National Tuberculosis and other respiratory communicable Diseases Program

Rwanda Biomedical Centre

Healthy People, Wealthy Nation

Annual Report 2021-2022

August 2022

HYPERLINK "http://www.rbc.gov.rw" *www.rbc.gov.rw* |HYPERLINK "mailto:Info@rbc.gov.rw"
Info@rbc.gov.rw* | *KG 17 Ave, PO Box : 7162 ,Kigali - Rwanda

FOREWORD

The Ministry of Health and Rwanda Biomedical Centre (RBC) would like to take this occasion to express its deep appreciation and sincere thanks to all who contributed to this annual report on Tuberculosis (TB) and other respiratory communicable diseases (ORD) control in Rwanda.

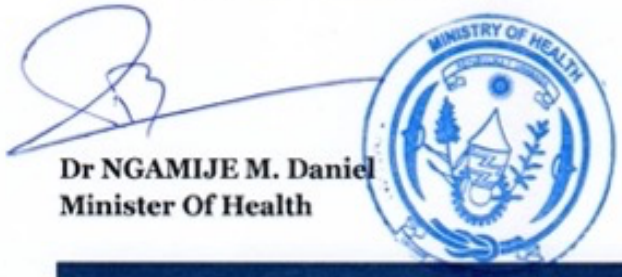
This report has been developed based on data collected through TB and ORD surveillance systems national wide. This report contains activities implemented and achievements made in the fight against TB and leprosy diseases based on the 2019-2024 Rwanda TB National Strategic Plan and Rwanda Leprosy National Strategic Plan.

Required actions toward the elimination of Tuberculosis and leprosy in Rwanda, in the context of covid-19 pandemic, include strengthening active case finding and continue to integrate health services to have a strong and resilient health system. We observed a little increase of TB cases notification compared to the last two fiscal years (2019-2020 and 2020-2021).

As we are approaching 2025 End TB target, Rwanda will continue to implement evidence-based interventions to reduce TB incidence and mortality; and continue to engage the private sector in the fight against TB through contribution to TB services delivery and advocacy for new tools like TB vaccine.

I gratefully acknowledge all those who contributed on the frontline at health facilities for their commitment and involvement in implementation of strategies adopted by the Government of Rwanda through the Ministry of Health to fight TB and Leprosy.

The Government of Rwanda will continue to support and collaborate with all partners by availing and advocating for all resources needed to achieve the 2025 milestones set by End TB and Leprosy strategies.



Dr NGAMIJE M. Daniel
Minister Of Health

EXECUTIVE SUMMARY

TB diagnostic and Notification

Rwanda has made tremendous efforts with political will to detect and diagnose TB in the framework of WHO strategies aiming to ending TB in 2035. As the Covid-19 pandemic has challenged health sector in general, National TB program has been able to ensure continuity of service mainly based on the strengthening of community health workers and conduct active case finding specifically among prisoners. During this 2021-2022 FY, TB presumptive were identified 126,294 and community health workers referred 55.7% of them compared 63.7% in 2020-2021 FY. This decrease was due to the involvement of CHWs in the COVID-19 preventive measures especially vaccination campaign. The total number of all TB cases diagnosed was 5,538 including 39 RR/MDR-TB cases, children under 15 years was 271(5%) and male represented 72,6% and 27.6% were referred by CHWs with ratio male: female at 2.6. New and relapse were 5,455(98.5%), 4,505(81.3%) had pulmonary TB. The proportion of HRG was 50,4 % compared to 53.4 % in 2020-2021 FY. Regarding drug susceptibility testing, 75,8% of bacteriologically confirmed TB performed it versus 89.1% for the previously FY. This decrease was mainly due to the delay of genexpert machines maintenance.

To ensure quality of laboratory diagnosis, external quality control for smear microscopy was conducted in 60% of Center for Diagnostic and Treatment (CDT) at least 3 times and 60% met/passed the minimum external quality control requirement. Proficiency panel of Gene-Xpert test was performed in 23 out of 56 sites enrolled in external quality control and 21 sites passed.

