Rwanda Biomedical Centre

Healthy People, Wealthy Nation

MALARIA MATCHBOX ASSESSMENT IN RWANDA

FINDINGS REPORT

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Abbreviations and Acronyms

ACT	Artemisinin-based Combination Therapy
AL	Artemether-Lumefantrine
ANC	Antenatal Care
CBO	Community-based Organisation
CCM	Country Coodinating Mechanism
CDC	Centers for Disease Control
CHW	Community Health Worker
CSO	Civil Society Organisation
DHS	Demographic and Health Survey
DHS	Demographic and Health Survey
FBO	Faith-Based Organisation
FGD	Focus Group Discussion
GF	Global Fund to Fight AIDS, Tuberculosis and Malaria
GoR	Government of Rwanda
HBHI	High burden to high impact
HMIS	Health management information system
IPTp	Intermittent Preventive Treatment in pregnancy
IRS	Indoor Residual Spraying
ISA	Impact Santé Afrique
ITN	Insecticide-Treated mosquito Net
IV	Intravenous
KAP	Knowledge, attitudes, and practices
KI	Key Informant
LLIN	Long-lasting Insecticide-treated Net
MIP	Malaria in Pregnancy
MIS	Malaria Indicator Survey
MoH	Ministry of Health
MOP	Malaria Operational Plan
MOPDD	Malaria and Other Parasitic Diseases Division
MPPD	Medical Procurement and Production Division
MSP	Malaria Strategic Plan
NGO	Non-governmental Organisation
OP	Organophosphate
OR	Operational Research
PEPFAR	President's Emergency Plan for AIDS Relief
PMI	President's Malaria Initiative
RBC	Rwanda Biomedical Center
RBM	Roll Back Malaria
RDT	Rapid Diagnostic Test
SBCC	Social and behavior change communication
SM&E	Surveillance, Monitoring, and Evaluation
STOMP	Stomping out Malaria in Africa
TES	Therapeutic Efficacy Study
TRP	Technical Review Panel
UNDP	United Nations Development Program
USAID	United States Agency for International Development
WHO	World Health Organization

Executive Summary

Introduction

Rwanda is one of the global leaders in gender equality progress. In 2017, the World Economic Forum ranked Rwanda in the Top 10 best countries in closing gender gaps[1]. During the writing of the application and the malaria program review, a quick review of available data was conducted to help guide on specific potential human rights or gender barriers in the context of malaria. The Malaria matchbox tool kit in addition to the Rwanda national gender policy were reviewed alongside the National census and the Gender Equality Strategy UNDP Rwanda.

In response to a resurgence of malaria cases in Rwanda in 2016, a situational analysis was conducted, and a malaria contingency plan was developed. The analysis included an assessment of the malaria burden among key vulnerable populations, including children under 5 years of age, pregnant women, refugees, and prisoners. An analysis of sex-disaggregated data by key malaria indicators was also conducted and showed no significant difference between male and female children in terms of malaria prevalence and care seeking. The results documented in the malaria contingency plan guided the NSP and the funding request.

It should be noted that a thorough and up-to-date analysis was not conducted to ensure equity in the implementation of activities, although the NSP and funding application took into account all potential human rights and gender barriers. Vulnerable populations such as children under 5, pregnant women, refugees, prisoners, boarding school children, armed forces/police, and people living in hard-to-reach areas were identified and strategies to reach them were developed.

Rationale for the Assessment

In light of this situation, Rwanda recognized that the desk review conducted was based on data that may not be current. Therefore, it was proposed and agreed that during 2021, the NMCP conduct an in-depth analysis using the Roll Back Malaria (RBM) Matchbox as a guide to ensure that implemented interventions address documented barriers, identify any additional human rights or gender-specific barriers in the context of malaria, and provide guidance on specific interventions to address these barriers.

This assessment was conducted between April and May 2021, under the coordination of the NMCP, by Olivia Ngou (RBM Consultant) of Impact Santé Afrique based in Cameroon and Innocent Turate (National Consultant), with support from CCM Rwanda. Technical assistance for data analysis and interpretation of results was provided by the Data Analysis Team of Impact Santé Afrique (ISA) from Cameroon (see **Appendix 6**). The results of the assessment are expected to help the country, through the NMCP and its partners, to better understand the nature and extent of barriers to equity in terms of gender and human rights in particular, to assess the effectiveness of current efforts to address and reduce barriers in the delivery of malaria interventions, and to identify opportunities for adapting or strengthening these efforts to achieve greater equity in malaria-related health outcomes across the country.

[1] https://www.weforum.org/agenda/2017/05/how-rwanda-beats-almost-every-other-country-in-gender-equality/

Participation

A total of 262 respondents participated in the assessment. This number takes into account 22 respondents to individual interviews including state and non-state officials involved in the implementation of malaria interventions (Government Officials, Health Centers, etc.), representatives of NGOs, CBOs, etc., as well as 240 participants in the FGDs of vulnerable groups such as: Mothers or Nannies of children under five, Fishermen, Mine workers, Pregnant women, Correctional Services Staff and Prisoners, Refugees, Rice farmers, Security guards, Female sex workers, Hotels staff and clients, Students and schools staff, Truck drivers. Women represented 54,5% of the respondents to the interviews and 56,3% of the participants in the FGDs. In addition, among the participants in the FGDs, young people aged 15 to 24 and people aged 60 and over were represented by 12% and 3.3% respectively.

Findings

While the NMCP Strategy for malaria control amongst vulnerable groups in the country appears comprehensive, and programme data suggest some success in reaching most of the at-risk population, findings from the assessment suggest that gaps may persist. These include barriers related to:

- Challenges related to general knowledge, attitudes and practices amongst vulnerable groups with regard to malaria;
- Specific negative attitudes and beliefs about malaria interventions, particularly LLINs;
- Trends in health seeking behaviour linked to traditional beliefs;
- Physical and financial accessibility;
- Negative experiences with health facilities;
- The influence of gender norms on women's and children's access to malaria services, …

In many categories of equity barriers, gender is a key factor in determining who is most affected by the barrier and who is not.

In general, the evaluation found that a number of stakeholders are attempting to address some of the barriers to equity that were identified by the evaluation. There has been an awareness of their existence, even if the means to reduce or remove these barriers are difficult to design, plan or implement. However, equity considerations have been incorporated into general malaria control programmes for vulnerable groups identified by previous studies.

The results of the evaluation show that much remains to be done in the fight against malaria, despite the significant investment by the government, the Global Fund and other partners, and the efforts of the many governmental and non-governmental partners working in the fight against malaria in the country's districts.

The evaluation relied heavily on qualitative data, which makes it difficult to assess the magnitude or level of some of the barriers described.

These results also indicate that there are some important gaps that could be due to these barriers. These include the following:

- **Insufficient involvement of vulnerable populations**, particularly mine workers, refugees and rice farmers, in the effective implementation of malaria prevention and treatment measures. Indeed, it appeared that some people use impregnated mosquito nets for other purposes. Efforts still need to be made to mobilize all vulnerable population groups to take ownership of the real risks of malaria and to

be increasingly at the center of efforts to promote malaria prevention or to encourage rapid diagnosis and access to treatment.

- **Limited commitment to addressing the use of self-medication and traditional treatment of malaria.** The results of the evaluation clearly showed that some vulnerable populations are strongly committed to buying malaria drugs from local pharmacies without a prescription. In addition, some prefer traditional remedies in case of illness.
- **Limited material resources compared to the needs of vulnerable populations.** Many participants noted the challenge of insufficient material and financial resources to adequately address the needs of vulnerable people. This has implications for the coverage of basic interventions.
- **Insufficient health personnel in terms of numbers compared to the demand for health care.** Informants from the health centers mentioned that they were often overwhelmed by the number of patients, which could affect the quality of care provided.

Recommendations

Below are a set of preliminary recommendations for action arising from the findings of the assessment. These are meant for further deliberation and elaboration during the stakeholder validation and action-planning workshop.

Equity barrier	Preliminary recommendations
Social-cultural and linguistic barriers:	• Recruit more community health workers, especially from vulnerable populations, by building their capacity in malaria prevention and control to mentor their peers locally. • Ensure that interventions take into account problematic attitudes and beliefs about malaria prevention, especially about LLINs.
Traditional beliefs and practices for malaria treatment	• Sensitise traditional healers and herbalists on the need to refer their patients to health centers. • Involve local drug sellers in activities related to malaria prevention and control, especially by showing them the harmful effects of self-medication. • Increase community awareness, showing people that traditional treatment does not exclude going to the hospital.
Physical and environmental barriers	• Strengthen the delivery of malaria prevention and control interventions in communities living in remote areas. • Develop alternatives to LLINs for effective malaria prevention and control among fishermen and refugees.
Financial barriers	• Provide regular information on free malaria services and raise awareness of other inappropriate charges for malaria prevention and treatment products.

Addressing the influence of gender norms	• Increase efforts to integrate malaria prevention and control elements into activities to reach women and children in critical situations for their health and survival needs. • Maintain a high level of involvement of women in community health education and promotion activities for malaria prevention and control as well as other health needs.
Monitoring and accountability	• Improve the availability of disaggregated data on malaria prevention and control efforts in the country. • Improve the sensitivity and specificity of current monitoring systems to assess progress to reduce or remove equity barriers for identified vulnerable communities. • Collect both qualitative and quantitative data for a better assessment of the situation in the target groups.

1. Introduction

The scaling up of vector control interventions between 2005 and 2011 in the Republic of Rwanda resulted in an 87% reduction in malaria morbidity, leading to pre-elimination levels in at least eight of the country's 13 districts. However, an increase in malaria cases and deaths was observed between 2012 and 2017. The World Malaria Report 2017 reports an approximate increase of 800,000 malaria cases in the Republic of Rwanda between 2015 and 2016.

Malaria thus remains a major cause of morbidity and mortality, especially among vulnerable populations such as refugees, prisoners, pregnant women, and children under 5. Several interrelated factors have contributed to the resurgence of malaria: pyrethroid resistance, rising temperatures and annual rainfall, environmental changes due to human activity, the precariousness of populations, changing mosquito behaviour and sub-optimal implementation of universal coverage with effective interventions.

To address this increase in cases, Rwanda has been implementing a comprehensive contingency plan since 2016 that incorporates the development of strategies to reach vulnerable populations such as children under 5, pregnant women, refugees, prisoners, boarding school children, armed forces/police and people living in hard-to-reach areas. This contingency plan includes home-based malaria management for all ages through community health workers in all 30 districts, a universal LLIN coverage campaign throughout the country and IRS spraying targeted at high endemic districts.

Therefore, it has become important for the National Malaria Control Programme (NMCP) and its partners, donors and other stakeholders to better understand why certain sub-populations and population groups in the country benefit more from malaria control interventions while others benefit less or not at all. With this in mind, the NMCP undertook the Malaria Matchbox in selected districts of the country that appear to be more endemic, where the local context is disrupted by the arrival of refugees and where some of the most vulnerable groups to malaria are present, including prisoners, pregnant women, and children under 5 years old. The results of this assessment are intended to help the NMCP, and partners active in the districts concerned, to better understand the nature and extent of the barriers, to adjust current efforts to address and reduce barriers to the delivery of malaria interventions and to identify opportunities to adapt or strengthen these efforts in order to achieve the best malaria-related health outcomes.

The assessment was conducted by NMCP Rwanda, Olivia NGOU (RBM consultant, Impact Santé Afrique), and Innocent TURATE as National Consultant.

1.1. Aims and Objectives of the Assessment

The main objective of this assessment was to identify the most vulnerable groups, barriers, including those related to human rights and gender related to current malaria control programmes for the most vulnerable groups (ex-children under five, pregnant women, refugees and prisoners), as well as the bottlenecks affecting access and effectiveness of malaria interventions programmes.

The specific objectives of the assessment were:

- Analyze existing plans, articles, reports and other documents, in order to understand the country context in terms of equity in malaria control programs for the most vulnerable groups (children under five, pregnant women, refugees, prisoners, etc.);
- Identify the characteristics (age, sex, gender, profession, ethnicity, etc.) associated with those vulnerable groups and possibly other underserved populations;
- Identify the obstacles (physical, cultural, ethnic, economic, gender, etc.) faced by those specific groups in accessing malaria control services;
- Gather the views of beneficiaries, implementers and stakeholders of malaria control programs;
- Evaluate the level of satisfaction of beneficiaries regarding access to services and the quality of the malaria control services provided;
- Identify the key factors that influence the use of malaria control programs by those specific groups.

2. Methodology

2.1. Assessment Design

The assessment was designed according to the Match Box guidance and involved the following stages and components: planning and preparation; desk review; primary data collection; data analysis and interpretation; results reporting; stakeholder validation and action-planning.

2.2. Choice of respondants and locations

Mothers or Nannies of children under five, Fishermen, Mine workers, Pregnant women, Correctional Services Staff and Prisoners, Refugees, Rice farmers, Security guards, Female sex workers, Hotels staff and clients, Students and schools staff, Truck drivers living in Rubavu, Mayange, Mahama Refugee Camp, Muhanga, Rubavu, Ngoma, Gasabo, Rusizi, Nyamasheke, ISCO, Rwamagana, Nyanza, Kigoma, Kicukiro and Kigali were the specific focus populations and locations for the assessment based on consultations between the NMCP, CCM, and other key stakeholders for the malaria response in Rwanda.

2.3. Participants and Participant Engagement Strategy

A total of 262 respondents participated in the assessment. This number takes into account 22 respondents to individual interviews including state and non-state officials involved in the implementation of malaria interventions (12 for Government Officials & 4 for Health Centers), 6 representatives of the other 2 targets (1 of NGOs_UN Agencies_PR_SRs & 5 of CSOs_CBOs_FBOs), as well as 240 participants in the FGDs of vulnerable groups such as: 21 Mothers and Nannies of children under five, 18 Fishermen, 10 Mine workers, 22 Pregnant

women, 48 Correctional Services Staff and Prisoners, 17 Refugees, 10 Rice farmers, 22 Security guards, 38 Female sex workers, 12 Hotels staff and clients, 16 Students and schools staff and 6 Truck drivers (see **Appendix 1** for the detailed characteristics of the participants, and **Appendix 2** for the list of organisations whose representatives were interviewed as key informants).
Participant engagement was achieved through convenience sampling. Government officials and organisational representees were selected based on information provided by the NMCP and Steering Committee members. The other targets were identified with the help of local governmental and non-governmental actors working with these populations.

2.4. Data collection

Data collection involved desk review (secondary data), key informant interviews and focus group discussions (primary data).

Desk review

At the start of the assessment, a desk review of literature was conducted, including Government of Rwanda policies and plans, programme reviews, journal articles, donor plans and reports, and development partner and humanitarian agency reports.

Interview and focus group discussions

Primary data were collected either through individual interviews with key informants or through FGDs, using open-ended questions. The FGDs and interviews were conducted by trained data collectors using discussion guides (see **Appendix 3**). Data collectors were selected from experienced staff who had previously worked on similar tasks with NMCP (04) and CSOs/CBOs (04). Each FGD was conducted by a team of two data collectors who worked simultaneously: 01 evaluator in charge of conducting the FGDs and 01 reporter. The interviews and the FGDs were conducted in Kinyarwanda or in English at the request of the participants.

Fieldwork

Primary data collection took place over three days according to the deployment plan established for this purpose and validated by the NMCP (see **Appendix 4**). The data collection was carried out simultaneously by four teams of two members each, who were deployed to the various target sites, while also conducting interviews with key informants.

A pre-test was conducted in Kigali and consisted of FGDs with two groups of FSWs, as well as a one-on-one interview with the WHO representative and the head of the Rwanda NGO forum, who assisted in finalizing the questionnaires. Data collection lasted 7 days and was supervised by the national consultant and the NMCP, the NMCP representative and the CCM permanent secretary. Data collectors were equipped with an audio recorder to monitor data quality. One data collector took notes, another acted as an evaluator and asked questions. The data collectors had two additional days to check the quality of the data and cross-check for data cleaning when necessary, and returned to the respondents when necessary to ensure that all questions were answered. The entire data collection process was conducted under strict COVID-19 prevention and control measures, including wearing masks, using alcohol-based hand sanitizers, and following social distancing guidelines by staying or sitting at least 2 meters away from others.

Figure 1: FGD with fishermen in Rubavu district on May 19th, 2021

Figure 2: FGDs with Female Sex Workers in Rubavu district on 20th May 2021

After collection, the different teams had an additional 2 days to enter the data in English into data entry forms developed using the Kobo Collect application and available online via hyperlinks.

2.5. Data analysis

Different analysis strategies were used depending on the type of data. For the desk study, a thematic analysis was conducted using the research questions as a guide to identify and classify relevant themes. For the interview and FGD data, data collectors first filled out handwritten "answer sheets" in which they summarized, in short phrases or sentences, the main points raised by the various participants, either individually or in groups. Subsequently, these data were transcribed in English into online forms and submitted on the KoboCollect platform. From there, it was possible to generate databases in Excel sheets that were then reviewed for quality and undertake disaggregation of responses. The exploitation and analysis of the data was then carried out using NVIVO software. This software, specialized in qualitative analysis, allowed us to use the data from the FGDs and interviews to organize the ideas that emerged. The data analysis focused on the objectives of the evaluation, while using the methodology recommended by the Malaria Matchbox tool.

