and use.

Social and Behavior Change (SBC)

SBC for malaria control is a major cross-cutting approach to support adherence to desired malaria prevention and treatment behaviors (e.g., service utilization and vector control) in the community. In Burundi, multiple partners support implementation of malaria SBC activities.

Summary of progress and key results to-date: USAID supports SBC interventions to enhance the use of malaria services, including the use of ITNs, at both the health facility and community level. Past efforts have focused on production and broadcasting of messages using mass media such as television and radio. In 2020, specifically, the focus was on promoting continued use of malaria services; two radio spots on malaria prevention in the context of COVID-19 were produced and broadcast. Interventions involving interpersonal communication or community mobilization were limited due to a lack of updated materials.

Summary of proposed investments: USAID will provide TA to NMCP to revise the national malaria SBC strategy, with an emphasis on activities targeting pregnant women and caregivers of children under five years of age. The strategy will also include an implementation plan and measurable indicators. The revision of the national malaria SBC strategy will be based on epidemiological data, as well as a behavioral study, which is being conducted by Médecins sans Frontières (MSF)/Belgique in 2022.

I. INTRODUCTION

The U.S. Agency for International Development (USAID) delivers cost-effective, lifesaving malaria interventions alongside catalytic technical and operational assistance to support Burundi to end malaria. USAID has been a proud partner of Burundi since 2010, helping to decrease malaria-related child death rates by 19 percent and through investments totaling $94.2 million.

The proposed fiscal year (FY) 2022 malaria budget for Burundi is $8 million. This Malaria Operational Plan (MOP) outlines planned malaria activities in Burundi using FY 2022 funds. Developed in consultation with the national malaria control program (NMCP) and key malaria stakeholders, proposed activities reflect national and USAID strategies, draw on best-available data, and align with the country context and health system. Proposed malaria investments support and build on those made by the Government of Burundi as well as other donors and partners.

Burundi at a Glance

- **Geography:** Burundi is one of the Great Lakes countries and part of the East African community. It is 27,834km^2 in size and located between Rwanda to the north, the Democratic Republic of Congo to the west, and Tanzania to the east and south. It comprises 18 provinces with 47 health districts, 123 communes, and 2,911 "collines" (villages). The demographic density is approximately 341 persons per square kilometer.
- **Climate and Malaria Transmission Seasonality**: Burundi's four seasons include two dry seasons (January–February and June–September) and two rainy seasons (March–May and October–December). Malaria incidence generally peaks from March to June and October to December, and is associated with annual rainy seasons.
- **Population in 2021:** 11,215,578 inhabitants in 2020 (Source: ISTEEBU, projection of population 2008–2030 based on the 2008 general census)
- **Population at Risk of Malaria:** The prevalence of malaria is high in rural areas (29 percent). Children under five years of age and pregnant women are most vulnerable. The lowest risk is reported in districts on the Congo-Nile Divide (continental divide that separates the drainage basins of the Nile and Congo rivers), with a positivity rate varying from 15.8 percent to 31 percent. The region of Cankuzo (at North-East) registered a high prevalence of 43.1 percent, followed by the region of Muyinga with 39.9 percent (District Health Information System 2, (DHIS2)). Burundi experiences seasonal peaks that have evolved into outbreaks in recent years, often within the same district. This situation has occurred every two years since 2016 and the northern and eastern health districts (12 health districts within Kirundo, Muyinga, Ngozi, and Cankuzo provinces) are the most common sources of increased cases.
- **Principal Malaria Parasites:** Among the six species of plasmodium responsible for malaria, three exist in Burundi: *Plasmodium falciparum*, responsible for the severe forms (81.6 percent), *P. malariae* (12.5 percent), and *P. Ovale* (5.8 percent) (2016–2017 Demographic and Health Survey (DHS). According to the Malaria Indicator Survey data (MIS 2012), 12 percent of malaria cases are mixed infections constituted by *P. falciparum* with *P. malariae*, *P. falciparum* with *P. ovale,* or *P. malariae* and *P. ovale* (2020 Burundi Entomological Monitoring Annual Report).

- **Principal Malaria Vectors:** There are eight *Anopheles* species confirmed in Burundi including two major malaria vectors: *Anophele gambiae s.l.* (79.14 percent), and *Anophele funestus s.l.* (12.89 percent). The molecular analyses revealed that in the *Anophele gambiae* complex, *Anophele gambiae s.s.* was predominant at all the sentinel sites (64.46 percent to 96.34 percent) except at Gihofi and Mpanda, where *An. arabiensis* was predominant (54 percent to 82 percent). *Anopheles coluzzii* was found at low proportion at Gihofi, Kiremba, Mabayi, and Mutaho. Among members of the *Anopheles funestus* complex, *Anopheles funestus s.s.* was predominant in all sites (84 percent to 100 percent). *Anophele leesoni* was found at three sites (1.92 percent to 15.79 percent). *Source: The VectorLink Burundi Project, December 2020.*
- **Malaria Case Incidence per 1,000 Population**: 808 per 1,000 population in 2019 (Source: National Health Information System (DSNIS, 2019)
- **Under-Five Mortality Rate:** 78 (Confidence interval: 71–85)(2016–2017 DHS)
- **World Bank Income Classification and Gross Domestic Product (GDP)**: Low-income economy $1,035 or less; GDP of $3,012 in 2019.
- **Government Health Budget:** (2019–2020) $56,733 (Source: World Bank Report on Economic Impact of COVID-19 in Burundi)
- **Trafficking in Persons Designations, 2021: Tier 2 watchlist** (State Department report)
- **Malaria Funding and Program Support Partners Include:**
  - U.S. Agency for International Development (USAID)
  - Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund)
  - World Health Organization (WHO)
  - United Nations Children's Fund (UNICEF)
  - World Vision International
  - Médecins sans Frontières/Belgium
- **USAID Support for National Malaria Control Strategy:**

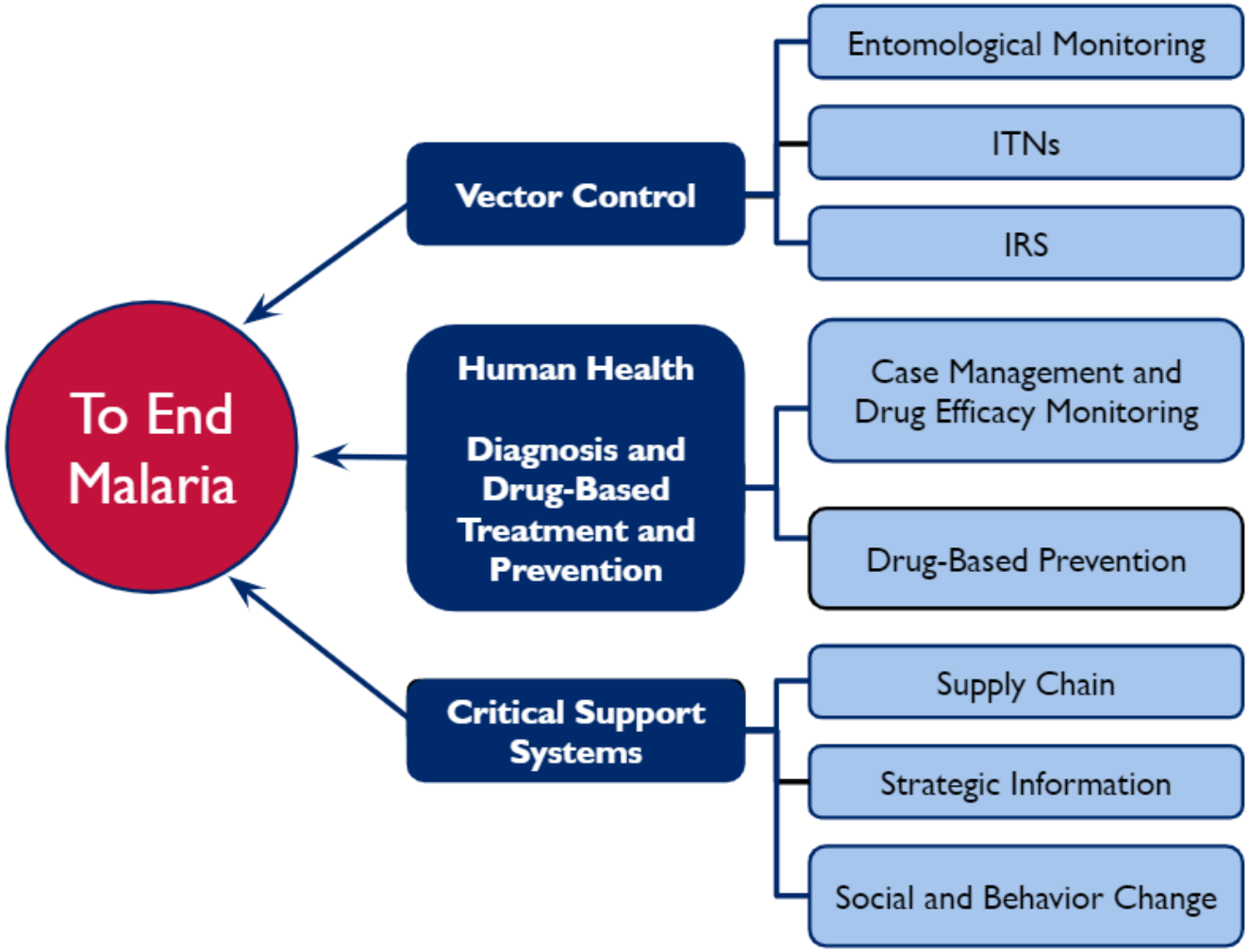
  Burundi's National Malaria Control Strategic Plan 2018–2023 (NMCSP) has the overall goal of reducing malaria-related morbidity by at least 60 percent by 2023 and reducing malaria-related mortality to zero by 2023. This new NMCSP includes eight strategic thematic areas: (i) strengthening coordination and partnership, (ii) improving supply and stock management, (iii) strengthening prevention, (iv) strengthening case management, (v) improving service delivery to key populations, (vi) strengthening communication, (vii) improving surveillance and response, and (viii) improving monitoring and evaluation.

  USAID is fully supporting the Government of Burundi in the implementation of these strategies in collaboration with donors, such as the Global Fund. The Global Fund 2021–2023 has a total budget for malaria activities of $70,849,593 and the United Nations Development Programme (UNDP) serves as the Principal Recipient. The Global Fund allocation will cover aspects of the strategy not funded by USAID such as indoor residual spraying (IRS) in 11 districts as per the national strategy.

USAID Investments: Burundi began receiving USAID malaria funding in FY 2010. The proposed FY 2022 USAID budget for Burundi is $8 million. This FY 2022 investment brings the total USAID malaria investment in Burundi to nearly $97 million.

USAID organizes its malaria investments around the activities below, in line with the Burundi national malaria strategy 2018–2023.

Figure 1. USAID's approach to end malaria[1]



[1]A number of actions are cross-cutting in nature. For example, social and behavioral change (SBC) is embedded in all vector control and human health work; program evaluation (PE) and operational research (OR) are relevant in all of the fieldwork; finance and management support and the introduction of new tools/interventions are critical for all programs; and elimination requires work across the full spectrum of transmission.

Building and strengthening the capacity of Burundi's people and institutions—from the central level to communities—to effectively lead and implement evidence-based malaria control and elimination activities is paramount to USAID. The majority of USAID's planned malaria support for FY 2022, across the areas of vector control, human health, and critical support systems such as supply chain, contains elements of capacity-building and system strengthening. USAID/Burundi will continue to rely on and engage with local partners such as Dushirehamwe and Caritas Burundi, and is expanding its local partner base to reach faith communities at service delivery sites.

II. MALARIA SITUATION AND PROGRESS

Malaria epidemiology is informed by three population-based surveys (DHS 2010, MIS 2012, and DHS 2016–2017), and by District Health Information Software 2 (DHIS2) data reported by health facilities. The next Demographic Health Survey (DHS) survey is expected to be carried out in 2022–2023. All surveys indicate that malaria is a major and likely increasing public health problem in Burundi. In children under five years of age, malaria prevalence increased from 17 percent in 2012 to 27 percent in 2017 (DHS), thus an increase of 59 percent over five years. Since that time, there have been two malaria epidemics that impacted the majority of health districts, the first epidemic officially declared in 2017 in which 23/47 districts had epidemic-level incidence, and the second (undeclared) in 2019 that recorded epidemic-level incidence in 36/47 districts. In 2020, 27 districts reported an incidence greater than 450/1,000 inhabitants. The seasonal peaks in 2020 are lower than in 2019, and the cases reported weekly increased by 62 percent in an 11-week period from September to November 2020. The outbreak consistently occurred in the same districts, in three northern provinces of Burundi. Malaria is the leading cause of morbidity and mortality in the general population, with nearly 60 percent of outpatient visits due to malaria in 2018 (Source: Statistical Yearbook Annual Report 2018).

The analysis of the geographical distribution of malaria shows that 70.2 percent of health districts (33 out of 47) had an incidence greater than 250 per 1,000 inhabitants in 2018. Twenty-six health districts with high incidence (greater than 450 per 1,000 inhabitants) are located in North and West, South-East, and Center-East. This health district's vulnerability is correlated to the malaria prevalence showing that 12 health districts (of Kirundo, Muyinga, Cankuzo, and Ngozi provinces) have a malaria prevalence rate between 37 percent and 51 percent in the North-East. In terms of prevalence, in the center, nine health districts of Gitega, Ruyigi, and Karusi provinces have a malaria prevalence rate between 30 percent and 35 percent.

In Burundi, malaria transmission occurs throughout the year with two seasonal peaks (March–May and October–December) that correlate to periods of heavy rain when mosquitos breed. The weekly thresholds produced by the National Health Information System allows regular monitoring of malaria cases at the district level and helps for decision-making. Over the five past years, malaria in Burundi has evolved in such a way that an epidemic has occurred every two years since 2016. With this recurrent epidemic situation, the following national malaria outbreak response plan was initiated: implementation of mobile clinics, and an ITN distribution in five health districts with high malaria cases (Cibitoke, Kirundo, Busoni, Mukenke, and Vumbi). An investigation of these recurrences was conducted by WHO experts in September 2019. Their report highlighted five findings: (i) a probable decreased in artesunate-amodiaquine (ASAQ) efficacy, (ii) inadequate prevention, with only 63 percent of households having at least one ITN for two people, (iii) a possible change in vector behavior, (iv) the existence

of vector breeding grounds due to human behavior, and (v) the vulnerability of the population due to chronic malnutrition.

Following the WHO expert recommendations to respond to epidemics, the NMCP changed its malaria treatment policy based on a 2019 therapeutic efficacy study, proceeded with an ITN mass distribution campaign, and improved the quality of IRS operations by using a long-lasting insecticide (Fludora Fusion).

Figure 2. Trends in malaria prevalence

Children 6 to 59 months of age who tested positive for malaria by microscopy/RDT

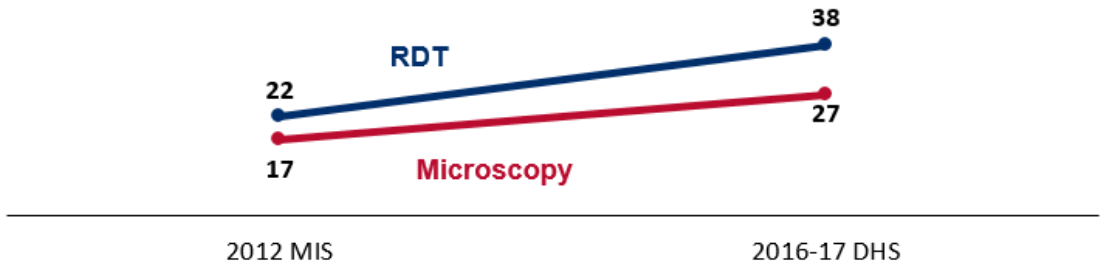


Figure 3a. Malaria prevalence by province

Children 6 to 59 months of age who tested positive for malaria by microscopy (2016–2017 DHS)

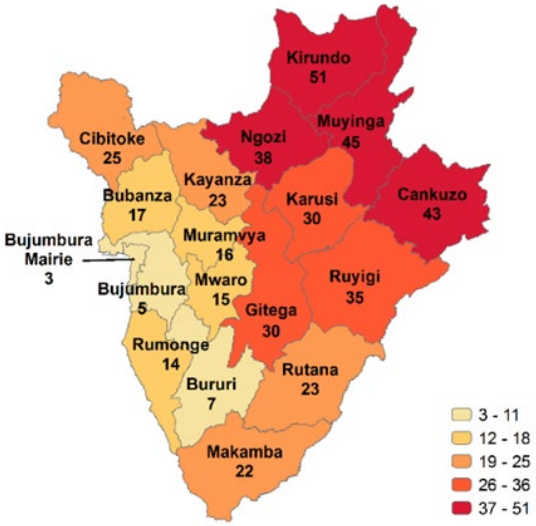


Figure 3b. Malaria incidence by district

Malaria cases confirmed by microscopy or RDT test per 1,000 inhabitants per year (DHIS2 2020)

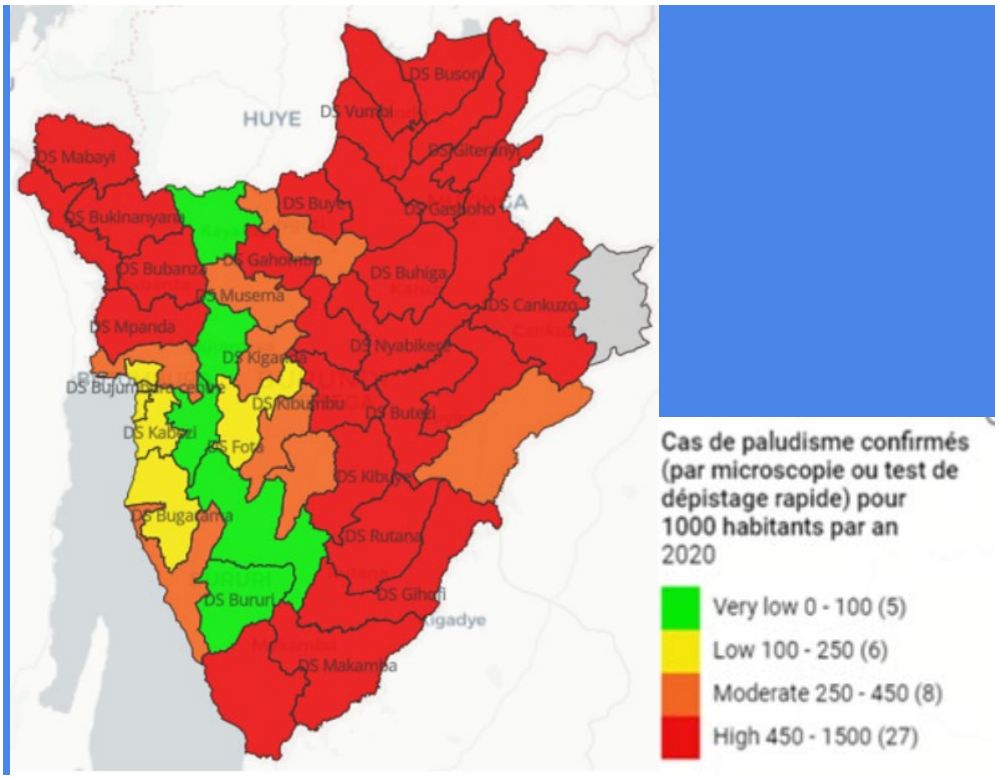


Table 1. Key indicators from demographic health surveys (DHS) and malaria indicator surveys (MIS)

Indicator	2010 DHS	2012 MIS	2016–2017 DHS
% Households with at least one ITN	52.0	63.0	46.2
% Households with at least one ITN for every two people	23.5	25.5	17.1
% Population with access to an ITN	39.1	46.0	32.3
% Population that slept under an ITN the previous night	37.8	48.6	34.7
% Children under five years of age who slept under an ITN the previous night	45.0	53.8	39.9
% Pregnant women who slept under an ITN the previous night	49.7	56.1	43.9
% Children under five years of age with a fever in the last two weeks for whom advice or treatment was sought	65.8	58.7	69.6
% Children under five years of age with a fever in the last two weeks who had a finger or heel stick	27.0	28.3	66.4
% Children receiving an ACT among children under five years of age with a fever in the last two weeks who received any antimalarial drug	12.0	18.0	5.3
% Women who received two or more doses of IPTp during their last pregnancy in the last two years	N/A	N/A	N/A
% Women who received three or more doses of IPTp during their last pregnancy in the last two years	0.0	0.1	12.6
Under-five mortality rate per 1,000 live births	96 (CI: 88–105)	78 (CI: 71–85)	
% Children under five years of age with parasitemia by microscopy	N/A	17.0	27.0
% Children under five years of age with parasitemia by RDT	N/A	22.0	38.0
% Children under five years of age with severe anemia (Hb<8gm/dl)	2.9	6.3	8.3

NA = not available, CI = confidence interval

Table 2. Evolution of key malaria indicators reported through routine surveillance systems

Indicator	2016	2017	2018	2019	2020
# Suspect malaria cases[1]	N/A	N/A	N/A	N/A	N/A
# Patients receiving diagnostic test for malaria[2]	12,562,193	11,868,543	10,350,401	15,187,477	10,501,521
Total # malaria cases[3]	8,839,984	7,666,945	5,654,535	9,739,929	5,383,129
# Confirmed cases[4]	8,363,248	7,659,618	5,648,749	9,720,860	5,363,503
# Presumed cases[5]	476,736	7,327	5,786	19,069	19,626
% Malaria cases confirmed[6]	94.6	99.9	99.9	99.8	99.6
Test positivity rate (TPR)[7]	66.6	64.5	54.6	64.0	51.0
Total # <5 malaria cases[8]	3,947,547	4,000,848	2,648,215	5,472,015	2,601,527
% Cases in children under five years of age[9]	44.7	51.4	45.9	66.6	41.6
Total # severe cases[10]	112,165	59,148	36,527	399,244	282,303
Total # malaria deaths[11]	6,564	4,253	2738	3,525	2,977
# Facilities reporting[12]	1,070	1,173	1,152	1,158	1,155
% Data completeness[13]	94.2	94.2	93.8	93.7	98.2

1 At this point, Burundi can only provide "Number of patients with a fever and tested by RDT or microscopy." 2. RDT or microscopy, all ages, outpatient and inpatient. 3. Total reported malaria cases; all ages, outpatient and inpatient, confirmed and unconfirmed cases. 4. Diagnostically confirmed; all ages, outpatient and inpatient. 5. Clinical/presumed/unconfirmed; all ages, outpatient and inpatient. 6. # confirmed cases divided by total # cases. 7. Confirmed cases divided by # patients receiving a diagnostic test for malaria (RDT or microscopy). 8. Outpatient and inpatient, confirmed and unconfirmed. 9. Total # <5 cases divided by total # of cases. 10. Definition 'severe' an acute form of malaria accompanied by signs of severity and/or dysfunction of vital organs. 11. All ages, outpatient, inpatient, confirmed, and unconfirmed. 12. Total # of health facilities reporting data into the HMIS/DHIS2 system that year. 13. # monthly reports from health facilities divided by # health facility reports expected

III. OVERVIEW OF USAID'S SUPPORT OF BURUNDI'S MALARIA STRATEGY

The national malaria strategy is aligned with WHO strategy with two objectives: Reduce malaria-related morbidity by at least 60 percent by 2023 and reduce malaria-related mortality to zero by 2023 with 10 specific objectives (listed below) and eight strategic focus areas.

