

BURUNDI MALARIA PROFILE

I. ABOUT

Launched in 2005, the [U.S. President's Malaria Initiative \(PMI\)](#) supports implementation of malaria prevention and treatment measures as well as cross-cutting interventions. PMI's 2021 – 2026 strategy, [End Malaria Faster](#), envisions a world free of malaria within our generation with the goal of preventing malaria cases, reducing malaria deaths and illness, and eliminating malaria in PMI partner countries. PMI currently supports 27 countries in Sub-Saharan Africa and three programs across the Greater Mekong Subregion in Southeast Asia to control and eliminate malaria. USAID has been investing in Burundi's fight against malaria since Fiscal Year (FY) 2010 and Burundi began implementation as a PMI country in FY 2023. Please see the Burundi Malaria Operational Plan for more information on PMI's approach and investments.

II. CONTEXT

Table 1: General Demographics and Malaria Situation

Population	13,097,399 inhabitants in 2023 (Institut de Statistiques et d'Etudes Economiques du Burundi), projection of population 2010-2050, based on the 2008 General Census)
Population at risk of malaria	100%
Malaria prevalence	27% (DHS, 2016-2017)
Malaria incidence/1,000 population at risk	528.1/1,000 population at risk (Health Statistics Yearbook, 2021)
Peak malaria transmission	April-May November-December

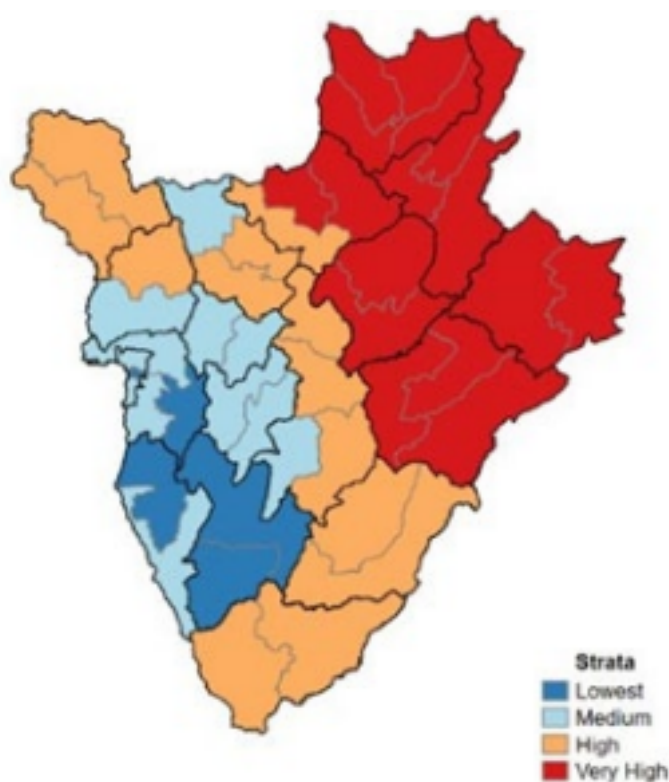
During FY 2022, the Government of Burundi created two new districts. The former two districts of Kinyinya (Ruyigi province) and Bururi (Bururi province) have each been divided into two new districts—the health district of Gisuru and the health district of Rutovu—increasing the number of districts in Burundi from 47 to 49.

STRATIFICATION

The map below shows a new epidemiological risk classification established in 2021 by the stratification exercise dividing Burundi in four zones:

1. **Very high-risk zone** with incidence in the northeast and central regions, covering six provinces—Kirundo, Muyinga, Karuzi, Cankuzo, Ruyigi, and Ngozi—and representing 17 of the 49 health districts;
2. **High-risk zone** covering 14 districts, consisting of the belt running from the northwest to the southeast;
3. **Medium-risk zone** made up of parts of the north, central west, and southwest, covering 12 districts; and
4. **Very low-risk zone** made up of the south and center-west of Burundi, covering six health districts.

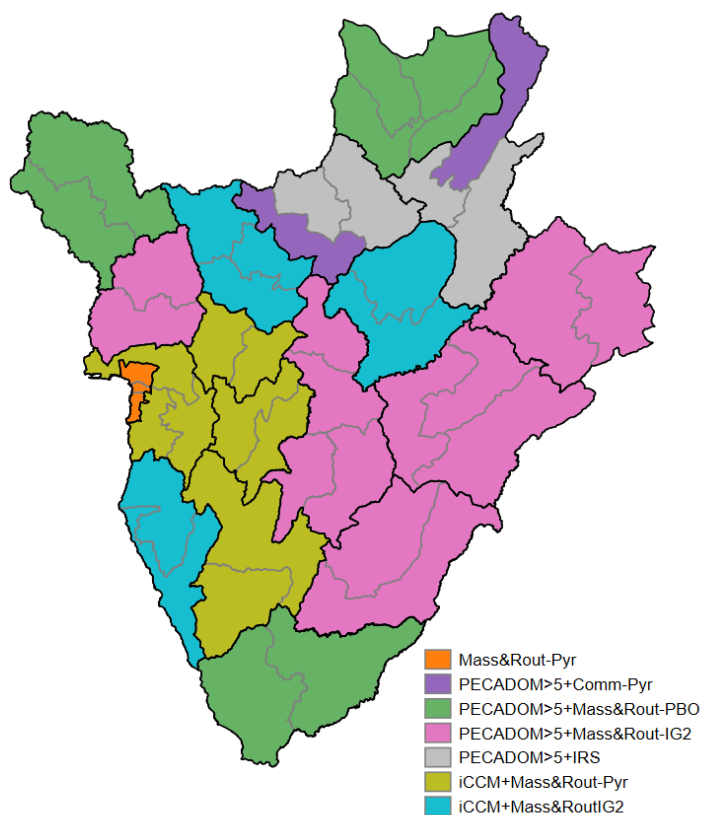
Figure 1: Classification of Provinces by Epidemiological Risk after the Stratification Exercise in 2021



A stratification exercise for Burundi was updated in 2023, but the epidemiological risk by province does not change from the 2021 stratification.

The map below from the 2023 stratification exercise shows the type of interventions to be implemented by province. Seven combinations of the key interventions highlighted will help to control the malaria epidemic.