TB treatment outcomes

For susceptible TB cases notified in 2020-2021 FY, treatment success rate was 88.8%(4,838/5,455) and 92.8% (323/348) for children under 15 years. Among clinically diagnosed (CD) and TB/HIV coinfected patients, the treatment success rate was 84.4% (1,132/1,341) and 81,4% (804/985) respectively. The main unfavorable TB treatment outcome was “death” representing 7.8% of all susceptible TB patients (427/5,455), 12.7% (170/1,341) in clinically diagnosed cases and 13% (128/985) in TB/HIV coinfected patients. The treatment outcome of 40 multidrug TB patients enrolled (16 in longer regimen in 20219-2020 FY and 24 in shorter regimen in 2020-2021, treatment success rate was 97.5%. However, the TSR for patients followed by CHW was 93.9% (2,174/2,314).

TB prevention

Effort toward meeting the UNHLM target on TB prevention, Rwanda started the scale up of the TPT among people living with HIV(PLHIV) 3 years ago as well as implementation among TB contacts above 5 years during this reported FY 2021-22. The coverage on initiation of TPT at the end of June 2022 was 63.8% among of PLHIV which increase from 25.6% end of June 2021. Regarding initiation of tuberculosis preventive therapy, 90.5% (1,047/1,157) of contact under 5 years and 19%(427/2,260) of contact above 5 years were initiated on TPT. The initiation of TPT among contact above 5 years is based on positivity of tuberculin testing while for children under

5years is done after clinical exclusion of TB. The treatment completion of children under 5 years and PLHIV initiated on TPT in 2020-2021 was 93.8% and 95.8% respectively

Tuberculosis management, coordination and research

To ensure quality and accuracy of TB data, quarterly data checking and validations were conducted every quarter in collaboration with data management team of district hospital. Progress in completeness and timeliness of reporting TB data in aggregated and individual case-based surveillance has been done in some district. However, there is still a need to reinforce capacity of district team to empower staff from HCs to fully comply on data management SOPs.

Rapid quality services were conducted to evaluate the quality of TB services in 94 sampled health facilities representing 16% of all Health facilities. Strategic areas were evaluated, and the Overall score increased from 70.0% to 74.3% during 2020-2021 and 2021-2022. There is need of District, provincial and referral Hospitals team to conduct this assessment regularly at least two time a year to improve the TB management at HCs level.

To strengthen culture on use of data to inform policy, TB&ORD division published prevalence of MDR TB using data from the case-based surveillance system which was published in International Health journal with title of Continuous surveillance of drug-resistant TB burden in Rwanda: a retrospective cross-sectional https://doi.org/10.1093/inthealth/ihac039.

Leprosy control

During this fiscal year, 34 leprosy cases were diagnosed, among whom 14 were women and 2 were children under 15 years of age. The proportion of MB cases represented 76.7% and 30% of the leprosy cases detected had disability grade 2(G2D).

The treatment completion rates for PB registered from July 2020 to June 2021 and MB forms registered from July 2019 to June 2020 for new cases were 100%.

During this FY, contact tracing in non-endemic area started to reinforce leprosy surveillance and electronic contact tracing surveillance system was developed in DHIS2.

TB&ORD financing

During the fiscal year 2021-2022, the total budget planned was USD 7,402,038 with a contribution of 58.2% from the Global Fund (GF), 41.5% from the Government of Rwanda (GoR) and 0.3% from the World Health Organization (WHO. CDC contributed also but the report of their contribution is mentioned in HIV report.

The overall budget execution rate was at 92.2% then specific budget execution rate for WHO, GoR and GF fundings was 64%, 97% and 89% respectively.