Finally, to link the analytic outputs from the different data sets, triangulation was used whereby preliminary findings were generated and checked back against the different data sources, and then further revised. This process was undertaken for several rounds until the assessment team was confident that the findings were an accurate and comprehensive reflection of the different views and experiences of the participants, as well as of the other data sources drawn on as part of the assessment process.

2.6. Results Reporting and Validation

The results were presented at a stakeholder workshop for further review and validation. The validated results were then used as the basis for developing an action plan to reduce or remove barriers to gender equity, human rights, access, uptake, and retention of malaria interventions for vulnerable communities in Rwanda.

2.7. Ethical Considerations

Permission to conduct the evaluation was granted by the NMCP. In addition, the evaluation team observed the following ethical practices:

- Verbal and written informed consent was obtained from all participants, according to a standard consent statement that was read and signed before the interviews or FGDs began (see **Appendix 5**);
- Separate verbal consent was sought for the recording of interviews or FGDs. A number of key informants declined to have their interviews recorded, and detailed notes were taken;
- No names or other identifying data were recorded on the data collection tools. Access to the recordings and the KoboCollect data platform was limited to evaluation team members;
- Compliance with Rwanda's child protection policies was observed throughout the evaluation. Therefore, no individuals under the age of 15 were interviewed.

2.8. Limitations

The study experienced some limitations:

- Not all key informants were available to participate in the assessment during the time allotted for data collection. However, a sufficient number and variety were available to

meet the data collection objectives of having a thorough representation of the range of views and interests in relation to the assessment aims and objectives.

- Almost all of the data was collected in Kinyarwanda, and then the data had to be transcribed into English using the input mask developed for this purpose. This had an impact on the duration of the collection and on the quality of the data, without however creating biases that could alter the information sought.
- Some participants expressed dissatisfaction with the length of the questionnaires and answer sheets. Although refreshments were provided during the FGDs, this did not fully alleviate these concerns.
- Lack of the transportation fees and bonus for participants in the assessment.
- A guide for FGD was not provided for the specific target "prison guards". As a result, data for this particular target was collected using the guide provided for the target "security guards", resulting in a slight bias in the information sought.
- As the assessment collected only qualitative data, it is not possible to measure the levels of influence of barriers among vulnerable groups and therefore to prioritise them for interventions.

3. Findings

3.1. Vulnerable communities and gaps in malaria control interventions in Rwanda

From 2005 to 2011, Rwanda achieved significant reductions in the burden of malaria through the successful implementation and scale-up of malaria control interventions. In 2008, malaria dropped from being the number one cause of morbidity in children under age five years of age to the number three cause of morbidity, and by 2012 dropped further to number four. However, from 2012 to 2016, malaria incidence increased every year in Rwanda from 48 per 1,000 populations in 2012 to 403 per 1,000 in 2016, revealing the fragility of the gains achieved. Rwanda saw more than an eight-fold increase in reported malaria cases, from 564,407 in 2012 to 4,794,778 in 2016, a 41% increase in mortality and 19% increase in test positivity rate. This increase was observed in all districts including the districts that were previously identified as pre-elimination districts. This was traced to other putative factors such as climatic and environmental determinants, agricultural development, technical, operational, and financial challenges, as well as factors related to human mobility (trans-border population movement with imported vector and parasite), malaria parasites, and vectors, including resistance to drugs to drugs and insecticides.

This sustained reversal of malaria gains observed in malaria pre-elimination districts, the entire population was now experiencing a malaria endemic environment shifted the overall strategy to malaria control. In addition, in response to the increase in cases, the Government of Rwanda granted free malaria diagnosis and treatment to the most economically vulnerable populations.

The good news is that the combination of interventions to improve access to malaria control services and prevention, Rwanda has recorded a sharp decline in malaria infection cases in the last three years. Malaria cases in Rwanda decreased from 4.8 million in 2017 to 1.8 million in 2020, and severe malaria infections dropped from 18,000 in 2016 to 3,000 in 2020, the RBC said in a statement. Malaria-related deaths also fell from 706 in 2016 to 148 in 2020, due to the efforts made by the government of Rwanda, as well as the participation of the communities.

As an example, in 2019-2020, there was a decrease in malaria incidence and mortality as follows:

- 38% reduction in Malaria Incidence from 2018/19 to 2019/2020 and 20% from 2017/2018 to 2018/2019
- 37% reduction in un-complicated malaria Cases from 2018/2019 to 2019/2020 and 15% from 2017/2018 to 2018/2019
- 38% reduction in severe malaria cases from 2018/19 to 2019/2020 and 34% from 2017/2018 to 2018/2019
- 39% reduction in malaria deaths from 2018/19 to 2019/2020 and 31% reduction from 2017-2018 to 2018-2019
- By June 30, 2020, over 58% of all malaria cases are being treated at community level by CHW)

Determinants of malaria transmission and their roles control and elimination in Rwanda

The transmission dynamics of malaria are complex, involving factors pertaining to the malaria parasites, the insect vectors, the human hosts, and the environment. Three parameters were used to put the entire population of Rwanda at risk of malaria disease: (i) receptivity of the country, given by the presence, distribution, seasonal abundance and bionomics of the mosquitoes transmitting malaria; (ii) the susceptibility of the vector, that is its ability to become infected with Plasmodium falciparum; (iii) vulnerability of the country, that is the presence of malaria reservoirs, given by the gametocyte carriers able to infect the vector preserving malaria transmission.

An understanding of the link between malaria transmission, epidemiologic, entomologic and social and climatic variables, together with other human-related factors, which determine vulnerability and risk to malaria disease, is therefore necessary for developing appropriate measures. It is also a paramount to select interventions targeting specific high-risk or vulnerable groups, which would significantly reduce transmission towards malaria elimination, and guaranty equity access to malaria prevention and control services.

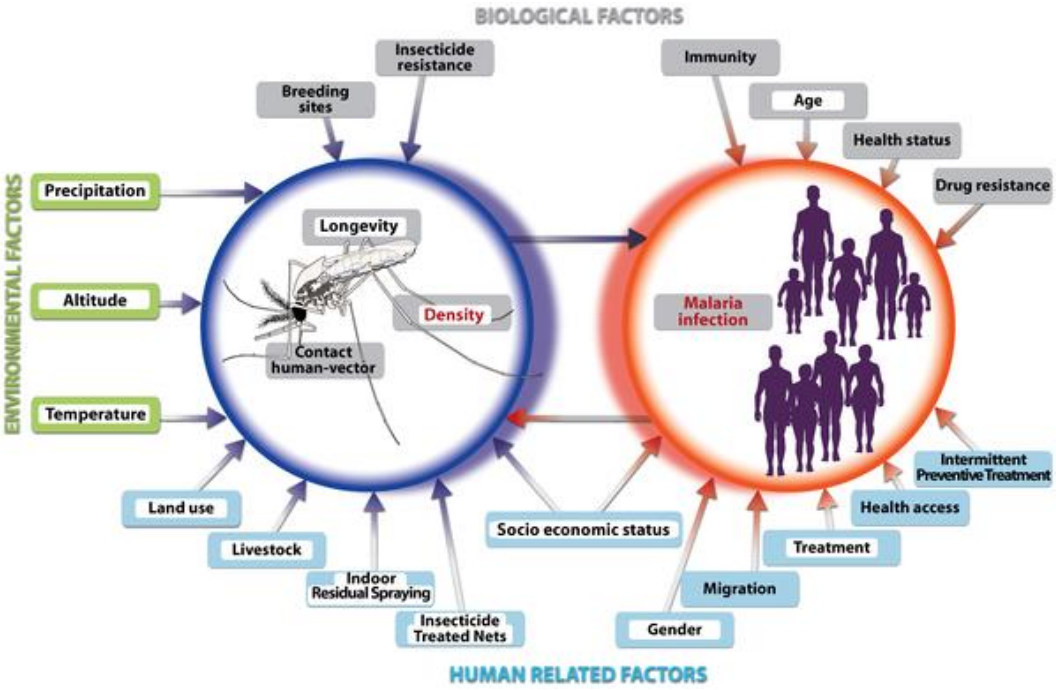
The level of risk and vulnerability to human populations living in a malaria endemic area like Rwanda varies markedly across different areas and between individuals, due to vector distribution, transmission rates, and malaria incidence rate. In line with combined strategies for malaria elimination, identifying gaps of high levels of social vulnerability to malaria can help decision-makers provide tailor-made interventions in the most vulnerable and high-risk populations in Rwanda. As malaria control efforts progress towards elimination, it is increasingly important to understand factors that influence the persistence of malaria transmission, despite the application of internationally recognized standard control measures, even when malaria incidence in the surrounding region decreases.

Although these strategies have temporarily reduced the overall malaria infection, they are ineffective for sustaining malaria reductions without addressing the proximate causes of malaria transmission and ultimate causes of malaria. These causes are rooted in the social structure, agro-ecological settings, and demographic pressures observed in the country. Successful malaria elimination therefore needs to expand on classic approaches, which mostly focus on environmental factors, entomological and epidemiological factors and should also consider the social, economic, demographic, and access-related factors that shape the vulnerability of the population.

The current public health approach for the NMCP in Rwanda is still based on the Global Health Initiative strategy, which is also focusing on the WHO classic definition of vulnerable population (pregnant women and children under five years of age and immigrants, etc.) in order to reduce malaria burden through funding specific interventions and strengthening the health care system. There is also recognition that socioeconomic, cultural, geographical, gender and human right contribute to the level of risk for malaria infection or severe disease progression, as a function of access to and use of health services. Along with several of the aforementioned vulnerable populations with limited or reduced immunity, these vulnerabilities and malaria risks are largely still under-researched and often not considered in national policies and strategies to control and eliminate malaria.

Heterogeneity in malaria risk in Rwanda is explained and influenced by three risk factors affecting exposure and response to malaria infection, which are (i) environmental factors such as altitude and climate; (ii) biological factors related to the Anopheles vector, the parasite and the human host; and (iii) human-related factors such as socio-economic status, health access, migration, gender, control activities (IRS, Insecticide Treated Net, and Intermittent Preventive Treatment) and land use (irrigation, deforestation, swamp drainage and living near breeding sites.

Figure 3: Conceptual model of important risk factors affecting malaria prevalence in the African Highlands



Source: Malaria and Other Parasitic Diseases Division 2013

Monitoring the most important risk factors for malaria disease helps to identify zones and population at higher risks and those who are most vulnerable, in order to more adequately prevent and control increases in malaria.

Environmental and climatic factors favorable to malaria endemic in Rwanda

Malaria stratification mapping and predisposing factors

Studies provide evidence of malaria transmission is clustering in small geographical and ecological zones, showing the pattern of spatial variations and temporal distribution of mosquito presence and malaria prevalence in Rwanda where populations share the same factors of transmission, such as climate and environmental conditions. As Rwanda strives to eliminate malaria infection by 2030, local interventions have to be more targeted to the areas of the most needs. To achieve this, the IVM has been adopted since 2013, based on local ecology, malaria epidemiology and socio-economic factors to eliminate pockets of malaria transmission by effective interventions targeted to the high-risk areas.

The malaria transmission in Rwanda is mesoendemic in the plains and prone to epidemics in the high plateaus and hills. Exposure to biting mosquitoes depends on different variables related to physical or landscape features such as proximity to vector breeding sites, landscape features and weather and climate conditions. The country is divided into four natural ecological zones based on epidemiological determinants, including elevation, climate, plasmodic index (Plasmodium infestation), Annual Parasite Incidence (API) per districts (defined as the ratio between the number of cases reported and the population at risk) and disease vectors for the purpose of guiding malaria interventions:

Low Endemicity Zone < 100 API per 1000: The first stratum extends from Lake Kivu to the Congo-Nile Divide at elevations ranging between 1,460 and 1,800 meters. The plasmodic indices among children here are generally between 5% and 30%.

Moderate Zone 100-250 API per 1000: The second stratum consists of a north-south band 160 km long and 20 to 50 km wide, located east of the first stratum between the elevations of 1,800 and 3,000 meters. The plasmodic index here is under 2%.

High Endemicity Zone: 250-450 API per 1000: The third stratum is situated on the central plateau between the elevations of 1,000 and 2,000 meters. The plasmodic indices vary widely here, ranging from 10 to 50%. This area is at risk of malaria epidemics, many of which have been recorded at elevations ranging between 1,675 and 1,860 meters. Malaria-endemic pockets in the valleys provide the starting points for these epidemics.

Highest Endemicity Zone: > 450 API per 1000: The fourth stratum covers the lower eastern shelf of the central plateau at elevations ranging between 1,000 and 1,500 meters, where malaria is endemic and appears to be stable.

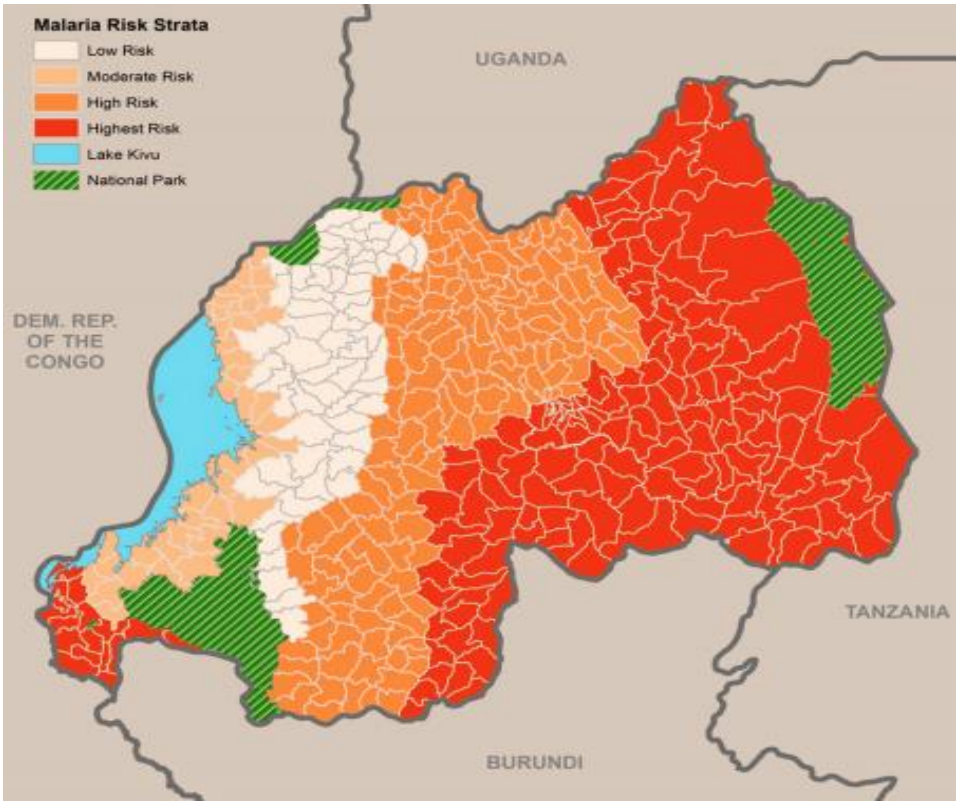
Within these four large strata, micro-stratification is also possible because of topographical variations and agricultural activity in the valley. Malaria is now present in sectors and at altitudes where the disease was not previously a major public health concern. Residents in these locations are poorly prepared to combat malaria and are therefore highly predisposed to malaria epidemics.

Malaria stratification in Rwanda has been studied since the 1960s by Meyus et al., who delineated malaria ecological zones based on altitude, climate, and malaria parasite prevalence.

A malaria endemicity map for Rwanda, published by the Malaria Atlas Project, shows that malaria is highly endemic in the Eastern Province lowlands, along the rivers near the bottom

of the valleys in the central plateau, and in the Southern Province and the Bugarama plain in the Western Province. The highlands in the Northern Province exhibit a very low endemicity, or absence of malaria transmission. Population living in these endemic zones have a higher risk of malaria infection, compared to those living in Northern Province. Therefore, Rwanda is divided into four malaria ecologic zones based on altitude, climate, past malaria incidence data and the level of transmission, disease-vector prevalence, risk determinants related to the human host, parasites, vectors and the environment (Figure 2).

Figure 4: Malaria risk strata in Rwanda



Source: Malaria and Other Parasitic Diseases Division 2013

Malaria elimination needs a concentration of activities towards identification of residual transmission foci or hotspots and intensification of efforts to eliminate the last few infections, located in so-called high-risk zones. The northern and the western regions, representing nearly 63% of the country, are epidemic-prone, while the remaining 37% of the country is characterized by a stable and endemic malaria transmission with main foci in the eastern and south-eastern parts. In these regions, the altitude is approximately below 1,500m a.s.l. and characterized by marshy plains, rice cultivation, and brick-making, all of which create suitable breeding sites for mosquitoes.