Figure 2: Recommended Combination of Interventions by Province from the Current WHO Stratification (February–March 2023)



Source: 2023 Burundi Sub-national Tailoring.

Table 2: Coverage of Population by Mix of Interventions from the 2023 Stratification

	Intervention Mix (Case Management+IPTp Everywhere)	Population*	%
1	Mass campaigns and routine distribution of Pyrethroid ITN (Mass&Rout-Pyr)	645,352	6.2
2	iCCM + Community case management in adults + Pyrethroid ITN through routine channels (PECADOM>5 + Comm-Pyr)	647,995	6.2
3	iCCM + Community case management in adults +PBO ITN through mass campaigns and routine channels (PECADOM**>5 + Mass&Rout-PBO)	2,013,414	19.2
4	iCCM + Community case management in adults + IG2 ITN through mass campaigns and routine channels (PECADOM>5 + Mass Rout-IG2)	2,606,285	24.8
5	iCCM + Community case management in adults + Indoor Residual Spraying (PECADOM>5 + IRS)	1,037,343	9.9
6	iCCM + Pyrethroid ITN during mass campaigns and routine channel (iCCM + Mass&Rout-Pyr)	1,744,159	16.6
7	iCCM + IG2 ITN during mass campaigns and routine channel (iCCM + Mass&RoutIG2)	1,795,763	17.1

iCCM: integrated Community Case Management; IG2: Interceptor G2 nets; IPTp: intermittent preventive treatment during pregnancy; ITN: Insecticide-treated mosquito net. IRS: Indoor residual spraying; PECADOM: *Prise en charge à domicile* (French acronym for community case management of malaria for all ages; Pyr: pyrethroid.

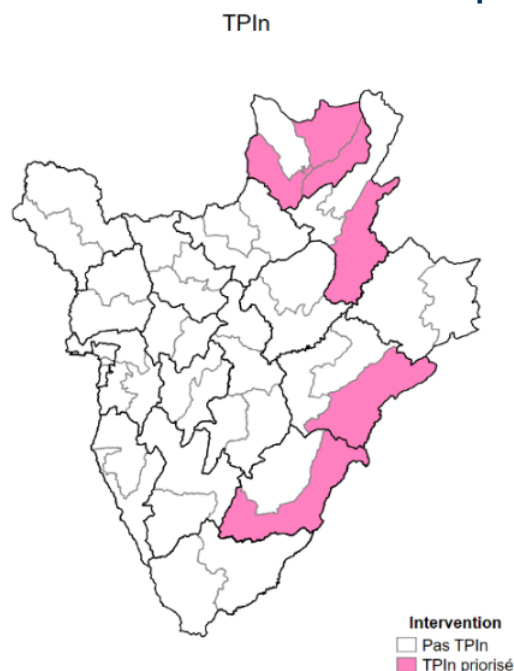
Facility case management and intermittent preventive treatment for pregnant women (IPTp) are recommended in all 18 provinces.

PECADOM in addition to iCCM for children under five years of age.

Two districts of the intervention combining PECADOM and IRS.

*Based on estimated population of 2021.

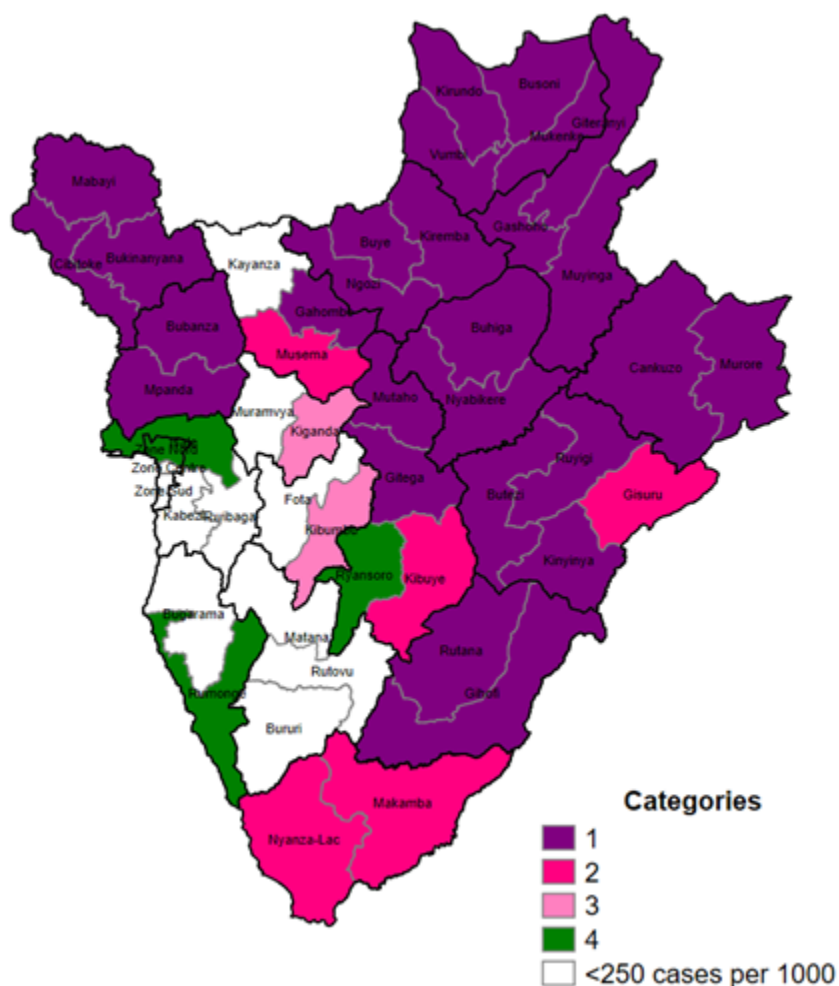
Figure 3: Perennial Malaria Chemoprevention targeted zones



Source: 2023 Burundi Malaria Sub-National Tailoring

While perennial malaria chemoprevention is not yet implemented, the stratification identified six districts with the highest rate of all malaria cases occurring in children under one year of age for this intervention.

Figure 4: Malaria Vaccine Targeted Zones



Source: 2023 Burundi Malaria Sub-national Tailoring.

The following table shows the provinces and districts targeted for malaria vaccine introduction and their priority levels.