Table of content

List of Figures

List of tables

ABBREVIATIONS

ACF	Active Case Finding
aDSM	Active Drugs Safety Monitoring
AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
BCC	Behaviour change communication
CBHI	Community based health insurance
CDC	Centre for Disease Control and Prevention
CDT	Centre for Diagnosis and Treatment of Tuberculosis
CHUB	Butare University Teaching Hospital
CHUK	Kigali University Teaching Hospital
CHW	Community Health Worker
COVID-19	Coronavirus Disease 2019
CRVS	Civil Registration and Vital Systems
CSB	Corn -Soya Blend
CSO	Civil Society Organizations
CT	Centre for Treatment of Tuberculosis
CXR	Chest X-ray
DF	Damian Foundation
DH	District Hospital
DHIS2	District Health Information System version 2
DIAMA	Diagnostics for Multidrug-resistant tuberculosis in Africa
DOT	Directly Observed Treatment
DQA	Data Quality Audit
DS-TB	Drug Susceptible Tuberculosis
DR-TB	Drug Resistant Tuberculosis
DST	Drug Susceptibility Testing
DTC	Drug Therapeutic Committee
EPTB	Extra Pulmonary TB
E-TB	Electronic Tuberculosis surveillance system
EQA	External Quality Assessment
FDA	Rwanda Food and Drugs Authority
FNA	Fine Needle Aspiration
FY	Fiscal year
G2D	Grade 2 Disability
GDF	Global Drug Facility
GFATM	Global Fund for AIDS, TB and Malaria
GHSC	USAID Global Health Supply Chain Program
GoR	Government of Rwanda
HC	Health Centre
HH	Household
HF	Health Facility
HFN	High False Negative
HFP	High False Positive

HIV	Human Immune Virus
HISP	Health Information Systems Program
HMIS	Health Management Information System
HRG	High Risk Group
HRTT	Health Resource Tracking Tool
HSSP	Health Sector Strategic Plan
IC	Infection Control
IEC	Information, education and communication
IPT	Isoniazid Preventive Therapy
ISS	Integrated Supportive Supervision
LFN	Low False Negative
LFP	Low False Positive
LMIS	Logistics Management and Information System
LPA	Line Probe Assay
LTBI	Latent tuberculosis infection
M&E	Monitoring and Evaluation
MB	Multibacillary
MCCH	Maternal Child Community Health Division
MD	Medical Doctor
MDR-TB	Multidrug Resistant Tuberculosis
MDT	Multidrug therapy
MoH	Ministry of Health
MPPD	Medical Production and Procurement Division
MTB	Mycobacterium Tuberculosis
MTEF	Medium Term Expenditure Framework
MTR	Mid-Term Review
NCD	Non-Communicable Diseases
NGOs	Non-Government Organizations
NRL	National Reference Laboratory
NSP	National Strategic Plan
NTPB	New Pulmonary Bacteriological confirmed
NTWG	National Technical Working Group
NYC	National Youth Council
PAL	Practical Approach for Lung diseases
PB	Paucibacillary
PBF	Performance- Based Financing
PLHIV	People Living with HIV
PMDT	Programmatic Management of Drug Resistant Tuberculosis
PMEBS	Planning Monitoring Evaluation and Business Strategies division
PPA	Patient Pathway Analysis
QC	Quality Control
QE	Quantification Error
RBC	Rwanda Biomedical Centre
RBF	Results Based Financing (of the Global Fund)

RDA	Rwanda diabetic associations
RH	Referral Hospital
RMH	Rwanda Military Hospital
RR	Rifampicin Resistant Tuberculosis
RRP+	Réseau Rwandais des Personnes vivant avec le VIH
RSQA	Rapid Services Quality Assessment
SLD	Second Line Drug
SMART FMIS	Integrated Financial Management Information System
SOPs	Standard Operating Procedures
SPH	School of Public Health
SPIU	Single Project Implementation Unit (MoH)
TB&ORD	Tuberculosis and Other Respiratory Communicable Diseases
TIME	TB impact modelling estimate
TPB+	TB Pulmonary Bacteriologically confirmed
TPT	Tuberculosis Preventive Therapy
TSR	Treatment Success Rate
TST	Tuberculosis skin testing
TWG	Technical Working Group
USD	United States Dollars
VOT	Virtually Observed Treatment
WHO	World Health Organization
XDR-TB	Extensively drug-resistant tuberculosis

1. INTRODUCTION

The National TB program was established in 1990 by the Ministry of Health and management of TB was integrated in health facilities. Gishali Sanatorium become a referral center for complicated TB cases until 1994, when the health system was dismantled due to the genocide against Tutsi. But before 1990, all TB cases were treated at Sanatorium in Gishali since 1954. The 1994-genocide resulted in a breakdown of the health system. After 1994, the National TB program (NTP) was rebuilt with the assistance of the Damien Foundation. By 2003, full national coverage was achieved again, and the DOT strategy was applied in all health facilities countrywide.