Although, malaria transmission occurs year-round in Rwanda and the entire population is at risk, there is heterogeneous spatial and temporal variations in mosquito presence and in malaria prevalence across the country as evident from different endemic settings, often in two peaks associated with the two rainy seasons. One from March to June and another, shorter season from November to December, alternated with a long and a short dry season and hospitals in the Eastern province report higher rates of malaria admissions and deaths than those in the other provinces. Most of the cases occur around May-June and November-

December, and studies have shown that it is related to altitude because of the high prevalence in lowlands than in highlands areas.

These hydrological microclimates are repeatedly identified as a dominant factor to the malaria risk from the different land use or land covers. Evidenced abounds in literature that malaria remains one of the most harsh health problems due to human settlement near the marshlands, like rice and sugar can farmers, miners and fish farmers.

Identified gaps in malaria control interventions

Gaps in timely access to malaria vector control tools

Rwanda, like any other sub-Saharan African country still have critical gaps in access to proven, life-saving malaria prevention and control tools, such as IRS. Although we know that IRS is one of the pillar of malaria prevention tool, the coverage gap remains huge, still very expensive, and very difficult to cover the entire country with this intervention. In addition, progress in the malaria fight is threated by the emergence and spread of mosquito resistance to insecticides.

Gaps in surveillance

There are several gaps in the surveillance system. For example, beyond the 12 sentinel sites there are still many regions where mosquito surveillance is not established because of limited funds or lack of trained entomologists. Consequently, it hinders the progress in malaria reduction, and limits community awareness on malaria vectors. A possible solution to complement the current malaria mosquito surveillance is to involve the public via citizen science-based program (CSP). Citizen science as a tool for mosquito surveillance requires an understanding of who is going to collect or report what, how, and when

Additional implementation research is urgently needed to understand how to better scale up coverage and quality of these interventions. Social interventions to improve child survival are as important as cause-specific interventions.

Gaps in Larviciding

Rwanda has large water bodies around, including rivers, marchlands, which could be a source of mosquito breeding sites.

The larviciding program is widely supported by both communities and NMCP, but there were gaps in technical knowledge, implementation and public engagement. To improve overall impact, it is important to: (i) intensify training efforts, particularly for identifying habitats of important vectors, (ii) adopt standard technical principles for applying larvicides or larval source management, (iii) improve financing for local implementation and (iv) improve public engagement to boost community awareness and participation; (iv) Use of innovation and technology. These lessons could also be valuable for other malaria endemic areas wishing to deploy larviciding for malaria control or elimination.

Community mobilization

Rwanda still cope with challenges to reduce its malaria burden but experts say the dream to eliminate disease by 2030 is only possible if community mobilization about malaria prevention is stepped-up.

Perceived severity of malaria, self-efficacy and response efficacy of malaria preventive measures, and subjective norms were reported to influence intentions to use malaria preventive measures consistently. Irritation, increase of warmth, and bed bugs were frequently cited as the main reasons for not using LLINs and distrust in sprayers affected the acceptance of IRS. Malaria prevention interventions should target individual perceptions to enhance consistent use of malaria preventive measures, using three strategies to improve consistent use and acceptance of these measures should be reinforced: ensure regular and timely access to LLINs and regular spraying activities, community mobilization and citizen engagement in malaria prevention activities.

Economic empowerment of the poor

Demographic differences, such as the differences in occupational structure may also produce different effects on malaria epidemics in different counties. Poor housing construction significantly leads to increased malaria vector density and thus possibly malaria risk in rural Rwanda. Improved housing structures are associated with a reduced risk of malaria infection and the risk of getting malaria are greater for inhabitants of the poorest type of house construction (incomplete, mud walls) compared to houses with complete cement walls and tiled roofs and better constructed houses have a significantly lower malaria incidence rate. This suggests that good house construction needs to be considered as one of the vector control strategies that can be provided for poor populations. To eliminate malaria morbidity in the population, it is important for the governments to empower the community economically, intellectually and ensure the health education and awareness is a part of the efforts to fight the endemic.

Environmental management and coping with climate change

Climate change could increase the threat of malaria in the region: Surveillance and program delivery need to improve to drive progress.

Multi-country and regional efforts cooperation

Advocacy for cross-border malaria collaboration initiatives to reduce the transmission of malaria and control.

Cooperation between neighboring countries can further support individual and collective malaria elimination efforts. Efforts for greater collaboration, increased lesson-sharing to tackle common challenges, and direct cooperation with neighboring countries to address specific border issues. With strategies such as active case detection, genotyping, and network identification, countries can better gather information about migration routes and patterns, and develop more targeted border screening techniques for high-risk groups.

Despite the growing importance of imported malaria, the largest international funder for malaria control (PMI, the GF to Fight AIDS, Tuberculosis and Malaria) are reluctant to allocate some proportion of funds of its malaria funding to multi-country proposals. Further, since the global financial crisis and ongoing Covid-19 health pandemic, reliance on funding from international donors is less certain.

Address socio-determinants of health

The strategy encompasses environmental modifications through both infrastructural development and sanitation services, to regulate not only the vectors but also the exposure to mosquito bites. It also seeks to improve public health and quality of life, and to minimize social-disparities

Intermittent preventive therapy for malaria control during pregnancy

Pregnant women are at increased risk of malaria, making this demographic group an important parasite reservoir in the community and a key target for interventions during elimination efforts, but the management of malaria is particularly complex in this population. Rwanda discontinued intermittent preventive treatment of malaria for pregnant women (IPTp) in 2008 due to significant parasite resistance to Sulfadoxine-Pyrimethamine. IPTp-SP prevents the adverse consequences of malaria on maternal and fetal outcomes, such as placental infection, clinical malaria, maternal anemia, fetal anemia, low birth weight and neonatal mortality.[76] This life-saving drugs has been shown to be highly cost-effective for both prevention of maternal malaria and reduction of neonatal mortality in areas with moderate or high malaria transmission[77].

Evidence demonstrates that SP is associated with higher mean birth weight and fewer low birth weight births across a wide range of SP resistance levels. Even in areas where a high proportion of P. falciparum parasites carry quintuple mutations, IPTp-SP remains effective in preventing the adverse consequences of malaria on maternal and fetal outcomes, with a significant benefit resulting in protection against both neonatal mortality (protective efficacy 18%) and low birth weight (21% reduction in LBW) under routine program conditions[81].

For the above-mentioned reasons above, and as Rwanda is targeting the elimination of malaria infection, with a low transmission rate, women lacking immunity will be at increased risk of acute severe disease and of death during malaria infection, the NMCP and partners should also assess whether the reintroduction of SP, in addition to ITNs to maximize their benefits.

Introduction of Malaria Vaccine

Vector control and improved access to treatment have contributed to a substantial decrease in malaria cases and deaths in Rwanda. However, despite improvements in coverage with millions of people in Rwanda receiving malaria interventions. Malaria vaccine could complement these existing malaria interventions, thereby offering the potential for further reductions in malaria burden. RTS, S is the first and, to date, the only vaccine that has been shown to reduce malaria in children, including life-threatening severe malaria, related hospital admissions and the need for blood transfusions, with 77% effective in early double blind RCTs, which could be a major breakthrough against the disease. Recently, the WHO agreed to consider the new malaria vaccine, as an additional prevention strategy.

3.2. Malaria Burden and Malaria Interventions

From 2005 to 2011, Rwanda achieved significant reductions in the burden of malaria through the successful implementation and scale-up of malaria control interventions. In a survey conducted in 2005, malaria was leading cause of morbidity of children less than five years of age. In 2008, malaria dropped to the third cause of morbidity, and by 2012 dropped further to the fourth cause of morbidity in children less than five years of age. According to data provided by the Rwanda HMIS, overall malaria incidence declined 86 percent between

2005 and 2011, outpatient malaria cases declined 87 percent, inpatient malaria deaths declined 74 percent, and malaria test positivity rate declined 71 percent. According to the 2010 Rwanda Demographic and Health Survey (DHS), malaria prevalence decreased from 2.6 percent in 2008 to 1.4 percent in 2010 in children less than five years of age. More than 95 percent of total reported malaria cases are laboratory confirmed.

From 2012 to 2016, however, malaria incidence increased every year in Rwanda from 48 per 1,000 population in 2012 to 403 per 1,000 in 2016. Rwanda saw more than an eight-fold increase in reported malaria cases, from 564,407 in 2012 to 4,794,778 in 2016. Increases in malaria cases were observed in all 30 districts (Figures 3 & 4). Ten districts, primarily in East and South Provinces, had the largest increases in malaria cases. The number of cases increased five-fold in East Province (from 356,736 in 2012 to 1.7 million in 2016), and 13-fold in South Province (from 132,108 in 2012 to nearly 1.8 million in 2016). An increase in malaria-related deaths was also reported – from 419 deaths in 2013 to 715 deaths in 2016 – but the overall case fatality rate was reported to decrease from 1.8 percent to 1.5 percent during this same period. Additionally, the DHS 2014–2015 revealed an increase of malaria prevalence among children less than five years of age (from 1.4 percent in 2010 to 2.2 percent) and stable prevalence among women aged 15–49 years (from 0.7 percent in 2010 to 0.6 percent). The Malaria Indicator Survey (MIS) 2017 confirmed the increase in malaria with prevalence (by microscopy) rising to 7.2 percent among children less than five years of age (compared with 2.2 percent in the DHS 2014-2015). The MIS 2017, which also provided the first set of prevalence estimates for other age groups, yielded aprevalence 11.2 percent among children 5–14 years of age and 5.4 percent among those ≥15 years.

In response to the dramatic increase in malaria cases and data requests from partners, the MOPDD conducted an in-depth analysis of surveillance and other data to ascertain the potential causes of the increase in cases. Among the different reasons that were identified were inconsistent vector control activities, increased rice cultivation, an increase in the total number of patients seeking healthcare in health facilities, increased number of health facilities reporting into the system, improved availability of rapid diagnostic tests (RDTs) and ACTs (encouraging patients to seek care at fully stocked health facilities), low universal ITN coverage (43 percent coverage of one ITN for every two people),2 vector resistance to pyrethroid insecticides, increased rainfall, and agricultural environmental modification. The MOPDD developed a Malaria Contingency Plan which identified improved strategies to reduce the case burden, and these strategies were incorporated into the extended Malaria Strategic Plan for 2013–2020 and implemented.

From 2016 to 2017, malaria cases in Rwanda stabilized, with 4,746,958 confirmed cases reported in 2017, minimally decreased from 4,794,778 cases in 2016. National incidence remained stable with 401 cases per 1,000 population in 2017 compared with 403 in 2016. Although cases rose slightly in East (up 14 percent) and South (up 1 percent) Provinces, case declines were noted in North, West, and Kigali Provinces. In all, 17 of 30 (57 percent) districts saw malaria cases decline from 2016 to 2017. Severe cases and deaths also declined with severe malaria incidence decreased from 39.0 per 10,000 cases in 2016 to 24.5 per 10,000 cases in 2017 (Figure 2), and malaria-related deaths decreasing from 715 in 2016 to 376 in 2017, indicating strong case management.

2 Rwanda DHS 2014-2015.

Figure 5: Malaria incidence by District, 2012

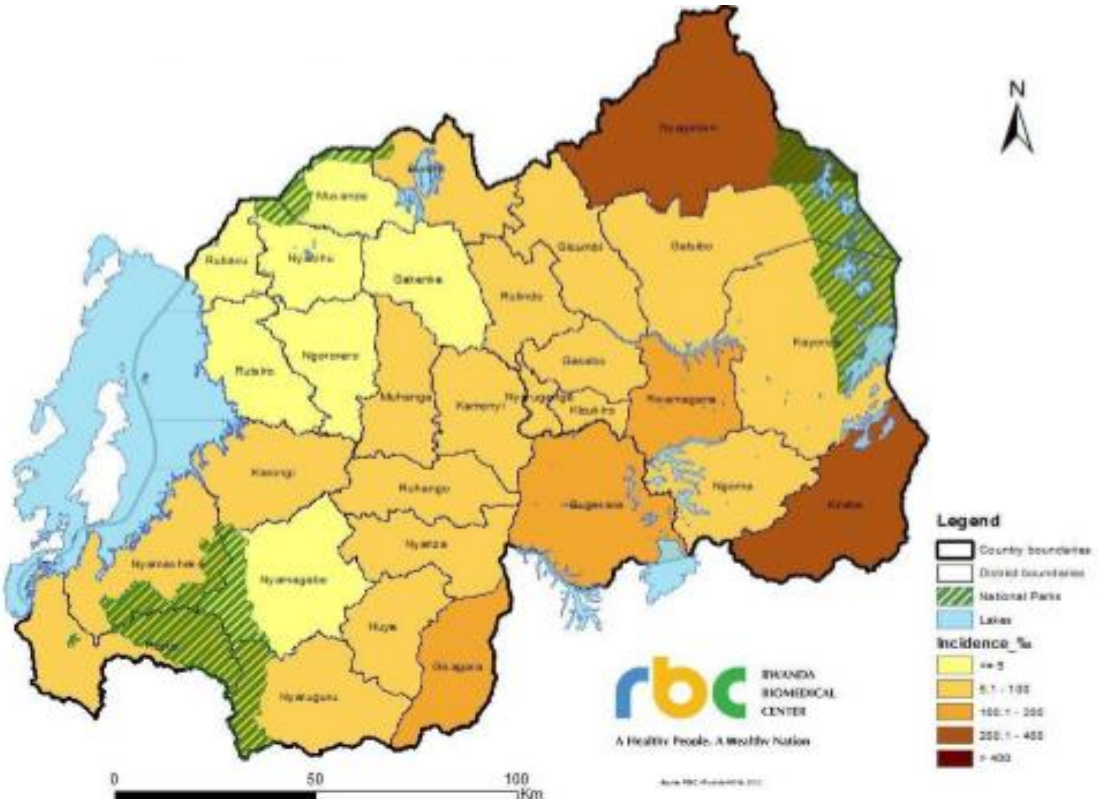
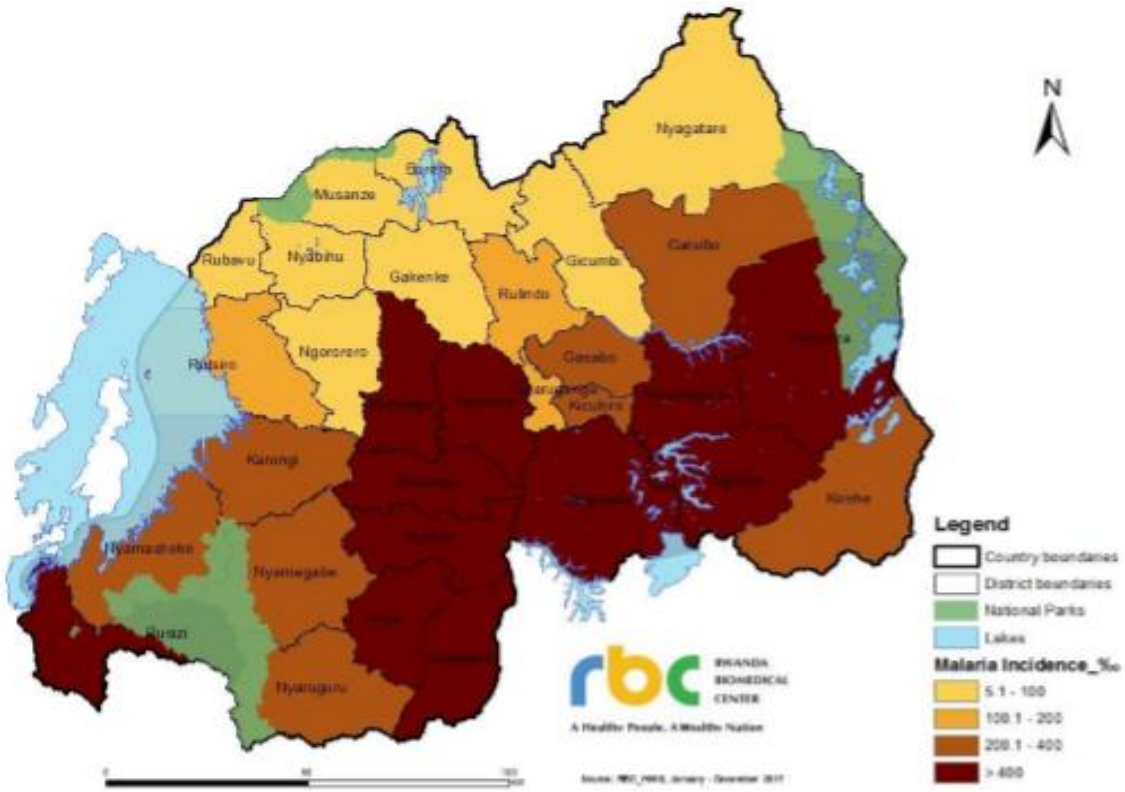