Table 3: List of Provinces and Districts Classified as Level 1 Priority for Malaria Vaccine

Level of priority	Provinces	Name of health district
1	Bubanza	DS Bubanza, DS Mpanda
1	Cankuzo	DS Cankuzo, DS Murore
1	Cibitoke	DS Bukinanyana, DS Cibitoke, DS Mabayi
1	Karusi	DS Buhiga, DS Nyabikere
1	Kirundo	DS Busoni, DS Kirundo, DS Mukenke, DS Vumbi
1	Muyinga	DS Gashoho, DS Giteranyi, DS Muyinga
1	Ngozi	DS Buye, DS Kiremba, DS Ngozi
1	Rutana	DS Gihofi, DS Rutana
1	Ruyigi	DS Butezi, DS Kinyinya, DS Ruyigi, DS Gisuru

Figure 5: Map of Malaria Prevalence (2017): Percentage of Children 6–59 months of Age Who Tested Positive For Malaria by Microscopy

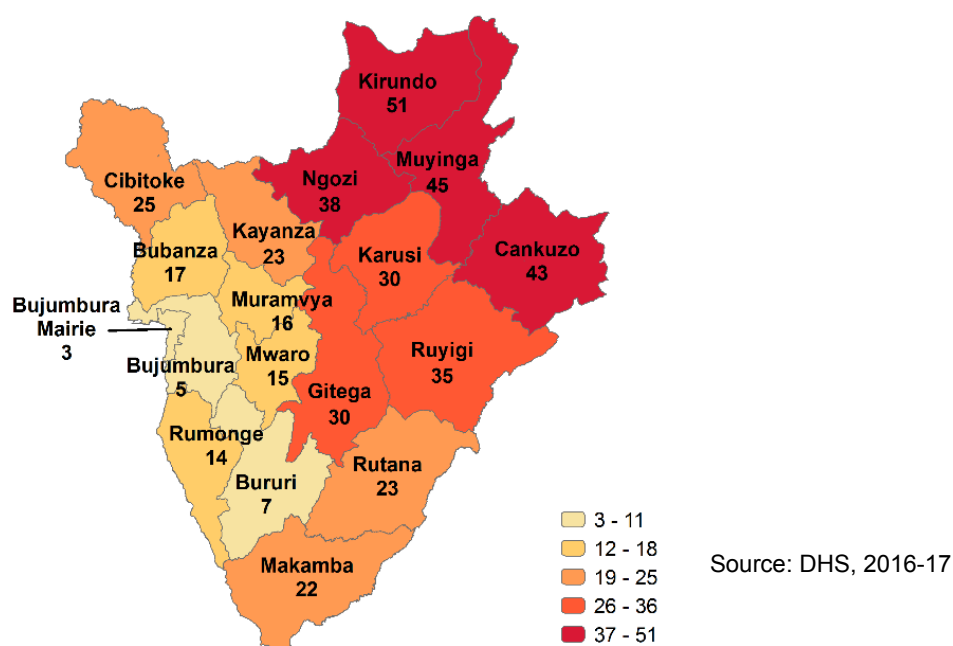
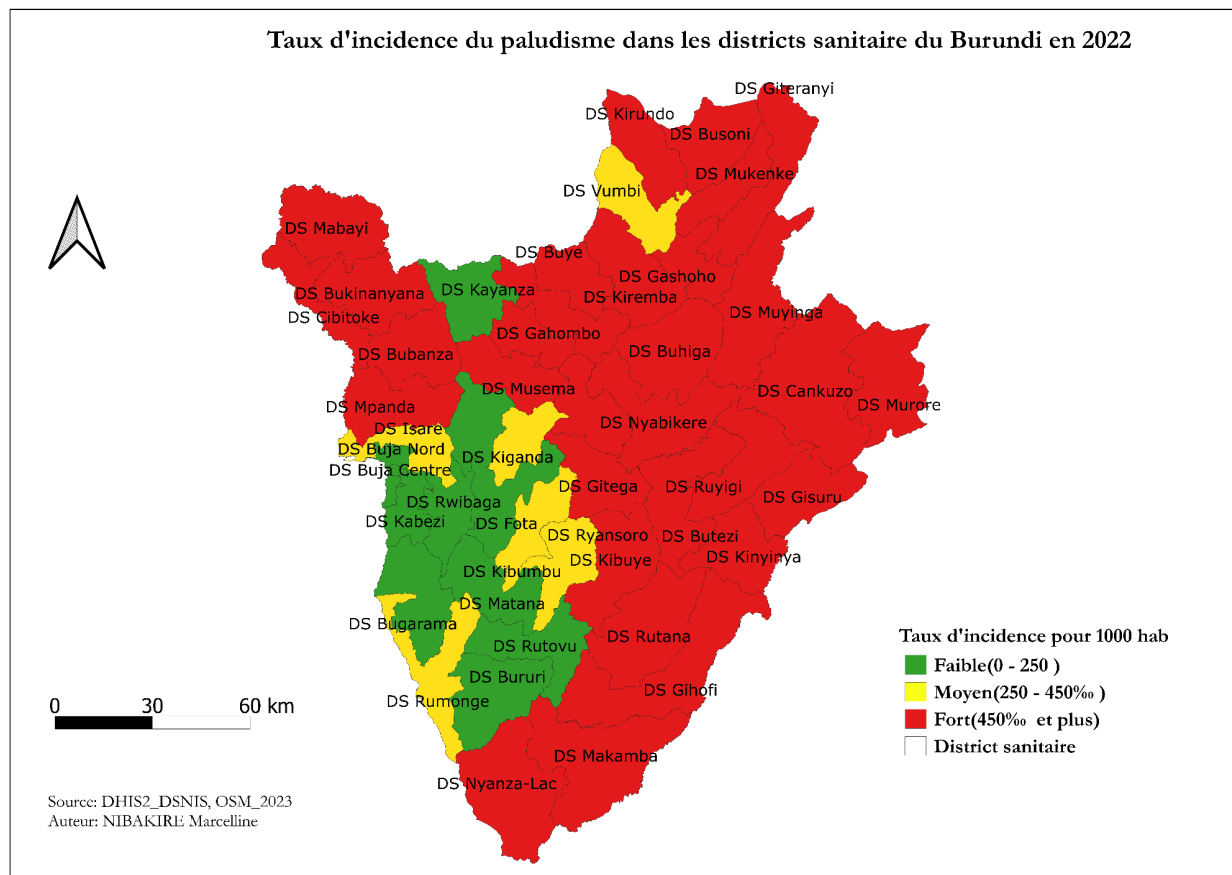