1. Achieve and maintain universal household coverage of ITNs and achieve at least 80 percent utilization rate in the general population by 2023.
2. Ensure and maintain coverage of at least 95 percent of IRS in targeted areas.
3. Ensure that at least 80 percent of pregnant women are covered by intermittent preventive treatment for pregnant women (IPTp) according to the national guidelines by 2023.
4. Ensure that 100 percent of suspected malaria cases received in health facilities are treated in accordance with national policy by 2023.
5. Ensure that 100 percent of suspected malaria cases are managed at the community level by 2023, in accordance with national policy.

6. Ensure that at least 90 percent of health facilities and community health workers (CHWs) have a continuous supply of antimalarials.
7. Ensure that at least 80 percent of the population adopt malaria control behaviors by 2023.
8. Strengthen the managerial, technical, and institutional capacities of the national malaria control program at all levels by 2023.
9. Ensure that at least 95 percent of health facilities report accurate malaria data by 2023,
10. Ensure 100 percent early detection of malaria epidemics by 2023 and control 100 percent of epidemics detected within two weeks by 2023.

Intervention areas are the following:

1) Vector Control: The National Malaria Control Strategy for Burundi's specific objectives for vector control are to achieve and maintain universal household coverage of ITNs and achieve at least 80 percent utilization rate in the general population by 2023, and to ensure and maintain coverage of at least 95 percent of IRS in targeted areas. USAID supports the strategy by procuring and distributing ITNs via routine distribution channels such as ANC and Expanded Program on Immunizations (EPI), as well as by building capacity in entomological monitoring. Since the start of the USAID malaria program in Burundi, effort has focused on increasing the national capacity to collect, analyze, and use entomologic data to inform the country's malaria prevention and control program. The support includes the establishment of a functioning insectary since 2013, and nine sentinel sites over the years, which, due to instability, have operated at varying capacity. USAID support over this period included training in entomology to ensure proper management of the insectary as well as the sentinel sites, and capacity-building at the NMCP to use information for program implementation. USAID supports nine sentinel sites for entomological data collection located in Kirundo, Cibitoke, Bubanza, Cankuzo, Ngozi, Rutana, Makamba, and Bururi provinces (see Figure 4). Global Fund and USAID are the major donors of ITNs. USAID mainly supports the procurement and distribution of ITNs to pregnant women at ANC clinics and to children under five years of age during routine immunization services. USAID also provides technical assistance (TA) for the nationwide mass distribution campaigns as well as for IRS to ensure high-quality operations.

2) Malaria in Pregnancy (MIP): According to the Burundi NMCSP, the objectives of the MIP program are to ensure that every pregnant woman receives at least three doses of sulfadoxine-pyrimethamine (SP) for IPTp. Each dose is administered under directly observed therapy (DOT) during ANC visits, starting in the second trimester (15 weeks gestation), at one-month intervals, and up to the day of delivery. Additionally, each pregnant woman receives an ITN at her first ANC visit. The treatment of uncomplicated malaria in pregnant women within the first trimester is a combination of quinine + clindamycin, and artemether-lumefantrine (AL) in the second and third trimesters. USAID supports the full package of malaria in pregnancy activities in the national strategy. In 2020, project reports showed that 62 percent of pregnant women received at least three doses of IPTp over the course of their ANC visits in the six USG-supported provinces. At the national level the proportion of pregnant women who received at least one dose of SP is at 79.4 percent and decreased to 58.3 percent for those who received at least three doses in 2020 (Source: DHIS2). Malaria in pregnancy still requires additional support at the health facility level for maximum impact. USAID support focuses on increasing timely access to ITNs and the first dose of IPTp, as well as adherence to four ANC visits currently promoted by the national guidelines and plans to support the adoption and the rollout of the new 2016 WHO guidelines.

3) Case Management: Burundi's malaria treatment guidelines require diagnostic confirmation of all fever cases, either by RDT or microscopy, before treatment with an artemisinin-based combination therapy (ACT). Burundi's policies, guidelines, and practices are consistent with WHO recommendations. The national malaria treatment guidelines changed in 2019, recommending the use of RDTs for all cases at the community, health center, and hospital levels. Microscopy testing is recommended at health centers and hospitals for patients presenting malaria symptoms 28 days after a correct malaria treatment. Health centers refer severe cases to hospitals. The new treatment protocol recommends the use of AL at all levels.

   Community testing and treatment of malaria for children under five years of age was introduced in 2013. The new treatment protocol for integrated community case management (iCCM) includes pre-referral rectal artesunate for children under five years of age presenting with symptoms of severe malaria. The NMCP will pilot home-based management of malaria for individuals of all ages, known as PECADOM (prise en charge à domicile) in 2021 using Global Fund resources. With CHWs treating all ages, the PECADOM model will provide an opportunity to conduct proactive community case management of malaria to anticipate seasonal peaks in some high-risk districts.

4) Pharmaceutical Management: The NMCSP (2018–2023) highlights the objective of strengthening the commodities quantification process and improving commodities storage and management at central, district and facility levels. This objective is also linked with achieving the case management objectives outlined in the NMCSP. The Burundian Regulatory for Medicines for Human Use and Food (Autorité Burundaise de Régulation des Médicaments à usage humain et des Aliments, ABREMA) is the division of the MOH charged with regulations and oversight of the pharmaceutical sector. The DPML also regulates the semi-autonomous central purchasing and warehousing agency, "Centrale des Achats des Médicaments Essentiels du Burundi" (CAMEBU) in line with national pharmaceutical policy. CAMEBU is responsible for the procurement and management of public sector pharmaceuticals destined for public health and faith-based health facilities. USAID support is aligned with the NMCSP and consists in support for forecasting and supply planning, quality assurance systems, warehousing, inventory management, and commodity distribution. USAID is also working with the MOH to establish an eLMIS governance structure and release an eLMIS action plan detailing the budget, timeline, and strategy for system development, rollout, and financial sustainability.

5) Social and Behavior Change (SBC): SBC is an important component of malaria prevention and control activities and is crucial to achieving ITN coverage and use objectives. A National Communication Strategy for Malaria was developed in 2014. The strategy aimed to further raise awareness in the general population and increase adoption and maintenance of behaviors related to malaria prevention and treatment. USAID is supporting the NMCP to implement SBC activities using channels such as radio, print material, theatre groups, and community outreach, and is focused on increasing uptake of malaria services, including correct and consistent use of ITNs, prompt care-seeking for fever, and early and frequent ANC attendance to increase uptake of IPTp among pregnant women. Due to the COVID-19 pandemic, community interventions have been limited in 2020. These interventions need to be improved in 2021, combined with the active engagement of civil society and community organizations and leaders.

6) Surveillance, Monitoring, and Evaluation (SM&E): The NMCP Monitoring and Evaluation Plan (2018–2023) is aligned with the NMCSP (2018–2023) covering the same period. It recognizes the need to strengthen monitoring and evaluation of malaria control interventions, activities, policies, and strategies and ensure that decisions are made using available evidence, including strengthening of entomological monitoring, to control the epidemic. USAID support for the health management information system (HMIS) takes into account contributions of existing partners to its improvement. USAID supports the improvement of malaria data collected through the Burundi Department of Statistics (DSNIS) using the District Health Information System (DHIS2) software deployed nationwide. Despite the presence of functioning DHIS2 software in the country, data collection and use for decision-making remains a challenge at all levels of the health system. USAID is supporting the data quality improvement process by building the capacity of key MOH staff (NMCP and DSNIS) and streamlining the Malaria SM&E TWG by a desk review of existing tools and protocols for data quality review, data quality assessment (DQA) during supportive supervision, and data analysis. USAID supports the integration of the WHO Global Malaria Program malaria module, which will also inform the production of quarterly malaria bulletins and simplify data use. This capacity-building process will gradually be expanded at provincial and district levels. Additionally, USAID supports surveys to orient decision-making at national level. This includes end-use verification surveys each year to inform supply planning for malaria commodities and DHS/MIS surveys at periodic intervals.

The Global Fund is Burundi's largest investor in malaria control, with a budget of $65,570,729 for the 2021–2023 grant. Geographically, Global Fund-funded malaria control activities cover all 18 provinces and 47 health districts. Global Fund funding covers the full range of strategies for malaria control including procurement of 85 percent of the country's annual malaria commodities, logistical support for ITN mass distribution campaigns, and support for IRS in four districts (for which USAID provides TA).

USAID is the second-largest donor, with an annual malaria budget of $8 million that strategically leverages the Global Fund investments to address the country's overall needs. USAID supports targeted routine ITN distribution, and procurement of other malaria commodities (ACT, RDT, injectable artesunate) for distribution nationwide. USAID also supports an integrated maternal and child health/family planning/malaria project in six provinces: Kirundo, Karusi Muyinga, Bururi, Makamba, and Rumonge, including 15 districts, 15 hospitals, and 410 facilities. Additionally, USAID invests in service delivery provision in both public and private sector facilities and at the community level.

World Vision International supports IRS in four districts. Médecins Sans Frontières Belgium supports comprehensive malaria prevention, clinical care, and IRS in Kinyinya District, Ruyigi Province. WHO and UNICEF provide technical support to the MOH in malaria control.

Figure 4. Map of target areas for USAID interventions

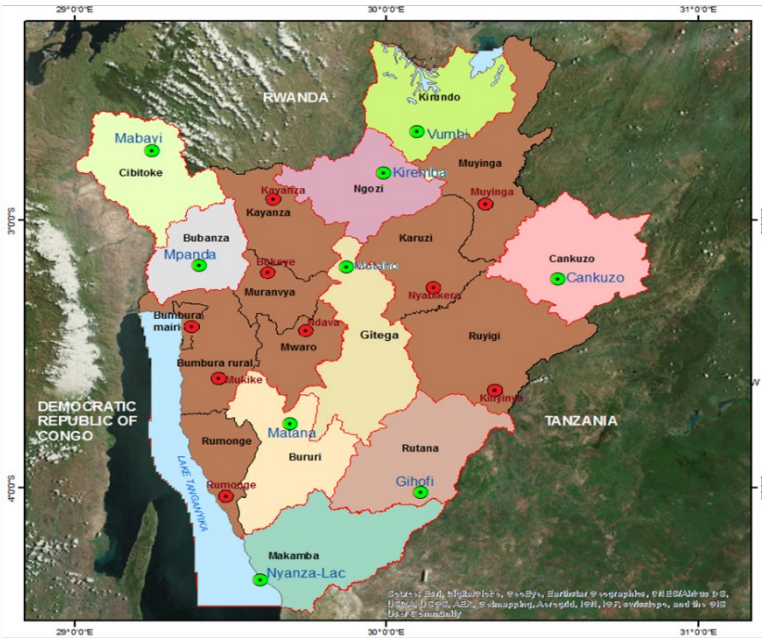
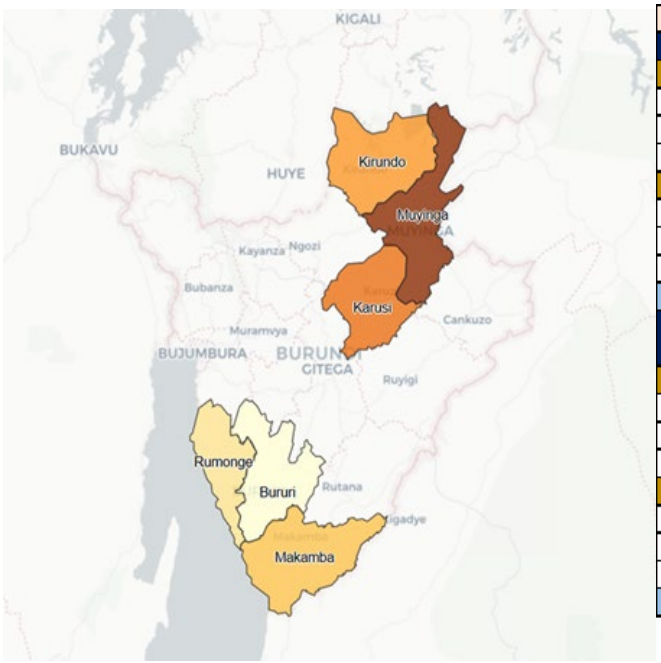


Figure 4 shows the nine sentinel sites supported by USAID for entomological data collection. They are located in Cankuzo, Gihofi, Kiremba, Mabayi, Matana, Mpanda, Mutaho, Nyanza-Lac, and Vumbi. The implementing partner collects data on a monthly basis on vector species composition, behavior, and susceptibility to insecticides used in vector control in Burundi.

Figure 5. Map of targeted areas of USAID investments in service delivery and data quality improvement with Tubiteho



TUBITEHO's Provinces					
Province Name		# Districts			#HF
Northern Provinces					
Muyinga		3			81
Karusi		2			40
Kirundo		4			65
Southern Provinces					
Makamba		2			91
Bururi		2			58
Rumonge		2			75
Global		15			410
Province Name	# Hospital				
	Public	Private	FBO	Civil society	Total
Northern Provinces					
Muyinga	3	1	0	0	4
Karusi	2	0	0	0	2
Kirundo	2	0	0	0	2
Southern Provinces					
Makamba	2	0	0	1	3
Bururi	3	0	0	0	3
Rumonge	1	0	0	0	1
Global	13	1	0	1	15

Figure 5 shows the six provinces including 15 health districts and 410 health facilities (see table to the right of the figure) supported by USAID with a focus on maternal and child health/family planning/malaria and cross-cutting aspects related to SBC, and delivery provision in both public and private sector facilities and at the community level.

IV. PARTNER FUNDING LANDSCAPE

USAID emphasizes the importance of partner alignment for malaria control, recognizing that different partners bring complementary expertise and resources. The Global Fund allocation for 2021–2023 for Burundi is $65.6 million, but this data is not yet available by year or budget category for this grant cycle.

Table 3a. Annual budget by Level 1 category for FY 2019/CY 2020

Funder	Vector Control	Case Management	Drug-Based Prevention[1]	Supply Chain[2]	Monitoring, Evaluation & Research	Cross-cutting and HSS[3]	Total Per Funder
USAID	$2.4M	$2.6M	$0.4M	$0.3M	$0.1M	$2.2M	$8.0M
Global Fund	1.9M	1.5M	3.8M	3.7m	$	$	10.9M
Gov	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other[4]	$1M	$.	$	$0.8M	$	$0.1M	$1.9M
Total Per Category	$5.3M	$4.1M	$4.2M	$4.8M	$0.1M	$2.3M	$20.8M

Table 3b. Annual budget by Level 1 category for FY 2020/CY 2021

Funder	Vector Control	Case Management	Drug-Based Prevention[1]	Supply Chain[2]	Monitoring, Evaluation & Research	Cross-cutting and HSS[3]	Total Per Funder
USAID	$2.6M	$2.6M	$0.4M	$0.4M	$0.2M	$1.8M	$8M
Global Fund	N/A	N/A	N/A	N/A	N/A	N/A	*
Gov	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other[4]	$5.5M	$1M	$	$0.5M	$0.07M	$0.3M	$7.37M
Total Per Category	$8.1M	3.7M	$0.4M	$0.9M	$0.27M	$2.1M	$15.37M

*Global Fund 2021–2023 allocation for Malaria = $65.6M.

Table 3c. Annual budget by Level 1 category for FY 2021/CY 2022

Funder	Vector Control	Case Management	Drug-Based Prevention[1]	Supply Chain[2]	Monitoring, Evaluation & Research	Cross-cutting and HSS[3]	Total Per Funder
USAID	$3.3M	$2.6M	$0.4M	$0.3M	$0.2M	$1.2M	$8M
Global Fund	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gov	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other[4]	$5.1M	$0.3M	$	0.4M	$0.07M	$0.1M	$5.97M
Total Per Category	$8.4M	$2.9M	$0.4M	$0.7M	$0.27M	$1.3M	$13.97M

1. Drug-based prevention, including seasonal malaria chemoprevention (SMC) and MIP where applicable. 2. Covers management of in-country warehousing and distribution of malaria commodities, except for ITNs, which are separately captured under Vector Control. 3. HSS = health systems strengthening. 4. UNICEF, Médecins Sans Frontières/Belgium, World Relief, Concern worldwide, WHO, and World Vision International, Initiative 5%, UNDP.
*Global Fund 2021–2023 allocation for Malaria

Table 4a. Annual budget, breakdown by commodity, FY 2019/CY 2020

Funder	ITNs *Continuous Distribution*	ITNs *Mass Distribution*	IRS[1] *Insecticide*	ACTs	RDTs	Severe Malaria	SMC-Related	IPTp-Related	Total
USAID[2]	$2.1M			$0.7M	$0.7M	$0.3M			$3.8M
Global Fund[3]	$	$	$1.9M		$1.5M	$	$	$3.8M	$7.1M
Gov	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other[4]	$0.02	$	$5.3M	$1.5M	$	$	$	$	$6.82M
Total	$2.12M	$0	$7.2M	$2.2M	$2.2M	$0.3M	$	$3.8M	$17.72M

Table 4b. Annual budget, breakdown by commodity, FY 2020/CY 2021

Funder	ITNs *Continuous Distribution*	ITNs *Mass Distribution*	IRS[1] *Insecticide*	ACTs	RDTs	Severe Malaria	SMC-Related	IPTp-Related	Total
USAID[2]	$2.1M	$	$	$0.7M	$0.7M	$0.4M	$	$	$3.98M
Global Fund[3]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gov	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other[4]	$0.2M	$0	$4.9M	$0.7M	$	$	$	$	$5.8
Total	$2.3M	$	$4.9	$1.4M	$0.7M	$0.4	$	$	$9.78M

Table 4c. Annual budget, breakdown by commodity, FY 2021/CY 2022

Funder	ITNs *Continuous Distribu-tion*	ITNs *Mass Distribu-tion*	IRS[1] *Insecticide*	ACTs	RDTs	Severe Malaria	SMC-Related	IPTp-Related	Total
USAID[2]	$2.6M	$	$	$0.7M	$0.8M	$0.2M	$	$	$4.3M
Global Fund[3]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gov	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other[4]	$0.2M	$0	$4.9M	$0.7M	$	$	$	$	$5.8M
Total	$2.8M	$	$4.9M	$1.4M	$0.8M	$0.2M	$	$	$10.1M

Note: Categories reflect the harmonized financial taxonomy (Levels 1-3) developed by Bill & Melinda Gates Foundation, Global Fund, and USAID in 2019, as part of a broader data harmonization initiative but may continue to evolve. 1. IRS insecticide: for USAID, commodity costs may be inextricable from IRS implementation costs in historical data; field identified as ND where this is the case. 2. USAID commodity costs are fully loaded, including costs for the ex-works price of the commodity, quality control, freight, insurance, and customs. 3. Global Fund commodity costs in the table above only include ex-works commodity value period. 4. UNICEF, Médecins Sans Frontières/Belgium, World Relief, Concern worldwide, WHO, and World Vision International, Initiative 5 percent, UNDP.