Figure 6: Malaria incidence by District, 2017

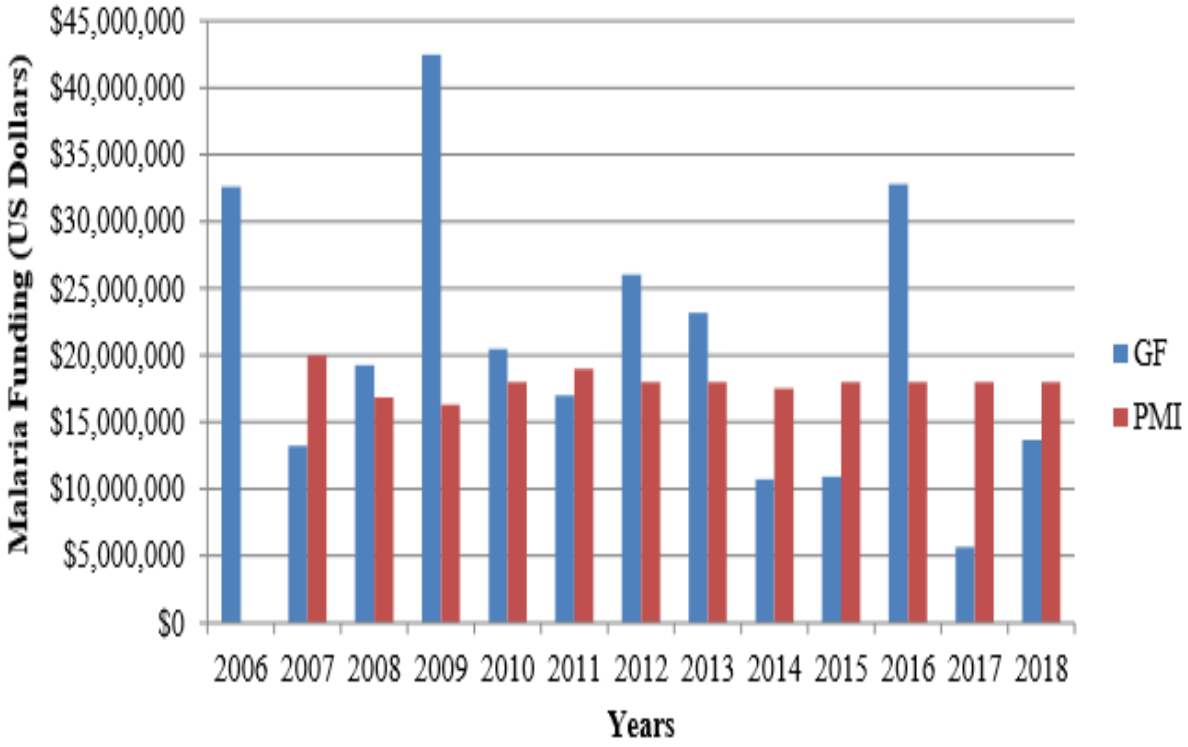


Source Fig 5&6: Rwanda Malaria Strategic Plan, 2019

3.3. Global Fund Support for Malaria Interventions in the country

The Global Fund is one of the two main donors of funds to the fight against malaria in Rwanda, along with PMI (Figure 5). Other technical development assistance for malaria comes from RBM and WHO. The Global Fund malaria grant supports the expansion of community case management with RDTs, antimalarials for treatment at health facilities and in the community, procurement of ITNs, strengthening of monitoring and evaluation systems, and resources for health communications, health systems strengthening, HMIS, and program management operating costs. The MOPDD had one Global Fund malaria grant for the 2015–2017 allocation period set at $49 million, and has recently signed a new agreement covering 2018 to 2020 with $41 million over the three years representing a 16 percent decrease in funding from the previous grant. In order to sustain the gains made after the 2016–2017 ITN mass distribution, the GoR has requested support from Global Fund to implement another mass ITN campaign in 2019 for distribution of 6.6 million ITNs in 27 districts nationwide. The GoR has also requested funding from both Global Fund and PMI to continue IRS in three to five high-burden districts as a strategy to manage insecticide resistance. Additionally, funds have been requested from Global Fund for implementation of entomological and insecticide resistance monitoring to inform vector control interventions. The GoR has requested Global Fund support the procurement and distribution of 5.6 million RDTs in calendar year 2020. Similarly, Global Fund has been asked to support procurement and distribution of 1.9 million ACT doses.

Figure 7: Global Fund and PMI support to Rwanda, 2006 - 2018



Sources: www.theglobalfund.org, www.pmi.gov

3.4. Equity Barriers to Malaria Interventions

While the NMCP Strategy for malaria control amongst vulnerable groups in the country appears comprehensive, and programme data suggest some success in reaching most of the at-risk population, findings from the assessment suggest that gaps may persist. These include barriers related to: challenges related to general knowledge, attitudes and practices amongst vulnerable groups with regard to malaria; specific negative attitudes and beliefs about malaria interventions, particularly LLINs; trends in health seeking behaviour linked to traditional beliefs; physical and financial accessibility; negative experiences with health facilities; the influence of gender norms on women's and children's access to malaria services; and other environmental factors.

In general, the evaluation found that a number of stakeholders are attempting to address some of the barriers to equity that were identified by the evaluation. There has been an awareness of their existence, even if the means to reduce or remove these barriers are difficult to design, plan or implement. However, equity considerations have been incorporated into general malaria control programmes for vulnerable groups identified by previous studies.

Across many of the categories of equity barriers, gender is a defining influence in terms of who is most affected by the barrier and who is not. Throughout the section, data from the desk review, key informant interviews and FGDs are drawn on illustrate the findings and to amplify their significance.

3.4.1. General knowledge, Attitudes, Practices and Beliefs About Malaria

The use of malaria prevention and treatment is highly dependent not only on people's knowledge of the causes, but also on their ability to recognize the early symptoms. With regard to these aspects, the evaluation found that vulnerable populations (mothers of children under five or nannies, fishermen, mine workers, pregnant women, prisoners, refugees, rice farmers, security guards, female workers, hotel staff and guests, school students and staff, truck drivers) have better access to information about malaria. Indeed, these populations declare to have already heard about malaria and know the immediate and remote causes of this disease.

We heard about malaria, there are campaigns who thought about malaria, illness that causes fever, weakness and cold. Malaria is caused by not sleeping in the mosquito bed net, not cutting bushes around the house, swamps, female mosquito when it bites someone.

Focus Group, pregnant women, RUBAVU District, Rubavu Sector

Overall, key informants from NGOs providing malaria control services stated that awareness raising activities on health issues and particularly malaria among vulnerable people are active, strategic and multi-faceted, formulated in local languages to reach all targets. This is the reason why the level of information on malaria is high among the population including the vulnerable.

They get information about malaria from radios, tv, healthcare workers, NGOs and from the hospital. There are different strategies that are used and everyone can be communicated

about malaria in any way; geographically we reach every one through minister of health and with the help of healthcare workers.

Key informant, WHO, Kigali_kimironko

In addition, as regards the practice of malaria prevention and treatment in the context of vulnerable populations, the populations practice environmental cleanliness, the use of impregnated mosquito nets, the use of insecticides and most of the time go to a hospital or to a health worker in case of malaria symptoms, but the use of traditional medicine and self-medication are also alternatives used.
In addition, in penitentiary centers, it appears that only a few prisoners are provided with an impregnated mosquito net.

In the prisons we avoid the holes that would be filled of water, no bushes and few prisoners have bed nets.

Focus Group, Correctional Services Staff and Prisoners, RUBAVU PRISON.

Although there is greater awareness of the dangers, prevention and treatment of malaria among vulnerable populations, practice is still influenced by individual characteristics such as poverty level, education and beliefs.

Ignorance and social-economic issue that cause fishermen to use the mosquito nets as the trap of fishes.
Some people have beliefs that the bed nets cause allergic and may cause the problem in the respiratory system and cases the warms during night, they use them to build house of chicken, to make kitchen garden.
Focus Group, Fishermen, Rusizi District/ Gihundwe Sector/ Kamatita Cell/ Gahwazi Village.

3.4.2. Negative Attitudes and Beliefs About Specific Malaria Interventions

Access to information on malaria control must be accompanied by good practice and strict adherence to instructions on how to use the means of prevention and treatment of this disease.
This evaluation found that there are many limitations to the correct and effective use of LLINs by vulnerable populations. While some people seemed to know that sleeping under an LLIN could prevent mosquito bites, and thus malaria, a number of them revealed that some people did not put this knowledge into practice because the nets were considered uncomfortable or inconvenient. The experience that it is too hot to sleep under a net is shared by pregnant women, students and staff, refugees and truck drivers. In addition, some people, including truck drivers, female workers, students and staff, security guards and pregnant women, are wary of long-lasting insecticide-treated nets because they believe they can cause allergies.

when we sleep in it, we get allergies, we did not sleep at night simply we do not use bed nets except we are using for protecting our children even if enough we have not enough bed nets.

Focus Group, Female sex workers, Rwanda NGO Forum Office and Nyamasheke District

It should also be noted that even when the LLINs are received, they are used for purposes other than those for which they were intended. This is the case for fishermen who use them for fishing activities and for refugees who use them to build pens for raising chickens.

We sometimes use them to build house of chicken, use them to make kitchen garden, use them in fishing activities.

Focus Group, Refugees, Mahama Refugee camp

In addition, there are other bad practices concerning the treatment of malaria. Indeed, self-medication is a common practice among vulnerable populations without testing for simple or severe malaria, whereas the treatment to be taken depends on the test result. In these cases, severe malaria is more likely to occur because it has been poorly treated. In some cases, vulnerable populations resort to traditional medicine with these uncertainties to treat malaria cases. In other cases, religion comes in as a major obstacle to accessing modern malaria treatment, as is the case for truck drivers.

because of their religious beliefs that they don't believe in the treatment provided, they only believe in God, and those who can't afford the treatment with no health insurance.

Focus Group, Truck drivers, kigali-Gikondo Magerwa

people who just purchase medicine from the local pharmacy and drink them immediately without getting tested, those who use herbal medicine.

Focus Group, Pregnant women, Mayange Health center.

3.4.3. Health-seeking behaviours

The results of this study raise a number of attitudes and practices regarding health seeking behaviour. Although some people continue to prefer medicines and healers over other health workers, in general, the use of traditional herbal medicine for malaria was weakly reported as a common practice among the vulnerable people in question. Several participants said that they go to a hospital or health worker to be tested and treated if they develop malaria symptoms. However, recourse to local pharmacies also appears to be a preferred direction for people to seek health care.

I go to the hospital to seek help, to the healthcare worker because they are near and can help, Because, we have insurance and aware to consult the health providers.

Focus Group, Security guards, Gasabo-Kacyiru

In prisons, there are not many alternatives for treating malaria. Malaria cases are treated free of charge in the prison health centers. Therefore, prisoners with malaria symptoms go to the prison health center for treatment.

All prisoners get free treatment at the health center in the prison.

Focus Group, Correctional Services Staff and Prisoners, RUBAVU PRISON

3.4.4. Physical and Environmental Barriers

Environmental and physical aspects play a major role in the prevention and management of malaria cases of vulnerable people in health facilities. The assessment found that for some, there are virtually no physical or environmental barriers to travel to health facilities. Some pregnant women, prisoners, refugees, rice farmers, security guards, and truck drivers report having health facilities around them.

we don't have any obstacle to go to the health center, because health centers are near us and healthcare workers, they are easier to get to in our communities.

Focus Group, Pregnant women, RUBAVU District, Rubavu Sector

On the other hand, it is equally apparent from mothers or nannies of children under five years of age, mine workers, hotel staff and guests, and students and staff respectively, that the procedures for registering children over three months of age for community insurance are difficult, excessive rainfall makes roads bad especially in deeply rural areas, lack of transport, long queues in health facilities are real obstacles to be broken to facilitate access to malaria case management services for all.

Sometimes the health center requesting the clients to bring the referral form from the community health center; sometimes the health providers may use the foreign languages when they discussing on her/his client; the means of transport was challenging because the ambulances may come at the late time; sometime the health providers did not take time to explains (native language) to the clients the responses from laboratory and did not inform the clients the negative effects of medical treatments they provide.

Focus Group, Students and schools' staff, Nyanza District/ Kigoma Sector/ High School of Nyanza

3.4.5. Financial Barriers

Vulnerable people often live in precarious financial conditions, with very limited means of earning a stable income, and face difficulties in meeting their basic survival and therefore health needs. This obstacle was noted by these populations in particular, but they claim that access to malaria prevention and treatment is either free or greatly reduced by health facilities or NGOs. However, it should be noted that mine workers and students/staff say that they spend a lot of money to access malaria prevention and treatment services, except when it comes to health centers, which are very often far from their place of work or residence.

The malaria medical treatments, bed nets and we access on the training and campaigns sessions on malaria prevention for free, all prisoners get testing and treatment services for free by the prison health center.

Focus Group, Correctional Services Staff and Prisoners, Ngoma Prison

We pay all fees of malaria medical treatment at HEALTH POST but at the health center we pay the minimum cost of malaria, But the pregnant women and Vaccination of babies at 9 months have got the Bed nets.

Focus Group, Mine workers, Western Province/Nyamasheke District/ Cyato Sector/ Murambi Cell/ Cyato Village

The obstacle is low budget in terms of money, the service that we provide like ios it didn't reach everyone but if we get money it can be done.

Key informant, WHO, Kigali_kimironko

The patient is required to pay the contribution to the treatment, like the percentage of the health insurance or full payment for those who don't have insurance.

Key informant, Woman nurse, Rubavu District, Rubavu Sector

3.4.6. Problematic Experiences with Health Facilities

The growing number of vulnerable people inevitably has an impact on the primary health care system, both in terms of infrastructure and human resources, according to many of the key informants consulted for this evaluation. In this Covid-19 context, this impact is most evident in terms of a lack of human and financial resources to carry out effective interventions or to provide reliable and uninterrupted services to the entire population, including refugees. The lack of resources can be attributed not only to the difficult context of the country in general, but also to the negative impact that Covid-19 has had on economic growth.
Key informants from health centers state that their capacity is low, staffing levels are limited compared to the demand for health care in general, and consequently malaria care.

There is a huge number of patients (66,000) and limited number of nurses to follow up the patients. Eg.: A nurse can serve an average for 100 patients per day.
The care givers are limited in numbers compared to the services in the health centers and compared with the patients who need service. For e.g., the nurses who work the night, cannot rest due to limited numbers of nurses.
It is hard because when patients are many, I can't do my own tasks.
Key informant, Woman nurse, Rubavu District, Gisenyi Health center

The obstacle is low budget in terms of money, the service that we provide like ios it didn't reach everyone but if we get money it can be done.
Key informant, WHO, Kigali_kimironko

This situation is alarming insofar as it has a direct impact on the time spent in a health facility before being taken care of, resulting in long waiting lines. For the vulnerable people consulted, this state of affairs could affect their judgement to go directly to a health center after the first symptoms of malaria appear, as mentioned above.

3.4.7. Influence of Gender Norms

During the interviews and discussions organized as part of this evaluation, it emerged from the majority of participants of all types that although the man is the head of the household and the role of women is to look after the house and children, there are basically no gender-based inequalities in terms of decision-making in the household with regard to the tendency to go to a health center in the event of illness, as well as in distribution, awareness-raising and management of malaria cases. But particular emphasis is placed on pregnant women because of their fragility and the concern to protect them and their unborn child from malaria.
In terms of care in health centers, women and men have no problem being consulted by health personnel of the opposite sex.

No difference between men and women in access to health care.
Women are more vulnerable due to their works as they stay for a long time outside in contact with mosquito while men can prevent from mosquito in house. In addition, the women are the only ones to get pregnancy and more risk than men.
Key informant, Male, Mayange Health Center

3.5. Efforts to Reduce Equity Barriers

Overall, this assessment suggests that a number of stakeholders (the Global Fund, WHO, Government and some NGOs) are attempting to address some of the identified barriers to equity.
With respect to these interventions, efforts to address the barriers to equity are summarized below:

Table 2 : Efforts to Address and Reduce Barriers
Addressing socio-cultural/knowledge barriers
In order to reduce the effects of cultural barriers and access to information, based on the national communication strategy on malaria, health centers have outreach activities conducted by community health workers and home visits. Awareness activities are conducted at strategic times and adapted to the cultural and linguistic context at the local level. To reach targets who cannot read or hear, drawings describing the steps from prevention to treatment of malaria are produced and displayed in the communities in large format. There are other strategies that are also used, such as community discussions, radio and television debates and media campaigns, to reach most targets. The stigma attached to the use of long-lasting insecticide-treated nets is also addressed in awareness campaigns. These activities extend to refugees and prisoners through awareness sessions and through camp and prison infirmaries.
Addressing financial barriers
There are several agencies or organizations that provide free services or support to vulnerable populations regarding malaria in the country. With regard to these services, the Ministry of Health, WHO, USAID, PMI, Global Fund, generally provide through their multiple programs and projects, treatment, bed nets, rapid test kits (RDTs).
Addressing physical and geographic barriers
To reduce barriers to physical accessibility, health posts are set up to bring health services closer to vulnerable populations, and community health workers are mobilized during major door-to-door campaigns.
Addressing barriers to access to treatment
The fundamental strategy to increase access to malaria treatment for all segments of the population used in Rwanda is the approach that aims at making the distance between health services and populations small on the one hand, and facilitating free access to testing and treatment of simple and severe malaria on the other. This requires a lot of financial means to build community health centers, to increase the quality of human resources to make the door-to-door approach more effective in order to reduce the socio-cultural barriers that can limit access to malaria treatment for the population.