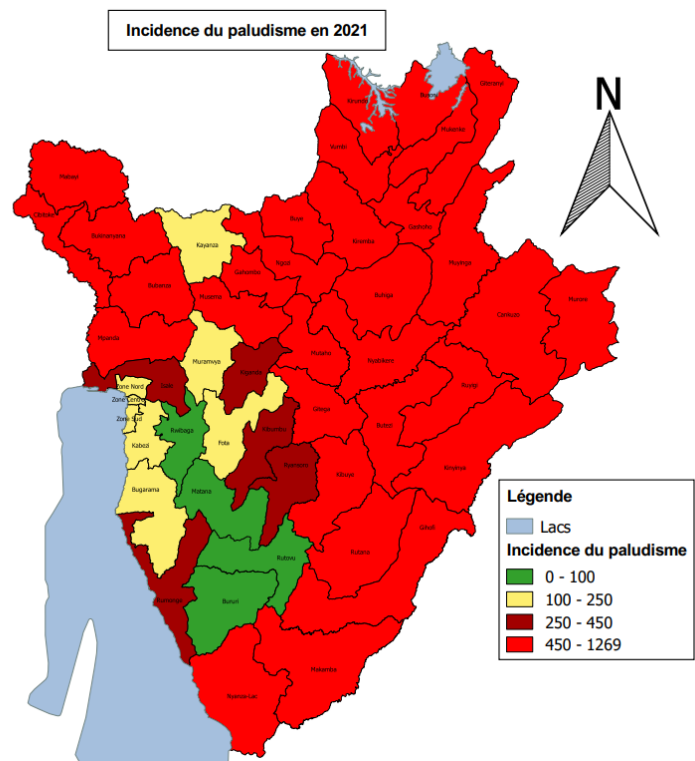
Figure 6: Malaria Incidence Map (2022)



Malaria incidence for the calendar year (CY) 2022 is as follows:

- 0 to 250 cases of malaria per 1,000 inhabitants: 12 health districts (green).
- 250 to 450 cases of malaria per 1,000 inhabitants: 6 health districts (yellow).
- 450 to 1,269 cases of malaria per 1,000 inhabitants: 31 health districts (red).

Figure 7: Malaria Incidence in 2021



Malaria incidence for the calendar year (CY) 2021 is as follows:

- 0 to 100 cases of malaria per 1,000 inhabitants: 4 health districts (green).
- 100 to 250 cases of malaria per 1,000 inhabitants: 8 health districts (yellow).
- 250 to 450 cases of malaria per 1,000 inhabitants: 5 health districts (dark red).
- 450 to 1,269 cases of malaria per 1,000 inhabitants: 32 health districts (bright red).

Note that while this map from 2021 shows 48 health districts, a new district (Gisuru) was created in FY 2022 from the two districts of Ruyigi and Kinyinya, both of which are located in the high malaria incidence area.

Table 4: Malaria Parasites and Vectors

Principal Malaria Parasites	<i>Pl. falciparum</i> , (81.6%), <i>Pl. malariae</i> (12.5%) and <i>Pl. ovale</i> (5.8%).
Principal Malaria Vectors*	<i>An. gambiae</i> , <i>An. funestus</i> . Secondary species: <i>An. ziemanni</i> , <i>An. coustani</i> , <i>An. squamosus</i> , <i>An. maculipalpis</i> , <i>An. Arabiensis</i>

*See Entomological Monitoring section of the MOP for more details on vector bionomics and insecticide resistance and Indoor Residual Spraying section for details on residual efficacy.
An.: *Anopheles*; *Pl.*: *Plasmodium*.

Monthly entomological monitoring surveys were conducted from October 2021 to September 2022 in nine sentinel sites in Burundi. One of the sites, Kiremba, in Ngozi Province, received indoor residual spraying (IRS) from the Government of Burundi; the other eight (Cankuzo,

Gihofi, Mabayi, Matana, Mpanda, Mutaho, Nyanza-Lac, and Vumbi) are non-IRS sites located throughout the country which received insecticide-treated nets (ITNs) in the 2019 mass campaign.

Summary of Distribution and Bionomics of Malaria Vectors in Burundi

According to the 2021–2022 Entomological Report, the primary vectors in Burundi are *Anopheles (An.) gambiae* and *An. funestus*, and the secondary vectors are *An. coustani*, *An. squamosus*, *An. maculipalpis*, and *An. ziemanni*. Peak transmission seasons are from March to June and October to December. The high biting seasons of each of the primary vectors are observed between October and February, with the highest biting rate of *An. gambiae* observed in December and in January for *An. funestus*. Biting rates are calculated from direct human biting rate (HBR) and vary across sentinel sites. Biting occurs predominantly outdoors, at 0.45 bites/person/hour (compared to 0.39 bites/person/hour indoors [$p=0.05$]) for *An. gambiae*. The highest biting rates were observed at Mpanda (Bubanza province). The lowest HBRs were observed at Matana (Bururi province), Gihofi (Rutana province), and Kiremba (Ngozi province) during the same October to May period. The recommended resting location is indoors, with peak biting time occurring from 12 a.m. to 6 a.m. The preferred host is human. There is a higher abundance of *An. gambiae* over *An. funestus* in all sentinel sites, except at Mabayi, where *An. funestus* is the predominant species.

Status of Insecticide Resistance in Burundi

The insecticide resistance monitoring showed that *An. gambiae* s.l. is fully susceptible to all tested insecticides: clothianidin (4µg/bottle), pirimiphos-methyl (.25 percent), chlorfenapyr (100µg/bottle), bendiocarb (.10 percent), deltamethrin (0.05 percent), permethrin (.75 percent), and alpha-cypermethrin (.05 percent). But the insecticide resistance mutation detection showed the two forms of knock-down resistance (kdr) mutation (kdr east and kdr west) and most of the samples were susceptible for Ace-1 mutation.