V. ACTIVITIES TO BE SUPPORTED WITH FY 2022 FUNDING

The FY 2022 budget tables contain a full list of activities that USAID proposes to support in Burundi with FY 2022 funding. Please visit https://www.usaid.gov/global-health/health-areas/malaria/countries for these FY 2022 budget tables. Key data used for decision-making for this MOP planned investments is provided in Annex A of this document.

ANNEX A: INTERVENTION-SPECIFIC DATA

This section outlines key data that helped inform decision-making around FY 2022 MOP funding allocations to USAID-supported activities.

1. VECTOR CONTROL

NMCP Objective

The NMCP specific objectives in vector control are to achieve the following by 2023:

- At least 95 percent of households in targeted areas are protected using IRS.
- At least 95 percent of pregnant women receive an ITN and 80 percent use it.
- At least 95 percent of children under five years of age receive an ITN during immunization service and 85 percent of them use it.

NMCP Approach

Malaria vector control in Burundi refers to two key interventions: ITN provision through both mass campaigns and routine distribution and the implementation of IRS. Evidence on insecticide susceptibility of vectors from entomological monitoring (supported by USAID since 2015) is used to guide decisions on both IRS products and ITNs in Burundi.

ITNs are distributed every three years through mass distribution campaigns, and continuously through routine distribution at ANC and EPI, with the objective of universal coverage defined as one ITN for two individuals. Mosquito nets used in mass campaign distribution (through 2019) and in routine distribution for pregnant women and children under five years of age are deltamethrin-based ITNs nationwide. The deltamethrin combined with piperonyl butoxide (PBO) nets are distributed in four districts, (Vumbi, Busoni, Mukenke, and Kirundo) due to the susceptibility level of PBO nets in these districts. The country has a planned mass distribution campaign in 2022. For the 2022 mass campaign, the NMCP has opted to expand the coverage zone of PBO nets from four to nine districts, to continue the distribution of the standard nets (deltamethrin only) in 18 health districts, and to introduce the new-generation Interceptor G2 (IG2) nets in 20 health districts. This 2022 plan is informed by the 2020 entomological annual report that showed that vectors were susceptible to deltamethrin in all sites tested with a resistance to deltamethrin in one site (Cankuzo) and possible resistance in three sites (Muramvya, Mabayi, and Rumonge). The report also documented full susceptibility to clothianidin + deltamethrin, clothianidin, pirimiphos-methyl, chlorfenapyr, and bendiocarb in all sites. The PBO and IG2 nets will be distributed in districts where vectors are resistant to deltamethrin. For cost-efficiency of vector control interventions, the decision made in 2020 stated that the mass ITN distribution campaigns will not be conducted in IRS-targeted health districts (though routine distribution for vulnerable persons will be maintained).

Routine ITN distribution targets pregnant women seeking ANC1 and children under five years of age attending measles and rubella immunization. The NMCP will implement a pilot program in community-based continuous distribution in 2021 in two health districts. This intervention aims to maintain a high household ITN coverage rate between mass distribution campaigns. The intervention will be gradually expanded based on the results of the pilot phase.

With the TA provided by USAID, in 2019, Burundi began implementing IRS with a highly effective and long-lasting insecticide, Fludora® Fusion, to cover the two transmission seasons with one round. The IRS intervention is supported by the Global Fund, World Vision International, and Médecins sans Frontières (MSF)/Belgium, and is

carried out in nine health districts (within four provinces: Cankuzo, Ruyigui, Muyinga, and Ngozi) with high risk of malaria epidemics. The IRS strategy prioritizes districts based on the burden of malaria and insecticide resistance status. Burden is calculated based on five indicators: annual incidence, incidence of malaria among pregnant women, malaria case fatality, health facility attendance rate, and poverty index and chronic malnutrition rate by district. Based on this prioritization, in 2018 17 of 47 districts were targeted for IRS; in 2019 and 2020, nine of the 17 districts were targeted.

USAID Objective in Support of NMCP

USAID supports the Burundi vector control strategy through support for procuring ITNs and routinely distributing them through antenatal care clinics and child vaccination services, and building capacity in entomological monitoring (described in Section 1.1, below). USAID supports nine sentinel sites for entomological data collection located in Kirundo, Cibitoke, Bubanza, Cankuzo, Ngozi, Rutana, Makamba, and Bururi provinces.

In addition, to respond to the country's need to extend the geographic coverage of vector control interventions, insecticide resistance monitoring rotates biannually to sites in the nine remaining provinces (Bujumbura Rural, Bujumbura Mairie, Karusi, Kayanza, Muyinga, Mwaro, Muramvya, Ruyigi, and Rumonge). Monitoring is conducted using three collection methods including pyrethrum spray catches, light traps, and human landing catches.

USAID also provides TA for IRS implementation by other partners including environmental compliance, testing of insecticide resistance, IRS operation standardization across partners in accordance with international standards, and monitoring the insecticide decay on sprayed walls after IRS.

USAID-Supported Recent Progress (FY 2020)

In FY 2020, USAID support focused on building and maintaining improved capacity in entomology with the aim of enhancing vector control interventions and included the following activities:

- Training on entomology to ensure proper management of the insectary as well as the sentinel sites, and to build the capacity of NMCP technicians to use data to inform program implementation.
- TA to the NMCP in planning, implementation, data collection, protocol/guideline development for IRS including the development of the 2019 Burundi national guideline for vector control and insecticide resistance management, and the insecticide resistance management plan.
- Training on environmental compliance for NMCP and its partners (WHO, UNDP, World Vision, and MSF/Belgium) to harmonize procedures, protocols, and technical approaches for environmental compliance in IRS operations.
- Implementation of ITN durability monitoring for the first time in Burundi. The baseline survey data collection in Vumbi and Gashoho districts started in August 2020, after the 2019 mass distribution campaign. Data collection on durability at 12 months post-distribution was carried out in February 2021.

Due to the COVID-19 pandemic, data collection for entomological monitoring was suspended from April to May 2020.

USAID-Supported Planned Activities (FY 2021)

- Conduct insecticide resistance monitoring in nine sites.
- Conduct vector bionomics monitoring monthly in nine sites.
- Distribute 995,881 ITNs including 391,046 standard ITNs, 184,396 PBO nets and 420,439 IG2 nets via routine channels targeting pregnant women and children under five years of age.
- Support mass campaign nationwide in June 2022, with SBC messages, macroplanning, and microplanning.
- Conduct community mobilization activities in conjunction with ITN campaign.
- Conduct data collection for 24-month ITN durability monitoring.

1.1. ENTOMOLOGICAL MONITORING

Key Goal

Determine the geographic distribution, bionomics, and insecticide resistance profiles of the main malaria vectors in the country to inform vector control decision-making.

Key Question 1

Where is entomological monitoring taking place, what types of activities are occurring, and what is the source of funding?

USAID supports nine sentinel sites for entomological data collection, including both vector bionomics and insecticide resistance, located in eight provinces (Kirundo, Cibitoke, Bubanza, Cankuzo, Ngozi, Rutana, Makamba, and Bururi). In addition, to respond to the need to extend the geographic coverage of vector control interventions, insecticide resistance monitoring rotates biannually to sites in nine additional provinces (Bujumbura Rural, Bujumbura Mairie, Karusi, Kayanza, Muyinga, Mwaro, Muramvya, Ruyigi, and Rumonge). Monitoring is conducted using three collection methods: pyrethrum spray catches, light traps, and human landing catches.

Supporting Data

Table A-1. Entomological monitoring activities

Site	District	Activities	Supported by
Mpanda	Bubanza	Longitudinal entomological surveillance, insecticide resistance monitoring	USAID
Matana	Bururi	Longitudinal entomological surveillance, insecticide resistance monitoring	USAID
Cankuzo	Cankuzo	Longitudinal entomological surveillance, insecticide resistance monitoring	USAID
Mabayi	Cibitoke	Longitudinal entomological surveillance, insecticide resistance monitoring	USAID
Mutaho	Gitega	Longitudinal entomological surveillance, insecticide resistance monitoring	USAID

Site	District	Activities	Supported by
Vumbi	Kirundo	Longitudinal entomological surveillance, insecticide resistance monitoring, ITN durability monitoring	USAID
Nyanza-Lac	Makamba	Longitudinal entomological surveillance, insecticide resistance monitoring	USAID
Kiremba	Ngozi	Longitudinal entomological surveillance, insecticide resistance monitoring, wall cone bioassay for IRS insecticide decay monitoring	USAID
Gihofi	Rutana	Longitudinal entomological surveillance, insecticide resistance monitoring	USAID
Mukike	Bujumbura Rural	Insecticide resistance monitoring biannually to extend geographic coverage	USAID
Bujumbura Mairie	Bujumbura Mairie	Insecticide resistance monitoring biannually to extend geographic coverage	USAID
Nyabikere	Karusi	Insecticide resistance monitoring biannually to extend geographic coverage	USAID
Kayanza	Kayanza	Insecticide resistance monitoring biannually to extend geographic coverage	USAID
Muyinga	Muyinga	Insecticide resistance monitoring biannually to extend geographic coverage	USAID
Ndava	Mwaro	Insecticide resistance monitoring biannually to extend geographic coverage	USAID
Bokeye	Muramvya	Insecticide resistance monitoring biannually to extend geographic coverage	USAID
Kinyinya	Ruyigi	Insecticide resistance monitoring biannually to extend geographic coverage	USAID
Rumonge	Rumonge	Insecticide resistance monitoring biannually to extend geographic coverage	USAID

Table A-2. Distribution and bionomics of malaria vectors

Site/ District	Vector*	Season (month)	Preferred Biting Location	Peak Biting Time	Preferred Resting Location**	Preferred Host	Annual EIR†
Mpanda	*An. arabiensis*	June–October	Indoor and outdoor	1:00 a.m.–6:00 a.m.	Indoor	Human	148.28
Matana	*An. arabiensis*	Low density, No peak	Indoor and outdoor	1:00 a.m.–6:00 a.m.	Outdoor	Human	0
Cankuzo	*An. gambiae s.s.*	February–June	Indoor and outdoor	1:00 a.m.–6:00 a.m.	Indoor	Human	103.73

Site/ District	Vector*	Season (month)	Preferred Biting Location	Peak Biting Time	Preferred Resting Location**	Preferred Host	Annual EIR†
Mabayi	*An. funestus*	October–February	Indoor and outdoor	6:00 p.m.–7:00 p.m.	Indoor	Human	14.21
Mutaho	*An. gambiae*	October–December, March–June	Indoor and outdoor	1:00 a.m.–6:00 a.m.	Indoor	Human	31.07
Vumbi	*An. gambiae*	October–December, March–June	Indoor and outdoor	1:00 a.m.–6:00 a.m.	Indoor	Human	103.76
Nyanza-Lac	*An. gambiae*	October–December, February–June	Indoor and outdoor	1:00 a.m.–6:00 a.m.	Indoor	Human	93.75
Kiremba	*An. gambiae*	October–December, March–June	Indoor and outdoor	1:00 a.m.–6:00 a.m.	Indoor	Human	15.57
Gihofi	*An. arabiensis*	October–December, March–June	Indoor and outdoor	1:00 a.m.–6:00 a.m.	Indoor	Human	53.39

*Primary vector listed first, in bold, followed by secondary vectors. †EIR = entomological inoculation rate.

Key Question 2

What is the current insecticide resistance profile of the primary malaria vectors?

Data collected in 2019–2020 (Table 1.3) indicate full susceptibility (100 percent mortality) to clothianidin + deltamethrin [12µg/bottle + 90µg/bottle], clothianidin(90µg/bottle), pirimiphos-methyl 0.25 percent, chlorfenapyr (100 µg/bottle), and bendiocarb 0.1 percent (used until 2019) in all sites. Vectors were also susceptible to deltamethrin except in Cankuzo, where resistance was detected and in Muramvya, Rumonge, and Mabayi, where possible resistance was observed. Resistance and possible resistance to permethrin and alpha-cypermethrin were observed in several sites.

Table A-3. Susceptibility of *An. gambiae* s.l. to insecticides (2019–2020)

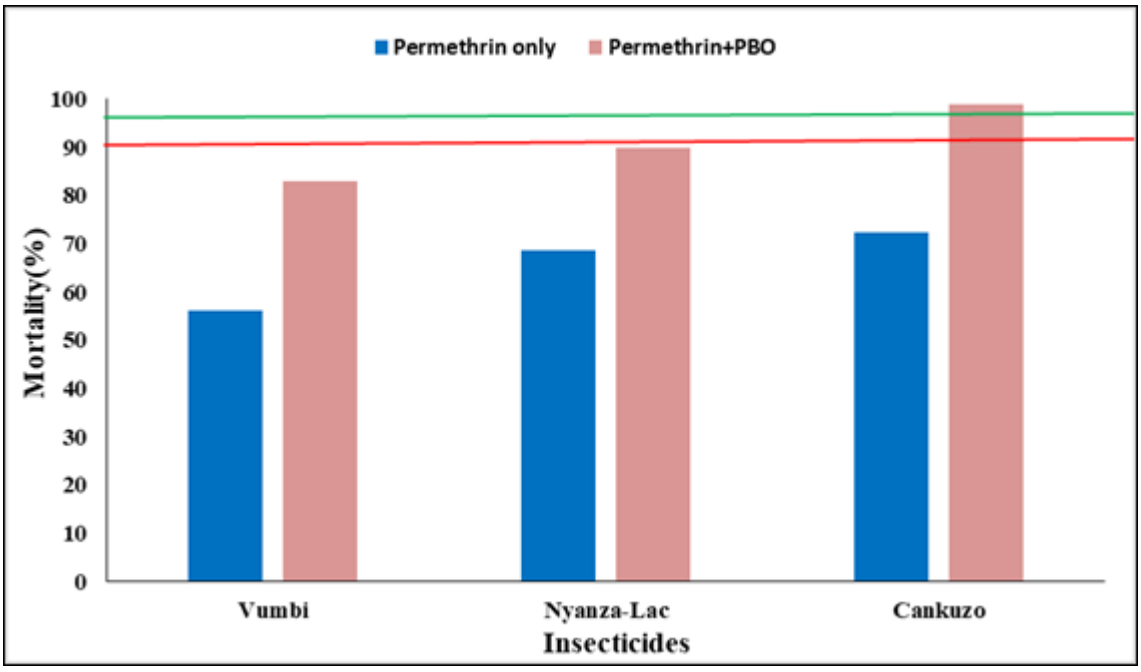
	Clothianidin+ Deltamethrin		Clothianidin		Chlorfenapyr		Pirimiphos-methyl		Bendiocarb		Deltamethrin		Permethrin		Alphacyper-methrin	
District	%	# tested	%	# tested	%	# tested	%	# tested	%	# tested	%	# tested	%	# tested	%	# tested
Bujumbura Rural	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	99 S	100	99 S	100	-	-
Bujumbura Mairie	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	99 S	100
Karusi	100 S	100	100 S	100	-	-	-	-	97PR	100	98 S	100	-	-	-	-
Kayanza	100 S	100	100 S	100	100 S	100	-	-	-	-	100 S	100	88 R	100	-	-
Muyinga	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	93PR	100	-	-
Mwaro	100 S	100	100 S	100	-	-	100 S	100	-	-	100 S	100	95 PR	100	-	-
Muramvya	100 S	100	100 S	100	-	-	-	-	-	-	95 PR	100	-	-	84 R	100
Kinyinya	100 S	100	100 S	100	100 S	100	100 S	100	-	-	100 S	100	97PR	100	94 PR	100
Rumonge	100 S	100	100 S	100	-	-	100 S	100	-	-	97 PR	100	-	-	-	-
Cankuzo	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	88 R	100	81 R	100	94 PR	100
Gihofi	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	-	-	-	-
Kiremba (IRS)	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	84 R	100	97 PR	100
Mabayi	100 S	100	100 S	100	99 S	100	99 S	100	100 S	100	94 PR	100	91 PR	100	92 PR	100
Mpanda	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	100 S	100	100	100
Nyanza-Lac	100 S	100	100 S	100	100 S	100	100 s	100	100 S	100	100 S	100	73 R	100	97 PR	100
Vumbi	100 S	100	100 S	100	100 S	100	100 S	100	98 S	100	100 S	100	79 R	100	98 S	100
Mutaho	100 S	100	100 S	100	100 S	100	100 s	100	100 S	100	100 S	100	85 R	100	85 R	100

Note: # = Number; % = Percentage; S = Susceptible; PR = Possible Resistance; R = Resistance.

Table A-4. Observed mortality with permethrin only and permethrin+ PBO from 2017 to 2019 (Source: Burundi PMI VectorLink Annual Reports 2017 to 2019)

Year	Localities	Permethrin only	Permethrin+PBO	Susceptibility restoration
2017	Vumbi	18.75	63.75	Partial
2018	Kiremba	36.25	46.25	Partial
2019	Vumbi	33.33	70	Partial
	Cankuzo	40	51.25	Partial
	Kiremba	45	86.26	Partial
	Mutaho	27.5	57.5	Partial
	Nyanza-Lac	41.25	76.25	Partial

Figure A-1. Observed mortality with permethrin and PBO in 2020



Note: Green line represents the WHO threshold cutoff for susceptible and red for resistance at the diagnostic dose.

Conclusions for Entomologic Monitoring Investments

Based on results of entomological monitoring in Burundi, the following priorities have been identified for USAID investments with FY 2022 funds:

- Continue to provide support for the operation of sentinel sites and the insectary.
- Build the local capacity in advanced entomology by strengthening local research institutions.
- Provide TA to NMCP for strengthening IRS quality control.
- Extend the collection methods to window exit trap.
- Provide TA for a DHIS2-based platform (VectorLink Collect) for improved storage, analytics, and visualization of entomological data.
- Evaluate the entomological and epidemiological impact of PermaNet 3.0 (deltamethrin+PBO), IG2 nets (chlorfenapyr+alphacypermethrin), and standard ITN (deltamethrin only) in Vumbi (North, PBO ITNs, very high malaria risk), Cendajuru (East, IG2 ITNs, very high malaria risk), and Giteranyi (North, standard pyrethroid ITNs, very high malaria risk).
- Continue data collection for 36-month ITN durability monitoring or the 6-month data collection for net durability monitoring covering the 2022 mass campaign distribution.

Please see FY 2022 budget tables for a detailed list of proposed activities with FY 2022 funding.

1.2. INSECTICIDE-TREATED NETS (ITNs)

Key Goal

Achieve high ITN coverage and use with effective nets, based on insecticide resistance data, and maintain high coverage and use with consistent ITN distribution (via campaigns and/or continuous channels).

Key Question 1

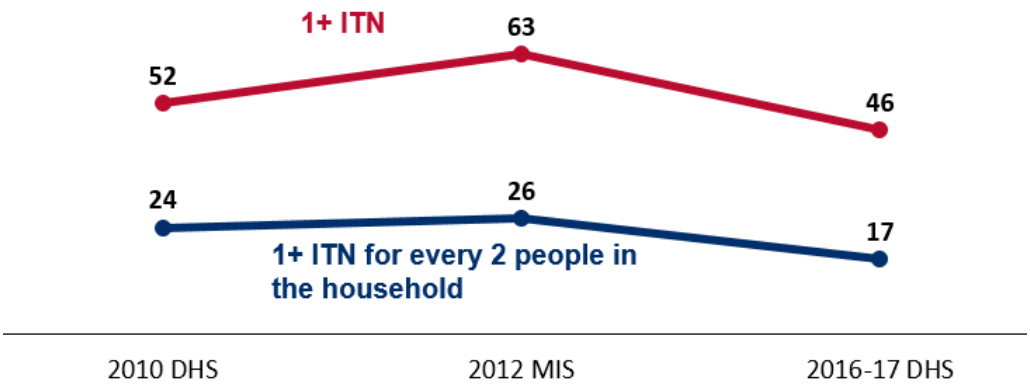
How has net ownership evolved in the country?