3.6. Challenges and gaps

The results of the evaluation show that much remains to be done in the fight against malaria, despite the significant investment by the government, the Global Fund and other partners, and the efforts of the many governmental and non-governmental partners working in the fight against malaria in the country's districts.

The evaluation relied heavily on qualitative data, which makes it difficult to assess the magnitude or level of some of the barriers described.

These results also indicate that there are some important gaps that could be due to these barriers. These include the following:

- **Insufficient involvement of vulnerable populations**, particularly mine workers, refugees and rice farmers, in the effective implementation of malaria prevention and treatment measures. Indeed, it appeared that some people use impregnated mosquito nets for other purposes. Efforts still need to be made to mobilize all vulnerable population groups to take ownership of the real risks of malaria and to be increasingly at the center of efforts to promote malaria prevention or to encourage rapid diagnosis and access to treatment.
- **Limited commitment to addressing the use of self-medication and traditional treatment of malaria.** The results of the evaluation clearly showed that some vulnerable populations are strongly committed to buying malaria drugs from local pharmacies without a prescription. In addition, some prefer traditional remedies in case of illness.
- **Limited material resources compared to the needs of vulnerable populations.** Many participants noted the challenge of insufficient material and financial resources to adequately address the needs of vulnerable people. This has implications for the coverage of basic interventions.
- **Insufficient health personnel in terms of numbers compared to the demand for health care.** Informants from the health centers mentioned that they were often overwhelmed by the number of patients, which could affect the quality of care provided.

3.7. Opportunities to Strengthen Programmes to Reduce Barriers

It is possible through current and future grants to ensure that the resource needs of these populations, in terms of long-lasting insecticide-treated nets, for example, and provisions for increasing the participation of vulnerable communities themselves in malaria prevention and control interventions, are included in proposed budget lines and strategic work plans.

Effective and strengthened mobilization of vulnerable populations for community health insurance uptake is a critical success factor for malaria prevention, control and elimination, regardless of location. According to the evaluation results, vulnerable people have not yet fully embraced community-based insurance. Their non-adherence inevitably limits access to malaria care services.

In view of some of the difficulties encountered by the population, particularly mine workers, more investment should be made in community-based mobile interventions for malaria prevention and control. The results show that many key interventions are based in facilities that are not very close to their workplaces, creating a range of barriers to accessing malaria services.

4. Recommendations for Action

Below is a set of preliminary recommendations for action arising from the results of the assessment. They are intended to be further developed and elaborated at the stakeholder validation and action planning workshop.

4.1. Related to social, cultural and linguistic barriers

- Recruit more community health workers, especially from vulnerable populations, by building their capacity in malaria prevention and control to mentor their peers locally
- Ensure that interventions take into account problematic attitudes and beliefs about malaria prevention, especially about LLINs
- Integrate community leaders, especially those who can reach truck drivers, in the formulation of messages and implementation of malaria awareness campaigns
- Involve peer educators attached to specific groups such as female sex workers, fishermen, mine and sugarcane workers, farmers, etc.

4.2. Related to traditional beliefs and practices for malaria treatment

- Sensitize traditional healers and herbalists on the need to refer their patients to health centers
- Involve local drug sellers in activities related to malaria prevention and control, especially by showing them the harmful effects of self-medication
- Increase community awareness, showing people that traditional treatment does not exclude going to the hospital

4.3. Related to physical and environmental barriers

- Strengthen the delivery of malaria prevention and control interventions in communities living in remote areas
- Develop alternatives to LLINs for effective malaria prevention and control among fishermen and refugees
- Creation of health posts dedicated to fight against malaria

4.4. Related to financial barriers

- Provide regular information on free malaria services and raise awareness of other inappropriate charges for malaria prevention and treatment products

4.5. Related to addressing the influence of gender norms

- Increase efforts to integrate malaria prevention and control elements into activities to reach women and children in critical situations for their health and survival needs
- Maintain a high level of involvement of women in community health education and promotion activities for malaria prevention and control as well as other health needs

4.6. Related to coordination, monitoring and accountability

- Develop a clear Action Plan to address gaps in Malaria in Vulnerable Groups
- Ensure CSOs are engaged in addressing malaria in Vulnerable Groups
- Improve the availability of disaggregated data on malaria prevention and control efforts in the country

- Improve the sensitivity and specificity of current monitoring systems to assess progress to reduce or remove equity barriers for identified vulnerable communities
- Collect both qualitative and quantitative data for a better assessment of the situation in the target groups

5. Conclusion

Vulnerable communities are at increased risk of malaria due to living conditions, socio-cultural and language barriers, and the negative influence of harmful gender norms. These barriers need to be addressed in order to effectively prevent and/or control malaria, not only in these populations, but also throughout the country.

Therefore, in addition to the many other causes of ill health and death that occur on a daily basis, malaria will continue to create a heavy burden of suffering and premature death, with particular gravity for women and young children.
Although considerable efforts are being made to address the health and humanitarian needs of vulnerable communities, particularly in high-incidence districts where the Global Fund is an active partner, these malaria prevention and treatment efforts are not yet sufficiently equitable to benefit all who need them.
This evaluation has therefore highlighted a number of these inequities and suggested areas where efforts can be scaled up, through more sensitive scaling up, mainstreaming or socio-cultural and linguistic adaptation, to reduce or remove these barriers. These findings and recommendations must therefore guide the multisectoral response to malaria in the country, so that the important public health goals of malaria control and elimination can be achieved, not only for the most vulnerable groups, but for all individuals, families and communities at all levels. It is therefore essential to understand and address the barriers to equity in order to remove them wherever they occur in Rwanda.

Appendix 1: Characteristics of Participants

Table A: FGDs Participants by type and gender

		Gender of FGDs participants				
Targets	**Number of FGDs**	**Men**	**Women**	**People aged 15-24**	**People aged 60 and over**	**TOTAL**
Mothers or Nannies of children under five	2	**0**	**21**	0	0	**21**
Fishermen	2	**14**	**4**	0	1	**18**
Mine workers	1	**7**	**3**	2	1	**10**
Pregnant women	2	**0**	**22**	8	0	**22**
Correctional Services Staff and Prisoners	6	**27**	**21**	1	6	**48**
Refugees	2	**11**	**6**	3	0	**17**
Rice farmers	1	**4**	**6**	0	0	**10**
Security guards	3	**20**	**2**	1	0	**22**
Female sex workers	4	**0**	**38**	3	0	**38**
Hotels staff and clients	2	**6**	**6**	0	0	**12**
Students and schools staff	2	**10**	**6**	11	0	**16**
Truck drivers	1	**6**	**0**	0	0	**6**
TOTAL	28	105	135	29	8	240

Table B: Interviews respondents by type and gender

		Gender of Interviews respondents		
Targets	**Number of Interviews**	**Men**	**Women**	**TOTAL**
CBO_CSO_FBOs	**5**	**1**	**4**	**5**
Government Officials	**12**	**6**	**6**	**12**
Health Centers	**4**	**2**	**2**	**4**
NGOs_UN AGENCIES_PRs_SRs	**1**	**1**	**0**	**1**
TOTAL	22	10	12	22

Appendix 2: List of Organisations Providing Key Informants

CSDI head Office
DEREVA Hotel Rwamagana
Gihundwe Health Sector
Gisenyi Health center
Mahama Refugee camp
Mayange Health Center
Muhanga Prison
Ngoma Prison
Nyagatare prison
Nyamasheke Health District
RNGO Forum
Rubavu Health District
Rubavu Prison
Rusizi Health District
Rwamagana Hospital
Rwanda Development Organisation
Rwanda NGO Forum
WHO

Appendix 3: Data collection tools

A 3.1. Focus Group Discussion Guides

Mother and Nannies of children under five

1. Knowledge and awareness of malaria	Tips for FGD facilitator
1.1. Have you heard about malaria?	
1.2. What causes malaria?	
1.3. What methods do you know are used for malaria prevention?	*Probe for all methods*
1.4. How do you prevent malaria in your context?	
1.5. How do you diagnose and treat malaria?	
2. Information about malaria	
How/Where did you get this information?	*Probe for:* • *Community health worker or volunteers (how?)* • *Traditional/community leaders (how?)* • *Pamphlets distributed in the communities (how?)* • *Inter-personal Communication (IPC) (how?)* • *Poster-Information, Education and /Communication (IEC) (how?)* • *Television (TV) (how?)* • *Radio (how?)* • *Group IPC/Community dialogue (how?)* • *Others: precise*
3. Identifying which populations are most impacted by malaria	
3.1. Are there groups of individuals that are more exposed to the malaria vector? Which groups? Why?	*Probe for men, women, children under five, and reasons related to occupation, behavior, etc.*
3.2. Are there groups of individuals that are less likely to access early malaria diagnosis and treatment? *Which groups? Which barriers they face?*	*Probe for language barriers, cultural barriers, financial barriers, physical barriers*
4. Beliefs and practices which affect the of use of malaria services	
Does your community have beliefs and practices which affect the use of:	
4.1. Malaria bed nets? (Yes/No)? Why?	
4.2. Anti-malaria treatment provided in health facilities (Yes/No) Why?	
4.3. When a family member has fever, what is the common treatment seeking	*Probe for: Use of traditional herbs, seek help of a traditional healer, seek*

behavior in the community? Does it differ for women, men and children? Why?	*diagnosis in a health facility, purchase drugs in local pharmacies, self-medication with traditional medicine, self-medication with non-traditional medicine, non-completion of treatment, use of chloroquine, self-medication, Use of medicine vendors*
5. Knowledge of any malaria campaigns/activities/education programs for communities	
5.1. Is your community aware of any malaria campaigns/activities/education programs for your communities? If yes, mention which ones	
5.2. Are they accessible and useful for your community?	
6. Access to health services in communities	
6.1. Do you know the nearest health center where you can test for malaria and access treatment? (Yes/No) If not, why?	
6.2. Does your community currently benefit from any free/low costs anti malaria services (including bed nets, rapid tests and treatment when necessary) (Yes/No) If not, why?	
6.3. Has your child always received free malaria services before the age of 5? (Yes/No) If yes, Which service and where? Was it provided in enough quantity to cover his needs? If no, why?	
7. Does having little/no money prevent your community's members from accessing testing and treatment services for malaria?	
7.1. Does having little/no money prevent your community's members from accessing testing and treatment services for malaria? (Yes/No) If yes, how? If no, explain	
8. Does your community encounter any types of obstacles (distance from health centers, rain, means of travel, languages, …) that prevents the children under five from going to a health center?	
8.1. If yes, what are these obstacles? If no, please explain	
9. **Kindly explain in details how you have seen children under five being treated in the health centers/ health clinics?**	

9.1. Kindly explain in details how you have seen children under five being treated in the health centers/ health clinics?	*Probe for: Acceptable, not acceptable, felt well treated, felt discriminated, etc.*
10. **What would you suggest to better prevent and manage malaria cases, especially for the children under five?**	
10.1. What would you suggest to better prevent and manage malaria cases, especially for the children under five?	*Recap the key barriers/issues mentioned in the conversation and help respondents to formulate their own inputs on what would be most adequate to the taget*

Pregnant women

1. Knowledge and awareness of malaria	Tips for FGD facilitator
1.1. Have you heard about malaria?	
1.2. What causes malaria?	
1.3. What methods do you know are used for malaria prevention?	*Probe for all methods*
1.4. How do you prevent malaria in your context?	
1.5. How do you diagnose and treat malaria?	
2. Information about malaria	
How/Where did you get this information?	*Probe for:* • *Community health worker or volunteers (how?)* • *Traditional/community leaders (how?)* • *Pamphlets distributed in the communities (how?)* • *Inter-personal Communication (IPC) (how?)* • *Poster-Information, Education and /Communication (IEC) (how?)* • *Television (TV) (how?)* • *Radio (how?)* • *Group IPC/Community dialogue (how?)* • *Others: precise*
3. Identifying which populations are most impacted by malaria	
3.1. Are there groups of individuals that are more exposed to the malaria vector? Which groups? Why?	*Probe for men, women, children under five, and reasons related to occupation, behavior, etc.*
3.2. Are there groups of individuals that are less likely to access early malaria diagnosis and treatment? *Which groups? Which barriers they face?*	*Probe for language barriers, cultural barriers, financial barriers, physical barriers*
4. Beliefs and practices which affect the of use of malaria services	

Does your community have beliefs and practices which affect the use of:	
4.1. Malaria bed nets? (Yes/No)? Why?	
4.2. Anti-malaria treatment provided in health facilities (Yes/No) Why?	
4.3. When a family member has fever, what is the common treatment seeking behavior in the community? Does it differ for women, men and children? Why?	*Probe for: Use of traditional herbs, seek help of a traditional healer, seek diagnosis in a health facility, purchase drugs in local pharmacies, self-medication with traditional medicine, self-medication with non-traditional medicine, non-completion of treatment, use of chloroquine, self-medication, Use of medicine vendors*
5. Knowledge of any malaria campaigns/activities/education programs for communities	
5.1. Is your community aware of any malaria campaigns/activities/education programs for your communities? If yes, mention which ones	
5.2. Are they accessible and useful for your community?	
6. Access to health services in communities	
6.1. Do you know the nearest health center where you can test for malaria and access treatment? (Yes/No) If not, why?	
6.2. Does your community currently benefit from any free/low costs anti malaria services (including bed nets, rapid tests and treatment when necessary) (Yes/No) If not, why?	
6.3. Have you received any free malaria services in the past malaria season? (Yes/No) If yes, Which service and where? Was it provided in enough quantity to cover the needs of your family?	
6.4. During your current pregnancy, have you done ANC? (Yes/No) If No, why?	
6.5. During your current pregnancy, did you receive antimalarial services? (Yes/No) If Yes, which services? Were they free? If No, why?	
7. Does having little/no money prevent your community's members from accessing testing and treatment services for malaria?	
7.1. Does having little/no money prevent your community's members from accessing	

testing and treatment services for malaria? (Yes/No) If yes, how? If no, explain	
8. Does your community encounter any types of obstacles (distance from health centers, rain, means of travel, languages, …) that prevents pregnant women from going to a health center?	
8.1. If yes, what are these obstacles? If no, please explain	
9. **Kindly explain in details how you are treated in the health centers/ health clinics?**	
9.1. Kindly explain in details how you are treated in the health centers/ health clinics?	*Probe for: Acceptable, not acceptable, felt well treated, felt discriminated, etc.*
10. **What would you suggest to better prevent and manage malaria cases, especially for pregnant women?**	
10.1. What would you suggest to better prevent and manage malaria cases, especially for pregnant women?	*Recap the key barriers/issues mentioned in the conversation and help respondents to formulate their own inputs on what would be most adequate to the taget*

Prisoners

1. Knowledge and awareness of malaria	Tips for FGD facilitator
1.1. Have you heard about malaria?	
1.2. What causes malaria?	
1.3. What methods do you know are used for malaria prevention?	*Probe for all methods*
1.4. How do you prevent malaria in your context?	
1.5. How do you diagnose and treat malaria?	
2. Information about malaria	
How/Where did you get this information?	
3. Identifying which populations are most impacted by malaria	
3.1. Are there groups of individuals that are more exposed to the malaria vector? Which groups? Why?	*Probe for men, women and reasons related to occupation, behavior, etc.*
3.2. Are there groups of individuals that are less likely to access early malaria diagnosis and treatment? *Which groups? Which barriers they face?*	*Probe for language barriers, cultural barriers, financial barriers, physical barriers*
4. Beliefs and practices which affect the of use of malaria services	
Does your community have beliefs and practices which affect the use of:	
4.1. Malaria bed nets? (Yes/No)? Why?	