COUNTRY HEALTH SYSTEM

Burundi's health care system is organized through a four-tier system: community level, operational level (health centers, district hospitals), intermediate level (four regional hospitals), and central level (four national hospitals). In addition to the national hospitals, there are private hospitals and clinics that participate in health care activities. The public health centers are the gateway to the health care network and offer a minimum package of activities including health promotion, along with preventive, curative and rehabilitative care. The district hospital is the first level of referral and offers a complementary package of curative activities, including the management of severe malaria. Regional hospitals are the second level of referral offering specialized health packages. Finally, the National Referral Hospital offers high-level specialized services. Private sector facilities provide curative health care and represent 27 percent of the total number of health centers. In total, Burundi has 1,251 health centers and clinics, of which

657 are public centers, 399 are private-for-profit clinics, 155 are faith-based, and 40 are community-based centers. There are 80 hospitals, of which 51 are public hospitals at the regional level, plus 10 private-for-profit hospitals, 28 faith-based hospitals/clinics, and one is a community-based hospital set up by a civil society organization (Source: Annuaire statistique de 2022). Most of these faith-based facilities and all the private-for-profit facilities have no access to PMI or Global Fund procured malaria commodities for preventive or curative care. Health facilities experience staff shortages and rapid turnover. According to the 2016-2017 DHS, the majority of Burundians do not have medical insurance, 78 percent among women and 79 percent among men, while health care is subsidized for children under five years of age, for pregnant women for pregnancy-related illnesses, and for malaria diagnosis and treatment.

Malaria in Pregnancy: According to the Burundi National Malaria Control Strategic Plan (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 through four ANC contacts. The new IPTp national guidelines in place from FY 2023, recommend a minimum of six doses of IPTp through eight contacts. Each dose is administered under directly observed therapy (DOT) during antenatal care (ANC) visits, starting in the second trimester (15 weeks gestation), at one-month intervals, and up to the day of delivery. Also, 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 in the second and third trimesters. This guideline is under review to comply with the November 2022 WHO guideline. The coordination of malaria in pregnancy (MIP) and ANC services between the national malaria control program (NMCP) and maternal/reproductive health programs is improving through the national working group focused on maternal and child health, which is the coordination body between these two programs.

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. 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 both national and regional hospitals. The new treatment protocol recommends the use of artemether-lumefantrine 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 also adopted PECADOM (*prise en charge à domicile*, or community case management of malaria for all ages) in 2021 as a national

strategy, with 21 districts currently integrating the strategy and a plan for expansion, pending availability of funding.

Community health workers (CHWs) are an integral part of Burundi's health system. In the calendar year 2021, there were 5,320 CHWs implementing iCCM among the 11,698 CHWs of all cadres (some of which are limited to health promotion activities) identified by the MOH. These CHWs report to health facilities and are supervised by health promotion technicians. Each CHW covers an average of 500 children under five years of age for iCCM intervention, representing 40 percent of the targeted population. The iCCM strategy is implemented in 42 of the 49 health districts of the country. The mechanism used to incentivize the CHWs is community performance-based financing, which started in 2018. Currently, performance-based community financing covers 13 of the country's 18 provinces (the five non-covered provinces are Bujumbura Mairie, Bujumbura, Bururi, Rumonge and Rutana). The goal is to cover all provinces.

Pharmaceutical management: The NMCSPP (2022-2027) 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 NMCSPP. The Burundian Regulatory Authority for Medicines for Human Use and Food (Autorité Burundaise de Régulation des Médicaments à usage Humain et des Aliments) is the division of the MOH charged with regulation and oversight of the pharmaceutical sector. This authority also regulates the semi-autonomous central purchasing and warehousing agency, "Centrale des Achats des Médicaments Essentiels du Burundi" in line with national pharmaceutical policy. This agency is responsible for the procurement and management of public sector pharmaceuticals destined for public health and faith-based health facilities through a push distribution system. However, community health systems are not well integrated in the existing supply chain and data management systems.

The MOH has selected an end-to-end eLMIS solution (software) and aim to be operational between 2022-2024. PMI will contribute to eLMIS scale up by procuring computers for health facilities after the facilities' needs assessment phase.

Social and behavior change: Social and behavior change (SBC) is an important component of malaria prevention and control activities. A national communication strategy for malaria was developed in 2014 and a communication plan for the fight against malaria developed in 2020. The two documents aimed to further raise awareness in the general population and increase adoption and maintenance of behaviors related to malaria prevention, diagnosis, and treatment in relation with determinants of malaria-related behaviors. The NMCP implements SBC activities using channels such as radio, print material, theater 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 were limited in 2020 and 2021. These interventions need to be improved, combined with the active engagement of civil society and community organizations and leaders.

Surveillance, Monitoring, and Evaluation: The NMCP monitoring and evaluation (M&E) plan (2018-2023) is aligned with the NMCSP 2018-2027. 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. Malaria program data is collected through the Burundi department of national health information system (DSNIS) using the district health information system (DHIS2) software deployed nationwide. The reporting of health data is done on a daily basis via registers at health centers, and these data are then transcribed into the DHIS2 by the health centers' head. The data from the community level are consolidated and integrated on a monthly basis.

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. With the support of PMI, the malaria surveillance monitoring and evaluation technical working group is functioning with four meetings held on a quarterly basis. PMI supported the production of quarterly malaria bulletins for simplified data use.

OTHER CONTEXTUAL INFORMATION

Burundi emerged from over a decade of protracted civil war in 2000, with the signing of the Arusha Peace Accord. Burundi's first democratic election after the civil war was held in 2005. However, Burundi faced a new upsurge of political instability and violence in 2015 brought on by a disputed election. The repercussions are still being felt at the socio-economic level, affecting households' financial access to health care and food.

Burundi is highly vulnerable to humanitarian shocks resulting from recurrent floods, recurrent epidemics, and displacement of populations, including refugees, returnees, and internally displaced persons (IDPs). Heavy rainfall causing widespread flooding and landslides, and rain insufficiency in the northeastern and eastern provinces, are the primary drivers of internal displacement in Burundi, adversely affecting up to 50,000 people in any given rainfall season. The International Organization for Migration (IOM) cited approximately 113,408 IDPs, of which 83 percent were affected by natural disasters in the month of September 2021 (Source: IOM, September 2021). Since September 2017, over 190,000 Burundians returned through the joint Government of Burundi-United Nations High Commissioner for Refugees voluntary repatriation exercise yet nearly 263,000 Burundian refugees, many of whom fled the 2015 political violence, still remain in regional countries as of January 2022. The Government of Burundi actively promotes refugee returns, but this strains provincial and local government resources, and returnees face food insecurity and other reintegration challenges upon return to their

communities. Burundi hosts more than 75,000 refugees and asylum-seekers, primarily from the Democratic Republic of the Congo, resulting from civil strife dating back to 2006.