Supporting Data

- Figure A-2 shows households owning at least one ITN increased from 52 percent in 2010 to 63 percent in 2012, but decreased to 46 percent in 2016–2017. Full household ITN coverage, as measured by the percent of households with at least one ITN for every two people in the household, increased from 24 percent in 2010 to 26 percent in 2012 and decreased to 17 percent in 2016–2017.
- The coverage rates of ITNs provided through routine distribution were 76 percent for pregnant women attending ANC and 82 percent for children attending EPI clinics (Source: DHIS2 2019).
- The mass distribution campaigns were designed to achieve universal coverage, defined as one ITN for two individuals.

Figure A-2. Trends in ITN ownership

Percentage of households



Key Question 2a

What proportion of the population has access to an ITN? Of those who have access, what proportion of the population reports using an ITN?

Supporting Data

Figure A-3. Trends in ITN access and use

Percentage of household population with access to an ITN and percentage of those who slept under an ITN the night before the survey

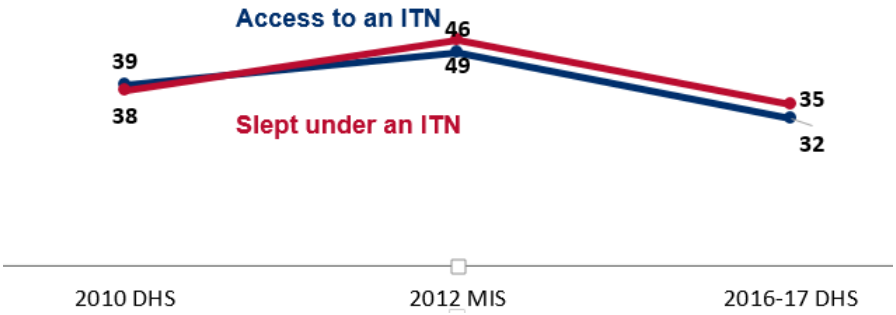
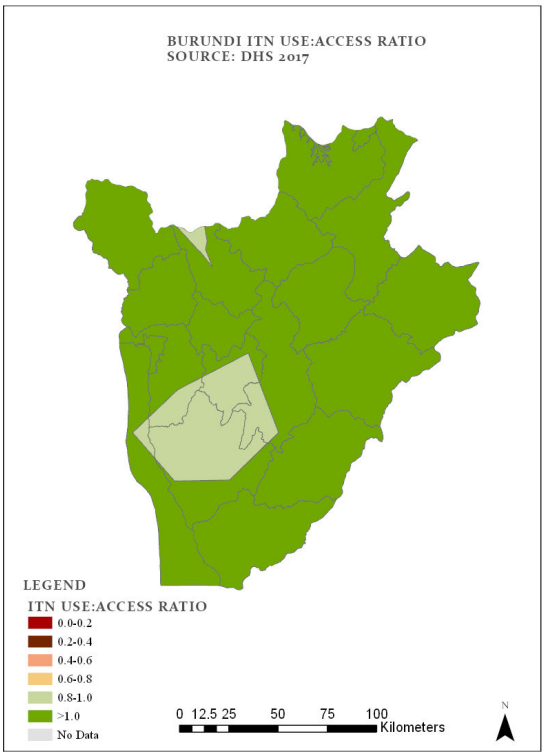


Figure A-4. ITN access:use ratio by province

Ratio of percentage of household population with access to an ITN to percentage of those who slept under an ITN the night before the survey



The 2010 DHS reported population ITN access of 39 percent, and ITN use of 38 percent. The 2012 MIS report documented ITN access of 49 percent and ITN use of 46 percent. Because population access is calculated as the proportion of the household population who could use a net *if each net in the household were used by two people*, in settings where more than two people use a single net, ITN use can be higher than access. Access and use were shown to have decreased in the 2016–2017 DHS, which was completed before the 2017 campaign and reported access of 32 percent and use of 35 percent. The 2017 mass distribution was the largest contribution in terms of availability of ITN in households. Comparing data from the 2018 Knowledge, Attitude, and Practices (KAP) survey and the 2016–2017 DHS, availability increased from 32 percent to 86 percent.

Two surveys were conducted following the July 2017 mass campaign: a post-campaign evaluation in December 2017, four months after the campaign, and a KAP survey in August 2018, one year after the campaign. The December 2017 survey was conducted in 3,455 households with an average of 172 households per province for the 18 provinces and showed that 96.8 percent received ITN, and that 83.3 percent were hung up, and that 92.9 percent of the population and 95.9 percent of children under five years of age slept under an ITN.

The survey conducted in 2018, one year after the mass campaign, was a KAP survey conducted in 1,965 randomly selected households, which documented that 72 percent of ITNs distributed were hung up, while 28 percent were stored and kept in their packaging.

Results of these two surveys indicate that the use of ITN needs to be sustained by availability of ITNs at the household level and active SBC on ITN use and care in rural areas. To better understand the ITN access and use data, the indicators will be integrated in the next 2023 DHS2 with data collection planned six month after the 2022 ITN mass distribution campaign.

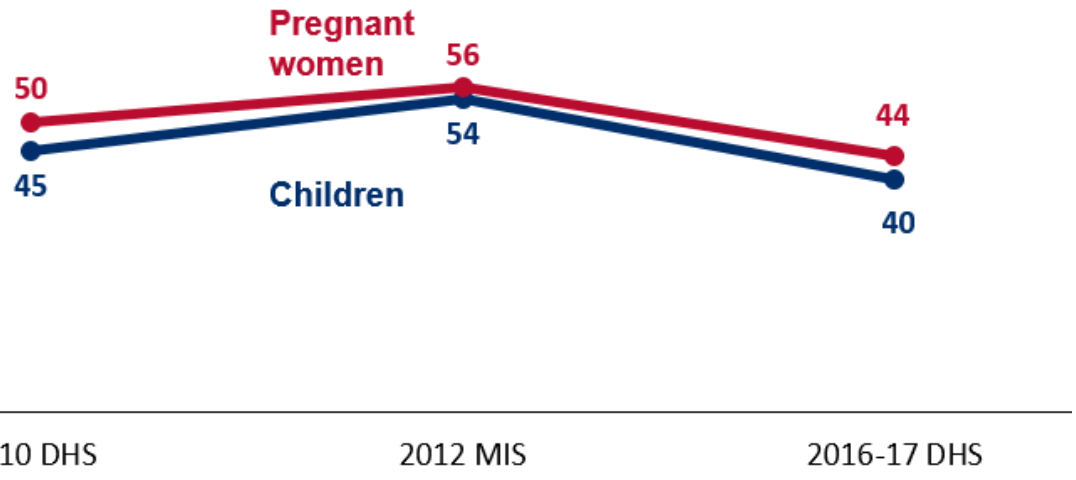
Key Question 2b

What percent of pregnant women and children under five years of age report sleeping under an ITN?

Supporting Data

Figure A-5. Trends in ITN use among children and pregnant women

Children under five years of age and pregnant women 15 to 49 years of age who slept under an ITN the night before the survey.



The proportion of pregnant women who slept under an ITN the night before the survey was at 50 percent in 2010 and 56 percent in 2012. It then decreased to 44 percent in 2016–2017. The proportion of children under five years of age who slept under an ITN the night before the survey was at 45 percent in 2010 and 54 percent in 2012. ITN use by children then decreased to 40 percent in 2016–2017.

Key Question 3

If ITN access is high but use is low, what significant structural and/or behavioral challenges affect the adoption and maintenance of ITN use and care behaviors?

The survey data show that use is high given access, therefore lack of access is the main barrier to use. The 2018 KAP study showed that approximately 16.7 percent of the ITNs received during the 2017 mass distribution are no longer in the household. Possession of the ITNs is as low as 25.3 percent in high malaria burden areas with 39.0 percent in Kirundo Province, 30.5 percent in Cankuzo Province, and 35.6 percent Cibitoke Province. The main reason why there are no longer nets in the households, according to findings, was that nets were torn (69.3 percent), one year after the mass distribution campaign. Other reasons were nets given to friends or other family members (12.8 percent), nets sold (2.9 percent), or used for something else (6.8 percent).

Supporting Data

From findings in the 2018 KAP survey, the following factors have been identified as affecting the adoption and maintenance of ITN use and/or care behaviors: structural factors, (supply chain and availability), social factors (gender norms, social support, etc.), and environmental factors (economic barriers, seasonality, etc.).

Individual and within-household behavior related to malaria control activities is recognized as the main barrier to reducing malaria cases. Misconceptions regarding malaria are the main barriers of ITN use: data from the 2018 KAP survey showed that 12.8 percent of the 2017 mass distribution campaign were given to friends or other family members, and 6.8 percent were used for something else including the protection of seedlings (10.3 percent), as ropes (7.9 percent), fencing/wrapping (6.1 percent), as a screen for house windows (4.7 percent), and for transporting or storing crops (12 percent). Poverty is also the main factor of ITN non-use in the community; the 2018 KAP survey revealed that 2 percent of ITN were sold.

The KAP 2018 study revealed that 91.1 percent of ITNs observed in households are from the September 2017 mass distribution campaign and 6.9 percent are obtained from the first ANC visit and measles vaccine visit Only 1.1 percent are purchased nets.

Please refer to Section 3.4 for information on how SBC interventions will be directed to address the challenges identified above.

Key Question 4

What type of nets are being distributed via which channels?

In the period 2014 to 2018, only standard pyrethroid ITNs were used in routine and in mass campaign distribution. Based on the entomological monitoring annual reports that showed a resistance to permethrin in most of the sentinel sites, the Burundi malaria control program opted for ITNs with insecticides reflecting the susceptibility of vectors. Starting at the mass campaign distribution in December 2019, two types of ITNs have been used in both routine distribution and the mass campaigns: PermaNet 3.0 (deltamethrin+PBO), and standard ITN (deltamethrin) through routine distribution. PBO nets were limited to zones (four health districts) with high risk of malaria epidemic and pyrethroid (including deltamethrin) resistance (Kirundo, Busoni, Mukenke, and Vumbi). Standard nets cover 43 health districts based on entomological monitoring recommendations. In 2020, it

was decided to transition to IG2 nets in 20 districts based on the vector susceptibility to insecticides (Ruyigi, Kinyinya, Butezi, Rutana, Gihofi, Rumonge, Bugarama, Musema, Kayanza, Gahombo, Nyabikere Buhiga, Ryansoro, Mutaho, Kibuye, Gitega, Murore, Cankuzo, Mpanda, and Bubanza).

Supporting Data

Table A-5. Insecticide-treated net (ITN) distribution

Province (# Health Districts)	Mass Campaign [month/year]	ANC	EPI	School	Community	Other
Bubanza (2HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Bujumbura Mairie (3HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Bujumbura rural (3HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Bururi (2HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Cankuzo (2HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Cibitoke (3HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Gitega (4HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Karusi (2HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Kayanza (3HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Kirundo (4HD)	PBO, December 2019	PBO	PBO	N/A	N/A	N/A
Makamba (2HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Muramvya (2HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Muyinga (3HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	Giteranyi HD : continuous distribution 2021	N/A
Mwaro (2HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Ngozi (3HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	Ngozi HD : continuous distribution 2021	N/A

Province (# Health Districts)	Mass Campaign [month/year]	ANC	EPI	School	Community	Other
Rumonge (2HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Rutana (2HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A
Ruyigi (3HD)	Pyrethroid, December 2019	Pyrethroid	Pyrethroid	N/A	N/A	N/A

Key Question 5

What is the estimated need for ITNs during calendar years 2021–2023? How many, and what types, of ITNs will be procured, and by what partners? Through what channels will ITNs be distributed? Are there any projected ITN gaps?

The NMCP convenes a technical committee on commodities quantification that estimates the country's annual ITN needs. The committee adjusts the commodities quantities on a quarterly basis according to consumption data.

ITNs will be distributed through both routine distribution and mass distribution (both described above). The NMCP will pilot a continuous community-based distribution of standard ITNs in two health districts in two provinces: N'gozi (N'gozi District) and Muyinga (Giteranyi District), starting in 2021. This intervention aims to maintain high household ITN coverage between two mass distribution campaigns. Global Fund resources will support 327,460 standard deltamethrin-based ITNs for this intervention, which will be gradually expanded based on the pilot phase results. USAID will continue to support distribution of ITNs to pregnant women and children under five years of age by procuring three types of nets. A total of 995,88 ITNs will be procured with USAID resources including 391,046 standard ITNs, 184,396 PBO nets, and 420,439 IG2 nets.

The country has planned a mass distribution campaign in 2022. Three types of ITNs will be provided as follows: distribution of PBO nets in nine health districts, distribution of standard nets in 18 health districts, and distribution of IG2 nets (with chlorfenapyr+alphacypermethrin) in 20 health districts.

Based on data used to plan the 2021–2023 Global Fund grant, the documented gaps in ITNs (difference in available resources compared to country need, including a six-month buffer stock) are 378,934 in 2021, 1,788,099 in 2022 and 583,780 in 2023, respectively. It is not within the proposed malaria budget for USAID/Burundi to fully fill this gap.

Supporting Data

Table A-6. ITN Gap Analysis Table

Calendar Year	2021	2022	2023
Total country population	11,466,228	11,703,737	11,926,704
Total population at risk for malaria	11,466,228	11,703,737	11,926,704
PMI-targeted at-risk population	11,466,228	11,703,737	11,926,704
Population targeted for ITNs	11,466,228	11,703,737	11,926,704
Continuous Distribution Needs			
Channel 1: ANC	527,446	544,224	566,518.44
Channel 2: EPI	412,784	421,335	429,361
Channel 3: School	0	0	0
Channel 4: community channel in 2 health districts	327,460	167,659	171,683
Additional ITNs required to avoid ITN stockouts	633,845	566,609	583,781
Estimated Total Need for Continuous Channels	1,901,536	1,699,826	1,751,344
Mass Campaign Distribution Needs			
Mass distribution campaigns	0	7,607,429	0
Estimated Total Need for Campaigns	0	7,607,429	0
Total ITN Need: Continuous and Campaign	***1,901,536***	***9,307,255***	***1,751,344***
Partner Contributions			
ITNs carried over from previous year	350,793	0	0
ITNs from Government	*0*	*0*	*0*
ITNs from Global Fund	327,460	6,553,598	171,683
ITNs from other donors (UNICEF)	32,400	0	0
ITNs planned with PMI funding	811,947	965,558	995,881
Total ITNs Contribution Per Calendar Year	***1,522,600***	***7,519,156***	***1,167,564***
Total ITN Surplus (Gap)	***-378,936***	***-1,788,099***	***-583,780***

Key Question 6

What is the current status of durability monitoring?

The first ITN durability monitoring in Burundi was supported by USAID and refers to the December 2019 mass campaign distribution. The survey is conducted in Vumbi and Gashoho health districts in two provinces of Kirundo and Muyinga. Although data collection was planned to begin six months after the campaign, the start date was delayed due to constraints related to the COVID-19 pandemic, and it commenced in August 2020. The 12-month data collection survey ended in February 2021.

Supporting Data

Table A-7. Timing of durability monitoring

Campaign Date	Site	Brand	Baseline	12-month	24-month	36-month
December 2019	Vumbi	PermaNet 3.0	x	x		
August 2020	Gashoho	Yorkool	x	x		

ITN durability monitoring is ongoing and the conclusion will be presented at the end of the monitoring activity in December 2022. There is discussion ongoing on how to best address potential bias in the endline study given that there will be new nets distributed six months prior to the end of monitoring.

Conclusions for ITN Investments

Based on results of surveys providing information on ITN access, use and durability, we have identified the following priorities for USAID investments:

- Procure and distribute 995,881 ITNs including 391,046 standard ITNs, 184,396 PBO nets, and 420,439 IG2 nets via routine channels targeting pregnant women and children under five years of age.
- Support mass campaign nationwide in June 2022, with SBC messages, macroplanning and microplanning.
- Conduct community mobilization activities in conjunction with ITN campaign.
- Adapt the SBC messages to focus on ITN use and care.
- Conduct interpersonal SBC intervention based on message developed.
- Conduct an ITN durability study after the mass campaign.

Please see FY 2022 budget tables for a detailed list of proposed activities with FY 2022 funding.

1.3. INDOOR RESIDUAL SPRAYING (IRS)

USAID support for IRS in Burundi is limited to TA to NMCP in planning, implementation, data collection, and protocol/guideline development to ensure the quality of its operation. The majority of the support is related to entomologic monitoring that informs selection of insecticides in IRS. Although Burundi's IRS needs are not covered by available funding, Burundi's USAID malaria budget is insufficient to consider investing in IRS implementation at this time; IRS inclusion would be beneficial to the program.

Please see FY 2022 budget tables for a detailed list of proposed activities with FY 2022 funding.

2. HUMAN HEALTH

2.1. CASE MANAGEMENT

NMCP Objective

The NMCP objectives are aligned with the national malaria control strategic plan 2018–2023 that stated two objectives: By 2023, ensure the proper management of 100 percent of suspected malaria cases who reached the health facilities in accordance with the national policy and ensure the proper management of 100 percent of suspected malaria cases at the community level in line with the national policy.

NMCP Approach

The national guidelines for malaria treatment were updated in 2019 and are consistent with WHO recommendations. The malaria diagnostic and treatment services are organized at health facilities for all age groups and at community level for children under five years of age. In addition, Burundi is planning to extend the community case management of children up to five years of age and adults in districts at high risk of outbreaks. Considering the permanent and high transmission of malaria in Burundi, any case of fever is a suspected malaria case and must be confirmed for all age groups. Following the 2019 treatment guidelines, any malaria treatment should be provided after parasitological confirmation using a rapid diagnostic test (RDT) or microscopy.

- Following a shift in 2020 away from ASAQ, the first-line for the treatment of uncomplicated malaria is AL for three days (first dose to patient directly observed by the provider).
- The second-line treatment for uncomplicated malaria is the fixed combination of dihydro-artemisinin+piperaquine.
- The treatment for pregnant women within the first trimester is a combination of quinine + clindamycin, and AL in the second and third trimesters.
- The first-line treatment for severe malaria is injectable artesunate for three days, followed by AL tablets to complete the treatment.
- The second-line treatment of severe malaria is quinine injectable intravenous.
- At the community level, the 2019 treatment guidelines recommend the use of rectal artesunate suppositories as pre-referral treatment for children under five years of age with severe malaria symptoms.

Public Sector and Private Sector Characteristics:

Case management of malaria is carried out in all public health facilities, with protocols based on malaria national treatment guidelines, while few private health facilities implement case management practices in line with national guidelines. Private health facilities represent 31 percent of total health facilities in Burundi. Among people with fever tested for malaria, in 2019, 47 percent received a recommended uncomplicated malaria treatment at the private sector (DHIS2). The national guidelines for malaria testing and treatment are the same for public and private sector facilities. AL is available at private pharmacies in different formulations (tablets) as recommended by the national malaria control guidelines.

Malaria case management at the community level is integrated in the iCCM package and focuses on diarrhea, pneumonia, and malaria screening and treatment for uncomplicated cases among children under five years of age. The NMCP is also committed to introducing the home-based management of malaria strategy for individuals of all ages, known as PECADOM, in 2021. Burundi's approximately 12,000 community health workers (CHWs) are organized in a group called *Groupement d'agents de santé communautaire* (GASC) attached to a health center. Each sub-colline has one CHW who is responsible for SBC, curative, and home visit activities. S/he covers 200–600 households with approximately 1,500 people per CHW. Two CHWs per colline are selected to implement iCCM. They have been trained and equipped with a kit to test and treat the three diseases. In terms of retention strategies, in many health districts, CHWs receive financial incentives based on 25 indicators included in the performance-based financing approach. This payment approach is implemented in 35 of the 47 health districts with the Government of Burundi, World Bank fundings. For the remaining 12 districts in Bujumbura Mairie, Bujumbura Rural, Bururi, Rutana, and Rumonge provinces, Global Fund is supporting direct payment.

Supervision visits are part of the health system strengthening, which recommends that a supervision plan be integrated in the health district's work plan. The health system norms recommend visiting all the health centers every three months. The health district team has integrated supervision visits or joint supervision visits with the central-level team or implementing partner technical team for malaria-specific supervision.

USAID Objective in Support of NMCP

In Burundi, USAID support is fully aligned with the national strategy on case management. USAID contributes significantly to the control of malaria in Burundi at each level of the system. At the national level, the support includes active participation in the development and validation of the guidelines, policies, and strategies related to malaria control. Support is provided by both USAID staff and by implementing partners.