4.2. Anti-malaria treatment provided in health facilities (Yes/No) Why?	
4.3. When a family member has fever, what is the common treatment seeking behavior in the community? Does it differ for women, men and children? Why?	*Probe for: Use of traditional herbs, seek help of a traditional healer, seek diagnosis in a health facility, purchase drugs in local pharmacies, self-medication with traditional medicine, self-medication with non-traditional medicine, non-completion of treatment, use of chloroquine, self-medication, Use of medicine vendors*
5. Knowledge of any malaria campaigns/activities/education programs for communities	
5.1. Is your community aware of any malaria campaigns/activities/education programs for your communities? If yes, mention which ones	
5.2. Are they accessible and useful for your community?	
6. Access to health services in communities	
6.1. Does your community currently benefit from any free/low costs anti malaria services (including bed nets, rapid tests and treatment when necessary) (Yes/No) If not, why?	
6.2. Have you received any free malaria services in the past malaria season? (Yes/No) If yes, Which service and where? Was it provided in enough quantity to cover the needs of your family?	
7. Does having little/no money prevent your community's members from accessing testing and treatment services for malaria?	
7.1. Does having little/no money prevent your community's members from accessing testing and treatment services for malaria? (Yes/No) If yes, how? If no, explain	
8. Does your community face any types of barriers that prevent community members from accessing malaria services?	
8.1. If yes, what are these obstacles? If no, please explain	
9. **Kindly explain in details how you are and have seen members of the community being treated in the infirmary?**	

9.1. Kindly explain in details how you have seen children under five being treated in the health centers/ health clinics?	*Probe for: Acceptable, not acceptable, felt well treated, felt discriminated, etc.*
10. **What would you/your community suggest to better prevent and manage malaria cases, especially for the most vulnerable individuals?**	
10.1. What would you suggest to better prevent and manage malaria cases, especially for the children under five?	*Recap the key barriers/issues mentioned in the conversation and help respondents to formulate their own inputs on what would be most adequate to the taget*

Fishermen, Mine workers, Refugees, Rice farmers, Security guards, Female sex workers, Hotels staff and clients, Students and schools staff, Truck drivers

1. Knowledge and awareness of malaria	Tips for FGD facilitator
1.1. Have you heard about malaria?	
1.2. What causes malaria?	
1.3. What methods do you know are used for malaria prevention?	*Probe for all methods*
1.4. How do you prevent malaria in your context?	
1.5. How do you diagnose and treat malaria?	
2. Information about malaria	
How/Where did you get this information?	
3. Identifying which populations are most impacted by malaria	
3.1. Are there groups of individuals that are more exposed to the malaria vector? Which groups? Why?	*Probe for men, women, children under five, and reasons related to occupation, behavior, etc.*
3.2. Are there groups of individuals that are less likely to access early malaria diagnosis and treatment? *Which groups? Which barriers they face?*	*Probe for language barriers, cultural barriers, financial barriers, physical barriers*
4. Beliefs and practices which affect the of use of malaria services	
Does your community have beliefs and practices which affect the use of:	
4.1. Malaria bed nets? (Yes/No)? Why?	
4.2. Anti-malaria treatment provided in health facilities (Yes/No) Why?	
4.3. When a family member has fever, what is the common treatment seeking behavior in the community? Does it differ for women, men and children? Why?	*Probe for: Use of traditional herbs, seek help of a traditional healer, seek diagnosis in a health facility, purchase drugs in local pharmacies, self-medication with traditional medicine, self-medication with non-traditional medicine, non-completion of*

	treatment, use of chloroquine, self-medication, Use of medicine vendors
5. Knowledge of any malaria campaigns/activities/education programs for communities	
5.1. Is your community aware of any malaria campaigns/activities/education programs for your communities? If yes, mention which ones	
5.2. Are they accessible and useful for your community?	
6. Access to health services in communities	
6.1. Does your community currently benefit from any free/low costs anti malaria services (including bed nets, rapid tests and treatment when necessary) (Yes/No) If not, why?	
6.2. Does your community currently benefit from any free/low costs anti malaria services (including bed nets, rapid tests and treatment when necessary) (Yes/No) If not, why?	
6.3. Have you received any free malaria services in the past malaria season? (Yes/No) If yes, Which service and where? Was it provided in enough quantity to cover the needs of your family?	
6.4. Is there pregnant women or children under five in your family? (Yes/No) If yes, did/do they still have access to free malaria services?	
7. Does having little/no money prevent your community's members from accessing testing and treatment services for malaria?	
7.1. Does having little/no money prevent your community's members from accessing testing and treatment services for malaria? (Yes/No) If yes, how? If no, explain	
8. Does your community encounter any types of obstacles (distance from health centers, rain, means of travel, languages, …) that prevents the community's members from going to a health center?	
8.1. If yes, what are these obstacles? If no, please explain	
9. **Kindly explain in details how you are and have seen members of the community being treated in the health centers/ health clinics/in camps?**	

9.1. Kindly explain in details how you have seen children under five being treated in the health centers/ health clinics?	*Probe for: Acceptable, not acceptable, felt well treated, felt discriminated, etc.*
10. **What would you/your community suggest to better prevent and manage malaria cases, especially for the most vulnerable individuals?**	
10.1. What would you suggest to better prevent and manage malaria cases, especially for the children under five?	*Recap the key barriers/issues mentioned in the conversation and help respondents to formulate their own inputs on what would be most adequate to the taget*

A 3.2. Interview Questionnaires

CSOs_CBOs_FBOs

1. General questions about malaria Programs for vulnerable communities	Tips for the interviewer
1.1. Which malaria vulnerable groups do you have in Rwanda? Explain	
1.2. What are the recent statistics on the number of vulnerable communities? Please, provide the sources and the years? Are the data disaggregated by age, sex and others	
1.3. Are there any malaria interventions dedicated to vulnerable communities in your state? If yes, which ones and who are the providers of these programs or services?	
1.4. Do These programs take into account and address gender issues?	
1.5. Are there any malaria interventions dedicated to vulnerable communities? If yes, which ones and who are the providers of these programs or services?	
1.6. Do These programs take into account and address gender issues?	
1.7. What are the malaria services provided in these programs for the vulnerable communities, in terms of malaria prevention, malaria diagnostic and malaria treatment?	
1.8. Do these malaria services respond to the needs of men, boys and those of women, girls differently?	
1.9. Do they address other social characteristics differences among vulnerable communities?	
1.10. Do vulnerable communities' representatives participate in the design and implementation of malaria control programs in your state (Yes/No) If not, why? If yes, in which way?	
1.11. Who are the most represented men or women? why	

1.12. Do malaria services for vulnerable communities ensure full coverage of all vulnerable communities? (Yes/No) If no, what is the gap or need to ensure full coverage of this malaria services for vulnerable communities? If yes? explain	*Probe for Mosquito nets, malaria treatment, malaria test, SMC, …*
1.13. Is there a difference between men and women in terms of coverage? If so why?	
1.14. Besides vulnerable communities, have you identified other underserved populations in the fight against malaria? If so, please cite them	
1.15. If they are malaria services specifically for these populations, cite them and the services providers	
1.16. If there is a gap in terms of coverage of these services, please indicate what is the gap, for whom? where?	
1.17. Is there a difference between men and women in terms of coverage? why?	
1.18. In your opinion, do vulnerable groups routinely seek care from malaria service providers when they have malaria? (Yes/No) If not, which groups have the greatest gaps? Why?	*Probe for U5, pregnant women, prisoners, refugees, …*
2. Critically examining how risk factors, barriers to accessing services, and bottlenecks for service delivery affect health equity in the context of malaria	
Information accessibility and health literacy	
2.1. Where do vulnerable communities receive information about malaria? Explain	
2.2. Are malaria communication strategies culturally adapted by vulnerable communities? (Yes /No) Explain	
2.3. Are they adapted in the local languages of vulnerable communities? (Yes /No) Explain	
2.4. Are they adapted to the geographical context of vulnerable communities? (Yes /No) Explain	
2.5. Are they adapted to gender and age? (Yes /No) Explain	
2.6. Are they easily understood by vulnerable communities? (Yes /No) Explain	
2.7. Do all communication malaria programs reach all vulnerable communities? (Yes /No) Explain	
2.8. Is there a difference for men and women? Explain	
2.9. What evidence is used to determine whether the chosen modes of providing malaria information are delivered to all vulnerable communities? Please cite them and explain.	
2.10. In general, are vulnerable communities' representatives involved in the design and implementation of malaria communication/ malaria mobilization campaigns in your state? If so, in which ways?	

2.11. Who are the most represented men or women? why?	
2.12. Have you conducted an assessment of the needs of vulnerable communities in terms of malaria in your community? If so, what did you find? Please explain.	
Financial accessibility	
2.13. In the community, is there an accessible information system on expenditure (national and external) allocated to vulnerable communities for malaria services? If so, how?	
2.14. What factors influence budget decisions for malaria services for vulnerable communities and for inclusion of gender in these services? Please cite them	*e.g., available resources, currently funded priorities, religion, socio-cultural factors, legal context, etc.*
2.15. What are the obstacles to the execution of budgets allocated for vulnerable communities and for inclusion of gender in the fight against malaria? Please cite them	*e.g., political commitment, lack of data, insufficient capacity, etc.*
2.16. Are financial data for malaria interventions disaggregated by sex, age of vulnerable communities? (Yes/No) If no, why?	
2.17. Within vulnerable communities, are the specific needs of women, girls, men, boys and other gender identity, other needs based on socio-cultural difference taken into account in the budget allocated to malaria interventions?	
2.18. Is the amount allocated for malaria services sufficient to meet the needs of vulnerable communities in all the differences (sex, age, ...)? Please differentiate the groups in your response	
2.19. Which malaria services are free of charge for the vulnerable communities? please, cite them	*Probe for prevention, diagnostic and treatment*
2.20. Who are the providers of these services? and mention if there are free for a specify category (groups) of vulnerable communities?	
2.21. Which malaria services (Prevention, diagnostic and treatment) are not free of charge for the vulnerable communities? please, cite them?	
2.22. Is there a national or regional level policy of free malaria services for vulnerable communities? (Yes/No) Explain	
Physical accessibility	
2.23. Are there any physical barriers that prevent vulnerable communities from accessing malaria services? If so, please, cite them.	*Probe for: distance from health centers, rain, means of travel, ...*
2.24. Are strategies to address such physical barriers taken into consideration in the malaria programs? (yes/No) If yes, explain	
2.25. Are there differences for men and women? If so, explain	

2.26. Are there differences based on other social and cultural characteristics among vulnerable communities? Explain	
2.27. Are there security issues affecting the search for healthcare of vulnerable communities? If so, explain	
Provision of quality of health care services	
2.28. Are there adequate laboratory supplies for malaria testing and, adequate antimalarials in the community? (Yes/No) Explain	
2.29. Are vulnerable communities served by an adequate number personnel or/and dedicated service at the health centers for malaria in your state? (Yes/No) Explain	
2.30. Are the malaria diagnosis and treatment protocols, guidelines and manuals available to and utilized by health care providers for vulnerable communities? (Yes/No) Explain	
2.31. What is your appreciation of malaria services in general in terms of prevention (Mosquito nets, SMC, …), of diagnostic (RTD and others) and treatment (Simple malaria, severe malaria) for vulnerable communities in the community? Please explain.	*Probe for : Very satisfy, Satisfy, No satisfy*
2.32. What is your appreciation of malaria services in terms of the inclusion of gender in prevention (Mosquito nets, SMC, …), in diagnostic (RTD and others) and in treatment (Simple malaria, severe malaria) for vulnerable communities in the community? Please explain.	*Probe for : Very satisfy, Satisfy, No satisfy*
Provision of non-discriminatory health care services	
2.33. Are there any noticeable differences in terms the access to malaria services among vulnerable communities? (Yes/No) Explain	
2.34. Are there differences for men and women? and are there difference based on other social and cultural characteristics among vulnerable communities? If so, explain	
Others barriers in terms of access of services	
2.35. What are the obstacles or challenges encountered during the implementation of malaria programmes/campaigns of vulnerable communities? Please, cite them and explain.	*Probe for physical, Cultural, Environmental, security, and other obstacles*
3. Suggestions	
3.1. Suggestions for a better consideration of vulnerable communities in the fight against malaria in your communities	
3.2. Suggestions for a better consideration of gender in the fight against malaria	
3.3. Please, do you have another comment to make?	

Government Officials

1. General questions about malaria Programs for vulnerable communities	Tips for the interviewer
1.1. Which malaria vulnerable groups do you have in Rwanda? Explain	
1.2. What are the recent statistics on the number of vulnerable communities? Please, provide the sources and the years? Are the data disaggregated by age, sex and others?	
1.3. Are there any malaria interventions dedicated to vulnerable communities in your state? If yes, which ones and who are the providers of these programs or services?	
1.4. Do These programs take into account and address gender issues?	
1.5. Are there any malaria interventions dedicated to vulnerable communities? If yes, which ones and who are the providers of these programs or services?	
1.6. Do These programs take into account and address gender issues?	
1.7. What are the malaria services provided in these programs for the vulnerable communities, in terms of malaria prevention, malaria diagnostic and malaria treatment?	
1.8. Do these malaria services respond to the needs of men, boys and those of women, girls differently?	
1.9. Do they address other social characteristics differences among vulnerable communities?	
1.10. Do vulnerable communities' representatives participate in the design and implementation of malaria control programs in your state (Yes/No) If not, why? If yes, in which way?	
1.11. Who are the most represented men or women? why	
1.12. Do malaria services for vulnerable communities ensure full coverage of all vulnerable communities? (Yes/No) If no, what is the gap or need to ensure full coverage of this malaria services for vulnerable communities? If yes? explain	*Probe for Mosquito nets, malaria treatment, malaria test, SMC, …*
1.13. Is there a difference between men and women in terms of coverage? If so why?	
1.14. Besides vulnerable communities, have you identified other underserved populations in the fight against malaria? If so, please cite them	
1.15. If they are malaria services specifically for these populations, cite them and the services providers	
1.16. If there is a gap in terms of coverage of these services, please indicate what is the gap, for whom? where?	
1.17. Is there a difference between men and women in terms of coverage? why?	

1.18. In your opinion, do vulnerable groups routinely seek care from malaria service providers when they have malaria? (Yes/No) If not, which groups have the greatest gaps? Why?	*Probe for U5, pregnant women, prisoners, refugees, …*
2. Critically examining how risk factors, barriers to accessing services, and bottlenecks for service delivery affect health equity in the context of malaria	
Information accessibility and health literacy	
2.1. Where do vulnerable communities receive information about malaria? Explain	
2.2. Are malaria communication strategies culturally adapted by vulnerable communities? (Yes /No) Explain	
2.3. Are they adapted in the local languages of vulnerable communities? (Yes /No) Explain	
2.4. Are they adapted to the geographical context of vulnerable communities? (Yes /No) Explain	
2.5. Are they adapted to gender and age? (Yes /No) Explain	
2.6. Are they easily understood by vulnerable communities? (Yes /No) Explain	
2.7. Do all communication malaria programs reach all vulnerable communities? (Yes /No) Explain	
2.8. Is there a difference for men and women? Explain	
2.9. What evidence is used to determine whether the chosen modes of providing malaria information are delivered to all vulnerable communities? Please cite them and explain.	
2.10. In general, are vulnerable communities' representatives involved in the design and implementation of malaria communication/ malaria mobilization campaigns in your state? If so, in which ways?	
2.11. Who are the most represented men or women? why?	
2.12. Have you conducted an assessment of the needs of vulnerable communities in terms of malaria in your community? If so, what did you find? Please explain.	
Financial accessibility	
2.13. In the community, is there an accessible information system on expenditure (national and external) allocated to vulnerable communities for malaria services? If so, how?	
2.14. What factors influence budget decisions for malaria services for vulnerable communities and for inclusion of gender in these services? Please cite them	*e.g., available resources, currently funded priorities, religion, socio-cultural factors, legal context, etc.*
2.15. What are the obstacles to the execution of budgets allocated for vulnerable communities and for inclusion of gender in the fight against malaria? Please cite them	*e.g., political commitment, lack of data, insufficient capacity, etc.*

2.16. Are financial data for malaria interventions disaggregated by sex, age of vulnerable communities? (Yes/No) If no, why?	
2.17. Within vulnerable communities, are the specific needs of women, girls, men, boys and other gender identity, other needs based on socio-cultural difference taken into account in the budget allocated to malaria interventions?	
2.18. Is the amount allocated for malaria services sufficient to meet the needs of vulnerable communities in all the differences (sex, age, ...)? Please differentiate the groups in your response	
2.19. Which malaria services are free of charge for the vulnerable communities? please, cite them	*Probe for prevention, diagnostic and treatment*
2.20. Who are the providers of these services? and mention if there are free for a specify category (groups) of vulnerable communities?	
2.21. Which malaria services (Prevention, diagnostic and treatment) are not free of charge for the vulnerable communities? please, cite them?	
2.22. Is there a national or regional level policy of free malaria services for vulnerable communities? (Yes/No) Explain	
Physical accessibility	
2.23. Are there any physical barriers that prevent vulnerable communities from accessing malaria services? If so, please, cite them.	*Probe for: distance from health centers, rain, means of travel, ...*
2.24. Are strategies to address such physical barriers taken into consideration in the malaria programs? (yes/No) If yes, explain	
2.25. Are there differences for men and women? If so, explain	
2.26. Are there differences based on other social and cultural characteristics among vulnerable communities? Explain	
2.27. Are there security issues affecting the search for healthcare of vulnerable communities? If so, explain	
Provision of quality of health care services	
2.28. Are there adequate laboratory supplies for malaria testing and, adequate antimalarials in the community? (Yes/No) Explain	
2.29. Are vulnerable communities served by an adequate number personnel or/and dedicated service at the health centers for malaria in your state? (Yes/No) Explain	
2.30. Are the malaria diagnosis and treatment protocols, guidelines and manuals available to and utilized by health care providers for vulnerable communities? (Yes/No) Explain	
2.31. What is your appreciation of malaria services in general in terms of prevention (Mosquito nets, SMC,	*Probe for : Very satisfy, Satisfy, No satisfy*

…), of diagnostic (RTD and others) and treatment (Simple malaria, severe malaria) for vulnerable communities in the community? Please explain.	
2.32. What is your appreciation of malaria services in terms of the inclusion of gender in prevention (Mosquito nets, SMC, …), in diagnostic (RTD and others) and in treatment (Simple malaria, severe malaria) for vulnerable communities in the community? Please explain.	*Probe for : Very satisfy, Satisfy, No satisfy*
Provision of non-discriminatory health care services	
2.33. Are there any noticeable differences in terms the access to malaria services among vulnerable communities? (Yes/No) Explain	
2.34. Are there differences for men and women? and are there difference based on other social and cultural characteristics among vulnerable communities? If so, explain	
Others barriers in terms of access of services	
2.35. What are the obstacles or challenges encountered during the implementation of malaria programmes/campaigns of vulnerable communities? Please, cite them and explain.	*Probe for physical, Cultural, Environmental, security, and other obstacles*
3. Suggestions	
3.1. Suggestions for a better consideration of vulnerable communities in the fight against malaria in your communities	
3.2. Suggestions for a better consideration of gender in the fight against malaria	
3.3. Please, do you have another comment to make?	