In terms of gender norms, men's dominant role in household decision-making may result in men selling the bed nets without women's permission and may limit women's ability to make decisions regarding malaria prevention for them and their children. This is anecdotal however, as gender issues regarding net use were not covered in the 2018 knowledge, attitudes, and practice survey.

III. NMCP STRATEGIC PLAN

The National Malaria Strategy is aligned with WHO strategy along two objectives: 1) Reduce malaria-related morbidity by at least 60 percent by 2027, and 2) Reduce malaria-related mortality to zero by 2027 with 11 specific objectives (listed below) and seven 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 2027.
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 IPTp according to the national guidelines by 2027.
4. Ensure that 100 percent of suspected malaria cases received in health facilities are treated in accordance with national policy by 2027.
5. Ensure that 100 percent of suspected malaria cases are managed at the community level by 2027, in accordance with national policy.
6. Ensure that at least 90 percent of health facilities and CHWs have a continuous supply of antimalarials by 2027.
7. Ensure that at least 80 percent of the population adopts malaria control behaviors by 2027.
8. Strengthen the managerial, technical, and institutional capacities of the NMCP at all levels by 2027.
9. Ensure that the NMCP has sufficient human, material, and logistical resources for the monitoring and evaluation of malaria interventions by 2027.
10. Capture, analyze, and disseminate at least 95 percent of malaria data including research results for decision making by 2027.
11. Ensure 100 percent early detection of malaria epidemics by 2023 and control 100 percent of epidemics detected within two weeks by 2027.

Major innovations in the national malaria strategy plan are as highlighted below:

- Extension of community-based health services by 2026: In order to increase access to health services, community-based care will be extended from nine in 2022 to 28 health districts for all ages through PECADOM and for children under five years of age through

iCCM from 42 health districts in 2022 to 46 health districts (all health districts in the country excluding the three districts of Bujumbura). The emphasis will be put on high quality service, and increased access to malaria commodities for CHWs by strengthening the supply chain system at community level.

- The revision of the national guidelines for ANC visits and IPTp uptake. The new guidelines include eight ANC contacts including five ANC contacts in the facility, the first ANC visit at 13 weeks of pregnancy, the IPTp1 at 15 weeks of pregnancy, then at 28 weeks (IPTp4), 36 weeks (IPTp6) and 40 weeks of pregnancy. It also includes three contacts with CHWs at community level for IPTp2 at 20 weeks of pregnancy, IPTp3 at 24 weeks and IPTp5 at 32 weeks of pregnancy.
- The introduction of Community IPTp: CHWs will be in charge of sulfadoxine-pyrimethamine provision in the community through three contacts as well as provision of SBC messages towards the pregnant woman for adherence to IPTp uptake.
- Strengthening entomological surveillance by 2026: Four sentinel sites will be set up with the support of the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), in addition to the USAID-supported nine sentinel sites already operating, to ensure coverage of all the country's geo-epidemiological zones.
- Introduction of malaria vaccine by 2025: Burundi is among the countries that submitted Gavi's application in January 2023 with the objective of introducing the RTS,S/AS01 vaccine targeting 250,000 children under two years old in 25 districts.
- Introduction of perennial chemoprevention for children under two years old is being considered by the NMCP.

IV. KEY MALARIA DATA

EVOLUTION OF KEY SURVEY BASED MALARIA INDICATORS

Table 5: Key Survey Indicators

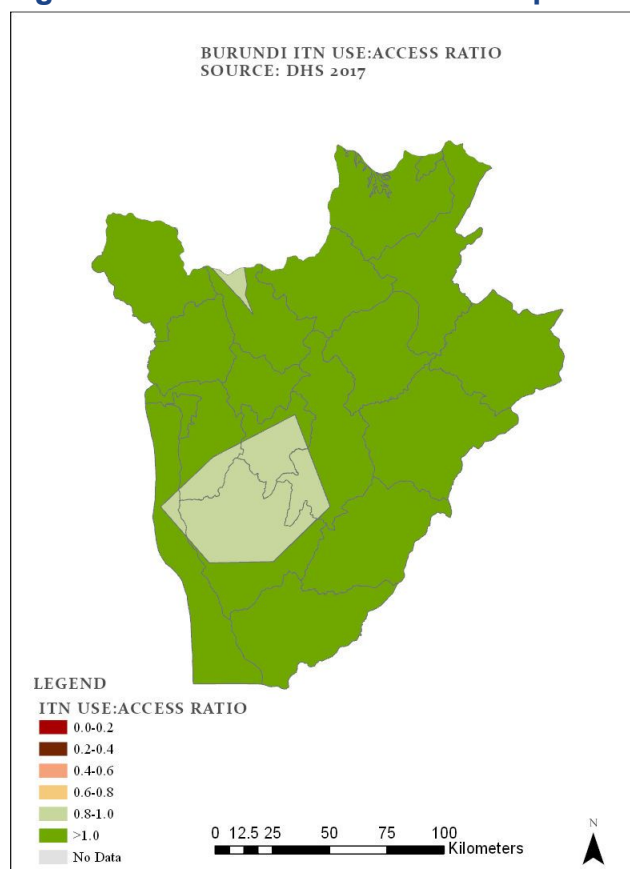
Indicator	2010 DHS	2012 MIS	2016–17 DHS
% of Households with at least one ITN	52.0	63.0	46.2
% of Households with at least one ITN for every two people	23.5	25.5	17.1
% of Population with access to an ITN	39.1	46.0	32.3
% of Population that slept under an ITN the previous night	37.8	48.6	34.7
% of Children under five years of age who slept under an ITN the previous night	45.0	53.8	39.9
% of Pregnant women who slept under an ITN the previous night	49.7	56.1	43.9
% of 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

% of 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
% of 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
% of Women who attended 4 ANC visits during their last pregnancy	33	N/A	49
% of Women who received three or more doses of IPTp during their last pregnancy in the last two years	0.0	0.1	12.6
Mortality rate per 1,000 live births among children under five years of age	96 (88-105)	N/A	78 (71-85)
% of Children under five years of age with parasitemia by microscopy	N/A	17.0	27.0
% of Children under five with parasitemia by RDT	N/A	22.0	38.0

Source: Demographic and Health Survey; Malaria Indicator Survey.