USAID is supporting integrated malaria, family planning, and maternal and child health service delivery in six provinces (15 of the 47 health districts) including 410 health facilities. The support includes capacity-building through training of healthcare providers at facility and community levels (including the provision of printed documents to support training and coaching sessions for quality of service delivery), and strengthening the supervision tools and provision of logistic support to districts for quarterly supervision.

USAID support for commodities leverages the commodities procured by the Global Fund. USAID investments cover between 20 and 25 percent of malaria commodities needed nationwide in a given year.

USAID-Supported Recent Progress (FY 2020)

USAID supported the NMCP in rolling out the 2019 malaria guidelines, including the introduction of AL, through the procurement of commodities and materials, along with training.

- In 2020, USAID resources procured 1,994,280 of AL (6x1blister), 135,415 RDT kits, and 132,626 vials of injectable artesunate.
- USAID supported the NMCP to organize several refresher sessions for health providers from each health facility, including private facilities and faith-based health centers. In the six USG-supported provinces, 175 health service providers were trained and provided with 500 copies of the new guidelines.

- During the rollout of the new treatment guideline, USAID supported the NMCP to conduct supportive supervision visits in six health districts and 26 health facilities.
- USAID supported the NMCP to train 350 CHWs from five health districts (Buhiga, Nyabikere, Bururi, Nyanza-Lac, and Rumonge) in January 2021. USAID also engaged in active surveillance of malaria data that helped the NMCP to respond to November 2020 malaria elevated cases in 21 districts, including four USG-supported districts of Kirundo, Busoni, Vumbi in Kirundo Province and Giteranyi in Muyinga Province. The mobile clinic is a minimum of 10-days intervention by health providers with active testing and treatment of all fever cases among all age groups at hard-to-reach sites, in response to an increase of malaria cases during the seasonal peaks. This intervention complements case management at community and health facility levels. For the November 2020 intervention, 46 hard-to-reach sites were targeted around 10 health facilities of the four districts. The intervention successfully reached 59,770 patients, of whom 39, 959 tested positive and were treated for malaria, and was followed by a decrease of surveillance curve below the alert threshold.

There were challenges in the initial rollout of AL, which began in 12 districts in February 2020 and with gradual introduction planned in all 47 health districts. The remaining 35 districts planned to continue use of ASAQ until the stock was depleted, which was anticipated to be in May 2020. Unfortunately, in March 2020, the country faced a stockout of ASAQ for adults, changing the initial deployment plan of AL. In addition, transportation constraints linked to the COVID-19 pandemic delayed delivery of AL for scale up, until July 2020 (both UNDP/Global Fund and Global Health Supply Chain-Procurement and Supply Management orders). While waiting for the delivery of AL ordered, quinine tablets were used for treatment of uncomplicated malaria in 35 health districts from May to July 2020.

USAID-Supported Planned Activities (FY 2021)

- USAID will continue the procurement of the following malaria commodities: 775,248 blisters of AL all forms, 1,694,720 kits of RDTs, and 105,795 vials of artesunate Injectable.
- USAID support will also focus on the quality of services delivered to the population with emphasis on training of health providers at facility and community levels. CHWs will be trained to expand iCCM in targeted provinces with a high malaria burden in Tubiteho catchment area. USAID will support coaching sessions targeting CHW and supportive supervision visits for both health provider categories.
- USAID will continue to support NMCP to implement cost-effective interventions including iCCM and PECADOM.
- To strengthen the private–public partnership for malaria control, in 2021 USAID invested in a new mechanism, Momentum Private Healthcare Delivery, with an integrated malaria, family planning, and maternal and child health service delivery, to engage the private sector targeting 200 private and faith-based health facilities. Starting in FY 2021, USAID is supporting case management of uncomplicated malaria including appropriate treatment (with ACTs) in 120 private and faith-based healthcare centers. This support will be extended to additional 80 private clinics. USAID is working to set up appropriate tracking systems for private sector use of PMI-supported commodities.

Key Goal

Improve access to and use of timely, quality, and well-documented malaria testing and treatment by providing facility- and community-based health workers with training, supervision, and malaria commodities to provide quality, effective care.

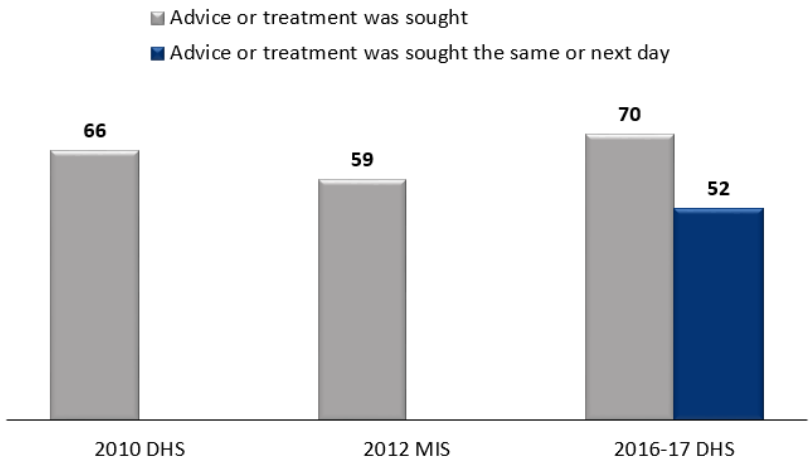
Key Question 1a

What is the status of care-seeking and/or access to care for children under five years of age with fever?

Supporting Data

Figure A-6. Trends in care-seeking for fever

Among children under five years of age with fever in the two weeks before the survey, percentage for whom advice or treatment was sought



**Excludes treatment or advice from a traditional practitioner*

The NMCSP target for the proportion of children who seek care is 100 percent. According to the 2010 DHS and 2016–2017 DHS, the proportion of children under five years of age who seek care in the context of fever was 66 percent in 2010 and 70 percent in 2016–2017. However, only 52 percent of children sought advice or treatment the same or next day of fever (2016–2017 DHS).

Key Question 1b

What significant structural and/or behavioral challenges affect prompt care-seeking?

Supporting Data

- Geographic access to the nearest health facility for people living in rural areas: In rural areas, 44 percent of households can reach a health facility in less than 30 minutes, and 20 percent require 61–120 minutes to reach the nearest health facility (Source: 2016–2017 DHS). Even so, most malaria cases are recorded in rural areas.

- Socioeconomic barriers due to fees associated with malaria diagnosis and care at health facilities: Consultation fees, microscopy if an RDT is not used, and adjuvant therapy (e.g., antipyretic) are not free.
- Social factors limiting early care-seeking: These factors include gender norms—the proportion of women involved in decision-making about healthcare decreased from 77 percent in 2010 to 72 percent in 2016 (Source: 2016–2017 DHS).

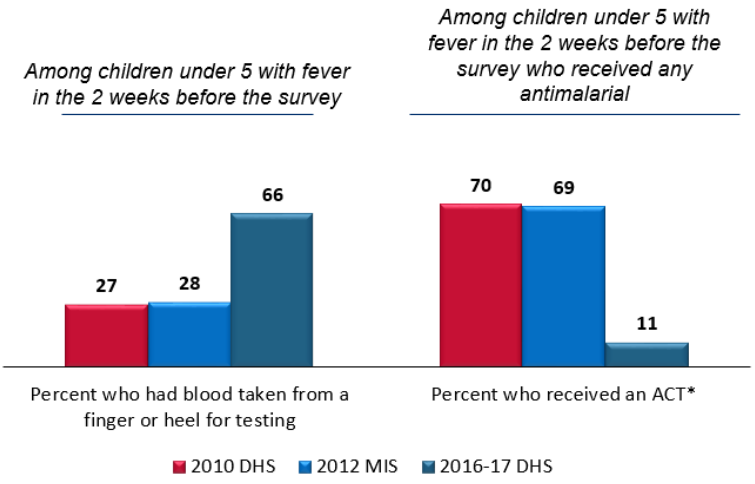
Key Question 2a

What proportion of patients are being tested and appropriately treated for malaria?

Supporting Data

Figure A-7. Trends in diagnosis and treatment of children with fever

Among children under five years of age with fever in the two weeks before the survey and with fever in the two weeks before the survey who received any antimalarial



*The estimate for the ACT indicator for the 2016-17 DHS should be interpreted with caution. The final report for the survey shows that 77% of respondents answered that the child received amodiaquine.

Survey data show that among children under five years of age with recent fever, 66 percent received a finger or heel stick for testing, a substantial increase from 27 percent in 2010. However, only 70 percent of febrile children who received any antimalarial received ACT in accordance with national guidelines in 2010 (DHS), 69 percent in 2012 (MIS), and 11 percent in 2017 (2016–2017 DHS). The estimate from 2011 should be interpreted with caution—while only 11 percent reported having received ACT, respondents for 77 percent of febrile children said they had received amodiaquine, suggesting an error in coding responses.

In 2017, a healthcare quality assessment conducted under the Global Fund Grant revealed that among people with malaria symptoms, an average of 64 percent of malaria cases were diagnosed at health centers using RDT, with 34 percent tested using microscopy. Over 98 percent of reported malaria cases were confirmed by diagnostic tests compared with 63 percent in 2011. (In 2019, guidelines shifted to put an emphasis on using RDT at each level of the health pyramid.)

In 2020, overall, 4,736,334 uncomplicated malaria cases and 25,530 severe malaria cases were recorded (Source: DHIS2). Of these, children under five represented 2,112,446 (45 percent) of uncomplicated cases and 9,325 (36 percent) of severe malaria cases. Overall, 4,248,487 (89.6 percent) were treated with ACT including 60 percent (2,566,072 cases) with AL. AL was transitioned into first-line treatment in 2020 (as described above). Among children under five years of age, 94 percent were treated. Malaria cases treated in the community represented 7 percent (300,002 cases).

Key Question 2b

What significant structural and behavioral challenges affect testing and treatment practices among providers?

Supporting Data

The survey on the quality of malaria case management conducted respectively in 2011 and in 2017, showed that the providers have improved their malaria case management behaviors. Indeed, the request for biological confirmation of malaria, by RDT or microscopy tick drops, has increased significantly from 62.7 percent in 2011 to 97.7 percent in 2018. This shows that health providers are more in compliance with the national guideline for malaria case management. In addition, health providers demonstrated that they knew how to administer the treatment in 89.4 percent of cases in 2017 compared with 49.5 percent in 2011.

The 2018 survey also documented that availability of guidelines, protocols, and job aids on malaria testing and treatment varied by facility type, with faith-based facilities demonstrating much better access to these essential materials than public and private health facilities. The survey showed that malaria guidelines were available in 45.9 percent of public health facilities, 66.7 percent of faith-based facilities, and in 26.1 percent of private health facilities. Job aids for malaria testing and malaria treatment were observed in 55.,7 percent of public health facilities, 85.7 percent of faith-based facilities, and 26.1 percent of private health facilities. The job aid on severe malaria case management was observed in 24.6 percent of public health facilities, 42.9 percent of faith-based facilities, and 8.7 percent of private health facilities.

The manual of standard operating procedures (SOPs) for the laboratory was observed in 36.1 percent of public health facilities, 57.1 percent of faith-based health facilities, and 34.8 percent of private health facilities. The SOPs for providing ACT were observed in 72.1 percent of public health facilities, 71.4 percent of faith-based facilities, and 17.4 percent of private health facilities. The job aid on use of injectable artesunate was observed in 41.0 percent of public health facilities, 66.7 percent of faith-based health facilities, and 13.0 percent of private health facilities. The job aid of IPTp was observed in 45.9 percent of public health facilities, 71.4 percent of faith-based health facilities, and 17.4 percent of private health facilities.

USAID/Burundi will invest in SBC interventions to improve provider behavior related to the quality of care at public and private health facilities, including improvement in SOP observance (e.g., separating donor stock, training on LMIS, and maintaining accurate inventory).

Please refer to Section 3.4 for information on how SBC interventions will be directed to address the challenges identified above.

Key Question 3

What is the current and planned support for case management at health facilities and in the communities by CHWs?

At the central level, plans include to support NMCP in the supervision of health district offices.

At the district level, the following support is planned:

- Train and conduct supportive supervision on laboratories activities to ensure compliance with standard operating procedures on malaria diagnosis.
- Support health districts to conduct supportive supervisions at health facilities including faith-based and private clinics.
- Increase coaching sessions for healthcare providers.
- Conduct joint supervisions in public and several private health clinics using the Health Network Quality Improvement System tool.
- Support training laboratory staff on equipment quality control and assurance procedures.

At the community level the following support is planned:

- Complete the assessment and prepare the rollout of a new digital health technology tool to support and improve the correct use of ITNs in households with Connecting with Sara.
- In collaboration with health district bureaus, conduct workshops with GASCs on data reporting.
- Support the NMCP to conduct training sessions for CHWs on iCCM focused on the newly updated malaria case management guidelines.
- Produce and distribute CHW reporting tools.
- Support the MOH to develop an implementation guide for the effective operation of mobile clinics.

Supporting Data

Table A-8. Mapping of intervention by donors

Interventions supported	Number of districts covered by each donor (total districts = 47)			
	USAID	Global Fund	World Vision International	UNICEF
Malaria service delivery	15	47	NS	NS
Malaria in pregnancy	15	47	NS	NS
IRS	NS	4	4	NS
ITN supply and	47*	47**	NS	NS

Interventions supported	Number of districts covered by each donor (total districts = 47)			
	USAID	Global Fund	World Vision International	UNICEF
distribution				
ITN use	15	NS	NS	NS
SBC	15	32	NS	NS
SM&E (Surveillance, monitoring, and evaluation)	15	32		NS
iCCM	13	9		4
CCM for adults (PECADOM)	13	9		NS

NS: not supported; *RD: Routine Distribution; **MCD: Mass Campaign Distribution.

Key Question 4

What is the estimated need for RDTs during calendar years 2021–2023? Are there any projected RDT gaps based on anticipated partner contributions compared to estimated needs?

The estimated needs are described in the table below, which include the annual estimated needs and a nine-month buffer stock. As shown in the gap analysis table, government and Global Fund contributions are expected to cover the annual estimated need, as well as the buffer stock.

Table A-9. RDT Gap Analysis Table

Calendar Year	2021	2022	2023
Total country population	11,466,228	11,703,737	11,926,704
Population at risk for malaria	11,466,228	11,703,737	11,926,704
PMI-targeted at-risk population	11,466,228	11,703,737	11,926,704
RDT Needs			
Total number of projected fever cases	10,274,617	11,181,951	9,136,323
Percent of fever cases tested with an RDT	80%	80%	80%
RDT Needs (tests)	**8,790,788**	**8,795,312**	**6,499,735**
Needs Estimated based on HMIS Data			
Partner Contributions (tests)			
RDTs from Government	*990,000*	*850,313*	*722,766*
RDTs from Global Fund	7,645,625	5,804,756	3,994,394
RDTs from other donors (World Vision International)	422,104	278,175	0
RDTs planned with PMI funding	4,942,875	1,694,720	0
Total RDT Contributions per Calendar Year	***14,000,604***	***8,627,964***	***4,717,160***
Stock Balance (tests)			
Beginning Balance	2,275,750	7,485,566	7,318,218
- Product Need	8,790,788	8,795,312	6,499,735
+ Total Contributions (received/expected)	14,000,604	8,627,964	4,717,160
Ending Balance	7,485,566	7,318,218	5,535,643
Desired End of Year Stock (months of stock)	9	9	9
Desired End of Year Stock (quantities)	6,593,091	6,596,484	4,874,801
Total Surplus (Gap)	***892,475***	***721,734***	***660,842***

Supporting Data

Key Question 5

What is the estimated need for ACTs during calendar years 2021–2023? Are there any projected ACT gaps?

The estimated needs are described in the table below; 300,000 blisters of AL will be procured to cover the estimated need of the country in 2023.

Supporting Data

Table A-10. ACT Gap Analysis Table

Calendar Year	2021	2022	2023
Total country population	11,466,228	11,703,737	11,926,704
Population at risk for malaria	11,466,228	11,703,737	11,926,704
PMI-targeted at-risk population	11,466,228	11,703,737	11,926,704
ACT Needs			
Total projected number of malaria cases	5,898,477	5,215,262	4,261,181
Total ACT Needs (treatments)	***5,854,157***	***5,176,076***	***4,229,163***
Needs Estimated based on HMIS Data			
Partner Contributions (treatments)			
ACTs from Government	*465,580*	*531,450*	*790,531*
ACTs from Global Fund	5,297,880	4,082,294	2,417,611
ACTs from other donors: UNICEF	203,700	488,801	0
ACTs planned with PMI funding	2,802,120	775,248	300,000
Total ACTs Contributions per Calendar Year	***8,769,280***	***5,877,793***	***3,508,142***
Stock Balance (treatments)			
Beginning Balance	3,396,480	6,311,603	7,013,320
- Product Need	5,854,157	5,176,076	4,229,163
+ Total Contributions (received/expected)	8,769,280	5,877,793	3,508,142
Ending Balance	6,311,603	7,013,320	6,292,299
Desired End of Year Stock (months of stock)	9	9	9
Desired End of Year Stock (quantities)	4,390,618	3,882,057	3,171,872
Total Surplus (Gap)	***1,920,985***	***3,131,263***	***3,120,427***

Key Question 6

What is the estimated need for definitive treatment and pre-referral treatment for severe malaria during calendar years 2021–2023? Are there any anticipated gaps?

Supporting Data

The gap analysis tables indicate a gap of 598,050 vials of injectable artesunate and 11,086 rectal artesunate suppositories for 2023, inclusive of six months of buffer stocks; however, due to budget constraints, USAID will procure 130,795 vials of injectable artesunate and 13,000 rectal artesunate suppositories.

Table A-11. Inj. Artesunate Gap Analysis Table

Calendar Year	2021	2022	2023
Injectable Artesunate Needs			
Projected number of severe cases	238,298	210,697	172,152
Projected number of severe cases among children	173,521	153,422	125,355
Average number of vials required for severe cases among children	5	5	5
Projected number of severe cases among adults	67,717	59,873	48,920
Average number of vials required for severe cases among adults	15	15	15
Total Injectable Artesunate Needs (vials)	***1,962,836***	***1,735,483***	***1,417,993***
Needs Estimated based on HMIS Data			
Partner Contributions (vials)			
Injectable artesunate from Government	0	0	0
Injectable artesunate from Global Fund	1,685,830	1,461,022	1,177,706
Injectable artesunate from other donors: UNICEF	95,000	0	0
Injectable artesunate planned with PMI funding	585,228	105,795	130,795
Total Injectable Artesunate Contributions per Calendar Year	***2,366,058***	***1,566,817***	***1,308,501***
Stock Balance (vials)			
Beginning Balance	340,381	743,603	574,937
- Product Need	1,962,836	1,735,483	1,417,993
+ Total Contributions (received/expected)	2,366,058	1,566,817	1,308,501
Ending Balance	743,603	574,937	465,445
Desired End of Year Stock (months of stock)	9	9	9
Desired End of Year Stock (quantities)	1,472,127	1,301,612	1,063,495
Total Surplus (Gap)	***(728,524)***	***(726,675)***	***(598,050)***

The guidelines for malaria case management recommend rectal artesunate suppository at the community level as a pre-referral treatment for children under five years of age with severe malaria symptoms. Intramuscular artesunate is used within 24 hours to treat any case of severe malaria at all health facilities. Intramuscular artesunate can be continued combined with adjuvant treatment when symptoms persist associated with additional investigation.

Table A-12. RAS Gap Analysis Table

Calendar Year	2021	2022	2023
Artesunate Suppository Needs			
Number of severe cases expected to require pre-referral dose	30,979	27,391	22,380
Total Artesunate Suppository Needs (suppositories)	***30,979***	***27,391***	***22,380***
Needs Estimated based on HMIS Data			
Partner Contributions (suppositories)			
Artesunate suppositories from Government	0	0	0
Artesunate suppositories from Global Fund	0	6,619	9,484
Artesunate suppositories from other donors	0	0	0
Artesunate suppositories planned with PMI funding	0	20,072	13,000
Total Artesunate Suppositories Available	***0***	***26,691***	***22,484***
Stock Balance (suppositories)			
Beginning Balance	130,694	0	0
- Product Need	30,979	27,391	22,380
+ Total Contributions (received/expected)	0	26,691	22,484
Ending Balance	0	-700	104
Desired End of Year Stock (months of stock)	6	6	6
Desired End of Year Stock (quantities)	15,489	13,695	11,190
Total Surplus (Gap)	***(15,489)***	***(14,395)***	***(11,086)***

Key Question 7

What is the estimated need for any other standard antimalarial drug used in the country (e.g., primaquine for P. vivax) during calendar years 2021–2023? Are there any anticipated gaps?