Health Centers

1. Identifying who and where are the populations most impacted by malaria	Tips for the interviewer
1.1. In your view, which specific groups within vulnerable communities are most affected by malaria?	*Probe for age, occupations, ethnic, religious, social and other characteristics*
1.2. Why are they the most affected? Are there the differences between men and women?	
1.3. Which specific groups within vulnerable communities are deprived of access to malaria: • Prevention services (which ones?) and Why are they deprived? • Testing services (RDTs, Microscopy…)? Why are they deprived? • Malaria treatment services (ACTs, severe malaria treatment…)? Why are they deprived? • Are there the differences between men and women?	

2. Behavior and sociocultural factors	
In the community, what local or traditional beliefs, behaviors, perceptions and practices in women and girls, men, boys in vulnerable communities affect the use of malaria control interventions or services:	
2.1. Prevention methods? How? Please, explain	
2.2. Diagnostics? How? Please, explain	
2.3. Treatment seeking? How? Please, explain	
3. **Information accessibility and health literacy**	
3.1. What role to health care givers play in providing information and advice about malaria within vulnerable communities?	
3.2. Does this information differ for different groups within vulnerable communities?	
3.3. Are they culturally adapted? Or are they the same information?	
4. **Financial accessibility**	
4.1. Are there free of charge malaria prevention services for the vulnerable communities? (Yes/No) If yes, please, cite them? who are the providers of these services? If No, Why?	
4.2. Are there free of charge malaria diagnostic services for the vulnerable communities? (Yes/No) If yes, please, cite them? who are the providers of these services? If No, Why?	
4.3. Are there free of charge malaria treatment services for the vulnerable communities? (Yes/No) If yes, please, cite them? who are the providers of these services? If No, Why?	
4.4. Do you know which malaria services (Prevention, diagnostic and treatment) are not free of charge for the vulnerable communities? (Yes/No) If yes, please, cite them? who are the providers of those services?	
5. **Provision of quality of health care services**	
5.1. Are there adequate laboratory supplies for malaria testing and, adequate antimalarials in your state? (Yes/No) Explain	
5.2. Are the malaria diagnosis and treatment protocols, guidelines and manuals available to and utilized by health care providers for vulnerable communities? (Yes/No) Explain	
5.3. Is the vulnerable communities served by an adequate number personnel or/and dedicated service at the health centers for malaria? (Yes/No) Explain	
5.4. Are clinical audits conducted to assess the quality of laboratory, and treatment services provided for malaria? (Yes/No) Explain.	
5.5. In addition to vulnerable communities, are there other underserved population groups that have limited access to malaria control services? (Yes/No) Explain.	

6. **Provision of non-discriminatory health care services**	
6.1. Does the gender of the health care provider impact on the perception or acceptability of health care by the vulnerable communities? (Yes/No) Explain	
6.2. How does it differ across sex and age disaggregation?	
6.3. Overall, are health facilities able to respond to vulnerable communities' preferences to be assisted by a male or female health providers? (Yes/No) If not, why?	
6.4. How does it affect health seeking behavior of men and women among vulnerable communities of different age ranges?	
6.5. Does the sex of health care workers affect their capacity to interact with the vulnerable communities? (Yes/No) If yes, please explain	e.g., in certain contexts, male health care workers cannot do home visits to raise awareness on malaria prevention if the woman is alone in the house
6.6. If malaria prevention is primarily delivered through targeted interventions, how do programmes ensure that all vulnerable communities at risk receive these services?	
6.7. Does the initial malaria trainings for health workers / workers include sensitization sessions on gender, human rights, stigma and discrimination? If so, please explain	
6.8. Does the continuing education malaria training for health workers providing malaria related services include awareness sessions on gender, human rights, stigma and discrimination? If so, what are the specific themes that are addressed?	
7. **Others barriers in terms of access of services**	
7.1. For vulnerable communities, what are the barriers in terms of access malaria services?.	
7.2. Are there any differences among groups? Please explain	
8. Suggestions to increase access to malaria services for vulnerable groups	
8.1. Any suggestions to increase access to malaria services for vulnerable groups?	
9. Suggestions for a better consideration of gender in the fight against malaria	
9.1. Any suggestions for a better consideration of gender in the fight against malaria?	
9.2. Please, do you have another comment to make?	

NGOs_UN Agencies_PR_SRs

1. General questions about malaria Programs for vulnerable communities	Tips for the interviewer
1.1. What are targeted populations your organization is providing support? Please disaggregate data by age, sex and gender identity	
1.2. Which malaria services does your organization provide to vulnerable communities? • Prevention? Please cite them • Diagnostics? Please cite them • Treatment seeking? Please cite them	
1.3. Do These programs take into account and address gender issues? (Yes/No) If yes, how? If no, why?	
1.4. These programmes respond differently to the different needs among vulnerable communities? (Yes/No) If yes, how? If no, why?	
1.5. Have you conducted an assessment of the needs of vulnerable communities in terms of malaria? (Yes/No) If yes, At which moment in the cycle of the malaria project? What did you find? If no, what for?	
1.6. Do vulnerable communities' representatives participate in the design and implementation of malaria interventions in your project? (Yes/No) If no, why? If yes, in which way? Who are the most represented men or women? why?	
1.7. Do malaria services for vulnerable communities ensure full coverage of all community? (Yes /No) If no, what is the gap or need to ensure full coverage of this malaria services for vulnerable communities? if yes? Explain Is there a difference between men and women in terms of coverage? why?	*Probe for: Mosquito nets, malaria treatment, malaria test, SMC, …*
1.8. Besides vulnerable communities, have you identified other underserved populations affected by malaria? If so, please cite them.	
1.9. If they are malaria services specifically for these populations in your community, cite them and the services providers.	
1.10. If there is a gap in terms of coverage of these services, please indicate what is the gap, for whom? where?	
2. Critically examining how risk factors, barriers to accessing services, and bottlenecks for service delivery affect health equity in the context of malaria	
Information accessibility and health literacy	
2.1. Where do vulnerable communities receive information about your malaria project? Explain	

2.2. Are malaria communication strategies culturally adapted by vulnerable communities? (Yes /No) Explain	
2.3. Are they adapted in the local languages of vulnerable communities? (Yes /No) Explain	
2.4. Are they adapted to the geographical context of vulnerable communities? (Yes /No) Explain	
2.5. Are they adapted to gender and age? (Yes /No) Explain	
2.6. Are they easily understood by vulnerable communities? (Yes /No) Explain	
2.7. Do all communication malaria programs reach all vulnerable communities? (Yes /No) Explain	
2.8. Is there a difference for men and women? Explain	
2.9. What evidence is used to determine whether the chosen modes of providing malaria information are delivered to all vulnerable communities? Please cite them and explain.	
2.10. In general, are vulnerable communities' representatives involved in the design and implementation of malaria communication/ malaria mobilization campaigns in your state? If so, in which ways?	
2.11. Who are the most represented men or women? why?	
2.12. Have you conducted an assessment of the needs of vulnerable communities in terms of malaria in your community? If so, what did you find? Please explain.	
Financial accessibility	
2.13. Are resources adequate to effectively implement malaria services/campaigns of vulnerable communities? (Yes/No) Explain.	
2.14. How do you mobilize your resources?	
2.15. In the community, is there an accessible information system on expenditure (national and external) allocated to vulnerable communities for malaria services? If so, how?	.
2.16. What factors influence budget decisions for malaria services for vulnerable communities and for inclusion of gender in these services? Please cite them	*e.g., available resources, currently funded priorities, religion, socio-cultural factors, legal context*
2.17. What are the obstacles to the execution of budgets allocated for vulnerable communities and for inclusion of gender in the fight against malaria? Please cite them	*Probe for: political commitment, lack of data, insufficient capacity, etc.*
2.18. Are financial data for malaria interventions disaggregated by sex, age of vulnerable communities? (Yes/No) If no, why?	
2.19. Within vulnerable communities, are the specific needs of women, girls, men, boys and other gender identity, other needs based on socio-cultural difference	

taken into account in the budget allocated to malaria interventions?	
2.20. Is the amount allocated for malaria services sufficient to meet the needs of vulnerable communities in all the differences (sex, age, ...)? Please differentiate the groups in your response.	
2.21. Which malaria services (Prevention, diagnostic and treatment) are free of charge for the vulnerable communities? please, cite them.	
2.22. Who are the providers of these services? and mention if there are free for a specify category (groups) of vulnerable communities?	
2.23. Which malaria services (Prevention, diagnostic and treatment) are not free of charge for the vulnerable communities? please, cite them?	
2.24. Is there a national or regional level policy of free malaria services for vulnerable communities? (Yes/No) If yes, explain. if no, why?	
Physical accessibility	
2.25. Are there any physical barriers that prevent vulnerable communities from accessing malaria services? If so, please, cite them.	*Probe for: distance from health centers, rain, means of travel, ...*
2.26. Are strategies to address such physical barriers taken into consideration in the malaria programs? (yes/No) If yes, explain	
2.27. Are there differences for men and women? If so, explain	
2.28. Are there differences based on other social and cultural characteristics among vulnerable communities? Explain	
2.29. Are there security issues affecting the search for healthcare of vulnerable communities? If so, explain	
Provision of quality of health care services	
2.30. Are there adequate laboratory supplies for malaria testing and, adequate antimalarials in the community? (Yes/No) Explain	
2.31. Are the malaria diagnosis and treatment protocols, guidelines and manuals available to and utilized by health care providers for vulnerable communities? (Yes/No) Explain	
2.32. How do you evaluate the quality of malaria services for vulnerable communities?	
2.33. Do you have evaluation documents on quality malaria services provided to vulnerable communities? If so, explain.	
2.34. . What is your appreciation of malaria services in general in terms of prevention (Mosquito nets, SMC, …), of diagnostic (RTD and others) and treatment (Simple malaria, severe malaria) for vulnerable communities in the community? Please explain	*Probe for : Very satisfy, Satisfy, No satisfy*

2.35. What is your appreciation of malaria services in terms of the inclusion of gender in prevention (Mosquito nets, SMC, …), in diagnostic (RTD and others) and in treatment (Simple malaria, severe malaria) for vulnerable communities in the community? Please explain.	*Probe for : Very satisfy, Satisfy, No satisfy*
Provision of non-discriminatory health care services	
2.36. Are there any noticeable differences in terms the access to malaria services among vulnerable communities? (Yes/No) Explain	
2.37. Are there differences for men and women? and are there difference based on other social and cultural characteristics among vulnerable communities? If so, explain	
Others barriers in terms of access of services	
2.38. What are the obstacles or challenges encountered during the implementation of malaria programmes/campaigns of vulnerable communities? Please, cite them and explain.	*Probe for physical, Cultural, Environmental, security, and other obstacles*
3. Suggestions	
3.1. Suggestions for a better consideration of vulnerable communities in the fight against malaria in your communities	
3.2. Suggestions for a better consideration of gender in the fight against malaria	
3.3. Please, do you have another comment to make?	

Appendix 4: Fieldwork Plan

Stakeholders		Groups Invited for interview	Contact Person	Day 1 (Training)	Day 2 (Pre-test)	Day 3	Day 4	Day 5	Day 6 (Data Cleaning and Data Entry)	Day 7 (Data Cleaning and Data Entry)
Health Center	Rubavu HC (pregnant women+U5)	Grp I: 5 Healthcare Providers in ANC Grp II: 10 Pregnant Women	Head of HC			Team 1				
Health Center	Mayange HC (pregnant women+U5)	Grp I: 10-15 Community Health Warkers Grp II: 10 Pregnant Women	Head of HC				Team 4			
UNHCR	Mahama Refugee Camp	Grp I 15 Refugees Grp II:Camp leaders+Health Providers+partners	Mrs Jeanne Mumporeze			Team 3				
Rwanda Correctional Services	Muhanga Prison	Grp I: 10 Prisoners Grp II: Prison guards	Dr Diane			Team 2				
Rwanda Correctional Services	Rubavu Prison	Grp I: 10 Prisoners Grp II: Prison leaders + prison dispensary nurse	Dr Diane					Team 1		
Rwanda Correctional Services	Ngoma Prison	Grp I: 10 Prisoners Grp II: 5 Prison local staff, including nurses	Dr Diane			Team 3				
Rwanda Correctional Services	Nyagatare Prison	Grp I: 10 Prisoners Grp II: 5 Prison local staff, including nurses	Dr Diane				Team 3			
Rice famers	Gasabo District	10 members of cooperatives	Claudien (URUNANA DC)			Team 4				
Fishermen	Rubavu District	10 members of cooperatives	V/M Social Affairs				Team 1			
Fishermen	Rusizi District	10 members of cooperatives	V/M Social Affairs					Team 2		
Mining workers	Nyamasheke District	10 members of cooperatives	V/M Social Affairs					Team 2		
Security gards	ISCO	5 field security staff				Team 4				
Security staff	Rwanda National Police							Team 4		
Provincial Hospital	Rwamagana PH	10 Healthcare providers	Dr Utumatwishim, DG of Hosp					Team 3		
Female Sex Workers	Nyamasheke Hotspot	Grp I: 10 FSWs Individual Interview with: Coordinators	NGOs Forum			Team 2	Team 2			
Female Sex Workers	Rubavu Hotspot	Grp I: 10 FSWs Individual Interview with: Coordinators	NGOs Forum			Team 1				
Female Sex Workers	Gasabo/Gatsata Hotspot	Grp I: 10 FSWs Individual Interview with: Coordinators	NGOs Forum			Team 4				
Hotels (staff&Clients)	Dereva Hotel Rwamagana	Grp I: 10 clients Grp II: 5 staff members	Dr Method Dereva					Team 3		
Boarding Schools	Lycee de Nyanza, Kigoma Sector	Grp I: 10 students representatives Grp II: 5 staff members	TBD			Team 2				
Truck Drivers	Association des Conducteurs des Poids Lourds au Rwanda (ACPLRWA) –Kicukiro District	Grp I: 5 truck drivers	Issa Mugarura, vice-president 07885355				Team 4			
CSOs	City of Kigali	Grp I: 5 CSOs representatives	NGOs Forum				Team 4			

Appendix 5: Consent Forms

INFORMED CONSENT FORM (English)

MALARIA MATCHBOX ASSESSMENT-RWANDA

Protocol Title:

Malaria Matchbox Assessment-Rwanda

Principal Investigator (name, address and phone):

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1. What you should know about the Malaria Matchbox Assessment:

The Ministry of Health/RBC/MOPDD, in collaboration with partners have conducted an in-depth analysis using the Roll Back Malaria (RBM) Matchbox Toolkit as a guide to ensure that the interventions being implemented are addressing the documented barriers, to identify any additional specific human rights or gender barriers in the context of malaria and to provide guidance on specific interventions to address any barriers. The roll-out of the Matchbox in Rwanda which aims to identify gaps and generate key information to guide efficient and effective implementation of malaria control programs. More specifically, it aims to identify the most vulnerable groups and key populations at increased risk of malaria infection, the barriers related to access to malaria services for these populations, how gender, humans' rights and social issues affect malaria programs. It is also intended to contribute robust recommendations for improving malaria services coverage and decreasing malaria risk among the most affected populations.