ACT: Artemisinin-based combination therapy; ANC: antenatal care ITN: insecticide-treated mosquito net; RDT: rapid diagnostic test.

Figure 8. ITN Use:Access Ratio Map



Source: Koenker, H., Olapeju, B., Toso, M., Millward, J., & Ricotta, E. Insecticide-Treated Nets Access and Use Report. Breakthrough ACTION and PMI VectorWorks projects, Johns Hopkins Center for Communication Programs. (August 2019. Updated April 2020): <https://breakthroughactionandresearch.org/resources/itn-use-and-access-report/burundi/>

Map based on data from the 2016-2017 DHS shows that the ratio of ITN use to access use in Burundi is very high, ranging between 0.83 in Bururi to 1.21 in Karusi. It should be noted, however, that this high use:access ratio is calculated from both low access (32 percent) and low use (35 percent). While there is a need to increase access to ITNs, the low overall percentage of household members using an ITN indicates a need for strong SBC activities promoting net use to accompany efforts to increase ITN access.

Table 6: Evolution of Key Malaria Indicators Reported through Routine Surveillance Systems

Indicator	2018	2019	2020	2021	2022
# of All-cause patient consultations	18,527,521	23,217,505	20,604,736	21,941,937	21,015,711
# of Suspect malaria cases ¹	N/A	N/A	N/A	N/A	N/A
# of Patients receiving diagnostic test for malaria ²	10,350,401	15,187,477	10,501,521	12,328,863	12,640,687
# of Malaria cases ³	5,654,535	9,739,929	5,383,129	6,758,569	8,251,354
# of Confirmed cases ⁴	5,648,749	9,720,860	5,363,503	6,753,290	8,238,245
# of Presumed cases ⁵	5,786	19,069	19,626	5,279	13,109
% of Malaria cases confirmed ⁶	99.9	99.8	99.6	99.9	99.8
Test positivity rate ⁷	54.6	64.0	51.0	44.2	42.0
# of Malaria cases among children under five years of age ⁸	2,648,215	4,472,015	2,601,527	2,951,271	2,646,791
% of Cases in children under five years of age ⁹	45.9	66.6	41.6	43.7	39.06
# of Severe cases ¹⁰	36,527	399,244	282,303	300,007	321,637
# of Malaria deaths ¹¹	2,738	3,525	2,977	2,516	2,488
# of Facilities reporting ¹²	1,152	1,158	1,155	1,171	1,257
% of Data completeness ¹³	93.8	93.7	98.2	99.5	98.5

¹ Suspected malaria cases are not reported by the health system. 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 # of confirmed cases divided by total # of cases.

⁷ Confirmed cases divided by # of patients receiving a diagnostic test for malaria (RDT or microscopy).

⁸ Outpatient and inpatient, confirmed and unconfirmed.

⁹ Total # of children under five years of age cases divided by total # of cases.

¹⁰ Severe cases are defined as 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 # of monthly reports from health facilities divided by # of health facility reports expected (average for the calendar year).

Community-level data are integrated into the broader HMIS, and these numbers are inclusive of both community and health facility-level data.

Table 7: Disaggregated Community-Level Data

Indicator	2020	2021	2022
# of Patients receiving malaria diagnostic test from a CHW	454,659	595,421	1,721,513*
Total # of of malaria cases reported by CHWs ¹	328,793	468,288	1,340,208*
% of CHW reported cases (among total malaria cases) ²	6.1	6.9	19.8

¹ Includes all ages, confirmed and unconfirmed.

² Total # of malaria cases reported by CHWs/Total # of malaria cases in the previous table.

*These data show 78% positivity rate at community level, while the positivity rate nationwide is 44.2%. This requires more supervision and more data quality assurance at community level.

CHW: community health worker.

V. Other Implementation Information

Table 8: Results of Durability Monitoring

Site	Survey round and actual time since distribution (months)	Attrition due to wear and tear (%)	Remaining nets in serviceable condition (%)	Remaining nets hanging over sleeping space (%)		Optimal insecticidal effectiveness in bioassay (%)
				Cohort	Other	
Kirundo Health District (PermaNet 3.0)	Baseline: (7.8)	3.4	84.0 (N=300)	60.7	81.8	100.0
	12-month: (13.4)	9.5	72.8 (N=246)	70.0	55.6	100.0
	24-month: (26.5)	16.4	51.4 (N=175)	64.0	60.0	100.0
Muyinga Health District (Yorkool)	Baseline: (7.8)	16.5	79.1 (N=235)	60.9	41.9	100.0
	12-month: (13.4)	19.0	66.4 (N=217)	46.1	42.9	100.0
	24-month: (26.5)	30.4	55.9 (N=145)	26.2	40.6	100.0

The last durability monitoring supported by USAID ended in March 2022. The study included standard nets and PBO nets from the 2019 mass campaign. Results of the two-year data collection suggested a concerning level of attrition as shown in Table 8. The country and Vectorlink decided to discontinue the 36-months data collection due to potential bias in the endline study given that there would be new nets distributed in September 2022 through the mass distribution campaign, six months prior to the end of monitoring.

A Therapeutic Efficacy Study (TES) was conducted in 2018 with many challenges with data collection. The results of this study (with 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 1.4 percent in Kigobe (located in the capital Bujumbura), 2.4 percent in Kazirabageni (southern Burundi), 3.4 percent in Buhiga, and 0 percent in Mutoyi. These results showed that ASAQ remained effective within the lower limits of WHO standards. Nevertheless, the country decided to 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 conducted a TES in 2021 in three of the four sites of the 2019 TES, Kazirabageni being left out because of low patients to be included. The results are shown in the table below.

WHO plans another TES in 2023 with the aim of including a new site bordering Rwanda or Tanzania, where artemisinin resistance has been monitored.