USAID does not procure other malaria commodities such as dihydroartemisinin + piperaquine (DHA- PPQ) tablets, recommended by the national guideline as second-line treatment for uncomplicated malaria treatment as well as clindamycin, quinine tablets, and injectable quinine recommended in case of contraindication to AL. Quinine injectables are available at central warehouses, at district pharmacies and facilities levels but not free of charge for eligible patients.

Key Question 8

Are first-line ACTs effective and monitored regularly?

The last therapeutic efficacy study (TES) was conducted in 2018 with many challenges on data collection. The results of this study (with polymerase chain reaction [PCR] correction) in the sentinel sites of Buhiga, Mutoyi, Kigobe, and Kazirabageni showed a slight decline in the efficacy of artesunate- amodiaquine (ASAQ). The failure rate varied from and 0 percent in Mutoyi to 1.4 percent in Kigobe (located in the capital Bujumbura), 2.4 percent in Kazirabageni (southern Burundi), and 3.4 percent in Buhiga. These results show that ASAQ remains effective within the lower limits of WHO standards. Nevertheless, the country decided the change from ASAQ to AL as

first-line treatment in 2019 based on other considerations. The monitoring of artemisinin molecular markers (K13) showed the absence of artemisinin resistance in Burundi compared to Rwanda. WHO is conducting a TES in 2021, with another planned for 2023.

Supporting Data

Table A-13. Recently completed and ongoing antimalarial therapeutic efficacy studies

Year	Sites	USAID Funded Y/N	Treatment Arms	PCR-Corrected ACPR>90%	Location Molecular Resistance Work Completed or Planned
2018	Mutoyi, Kigobe, Buhiga, and Kazirabageni	N	ASAQ vs. AL	92.7%	Completed
2021	TBD	N	AL vs. AL	TBD	

ACPR: adequate clinical and parasitological response; AL: artemether-lumefantrine; ASAQ: amodiaquine-artesunate.

Key Question 9

Are there other areas (e.g., lab strengthening, private sector support, etc.) that should be considered for USAID-support?

In the context of permanent transmission with exposure of the overall population, USAID will contribute to ensuring universal coverage of malaria service delivery by engaging and strengthening the faith-based and private sector health facilities throughout the Momentum Private Healthcare Delivery mechanism that includes malaria, family planning, and maternal and child health to optimize the contributions of faith-based facilities, and the private sector in the malaria fight at all levels in Burundi.

Supporting Data

- The 2016–2017 DHS found that, among children under five years of age with fever for whom advice or treatment was sought, 21 percent of care-seeking occurred in the private/faith-based sector. The health facility assessment conducted in 2020 by Tubiteho in six USG-supported provinces demonstrates that only 55 percent of non-faith-based private facilities surveyed offered a full range of malaria prevention, diagnostic, and treatment services.

Conclusions for Case Management Investments

Based on results of assessments of service quality in Burundi, we have identified the following priorities for USAID investments:

- USAID will continue to support improved quality of services provided to populations at health facilities and at community levels. The support will consist of a wide range of activities currently in implementation such as training, coaching, and supportive supervision in malaria case management at facility and community levels. It will also include support to private health clinics by engaging them to offer high-

quality malaria services. It will be an opportunity to strengthen the public–private sector engagement in malaria control.

- USAID will continue to procure malaria commodities needed by the population with strong supply chain management to mitigate stockouts.
- USAID will work with NMCP to quickly expand iCCM interventions in the six USG-supported provinces as well as the rollout of PECADOM after the pilot phase.
- There is no plan to change case management activities.

Please see FY 2022 USAID budget tables for a detailed list of proposed activities with FY 2022 funding.

2.2. DRUG-BASED PREVENTION

NMCP Objective

The Burundi national policy recommends malaria prevention in pregnancy using Intermittent Preventive Treatment in pregnancy (IPTp) to improve pregnancy outcomes. The objective related to drug-based prevention in the malaria in pregnancy (MIP) program is to ensure that every pregnant woman receives at least three doses of SP for IPTp.

NMCP Approach

The Malaria in Pregnancy program was rolled out in 2015, and IPTp is included in the focused ANC package which is under the Reproductive, Maternal, Neonatal, Child, and Adolescent Health (RMNCAH) program management. NMCP and RMNCAH collaborate to develop all policies and guidelines to improve IPTp uptake.

Burundi's 2019 ANC guidelines recommend four ANC visits and highlight the importance of early ANC visits. IPTp, via SP, is offered at health facilities in the first trimester of the pregnancy starting at 15 weeks of gestation, then monthly to delivery. Each dose is administered under direct observation therapy (DOT). Additionally, facilities provide an ITN to each woman at her first ANC visit. Health facilities, including hospitals, have at least two health providers who have been trained on IPTp 2015–2016. CHWs have been trained and provided with communication materials (leaflets) to ensure SBC activities for pregnant women to support ANC attendance and adherence to care. Joint supportive supervision visits are organized quarterly by the health district with the two national programs (NMCP and RMNCAH) to ensure that guidelines and reporting on IPTp and ANC are well implemented.

Since the rollout of IPTp in 2015, the progress toward uptake of IPTp has remained low. The 2016–2017 DHS found that the proportion of women attending ANC four times was only 49 percent, limiting contacts for the provision of IPTp. The 2017 quality of malaria case management survey, published by the MOH/NMCP, reported that 100 percent of healthcare workers provided IPTp to pregnant women but not necessarily according to the DOT strategy.

Since 2019, the treatment for uncomplicated malaria in pregnant women during the first trimester is a combination of quinine + clindamycin, and AL in the second and third trimesters.

USAID Objective in Support of NMCP

USAID supports the full package of MIP activities in the national strategy. USAID is supporting integrated malaria, family planning, and maternal and child health service delivery in 15 of the 47 health districts and in 406 health facilities. As such, the integration of MIP in maternal healthcare puts women at the center of care, to enhance their experience of pregnancy and ensures safe delivery and appropriate care for the newborn.

USAID-Supported Recent Progress (FY 2020)

USAID supported the training of 75 health providers on essential obstetric and neonatal care that included the malaria prevention package (provision of ITNs and SP) in collaboration with the RMNCAH. USAID supported coaching sessions for newly trained health providers, and district team supportive supervision as well as the supply chain system management to avoid SP stockout. The Tubiteho project 2020 annual report showed that 62 percent of pregnant women received at least three doses of IPTp during ANC visits in the six USG-supported provinces.

Due to low adherence to IPTp uptake, the Tubiteho mechanism is conducting a rapid assessment of population behavior regarding adherence to IPTp. The results are expected at the end of 2021 and will be used to improve interventions to increase IPTp uptake.

USAID-Supported Planned Activities (FY 2021 with currently available funds)

- Strengthen MIP integration to Maternal and Child Health using the focused ANC strategy and conduct post-training supportive supervision at USG supported districts.
- Involve CHWs in MIP interventions by conducting interpersonal communication sessions toward pregnant women in target communities.
- Introduce digital health at the community level to monitor referral of pregnant women for IPTp and ITNs from community to facility (connecting with Sara mobile application:CwS).
- Implement evidence-based strategies in the USG-supported districts to motivate pregnant women to complete the required four ANC visits such as ANC group discussions, and celebration of “model” pregnant women (who attended four ANC visits, received the full three doses of SP, and delivered with a skilled professional).

Please see FY 2022 MOP budget tables for a detailed list of proposed activities with FY 2022 funding.

2.2.1. MALARIA IN PREGNANCY (MIP)

Key Goal

Ensure the timely provision of ITNs at the first antenatal care (ANC) visit, a minimum of three doses of intermittent preventive treatment for pregnant women (IPTp) starting at the 15th week of gestation, and effective case management of malaria cases during pregnancy.

Key Question 1a

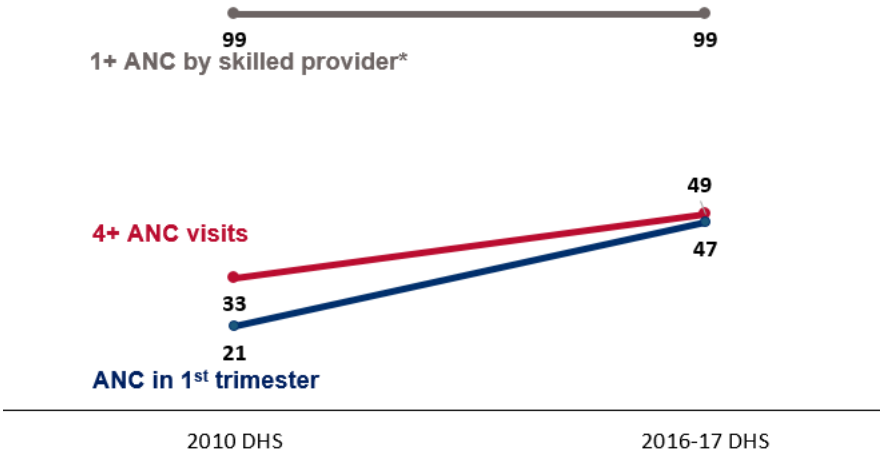
What proportion of pregnant women are accessing ANC early and frequently (as recommended by national and/or WHO strategies) during their pregnancy?

Supporting Data

While nearly all women receive at least one ANC visit from a skilled provider, there are remaining challenges in the frequency and timing of ANC visits. The ANC attendance rate for a visit in the first trimester has increased from 21 percent in 2010 to 47 percent in 2016–2017, and ANC attendance rate for four or more visits has increased from 33 percent in 2010 to 49 percent in 2016–2017. Despite this progress, Burundi continues to be far from the desired target of 80 percent for ANC1 and 50 percent for ANC4, set by the RMNCAH national strategic plan 2019–2023. The 2016–2017 DHS report revealed that only 47 percent of pregnant women attended an ANC visit during their first trimester. The drop-off of pregnant women between the first ANC and fourth ANC visits limits delivery of a comprehensive ANC package.

Figure A-8. Trends in ANC coverage

Women 15 to 49 years of age with a live birth in the five years before the survey (most recent birth)



**Skilled provider includes doctor, nurse, or midwife.*

Key Question 1b

Are there important health systems and/or behavioral barriers to ANC attendance at health facilities?

The development of 2019–2023 RMNCAH national plan included a review of the 2017–2018 plan and identified gaps that included inappropriate communication tools (not in line with the guidelines on Reproductive Health); low involvement of the community in improving the health conditions of mothers, children, and adolescents; low empowerment of women; and low quality of service provision.

Supporting Data

- The latest 2017 Maternal Death Surveillance and Response report indicates that more than half of maternal deaths (52.5 percent) occur in the immediate postpartum while 17.8 percent of maternal deaths occur during pregnancy. According to the monitoring Obstetric and Neonatal Emergency Care of 2017, hemorrhage remains the most frequent cause (34 percent) of maternal death in the health facilities, followed by severe pre-eclampsia/eclampsia (12.1 percent) and severe postpartum infection (8.6 percent). In women of childbearing age, morbidity is dominated by infectious diseases, particularly malaria and sexually transmitted infections, including HIV/AIDS.
- MIP interventions still require additional support at the health facility and community levels. USAID will focus on increasing timely access of pregnant women to ITNs, first dose of IPTp, and adherence to the four ANC visits to prevent malaria transmission. The other high priority is the rollout of the 2016 WHO guidelines, which recommend eight ANC contacts over the course of a pregnancy. To that end, rapid assessment of determinants of lack of adherence to IPTp uptake to be conducted in 2021 will lead to understanding root causes. Pilot of the 2016 WHO guidelines will start in the USG-supported districts in collaboration with NMCP and PNRS with the aim of eventual adoption by the Government of Burundi based on the evidence generated.
- The COVID-19 impact on service delivery especially on MIP was not assessed and could not be reported.

Please refer to Section 3.4 for information on how SBC interventions will be directed to address the challenges identified above.

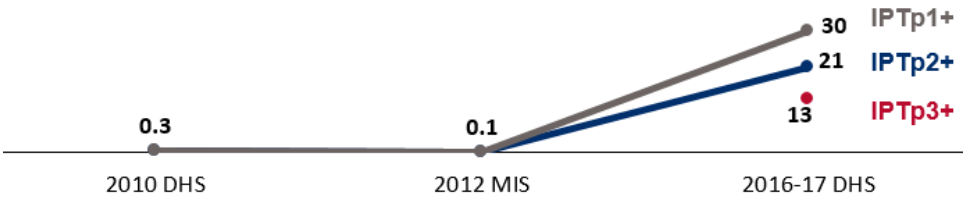
Key Question 2

What proportion of pregnant women are receiving the recommended doses of IPTp?

Supporting Data

Figure A-9. Trends in IPTp

Women 15 to 49 years of age with a live birth in the two years before the survey who received the specified number of doses of SP/Fansidar during their last pregnancy



Note that these indicators have been recalculated according to the newest definition, at least the specified number of doses of IPTp from any source.

Note: IPTp3 baseline uses the first survey available after the recommendation was updated to three or more doses.

IPTp was adopted as a national policy in 2015 and scaled up nationwide in 2016 with support from USAID; this explains the low percentage from 2010 DHS and 2012 MIS data. Based on 2020 DHIS2 data, 79 percent of pregnant women attending ANC received IPTp1, 70 percent received IPTp2, and 58 percent received IPTp3.

The 2020 results are higher than those reported in the DHS 2016–2017, but lower overall than 2019 data reported in the statistical yearbook:

- The DHS 2016–2017 reported 30 percent of pregnant women received IPTp1, 21 percent received IPTp2, and 13 percent received IPTp3. IPTp services were limited in the north of the country when the DHS data collection was launched.
- The statistical yearbook annual report 2019 showed that 90 percent of pregnant women received IPTp1, 87 percent received IPTp2, and 54 percent received IPTp3.

Key Question 3a

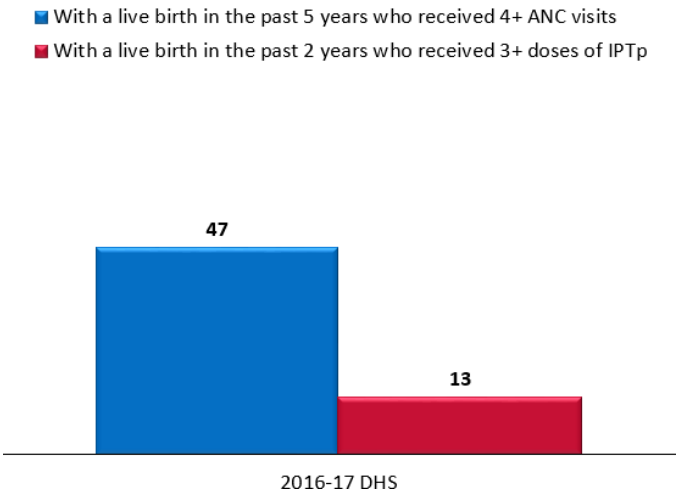
What is the gap between ANC attendance and IPTp uptake (i.e., missed opportunities for giving IPTp at ANC)?

The progress toward uptake of IPTp by pregnant women attending ANC visits remains weak. The underperformance in MIP implementation led to missed opportunities for pregnant women to access high-quality services.

Supporting Data

Figure A-10. Missed opportunities for IPTp in 2017

Percentage of women 15 to 49 years of age



The 2016–2017 DHS found that 47 percent of pregnant women received at least four ANC visits, while only 13 percent received at least three doses of IPTp.

Key Question 3b

What significant health system and/or behavioral challenges affect provider delivery of MIP services (e.g., IPTp and ITN distribution at ANC)?

Supporting Data

The quality of IPTp service delivery is limited by the high turnover of health providers trained in MIP. Lack of trained health providers is the main cause of low performance in MIP. When IPTp was introduced in 2015, two providers were identified and trained to implement the intervention at each health facility. The Case Management Quality Survey (*Enquête sur la Qualité de la Prise en Charge des cas de paludisme dans les structures de soins au Burundi*) conducted in 2017 found that 97 percent of healthcare workers were prompt to provide ITNs and 100 percent provided SP to pregnant women attending ANC1 in 30 health facilities covered by the study. Since 2018, no refresher trainings have been organized on MIP, with the exception of a USAID-supported training on essential obstetric and neonatal care, inclusive of MIP services, this year for 75 providers.

Low involvement of CHWs in MIP activities and lack of a strategy to motivate pregnant women to adhere to early ANC visits required are also barriers to MIP performance.

The results of a planned assessment regarding IPTp uptake planned to be conducted in Tubiteho mechanism will further inform and guide both the NMCP and USAID on decision-making to strengthen the quality of MIP.

Please refer to Section 3.4 for information on how SBC interventions will be directed to address the challenges identified above.

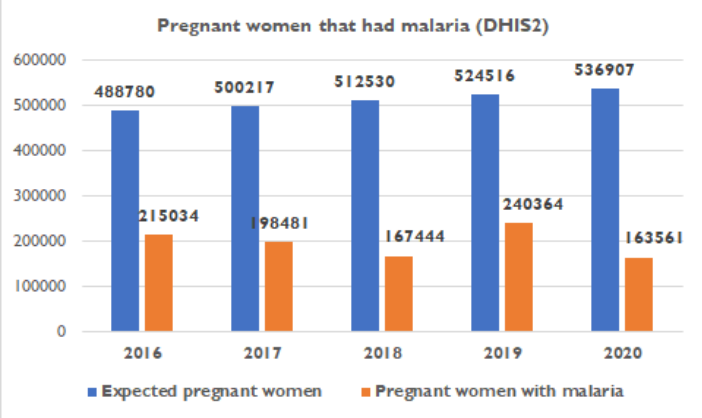
Key Question 4

Does the national ANC program or health information system collect data and track the proportion of pregnant women with fever, those tested for malaria, those found to have malaria infection, and those who are treated?

Supporting Data

The DHIS2 does not record pregnant women with fever or those tested for malaria. Only data on pregnant women with malaria are recorded. The figure below shows the number of malaria cases among total estimated pregnant women in the past five years. With the exception of 2019, which coincided with an undeclared epidemic in the country, the proportion of pregnant women diagnosed with malaria has decreased during this period, from 44 percent in 2016 to 30 percent in 2020. However, in 2019 over 45 percent of pregnant women were diagnosed with malaria.

Figure A-11. Number of malaria cases among pregnant women from 2016 to 2020 (DHIS2)



Key Question 5

What is the estimated need for SP during 2021–2023? Are there any anticipated SP gaps? Are there gaps in other IPTp commodities?

The estimated quantities for SP are 1,107,638 for 2021, 1,306,137 for 2022, and 1,359,644 for 2023. All SP needed for 2021 and 2022 will be procured by the Global Fund. In 2022 there is a gap of 17,474 tablets based on current resource projections. The quantity required for 2023 will be provided by USAID.

Supporting Data

Table A-14. SP Gap Analysis Table

Calendar Year	2021	2022	2023
Total Country Population	11,466,228	11,703,737	11,926,704
Total Population at Risk for Malaria	11,466,228	11,703,737	11,926,704
PMI Targeted at Risk Population	11,466,228	11,703,737	11,926,704
SP Needs			
Total Number of Pregnant Women	573,311	585,187	596,335
Proportion of women expected to attend ANC1 at 13 weeks or greater	92%	93%	95%
Proportion of women expected to attend ANC2	86%	87%	88%
Proportion of women expected to attend ANC3	68%	69%	70%
Proportion of women expected to attend ANC4	50.6%	55.2%	60.0%
Total SP Needs (treatments)	***1,107,638***	***1,306,137***	***1,359,644***
Needs Estimated based on Other (specify in comments)			
Partner Contributions (treatments)			
SP from Government	0	0	0
SP from Global Fund	1,897,833	1,306,137	0
SP from Other Donors	0	0	0
SP planned with PMI funding	0	0	1,359,644
Total SP Contributions per Calendar Year	***1,897,833***	***1,306,137***	***1,359,644***
Stock Balance (treatments)			
Beginning balance	171,933	962,129	962,129
- Product Need	1,107,638	1,306,137	1,359,644
+ Total Contributions (Received/expected)	1,897,833	1,306,137	1,359,644
Ending Balance	962,129	962,129	962,129
Desired End of Year Stock (months of stock)	9	9	9
Desired End of Year Stock (quantities)	830,728	979,603	1,019,733
Total Surplus (Gap)	***131,401***	***(17,474)***	***(57,604)***

Conclusions for MIP Investments

Based on the low IPTp uptake vs. ANC, we have identified the following priorities for USAID investments to improve MIP:

- Support training sessions/refresher training for healthcare providers at the facility level on focused ANC/core package ANC with emphasis on service integration of comprehensive care to pregnant women, followed by coaching sessions, and printing and distribution of jobs aids for improved quality of care.