You have been selected as key respondent and you are being asked to respond to questions from data collectors.

This consent form explains the purpose and objectives of this assessment. Please read it carefully and take as much time as you need. Ask your assessors to explain any words or information in this informed consent that you do not understand.

Include the following statement if children or cognitive impaired adult takes part in this compassionate use:

The person being asked to take part in this assessment not be able to give consent for this use. You are therefore being asked to give permission for this person as his/her decision maker.

2. Purpose of the Malaria Matchbox Assessment in Rwanda

1. To identify gaps and generate key information to guide efficient and effective implementation of malaria control programs.
2. To identify the most vulnerable population groups, the barriers related to access to malaria services for these populations, how gender, humans' rights and social issues affect malaria programs.
3. To contribute robust recommendations for improving malaria services coverage and decreasing malaria risk among the most affected populations.

3. What will happen if you agree to participate to this assessment?

If you agree to participate, you will be requested to give an individual interview or a Focus Group Discussion, and questionnaire will be used to respond to specific questions. A record will be taken to ensure that information given is well captured.

4. Potential risks and discomforts that may occur

Only researchers will have access to information provided and this information will be used for research purpose only. Neither you nor your family members will be put at risk due to your participation to this assessment.

5. What are your alternative options if you do not want to respond the interview?

You may choose not to respond to the entire questionnaire or some of the questions asked by data collectors or may stop the interview at any time. Your decision will not affect the quality of service you receive. Data collectors, as well, may discontinue the interview or focused group discussion if she/he feels it is in your best interest.

6. Is there any remuneration?

There is no expected remuneration for participating to this interview/FGD

7. Privacy and Confidentiality

Your confidentiality and privacy will be respected.

No information or records that disclose your identity will be published without your consent, nor will any information or records that disclose your identity be removed or released without your consent unless required by law. Any information derived from this assessment, that personally identifies you will not be voluntarily released or disclosed without your consent, except as

specifically required by Rwandan law. Records provided to authorized, non-above-mentioned entities will not contain identifiable information about you.

You will be assigned a unique study number as a participant in this assessment. This number will not include any personal information that could identify you (e.g., it will not include your name, your national ID card number). The information provided will only be used on any research-related information collected about you during this assessment, so that your identity will be kept confidential. Information that contains your identity will remain only with the Principal Investigator and/or designate. The list that matches your name to the unique study number that is used on your research-related information will not be removed or released without your consent unless required by Rwandan law.

Your rights to privacy are legally protected by national laws that require safeguards to ensure that your privacy is respected. You also have the legal right of access to the information about you that has been provided, if need be, you still have an opportunity to correct any errors in the information.

8. If you have questions

May you have any comments, concerns, or questions regarding the assessment, please contact the National Consultant, **Dr. Innocent TURATE** on Phone number: +250733113933 of E-mail: iturate@gmail.com or **Dr Aimable MBITUYUMUREMYI**, the Division Manager of Malaria and Other Parasitic Diseases Division in the Rwanda Biomedical Centre on Phone number: +250788486256 or on email: aimable.mbituyumuremyi@rbc.gov.rw

9. What does your signature on this consent form mean?

Your signature on this form means that:

- You understand the information given to you in this form
- You accept the provisions in the form
- You agree to allow the interview or FGD

You will not give up any legal rights by signing this consent form.

WE WILL GIVE YOU A COPY OF THIS SIGNED AND DATED CONSENT FORM

ASSENT STATEMENT

AGREEMENT TO PARTICIPATE IN THE MALARIA MATCHBOX ASSESSMENT:

By signing below, I consent to participate to the Malaria Matchbox Assessment in Rwanda.

I understand that I may refuse to accept this interview/FGD or withdraw from it at any time without penalty or loss of benefits to which you might otherwise be entitled in this institution. By signing this informed consent form, I do not give up any rights that I have as a study participant and my decision will not affect the quality of services I am supposed to receive.
My signature below indicates that I have read this consent form and the protocol has been explained to me verbally. All my questions have been answered to my satisfaction, and I agree to participate to Malaria Matchbox Assessment in Rwanda.

I have read the information in this consent form and have had a chance to ask any questions.

I will receive a copy of this consent form to keep.

Under these terms I voluntary accept to participate in the Malaria Matchbox Assessment

_____	_____	_____
Participant's Signature	**Printed name**	**Date** (dd-mm-yyyy)

_____	_____	
Signature of the Legally Authorized Representative (LAR)	**Relationship to Participant**	**Printed name of LAR Date** (dd-mm-yyyy)

_____	_____	_____
Data Collectors' Signatures	**Names**	**Date** (dd-mm-yyyy)

INFORMED CONSENT FORM (Kinyarwanda)

INYANDIKO YO KWEMERA NTA NKINGIMIRA

UBUSHAKASHATSI KURI MALARIYA MU RWANDA

Uko ubushakashatsi bwitwa:

Inyigo ku ndwara ya Malariya mu `Rwanda

Umushakashatsi mukuru (amazina, aho abarizwa, nimero za telefoni):

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10. Ibyo ukwiye kumenya ku bushakashatsi ku ndwara ya malariya

Minisiteri y'Ubuzima/RBC/Ishami rishinzwe kurwanya Malariya ifatanyije n'abafatanyabikorwa bakoze isesengura ryimbitse bakoresheje ubuhanga bita "Roll Back Malaria (RBM) Matchbox Toolkit" kugira ngo barebe niba ingamba zishyirwa mu bikorwa zirimo gukemura inzitizi zagaragajwe mu nyandiko kandi hamenyekane izindi nzitizi zose zihariye zibangamira iyubahirizwa ry'uburenganzira bwa muntu cyangwa inzitizi zishingiye ku gitsina mu rwego rwo kurwanya malariya kugira ngo hatangwe umurongo uhamye wo gukemura izo nzitizi zibangamira izo ngamba zafashwe. Gukoresha ubwo buryo bwiswe "match box" mu Rwanda bugamije kugaragaza ahari integer nke no gutanga amakuru yafasha mu gushyira mu bikorwa gahunda zo kurwanya malariya. By'umwihariko, igamije kumenya amatsinda yibasiwe cyane n'abaturage b'ibanze bafite ibyago byinshi byo kwandura malariya, inzitizi zituma aba baturage batabona serivisi za malariya, uburyo uburinganire, uburenganzira bwa muntu n'ibibazo by'imibereho bigira ingaruka kuri gahunda ya malariya. Ikaba igamije kandi gutanga ibyifuzo bifatika byo kunoza serivisi za malariya no kugabanya ibyago bya malariya mu baturage bibasiwe cyane.

Watoranyijwe mu bazasubiza ibibazo bizabazwa n'uzakusanya amakuru yo muri ubu bushakashatsi.

Iyi nyandiko yo kwemereraho nta nkingimira isobaura icyo iyi nyigo igamije. Turagusaba gufata akanya gahagije ugasoma iyi nyandiko. Egera abakora ubu bushakashatsi bagusobanurire amagambo cyangwa amakuru udasobanukiwe yanditse muri iyi nyandiko yo kwemera nta nkingimira.

Shyiramo aya magambo niba abana cyangwa abantu bakuru bafite ubumuga bwo mu mutwe bitabiriye ubu bushakashatsi:
Uwo muntu umeze gutyo niyitabira ubu bushakashatsi ntiyemerewe gusinya iyi nyandiko. Turagusaba gutanga uruhushya rwemerera uwo muntu kubwitabira niba ari wowe umufatira icyemezo

11. Icyo ubu bushakashatsi kuri malariya mu Rwanda bugamije

4. Kugaragaza icyuho no gutanga amakuru y'ingenzi kugira ngo yifashishwe mu gushyira mu bikorwa gahunda zo kurwanya malariya.
5. Kumenya amatsinda y'abatishoboye kurusha abandi, inzitizi zibangamira imitangire ya serivisi kuri aba baturage, kwerekana uko ibibazo bigaragara mu ihame ry'uburinganire, uburenganzira bwa muntu n'imibereho bigira ingaruka kuri gahunda yokurwanya malariya
6. Gutanga ibyifuzonama bikomeye byo kunoza serivisi zo kurwanya malariya kugabanya ibishobora gutera ibyago byo kurwanya malariya mu baturage bugarijwe kurusha abandi.

12. Niwemera kwitabira ubu bushakashatsi uzasabwa iki?

Niwemera kwitabira ubu bushakashatsi, tuzagusaba kugirana ikiganiro n'umwe mu bakusanya amakuru muri hamwe mwembi cyangwa mu itsinda ry'ibiganiro, tuzaguha ibibazo uzasubiza. Tuzafata amajwi icyo kiganiro kugira ngo dufate ibyo twavuganye byose.

13. Ingaruka zishobora kubaho n'uko ushobora kumva bikugoye

Abemerewe kubona ayo makuru ni abashakashatsi gusa kandi nta kindi aya makuru azakoreshwa uretse ubushakashatsi. Yaba wowe cyangwa umwe mu bagize umuryango nta numwe uzagira ibibazo bitewe nuko yitabiriye ubu bushakashatsi.

14. Niba udashaka gusubiza ibibazo biri muri ubu bushakashatsi ni iki kindi wakora?

Ushobora guhitamo kwanga gusubiza ibi bibazo byose cyangwa bimwe muri byo wabajijwe nushinzwe gukusanya amakuru cyangwa ugahitamo guhagarika kubwitabira igihe cyose ubishakiye. Icyemezo ufata ntikizatuma udakomeza guhabwa serivisi nziza. Abakusanya amakuru bashobora guhagarika ikiganiro cyangwa ibiganiro mu mutsinda igihe basanze byakugirira akamaro.

15. Harimo igihembo?

Nta gihembo giteganyijwe gutangwa ku muntu witabiriye iki kiganiro/ibiganiro mu matsinda.

16. Kugirirwa ibanga

Nta muntu uzamena ibanga ry'ibyo wavuze.
Ibyo tuzaganira byose ntibizatangazwa utabyemeye, kandi nta makuru agaragaza umwirondoro wawe azakurwamo cyangwa ngo atangazwe utabyemeye keretse amategeko abitegetse gutyo.

Amakuru yose aturuka muri iyi nyigo akugaragaza uwo uri we ntazatangazwa cyangwa ngo hagire uyabwirwa utabanje kubyemera, keretse bitegetswe n'amategeko y'u Rwanda. Amajwi yafashwe agashyikirizwa inzego zibyemerewe tutavuze haruguru ntabwo azaba akubiyemo amakuru akuranga.

Tuzaguha nimero yihariye mu bushakashatsi nk'uwabwitabiriye. Iyo nimero ntizaba igaragaza amakuru yihariye kuri wowe yatuma bakumenya (urugero, ntizagaragaza izina ryawe, nimero y'indangamuntu yawe).
Amakuru yatanzwe yakusanyijwe kuri wowe azakoreshwa gusa mu bijyanye n'ubushakashatsi, kandi umwirondoro wawe uzagirwa ibanga. Amakuru akubiyemo umwirondoro wawe azabikwa gusa n'umushakashatsi mukuru cyangwa umuhagarariye. Nta wemerewe guhanagura cyangwa gutangaza urutonde rugaragaza izina ryawe ruriho gusa na ya nimero yihariye ikugaragaza ku makuru yawe ajyanye n'ubu bushakashatsi, utabanje kubyemera keretse gusa igihe bisabwe n'amategeko yu Rwanda.

Amategeko y'igihugu arengera uburenganzira bwo kutavogera ubuzima bwawe bwite kandi agasaba ko byubahirizwa. Amategeko kandi aguha uburenganzira bwo kubona ya makuru witanzeho igihe ari ngombwa kuko uba ugifite umwanya wo kuba wakosora amakuru yatanzwe nabi.

17. Uwo wabaza uramutse ufite ikibazo

Niba ufite icyo wongeraho, ufite impungenge cyangwa ikibazo ku bijyanye n'iyi nyigo, wavigisha impuguke ku rwego rw'igihigu ari we , **Dr. Innocent TURATE** ukamuhamagara kuri iyi nimero: +250733113933 na E-mail: iturate@gmail.com cyangwa **Dr Aimable MBITUYUMUREMYI**, Umuyobozi w'Ishami rishinzwe kurwanya Malariya n'Izindi ndwara zandura, kamuhamagara kuri iyi nimero: +250788486256 cyangwa kuri email: aimable.mbituyumuremyi@rbc.gov.rw

18. Gushyira umukono wawe kuri iyi nyandiko bivuze iki?

Gushyira umukono kuri iyi nyandiko bivuze ko:
- Wasobanukiwe n'ibikubiye muri iyi nyandiko
- Wemera ibikubiye muri iyi nyandiko
- Wemeye gusubiza ibibazo bakubaza cyangwa kwitabira ibiganiro mu matsinda

Nusinya iyi nyandiko igaragaza ko wemeye kwitabira ubu bushakashatsi nta burenganzira mu mategeko uzatakaza

TUZAGUHA KOPI Y'IYI NYANDIKO YO KWEMERA KWITABIRA UBUSHAKASHATSI IRIHO UMUKONO WAWE N'ITARIKI WAYISINYIYEHO

INYANDIKO YO KWEMERA KWITABIRA UBUSHAKASHATSI

AMASEZERANO Y'UWITABIRA UBUSHAKASHATSI KURI MALARIYA:

Umukono wanjye nshyize kuri iyi nyandiko ugaragaza ko nemeye kwitabira ubushakashatsi kuri malariya mu Rwanda.

Nzi neza ko nshobora kwanga kwitabira iki kiganiro/ibiganiro mu matsinda cyangwa nkabivamo igihe icyo ari cyo cyose mbishakiye kandi ko ntabihanirwa cyangwa ngo ngire uburenganzira ntakaza nagombaga guhabwa n'iki kigo. Gusinya iyi nyandiko yo kwemera nta nkingimira bisobanuye ko bitazatuma hari uburenganzira ntakaza nk'uwitabiriye ubu bushakashatsi kandi icyemezo nzafata ntikizatuma ntahabwa serivisi nziza nagombaga guhabwa.
Umukono wanjye nashyize kuri iyi nyandiko ugaragaza ko nayisomye kandi nkaba nasobanukiwe n'amabwiriza yose ayikubiyemo. Ibibazo nabajije byose babishubije kandi nanyuzwe, ni yo mpamvu nemeye kwitabira ubu bushakashatsi kuri malariya mu Rwanda.

Nasomye amakuru yose akubiye muri iyi nyandiko kandi nahawe umwanya wo kubaza ibibazo.

Nzahabwa kopi y'iyi nyandiko kugira ngo nyibikire

Bityo rero nemeye ku bushake kwitabira ubushakashatsi kuri Malariya

Umukono w'uwitabiriye ubushakashatsi	**Amazina ye**	**Italiki** (dd-mm-yyyy)

Uhagarariye uwabwitabiriye byemewe	**Isano iri hagati y'uhagarariye uwabwitabiriye**	**Amazina y'uhagarariye uwabwitabiriye**	**Itariki nawe ubwe** (dd-mm-yyyy)

Umukono w'ukusanya amakuru	**Amazina ye**	**Itariki** (dd-mm-yyyy)

Appendix 6: Key individuals who contributed to the evaluation

List of Steering Committee Members

N°	Name	Position
1	Dr Bosco KANANI	Program Manager, CARITAS Rwanda
2	Dr Diane INGABIRE	Rwanda Correctional Services
3	GATETE Jean Marie Vianney	Executive Secretary, RieH
4	Jeanne MUMPOREZE	Health Department, VNHCR
5	Dr KAENDI MUNGUTI	PMI, Rwanda
6	Prof. Manasse NZAYIRAMBAHO	VR/SPH
7	Nooliet KABANYANA	Executive Secretary, RNGOF & HP
8	SAGE SEMAFARA	Executive Secretary, RRP+
9	Dr Jules MUGABO SEMAHORE	HIV, STIs, Hepatitis and TB Programmes, WHO
10	Dr Naomi LUCCHI	CDC Representative
11	Innocent CYIZA	Permanent Secretary, CCM-Rwanda
12	Dr Aimable MBITUYUMUREMYI	Malaria and OPD Division Manager
13	Olivia NGOU	International (RBM) Consultant for the Assessment
14	Dr Innocent TURATE	National Consultant for the Assessment

Data Collectors

Team n°	Name of the members
1	Jean Berchmans Tugirimana
	David Ntegerejimana
2	Aaron Nshimiyimana
	Eugenie Uwimpundu
3	Gakwandi Higiro Augustin
	Marthe Kubwimana
4	Thierry Serubuga
	Vanessa Isimbi

Data Analysis Team

Name	Position	Organization
Pierre Pascal FOUDA ESSAMA	Technical Assistant to the RBM Consultant/Data Manager and Analyst	Impact Santé Afrique (ISA), Cameroon
Jean Luc MBIA MVONDO	Data Analyst	Impact Santé Afrique (ISA), Cameroon