Table 9: Summary of Completed Therapeutic Efficacy Studies

Year	Site	Treatment arm(s)	Efficacy (PCR-corrected adequate clinical and parasitological result) for each drug at each site
2018	Mutoyi, Kigobe, Buhiga, and Kazirabageni	ASAQ, AL	Kigobe: 97.1% Mutoyi: 92.3% Buhiga: 93.2% Kazirabageni: 92.7%
2021*	Buhiga (Karusi), Mutoyi (Gitega) et Kigobe (Mairie de Bujumbura)	AL	Kigobe: 97.5% Mutoyi: 94.3% Buhiga: 80%

*Preliminary unpublished results without polymerase chain reaction (PCR) correction.

VI. Key Policies

Table 10: Policies in Burundi

National Malaria Strategic Plan (2021–2027)	
National Surveillance Monitoring and Evaluation Plan (2018–2023)	
National Digital Health Strategy (2020–2024)	
National Communication Strategy (2018–2023)	
National Supply Chain Strategy/Master Plan (2021–2025)	
National Vector Control Strategy and Integrated Vector Management Plan (published 2019)	
Malaria Case Management Policy (published 2019)	
Community Health Policy PECADOM policy (2021)	
Prevention of Malaria in Pregnancy Policy (2022)	
What is/are the first-line treatment(s) for uncomplicated <i>P. falciparum</i> malaria*?	AL
What is/are the second-line treatment(s) for uncomplicated <i>P. falciparum</i> malaria*?	Dihydroartemisinin + piperazine (these drugs are not available in the country, Alternative quinine)
What is/are the first-line treatment(s) for uncomplicated <i>P. vivax</i> malaria?	N/A
What is the first-line treatment for severe malaria?	Injectable artesunate
In pregnancy, what is the current first-line treatment for uncomplicated <i>P. falciparum</i> malaria in the <u>first trimester</u> ?	Quinine +Clindamycin (revision is ongoing to use AL as recommended by WHO)
Given the WHO policy change to recommend AL as treatment for uncomplicated malaria in the first trimester, does the MOH plan to update the policy on treatment of MIP in the first trimester? And if so, what is the status of this policy change and implementation of the new policy? (please include any plans for training providers on the new policy)	YES, policy under review.
In pregnancy, what is/are the first-line treatment(s) for uncomplicated <i>P. falciparum</i> malaria in the <u>second and third trimesters</u> ?	AL
In pregnancy, what is the first-line treatment for severe malaria?	Injectable artesunate (policy currently recommends injectable quinine for the first trimester. PMI is working with the MOH to update this policy).
Is pre-referral treatment of severe disease recommended at peripheral health facilities? If so, with what drug(s)?	Injectable artesunate

Is pre-referral treatment of severe disease with rectal artesunate recommended for community health workers?	Yes
What is the # of CHWs currently providing iCCM?	5,320
What is the country's target for the number of CHWs providing iCCM?	No target set, the rationale for iCCM is one CHW per <i>subcolline</i> and currently 46 health districts out of 49 provide iCCM according to the national guidelines of covering all the country except Bujumbura mairie, where health services accessibility is assumed to be high.
What percent of the country's target is met?	46 out of the 49 districts covered (1 CHW per <i>subcollines</i> regardless of the size of households).
Does the country have a policy that enables the routine, regular payment of salaries/stipends for CHWs?	Yes, performance-based financing.
Do CHWs have the authority to test and treat all ages for malaria?	Yes, in limited high-burden settings with plans for expansion.
At what gestational age is the first dose of IPTp-SP to be given to pregnant women according to the national guidelines for malaria and MCH?	Week 13.
Do the national ANC guidelines reflect the WHO 2016 recommendation of 8 ANC scheduled contacts (plus one additional contact for early initiation of IPTp at 13-16 weeks)? If not, how many ANC contacts are recommended?	Yes, 8 ANC contacts are recommended.
What is the status of training ANC providers on the WHO recommended 8+ contacts?	They are not yet trained, but training is planned in FY 2023 to align with the new guidelines.
Have HMIS/DHIS2 and ANC registers been updated to include 8+ contacts?	Yes.
Are ANC/IPTp data collected as single months where the January 2022 data represent the number of doses administered in January 2022, or cohort data, representing the cumulative data from pregnancies which began 6 months prior?	Data is collected as a single month.
Is ANC/IPTp provided by facility staff conducting ANC outreach to communities?	Yes.
Can CHWs deliver IPTp and if so, which specific cadres and beginning with which dose? How many districts are targeted for c-IPTp implementation?	Until now no, but the new guidelines will allow CHWs to deliver IPTp2, IPTp3, and IPTp5. Initially, 10 health districts of high burden provinces are targeted for the community IPTp, with a gradual expansion to cover all high burden provinces and all other provinces.

AL: artemether-lumefantrine; ANC: antenatal care; CHW: community health worker; HMIS/DHIS2: health management information system/district health information system 2; iCCM: integrated community case management; IPTp: intermittent preventive treatment of malaria during pregnancy.

VII. PARTNER LANDSCAPE

Table 11: Partner Landscape

Partner	Key technical interventions	Geographic coverage	Funding amount or in-kind contribution	Timeframe
Global Fund	- Support for nationwide mass campaign in 2022. - Procurement of national needs for SP. - Training and supportive supervision in 18 provinces.	- National for ITN campaign. - IRS in four health districts (Muyinga, Gashoho, Buye, Kiremba) out of the 49. - iCCM + PECADOM in 9 health districts out of the 49. - National for MIP. - National for case management.	\$65,600,000	Current grant covers 2021–2023.
Government of Burundi	- Procure 10% of RDT and ACT for national needs. - Implement case management at facility and community. - Organize training and supportive supervision at least once a year in 18 provinces.	National.	N/A	Annually.
UNICEF	- iCCM in seven provinces. - Supportive supervision.	Seven out of 18 provinces (Gitega, Kirundo, Ngozi, Cibitoke, Bubanza, Ruyigi, and Kayanza).	N/A	2012–Ongoing.
<i>Médecins Sans Frontières</i> Belgium	- Testing and treatment in Kinyinya and Ryansoro health districts. - Durability Monitoring.	Testing and treatment at district hospital.	N/A	2015–Ongoing.

iCCM: integrated community case management; ITN: insecticide-treated mosquito net; IRS: indoor residual spraying; MIP: malaria in pregnancy; PECADOM: community case management of malaria for all ages (a French acronym for prise en charge à domicile); RDT: rapid diagnostic test.