- Support supervision of health workers to improve implementation of the DOT strategy for SP during ANC visits.
- Adapt and implement evidence-based strategies to motivate pregnant women to attend early ANC visits to improve ITN and IPTp uptake and to increase the number attending other ANC visits (e.g., training midwives for group ANC).
- Support advocacy around the adoption of WHO 2016 guidelines for ANC visits.
- Procure 995,881 ITNs for routine distribution (including through ANC and EPI) of 184,396 PBO nets, 420,439 IG2 nets, and 391,046 standard nets.
- Involve CHWs in SBC interventions to conduct interpersonal communication sessions toward pregnant women in target communities.
- Introduce digital health at the community level to monitor referral of pregnant women for IPTp and ITNs from community to facility (connecting with Sara mobile application:CwS).

Please see FY 2022 MOP budget tables for a detailed list of proposed activities with FY 2022 funding.

2.2.2. SEASONAL MALARIA CHEMOPREVENTION (SMC):

SMC is not a recommended intervention for Burundi.

2.2.3. ADDITIONAL DRUG-BASED PREVENTIVE STRATEGIES

Burundi is not a designated country for near-term pre-elimination or elimination and there is no USAID support planned for such work in Burundi.

3. CROSS-CUTTING AND OTHER HEALTH SYSTEMS

3.1. SUPPLY CHAIN

NMCP Objective

The NMSP 2018–2023 highlights the objective of ensuring a functioning national supply chain system and ensuring an uninterrupted availability of malaria commodities in at least 90 percent of health facilities by strengthening the quantification process at all levels, improving warehousing and storage conditions, implementing a high-performance logistic information system, building capacity for supply chain stakeholders, prepositioning emergency stocks in case of epidemic, strengthening the pharmacovigilance system, and monitoring the efficacy of products.

NMCP Approach

The ABREMA (Autorité Burundaise de Régulation des Médicaments à usage humain et des Aliments formerly DPML) is the division of the MOH in charge of regulations and oversight of the pharmaceutical sector. The ABREMA also regulates the national warehousing and supply procurement department, *Centrale des Achats des Médicament Essentiels du Burundi* (CAMEBU), in line with national pharmaceutical policy.

CAMEBU is responsible for the procurement and management of public sector pharmaceuticals and faith-based health facilities officially registered in Burundi. CAMEBU is responsible for the management of malaria commodities from entry at the central warehouse through storage and distribution. CAMEBU was operating based on a pull system according to the health district orders but the transportation to the field was organized by each health district. Since July 2020, CAMEBU has revamped the supply chain system by initiating the "push" approach via an order point system, including the transportation of a three-month stock of essential medicines ordered by districts including malaria commodities. The districts' needs were previously approved by the NMCP.

USAID Objective in Support of NMCP

USAID's objective is to ensure uninterrupted supply of health commodities in the country. The support includes procurement and supply chain management support to the MOH as well as providing related systems strengthening TA for a comprehensive supply chain management.

USAID-Supported Recent Progress (FY 2020)

The USAID malaria program has contributed to improve procurement and delivery of malaria commodities, improving coordination between donors for training and supervision, availability of SOPs in pharmaceutical management, and best practices for commodities delivery.

In FY 2020, USAID continued to strengthen the malaria pharmaceutical management system by supporting ABREMA and NMCP in the following areas:

- Supporting malaria commodities forecasting and supply planning.
- Managing the procurement, storage, and distribution of inventory.
- Creating a coordination body for the management of stocks that supports the national quantification committee for malaria commodities and is led by the ABREMA with representation from CAMEBU, NMCP, and UNDP/Global Fund.
- Developing a commodity stock status dashboard.
- Developing a list of requirements for a functional LMIS as recommended by the 2019 roadmap, as well as terms of Reference for the eLMIS governance committee.
- Conducting the EUV surveys for evidence-based decision-making related to ITNs.
- Supporting a three-day training on the management and logistics information for pharmaceutical products for the pharmacy managers.
- Supporting joint supervision visits.

USAID-Supported Planned Activities (FY 2021 with currently available funds)

- Conduct national forecasting and quantification exercises for malaria commodities.
- Review quarterly supply plans.
- Procure and deliver malaria commodities.
- Continue to provide TA in storage, distribution, and inventory management at CAMEBU.
- Support the coordination body meetings as well as the national quantification committee for malaria commodities.

- Initiate a pilot plan to guide the eventual rollout of the eLMIS.
- Conduct the annual EUV survey.
- Ensure quality of drugs through improved stock management (LMIS).
- Support all districts on the pharmaceutical supply chain management at CAMEBU level.
- Support health districts and facilities to continuously monitor and manage drug stocks.
- Support supervision visits.

Key Goal

Ensure continuous availability of products needed for malaria control (ACTs, RDTs, SP, Art. Inj., and ITNs) at health facilities and community level.

Key Question 1

Has the central level (or subcentral level, if appropriate) been stocked according to plan for ACTs, RDTs, SP, and injectable artesunate over the last year (2020)? If not, have they been under, over, or stocked out?

During FY 2020, the central level stock of RDT, SP, and injectable artesunate was under-stocked and there was stockout of ACT.

Burundi changed the national malaria treatment guidelines at the end of 2019 shifting from ASAQ to AL for the first-line treatment of uncomplicated cases of malaria. Stockpiling for the new first-line drug was disrupted early in the COVID-19 pandemic. The introduction of AL was gradual, starting with 12 districts in February 2020 and the national scale-up in August 2020. In March 2020, the country experienced a stock shortage of ASAQ before having a sufficient stock of AL to extend its use nationwide. Due to the absence of historical consumption data for AL, the quantification was not accurate. This situation led to 2020–2021 understock of AL 20/120 mg 6x1 and 6x4 tablets and overstock of AL 20/120 mg 6x2 and 6x3. Injectable artesunate was out of stock from April to May 2020.

Supporting Data

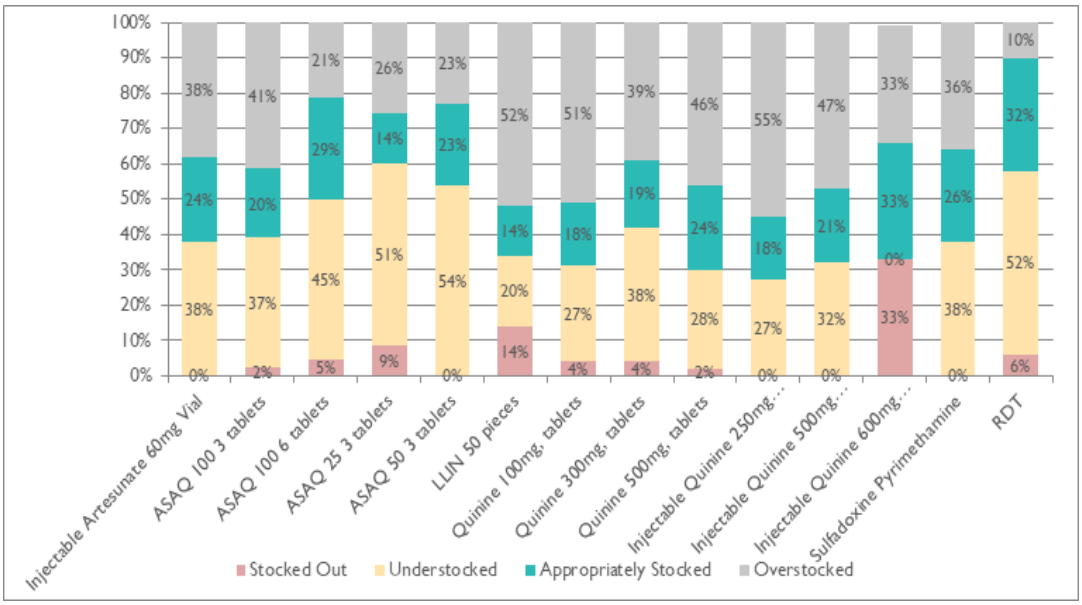
n/a

Key Question 2

What are the trends in service delivery point stockout rates for ACTs (including ability to treat), RDTs, Art. Inj., and SP over the last year (if tracked)? Is there a seasonal or geographic difference in stockout rates?

The table below demonstrates the stockout rates from the 2020 EUV. According to survey respondents, the main reasons for stock shortages are the unavailability of products at the higher level as well as expired, damaged, or lost products. However, these statements do not correlate with the results related to the availability of products at the district level or the expiration rate of malaria commodities due to a lag in district-level availability of data versus facility reporting. The stockout rates of ASAQ presentations were also likely due to the transition from ASAQ to AL. Stockouts of RDTs were observed in 13.5 percent of visited facilities on the day of the visit. None of the visited facilities reported stockouts of RDTs for an extended period (three days or more) in the last three months.

Figure A-12. District pharmacy stock levels ("Stocked according to plan") in February 2020



Source: 2020 EUV survey report.

The 2020 EUV showed that less than one-third of districts were appropriately stocked on the day of the survey. Many were in fact overstocked, and stockouts were greatest for injectable quinine 600 mg. The other presentations were used during the transition phase as requested by the national guidance issued early in 2020 as there was a delay of AL stock delivery in the country.

Table A-15. Stockout rate of malaria product at health facility level in Q4 FY 2020

Product	Stockout rate at health facility level	Target
First-line ACT (ASAQ 25/67.5mg)	2.5%	<1%
First-line ACT (ASAQ 50/135mg)	2.6%	
First-line ACT (ASAQ 100/270mgx3)	5.2%	
First-line ACT (ASAQ 100/270mgx6)	3.8%	
First-line ACT (AL 6x1)	1.3%	
First-line ACT (AL 6x2)	1.2%	
First-line ACT (AL 6x3)	2.0%	
First-line ACT (AL 6x4)	2.7%	
Long-lasting insecticide-treated nets	1.3%	
Sulfadoxine-pyrimethamine	1.4%	
Rapid diagnostic test for malaria	1.2%	
Total	1.8%	

Source: 2020 EUV survey report.

Key Question 3

What is the difference between quantities for ACTs consumed and malaria cases, and RDTs consumed and numbers tested? What is driving any differences seen?

Supporting Data

Table A-16. ACT and RDT discrepancies in 2019

# Malaria Cases	#ACTs Consumed	Discrepancy
5,566,106	4,289,347	1,276,760

There is a large difference between the number of malaria cases reported and the consumption of ACTs that needs to be monitored to improve management of malaria commodities at the operational level. The assumption is that this difference is due to lower reporting of consumption data in the LMIS and cases reported in the HMIS, but this needs to be confirmed with close monitoring. District and general hospital data related to uncomplicated malaria cases and the use of AL and RDTs are not documented in DHIS2; however, this has been identified as a challenge and the district and general hospitals are anticipated to collect and report data on uncomplicated malaria cases.

A monitoring plan will be discussed with NMCP, DSNIS, and operational-level stakeholders. The monitoring plan will also take a look at facility-level data of ACT consumption and disaggregate into facilities where reporting numbers deviate far from the standard deviation of consumption to cases data. By focusing on facilities with large deviations, NMCP can better recommend specific actions to increase reporting at those facilities, including retraining data collectors or assigning points of contact to harmonize collection for these important activities.

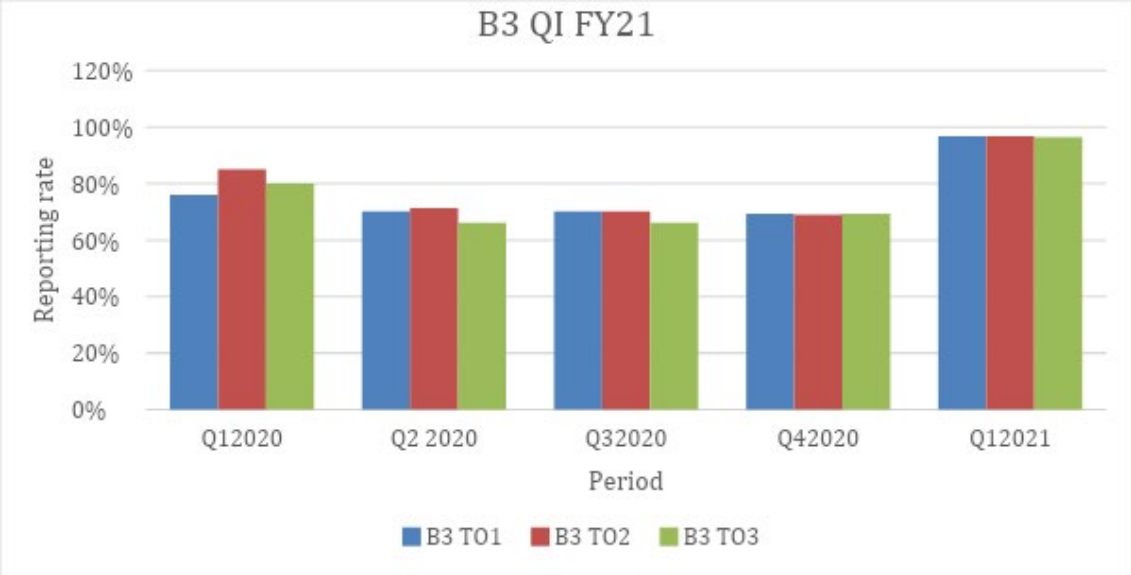
Key Question 4

To what extent does a functional LMIS provide visibility into timely and quality logistics data from various levels of the system? To what extent is commodity data visibility dependent on surveys or supervisory data rather than routine data reported by an LMIS?

LMIS data are tracked through active, paper-based data collection and data validation sessions at district level. Data is reported via DHIS2. Data collected during the EUV Survey provided evidence to adjust commodities management including their storage at all levels, as does the quantification and procurement plan revisions that are conducted on a quarterly basis.

Supporting Data

Figure A-13. Service delivery point reporting rate to the Logistics Management Information Systems (LMIS)



The red bars refer to reporting for malaria commodities, whereas the blue bars refer to HIV commodities and the green to family planning commodities. B3 refers to the service delivery points that are reporting into the LMIS.

In Q1 FY 2021, reporting performance gradually increased to approximately 90 percent following training and supervision. In FY 2020, DHIS2 district data validation and timely completion was challenging due to COVID-19 as well as a lack of training, but corrections resulted in a significant increase and quality reporting during Q1 FY 2021, compared to previous quarters, even if desired timely reporting is not yet fully achieved.

Key Question 5

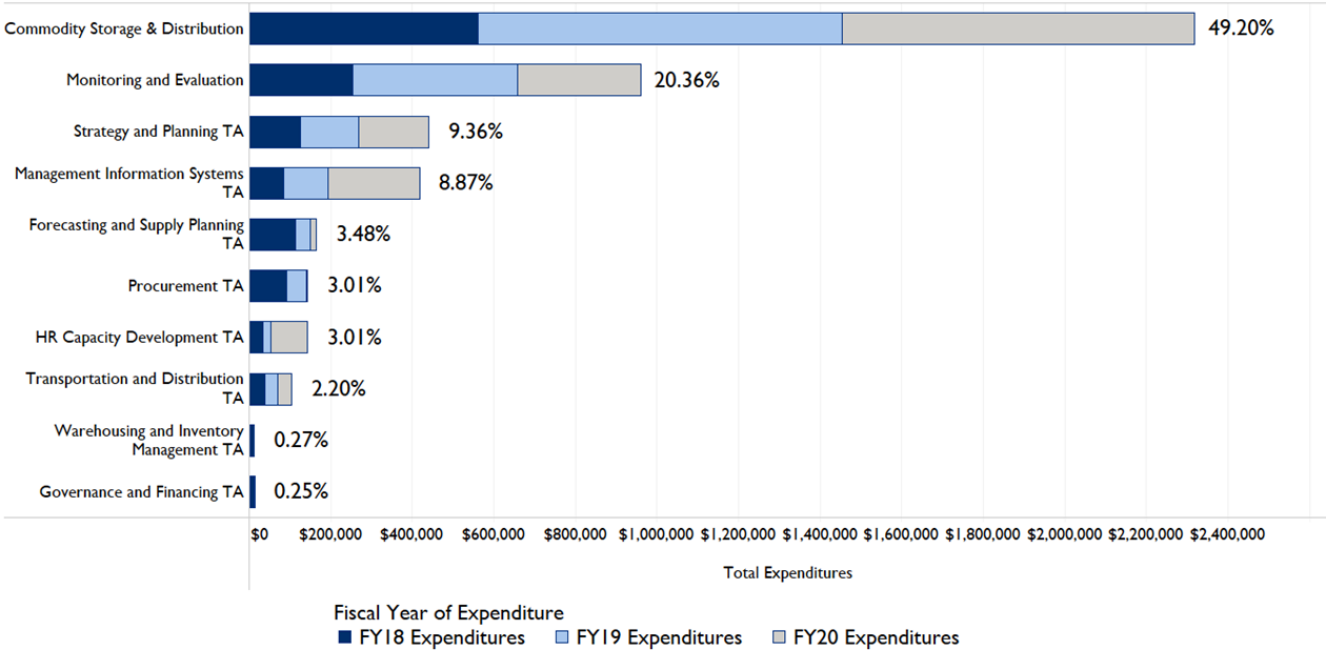
What are the main supply chain TA functions supported by USAID? Are there additional investments that USAID should make (e.g., increasing visibility of demand at health facilities) to ensure continual availability of quality products needed for malaria control and elimination at health facilities and the community level? In areas performing well, is it dependent on USAID/donor funding (e.g., USAID and Global Fund pay for warehousing and

distribution)? Should more be done to foster self-reliance in domestic systems and, if so, what approaches should be considered?

The main supply chain TA functions supported by USAID are the following:

- Support to malaria commodities forecasting and supply planning exercises with deliverables in terms of annual quantification report and quarterly update of the procurement planning and monitoring for malaria commodities.
- The EUV provides quality data to refer to for quantification adjustment.
- Development and implementation of good warehousing practices makes improvements to inventory management system.
- Development and implementation of distribution strategies and route planning.
- Support to MOH to improve LMIS.
- Support to MOH with Human Resources capacity development.
- Support logistics data quality improvement by qualified staff to ensure storage of malaria commodities at CAMEBU and follow up the push system of malaria commodities to health districts and commodities management at the field level. The skills transfer to the local workforce is ongoing.

Figure A-14. Supply chain investments breakdown



The root cause analysis identified two main causes of stockout: (i) In the past, there were major delays in disbursement of funding. For the mission the delay was due to Trafficking Victims Protection Act (TVPA) restrictions in FY 2018. This situation and delay in Government of Burundi procurement have resulted in insufficient supply of commodities at the national level as well as interrupted supply chain operations across different supply chain levels. (ii) Poor distribution/transportation system for efficient movement of commodities from health districts to health facilities.

Priorities identified in response to the above causes are as follows:

At the Mission level: related to TVPA, the mission has anticipated this question by providing each fiscal year a TVPA memorandum highlighting that all activities are for lifesaving in Burundi. The opportunity of the early funds request implemented by PMI headquarters helps to timely obligate the fund for procurement in the COVID-19 pandemic context. Additionally, Burundi has seen improvement and per the 2021 State Department report, is now a Tier 2 country.

At the country level: the Quantification committee will ensure accurate quantification of malaria commodities

At the implementing partner level: The implementing partner will anticipate advance malaria commodities orders placement.

At central and district levels:

- Reinforce active distribution from central medical stores (CAMEBU) to district pharmacies by providing technical support for the forecasting exercises taking into account the real needs of each health district, and support the preparation and execution of an active distribution timetable.
- Develop and implement the monthly requisition schedule from health districts to service delivery points.
- Train new staff including private sector staff and conduct refresher training for logistic staff on LMIS data reporting and analysis (on-the-job training). This will be done by the four provincial technical advisors in collaboration with the district managers.
- Increase supervision and coordination on data quality validation, as well as on inventory management.
- Support the implementation of an integrated eLMIS (acquire the selected eLMIS solution; develop a project management plan; customize and test software; and develop, deploy, and maintain a transition plan).

Conclusions for Supply Chain Investments

USAID will continue to support the supply chain logistics and pharmaceutical management systems at the national, district, and facility levels. Enhanced supervision and capacity-building at all levels will focus on enforcing use of SOPs and improving forecasting and supply planning particularly focused on timely ordering and maintenance of the recommended minimum stock level. USAID will continue coordination efforts with NMCP to improve stock availability at the health center and community levels. USAID will provide technical support to improve the LMIS, system of transportation of commodities, and conduct EUV surveys to inform the quantification.

USAID will collaborate with CAMEBU and coordinate with national committees. This investment will also strengthen the NMCP's capacity to quantify all malaria commodities and improve the pharmaceutical management capacity in targeted districts.

3.2. SURVEILLANCE, MONITORING, AND EVALUATION (S&ME)

NMCP Objective

The 2018–2023 NMSP intends to intensify epidemiological and entomological surveillance to generate evidence for program orientation. The main objectives are as follows:

- Ensure that at least 95 percent of health facilities provide quality data on malaria by 2023.
- Ensure early detection of 100 percent of malaria epidemics by 2023.
- Control 100 percent of detected epidemics within two weeks by 2023.
- Maintain at 90 percent the completeness and promptness of all reports from health facilities.