Since 2003, the NTP has launched many programs, including Community DOT in 2005, where community health workers were trained to provide treatment of TB patients nearest their home with the aim of bringing TB service close to the community. In February 2005, TB/HIV in integration of TB/HIV activities started with cotrimoxazole prophylaxis, and antiretroviral therapies were initiated in 2006 for HIV positive and co-infected TB/HIV patients. During the same period, HIV testing was offered to all TB patients and since 2009, all presumptive TB were routinely offered HIV counselling and testing.

The national TB program and leprosy in Rwanda is called Tuberculosis and other respiratory communicable diseases Division (TB&ORD) which is under the department of HIV/AIDS Disease Prevention and Control within the Rwanda Biomedical Centre.

The provision of TB services follows the Rwanda health pyramid. At community level, CHWs are responsible for community education and sensitization on TB symptoms and management and early identification of presumptive TB cases in their villages. They refer patients to the nearest health centre and ensure direct observation treatment as a key component of the community DOTS strategy. At the sector level, health centres are responsible to identify presumptive TB cases, perform diagnostic of TB and provide treatment. We have a centre for treatment (CT) and a centre for diagnostic and treatment (CDT). Overall, centres for treatment identify presumptive TB patients, collect sputum samples and perform slide preparation to be sent to CDT laboratory for staining and microscopy examination. CDT and CT provide DOT to patients. Each CT is under the catchment area of a specific CDT.
At the district level, all district hospitals are Centres of diagnosis and treatment (CDT) and provide operational support to health centres (whether CDT or CT) through coordination of activities. They provide supervision, mentorship, and quality control of all TB technical work done at health centres. This includes quality control for laboratory related activities at CDT/CT and quality of TB case management as well as quality of surveillance data.
Rwanda introduced the individual case-based surveillance system using the District Health Information System (DHIS) 2 platform, where each health facility records the individual patient data.

Rwanda developed the TB National Strategic Plan (TB-NSP) July 2019- June 2024, which gives a detailed view of the current state of TB control in Rwanda. The plan illustrates the most pressing problems and their root causes, based on evidence and data gathered in Rwanda and elsewhere. The plan also describes what we want to achieve by mid-2024 and our strategic and technical process for addressing identified gaps. At international level, the most important policies providing guidance and direction to this NSP are the Sustainable Development Goals (SDGs), the End TB strategy, and the Africa Health Strategy 2016-2030. Rwanda's vision is to end TB in 2035, attaining a reduction of the estimated TB incidence by 90% and mortality by 95% compared to 2015 levels. This plan aims to achieve the End TB milestones for 2024, including a reduction of TB incidence by 35%, reducing TB deaths by 57% as compared to 2015, and ensuring a reduction of TB affected families are facing catastrophic costs based on the result of the survey. The TB NSP intends to achieve the 2022 UNHLM and the TB Global plan targets of more than 90% treatment coverage and more than 90% treatment success rate (TSR) for all TB patients by June 2024, at the latest.

Chapter 1: TB SCREENING AND DIAGNOSTIC

In Rwanda, two screening methods are used to identify TB presumptive cases. Active case finding is performed among people attending health facilities or in the community for those not classified as high-risk groups for TB. The second method of TB screening is performed among people classified as high-risk groups (HRG) of developing TB. TB screening is based on five questions (cough and fever for ≥ 2 weeks , night sweats , weight loss and contact) except for PLHIV where the duration of symptoms is not considered. Community health workers (CHWs) contributed to screening by identifying people with symptoms related to TB and referred them to health centres for screening. In addition, chest x-ray is used systematically as a screening tool in prisons and people at transit centres (refugees entering the country).

1.1. Screening in the general population.

The total number of presumptive TB cases was 126,294 and 70,391 (55,7%) were referred by CHWs. We observed a decrease of 28,4% of presumptive at HFs level (from 176,636 in 2020-2021 to 126,294 in 2021-2022. There was also a decrease of presumptive referred by CHWs from 63,6% reported in 2020-2021 fiscal year. Among all presumptive TB, 9.5% (11,998) knew their HIV-positive status and 99.4% (113,624) of unknown HIV status have been tested during the TB diagnostic. The HIV incidence among all tested TB presumptive cases was at 9.9% (12,505).