NMCP Approach

Malaria SM&E is decentralized to the community level taking into account the contribution of CHWs. Starting at the community level, malaria data for iCCM are collected, analyzed by the health center, and submitted to the health district for compilation. Each health facility, including hospitals, submit its electronic report to the health district through DHIS2, already deployed nationwide and functioning well. Supportive supervision visits are conducted to identify discrepancies between data in DHIS2 and hard copies of registers for data quality improvement as well as prompt submission of reports.

Data quality assessments, which are conducted every three months on malaria data, are a key monitoring activity that aims to improve data quality and reinforce data officers to report accurate data. Workshops for malaria data analysis are conducted on a quarterly basis by the HMIS team in coordination with the NMCP at the health district level.

Once a year, the EUV survey for malaria commodities assesses availability and management of malaria commodities according to SOPs at each level of the health system. A case management quality assessment conducted every two years informs the quality of service delivery.

USAID Objective in Support of NMCP

USAID Burundi's support for malaria S&ME is fully aligned with the national strategy and aims to strengthen the country's capacity and systems to generate high-quality malaria health information for decision-making at local, national, and global levels, with the ultimate goal of reducing malaria burden.

USAID-Supported Recent Progress (FY 2020)

The HMIS in Burundi is supported by many donors, including USAID. USAID specifically supports the SM&E system in program implementation. USAID is supporting the NMCP to better play its role in coordinating the production and use of accurate data at all levels.

At the central level, USAID Burundi's support for SM&E included the following activities:

- Completed a capacity-building needs assessment process for NMCP and DSNIS that included a desk review and completion of Monitoring and Evaluation Capacity Assessment Tool; developed a capacity-building plan based on the findings.
- Supported the development of the malaria epidemiology bulletin on a quarterly basis.
- Supported the development and validation of the terms of reference of the TWGs and their meetings.
- Participated in and provided TA to the quarterly NMCP monitoring and evaluation TWG meetings.

At the district and service delivery levels, USAID Burundi's support for SM&E included the following activities:

- Provided technical support at the health district level to strengthen routine HMIS data.
- Organized monthly sessions with data managers for analyzing logistical data completeness and accuracy from health districts in the DHIS2.
- Provided TA and financial support for all health districts to hold quarterly data review meetings and routine reporting to provincial/national levels and the performance-based financing system.
- Supported health districts in providing training, refresher training, or mentoring on HMIS-related data collection, analysis, reporting, and decision-making.
- Carried out a Health Facility Assessment to measure the availability and quality of health services.
- Conducted regular data quality assessments at health centers.
- Provided quarterly coaching sessions to community health worker groups (GASCs) on collection and submission of complete and accurate malaria community data.

USAID-Supported Planned Activities (FY 2021 with currently available funds)

- Support for revision of various tools and protocols for data quality assurance, analysis, and use.
- Integrate WHO/GMP (Global Malaria Program) module to DHIS2.
- Integrate vector control data into DHIS2.
- Improve the quality of supportive supervisions using the Health Network Quality Improvement System tool to be used by the health district team supervisors for timely submission of the report to the central level.
- Contribute to the 2022–2023 DHS planning process, coordination, and data collection, and provide TA as well.
- Provide financial and technical support to the development of malaria quarterly bulletin.
- Provide technical and financial support to the monitoring and evaluation TWG meetings.
- Provide technical support, at health district level, to strengthen routine Health Information System in USG-supported districts.
- Provided quarterly coaching sessions to GASC on collection and submission of complete and accurate malaria community data.
- Provide TA and financial support for all health districts in holding quarterly data review meetings and routine reporting to provincial/national levels and the performance-based financing system.
- Support health districts in providing training, refresher training, or mentoring on HMIS-related data collection, analysis, reporting, and decision-making.
- Conduct quarterly data quality assessments at health centers.
- Develop a malaria quarterly bulletin.

- Update the Malaria SM&E training curriculum for training-of-trainers.
- Complete household baseline survey in the three USG-supported southern provinces.

Key Goal

To support the NMCP to build its capacity to conduct surveillance and review and use monitoring and evaluation data as a core malaria intervention using high-quality data from both surveys and routine health information systems.

Key Question 1

Which data sources are available to inform estimates of intervention coverage, service availability and readiness, and morbidity and mortality?

Supporting Data

Table A-17. Available malaria surveillance sources

Source	Data Collection Activity	2019	2020	2021	2022	2023	2024
Household Surveys	Demographic Health Survey (DHS)				p	p	
Household Surveys	Malaria Indicator Survey (MIS)				p*		
Household Surveys	Multiple Indicator Cluster Survey (MICS)						
Household Surveys	EPI survey						
Health Facility Surveys	Service Provision Assessment (SPA)	x			p*		
Health Facility Surveys	Service Availability Readiness Assessment (SARA) survey				p*		
Health Facility Surveys	Other Health Facility Survey						
Malaria Surveillance and Routine System Support	Therapeutic Efficacy Studies (TES)		x	p*	p*		
Malaria Surveillance and Routine System Support	Support to Parallel Malaria Surveillance System	x	x	x			
Malaria Surveillance and Routine System Support	Support to HMIS	x	x	x	P	P	P
Malaria Surveillance and Routine System Support	Support to Integrated Disease Surveillance and Response (IDSR)	x	x	x			
Malaria Surveillance and Routine System Support	Electronic Logistics Management Information System (eLMIS)			p	p	p	p

Source	Data Collection Activity	2019	2020	2021	2022	2023	2024
Malaria Surveillance and Routine System Support	Malaria Rapid Reporting System	x	x	x	p*	p*	p*
Other	EUV	x	x	p	p	p	p
Other	School-based Malaria Survey						
Other	Knowledge, Attitudes, and Practices Survey; Malaria Behavior Survey	x				p*	
Other	Malaria Impact Evaluation						
Other	Entomologic Monitoring Surveys	x	x	x	p	p	p

*Asterisk denotes non-USAID funded activities, X denotes completed activities, and P denotes planned activities.

Key Question 2

What HMIS activities have been supported? What current priorities will be supported with FY 2022 MOP funding?

USAID has provided TA and some operational costs through implementing partners for data quality assessments and the adaptation of national policy guidelines and coordination (adapting policies and guidelines, supporting subcommittee meetings, and supporting participation in subcommittee meetings).

To be supported with FY 2022 MOP:

- Contribute to the 2022–2023 DHS (planning process, coordination, and data collection, and provide TA as well).
- Provide TA and financial support for all health districts in holding quarterly data review meetings and routine reporting to provincial/national levels.
- Provide TA to health districts in providing training, refresher training, or mentoring on HMIS-related data collection, analysis, reporting and decision-making.
- Provide TA to NMCP to establish a quality improvement teams at each level of the production of data.
- Conduct quarterly data quality assessments at health centers.
- Provide TA to NMCP targeting high-risk provinces to strengthen surveillance efforts and supportive supervision to increase accuracy and promptness on data collection, analysis, reporting, and use.

Supporting Data

Data analysis and use for decision-making is a key intervention to measure progress and guide program planning. USAID will continue to provide TA to improve data quality. USAID will support the NMCP in strengthening data use and dissemination at all levels (central, district and facility). USAID will strengthen and capacitate health facilities to produce and submit quality data. USAID will provide support to develop updated material and guidelines for data analysis and use to be disseminated to health facilities nationwide.

Key Question 3

Are there specific outcomes of past/current HMIS strengthening efforts that can be identified?

Not yet, the capacity-building process is ongoing.

Supporting Data

Table A-18. Outcomes of HMIS strengthening efforts

	Indicator	2019	2020
Timeliness	% of reports received on time	86%	97%
Completeness	"Confirmed malaria cases for children under five years of age" was reported in % of facility-months	98%	98.2%
Accuracy	(No nationally representative DQA data available)	Not available	Not available

Timeliness of malaria data has been improved in 2020 (97 percent) compared with the situation in 2019 (86 percent). Regarding the timeliness of malaria data, which is under 100 percent, estimated around 92.5 percent (the mean of the two years), completeness estimated at 98 percent and accuracy (which is not available in the HMIS), there is a need for continuous improvement of data quality supported by the DQA approach. The HMIS will be strengthened by putting in place quality improvement teams at each level of the production of data.

Key Question 4

Are there any other considerations that impact your funding allocation in this category (e.g., strategic information or capacity-building in-country)?

The needs related to malaria SM&E are significantly higher than can be addressed with the current budget. USAID Burundi has made efforts to leverage other funding sources within the agency and with partners to optimize our investments in HMIS. These efforts include coordination of partners able to support eLMIS. In addition, we have optimized our key investment in USAID Measure Malaria by providing the majority of the technical support remotely and through regional experts.

Conclusions for Surveillance, Monitoring, and Evaluation Investments

The main sources of information related to malaria are classified in two categories. Surveys on malaria and routine surveillance data to support timely and effective decision-making.

USAID will continue to support the quality and timely production of malaria routine surveillance data and support NMCP to conduct surveys to guide all decisions. USAID will contribute to the DHS3 planned for 2022–2023, the end of project (Tubiteho mechanism) quality assessment of malaria services (conducted every two years), and the EUV Survey as well as additional targeted surveys planned within the limits of the available budget.

Please see FY 2022 USAID budget tables for a detailed list of proposed activities with FY 2022 funding.

3.3. SOCIAL AND BEHAVIOR CHANGE (SBC)

NMCP Objective

The overall SBC objective of the NMCP is to achieve key targets related to awareness and knowledge of behaviors that support malaria prevention and case management. The NMCSP emphasizes the need to involve community stakeholders to reach at least 80 percent of community members with SBC interventions.

NMCP Approach

In 2019, in collaboration with its partners, NMCP developed a national social behavior communication plan for the period of 2020–2023 with the following objectives:

- Bring the highest political authorities and partners to strengthen their support to malaria control.
- By 2023, promote partnership and coordination of all SBC interventions.
- By 2023, strengthen the monitoring, evaluation, and operational research on SBC.
- By 2023, develop innovative programs that target students at secondary school for their involvement in SBC messages within their community (school and household level).
- By the end of 2023, increase the proportion of households and families that practice hygiene for malaria control.
- By 2023, ensure that at least 80 percent of people acquire knowledge on malaria and comply with malaria prevention measures at community level.

Burundi's malaria communication strategy is based on mass and interpersonal communication approaches. Mass communication consists in using mobile cinema, conducting roadshows, celebrating special events (World Malaria Day), and organizing community theater with drama groups. The interpersonal communication approach uses broadcasting messages directed to individuals, and community meetings led by CHWs including household visits.

USAID Objective in Support of NMCP

USAID is aligned with the national SBC plan and contributes strongly to its implementation and monitoring at all levels of the health system. USAID supports SBC interventions for case management and vector control to enhance the use of malaria services including access to ITNs at health and community level but noticed low impact of current SBC interventions on targeted population based on programmatic results. Therefore, USAID plans to provide TA to NMCP to strengthen its SBC program.

Implementation of malaria SBC activities are supported by multiple partners whose efforts are coordinated to ensure non-duplication. NMCP also coordinates the development of national communication material and other relevant communication tools. Key activities supported by other donors and partners include the following:

- The development of the SBC Plan with UNICEF support.
- The implementation of malaria at school with the "Écolier contre le paludisme" strategy supported by UNICEF. Strip cartoons have been produced and shared with some schools after training sessions of teachers who transferred knowledge to their students. Supportive supervisions are ongoing.

- Social mobilization at the celebration of the Malaria World Day with Global Fund, International Medical Corps support.
- Mobile cinema during the upsurge period in high-transmission areas.
- Awareness activities in the context of IRS in targeted health districts with Global Fund support.
- Awareness activities before, during, and after ITN mass campaign distribution with Global Fund support.

USAID-Supported Recent Progress (FY 2020)

In USG-supported districts, SBC activities included the following:

- Production and broadcast of the radio serial drama *Agashi*, which promotes the use of key health services to increase demand generation, and the use of ITNs.
- Mobile cinema during upsurge of malaria in high-transmission areas to promote prompt care-seeking and ITN use.
- Produced videos with messages to address misinformation around malaria. The videos are used also by social media.
- Production of outreach messages (related to correct use of nets, early ANC visit and SP uptake, and early seeking of care) to be used by CHWs during sensitization activities. These messages are sent to CHWs to serve as a sensitization topic at the community level when organizing meetings with their community members.
- Malaria road shows and outreach events.
- Production of a radio spot, "Zero Malaria Starts With Me," and broadcast on 12 community radio stations.
- Production and broadcast of two additional radio spots on malaria prevention in the context of COVID-19.

All these SBC interventions are awareness campaigns mainly focused on mass communication.

USAID-Supported Planned Activities (FY 2021 with currently available funds)

USAID-funded SBC interventions will focus on challenges encountered in service delivery. These interventions include behavior change targeting providers to improve the quality of care at public and private health facilities; interventions targeting pregnant women to improve early care-seeking, adherence to IPTp, and ITN uptake; and SBC related to ITN care. USAID will provide support to hire a consultant, if needed, to help NMCP to develop materials and adapt messages. USAID will support NMCP to provide job aids to healthcare providers and conduct training sessions for CHWs and facility-based providers to improve their capacity.

The consultant will help to revise the national malaria SBC strategies linking them to the activities implementation challenges cited below targeting pregnant women and caregivers of children under five years of age. It will also include the implementation plan as well as the definition of measurable indicators. The revision of the SBC strategy will be based on epidemiological data and the behavior study planned to be conducted by MSF/Belgique in 2022.

USAID will continue to support the 2020–2023 SBC interventions while in revision, including:

- Rolling out the community dialogue at health districts with high transmission. This approach aims to enhance the ownership and decentralization of SBC activities at the community level by the community members. Barriers to ITN uptake and seeking care early in case of fever will be discussed with community groups and solutions promoted locally.
- Tracking net use in households using the "Connecting with Sara," a digital health platform led by CHWs.
- Empowering community leaders, religious leaders, and local authorities on malaria prevention and treatment.
- Conducting community theater using community drama groups to promote awareness regarding malaria consequences, correct use of nets, and seeking care early, before seasonal peak. These community theaters will be conducted in north health districts with high epidemic risk.
- Providing technical support for preparation of the World Day Malaria event and support the implementation of key activities related to the theme of the year within targeted health districts.
- Organizing malaria road shows and outreach activities to anticipate the seasonal peak.
- Continuing to broadcast radio spots on "Zero Malaria Starts With Me," on 12 community radio stations.

Key Goal

Through the use of SBC interventions and in alignment with a country's national malaria control communication strategy, USAID supports the uptake and correct and consistent use of malaria interventions, thereby improving the overall quality of malaria control efforts that will contribute to reductions in malaria.

Key Question 1

What behaviors is USAID proposing to prioritize through its SBC programming? What data support this prioritization? Will support be geographically targeted or national?

Priority USAID-funded SBC interventions will address challenges encountered in service delivery and in ITN use. These interventions include behavior change targeting providers to improve the quality of care at public and private health facilities; interventions targeting pregnant women to improve early care-seeking, adherence to IPTp, and ITN uptake; prompt care-seeking in case of fever, and SBC related to ITN care.

Supporting Data

Table A-19. Prioritized behaviors with FY 2022 funds

Behavior	Target Population	Geographic Focus	Justification
Correct use of ITN by households	Children under five years of age and pregnant women	Nationwide	The 2016–2017 DHS results indicated that 40% of children under five years of age and 44% of pregnant women slept under an ITN the previous night. This suggests an urgent strategy that ensures permanent availability of ITN and intensifies regular SBC activities promoting correct use and maintenance of ITNs.
Early ANC and IPTp uptake	Pregnant women	Nationwide	The 2016–2017 DHS results indicated that 13% of pregnant women received at least three doses of IPTp vs. 49% of women having attended at least four ANC visits. Routine data in the statistical yearbook annual report 2019 showed that 54% received IPTp3. The target in 2023 is to achieve at least 80% that receive three doses of IPTp. This suggests an SBC strategy to encourage women of reproductive age to attend early ANC and complete the recommended number of ANC visits. The statistical yearbook annual report 2019 documents the early ANC utilization rate was 54%. This suggests an SBC strategy to encourage women of reproductive age to attend early ANC and complete all ANC recommended.
Prompt care-seeking for fever	Children under five years of age and pregnant women	Nationwide	The 2020 DHIS2 data revealed that the malaria fatality rate is 1.4% at hospitals and highlighted the number of severe malaria cases at 247,580. This suggests an SBC strategy to adhere to seeking early care in case of fever to reduce and avoid death due to malaria and be in line with the NMCSP 20218–2023 goal of zero deaths due to malaria by 2023.

Key Question 2a

For correct use of ITNs by households what gaps exist in understanding the barriers to the adoption and maintenance of malaria prevention and treatment behavior?

For the prioritized behavior on correct use of ITN among children under five years of age and pregnant women, the gaps in understanding the barriers is related to the lack of survey/research on the behaviors that lead to the low use of ITNs distributed to that category of beneficiaries and the rest of the population. During the period of 2018–2023 NMSP, NMCP plans to conduct a Malaria Behavior Survey, which will be supported by MSF/Belgique in 2022.

Supporting Data

There is no evidence-based information to guide the design of impactful SBC intervention to address the correct use of ITNs by households. The NMCSP plans to conduct a Malaria Behavior Survey in 2022 to better understand and identify barriers to optimal use of ITNs.

Key Question 2b

For early ANC visit and IPTp uptake, what gaps exist in understanding the barriers to the adoption and maintenance of malaria prevention and treatment behaviors?

Supporting Data

For prioritized behavior 2 on the IPTp uptake of at least three doses of SP, with an early first ANC visit for ITNs. The gaps are in understanding the barriers to low use of early and optimal ANC. However, USAID is supporting the NMCP in conducting a rapid assessment on barriers to IPTp that will allow them to better understand the barriers and thus come up with an appropriate SBC or relevant strategy to involve pregnant women to complete the recommended doses of IPTp.

Key Question 2c

For prompt care-seeking for fever, what gaps exist in understanding the barriers to the adoption and maintenance of malaria prevention and treatment behaviors?

Supporting Data

The 2016–2017 DHS found that advice or treatment was sought within the same or next day of fever onset in only 52 percent of febrile children. In 2020, the DHIS2 reported 25,530 severe malaria cases including 9,325 cases (36 percent) representing children under five years of age. The malaria case fatality rate varied between 0.8 percent and 1 percent according to the 2021 DHIS2 quarterly report.

Key Question 3

What is the country's capacity to design, implement, and monitor SBC interventions at the national and subnational level?

The final review of the Malaria Strategic Plan 2013–2017 identified a lack of skilled staff and appropriate SBC material to affect behavior changes in malaria control at each level of the health system. While the country has communication experts to design, implement, and monitor SBC interventions at national and subnational level, capacity-building in SBC intervention design, implementation, and monitoring is needed in the country with a strong TA during the whole process. The country needs a strategic planning of SBC intervention, the implementation plan, and a monitoring and evaluation plan.

Supporting Data

SBC strategy for malaria control is a major cross-cutting approach to support adherence to positive malaria behaviors (service utilization and vector control) in the community. The communication plan of the 2018–2023 NMCSP and its monitoring and evaluation plan are key guidance documents that guide and optimize SBC interventions. SBC interventions are reviewed and guided by a TWG of partners engaged in SBC, which updates an SBC implementation plan every three months.

The NMCP has a dedicated SBC team who have been trained on the ground without any official qualification in SBC. This team needs TA on how to use programmatic results to design and implement SBC activities as well as monitoring and evaluation tools and processes.

At health facilities, the expectation is to conduct sensitization sessions every morning by health promotion technicians to all patients according to current health problem priorities established by the health center. These SBC activities suffer from weak coordination, weak decentralization, lack of updated or appropriate SBC materials, and inadequate supervision from the district or central level.

Conclusions for SBC Investments

Strategies and interventions on SBC related to malaria control need to be aligned to the programmatic data regarding low IPTp1 and IPTp3 uptake as well as ITN durability study preliminary results regarding use and care to ITN. The behavior study planned for 2022 to be supported by MSF/Belgique and the rapid assessment on IPTp uptake barriers supported by USAID will give supporting data to strengthen the strategies with the support of TA from available resources to the NMCP. The emphasis will be put on interpersonal communication rather than mass communication to ensure impact.

USAID will support the national programs (NMCP and RMNHP) to align with WHO recommendations in terms of ANC, IPTp, and ITN use. USAID will contribute to the national efforts to develop a relevant SBC strategy and introduce new approaches in SBC for ANC and IPTp.

Please see FY 2022 USAID budget tables for a detailed list of proposed activities with FY 2022 funding.