The overall positivity rate was 3.2% versus 2.3% from the previous fiscal year. The positivity rate from presumptive of the health facilities was 2.5-fold compared to the one from presumptive referred by CHWs. We commend TB screening improvement at the community level which led to the decrease of presumptive while the number of TB cases increased (112,368 presumptive and 1,312 TB cases in 2020-2021 FY vs 70,391 presumptive and 1,386 TB cases in 2021-2022 FY).
The total number of GeneXpert tests performed was 50,174 out of the 126,294 presumptive TB population.

Table 1: TB detection and contribution of each screening level, Rwanda, July 2021-June 22.

DETECTION	CDT	CT	CHWs	Total
Presumptive TB cases	35,414	20,489	70,391	126,294
	28.0%	**16.2%**	**55.7%**	**100%**
B+ among presumptive TB cases	1,951	750	1,386	4,087
	47.7%	**18.4%**	**33.9%**	**100%**
Positivity rate	**5.5%**	**3.7%**	**2.0%**	**3.2%**

1.2. Screening among high-risk group (HRG)

The Active Case Finding using mobile digital Chest x-ray (CXR) was conducted among inmates in Rwamagana, Muhanga and Huye prisons and youth in the Rehabilitation Transit Centre.

Among the total TB presumptive cases mentioned above, there were 3,650 who were screened positive on chest x-ray out of the total number of 22,747 of high-risk groups in prisons and youth rehabilitation transit centres. The presumption rate was 16% in that specific population.

1.3. Notification for susceptible tuberculosis

1.3.1. Notification of TB by sex and age groups

The total number of TB cases diagnosed was 5,538 and 271 (4.9%) were children under 15 years. Two thousand seven hundred ninety-three TB cases were from HRG, representing 50.4% of all TB cases. TB cases diagnosed with molecular testing as the initial diagnostic test represented 49.8% (2759/5538).

The majority of cases were male (72.6%) and the ratio male to female is 2.6. Almost half (50.5%) of our TB cases are represented in the age-group of 25 up to 44 years and 77.8% (4,307/5,538) were diagnosed among 15 to 54 years (see figure below). The figure shows the number of notified TB by sex and age groups.

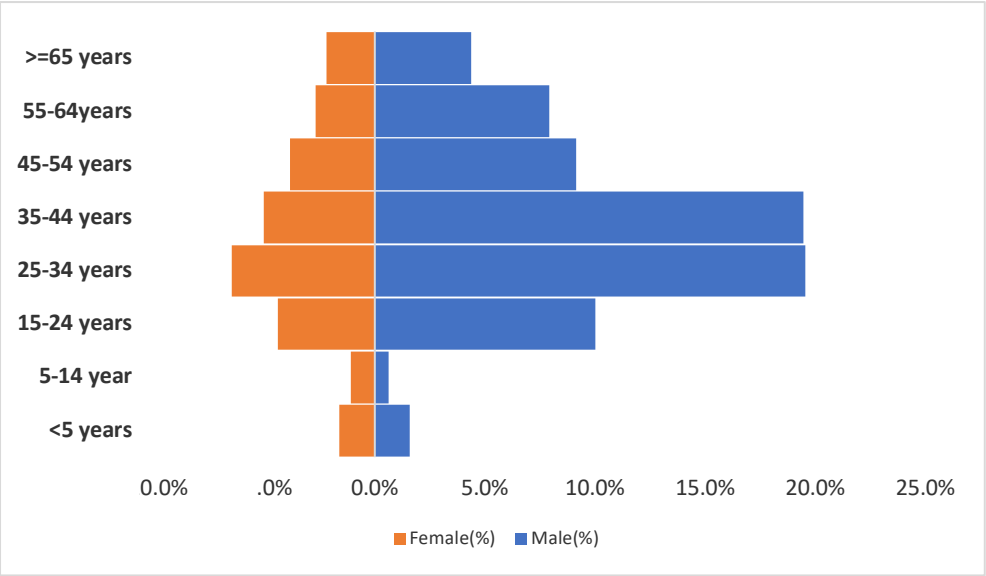


Figure 1: Age pyramid of TB cases, all forms, by sex, Rwanda, July 2021-June 202

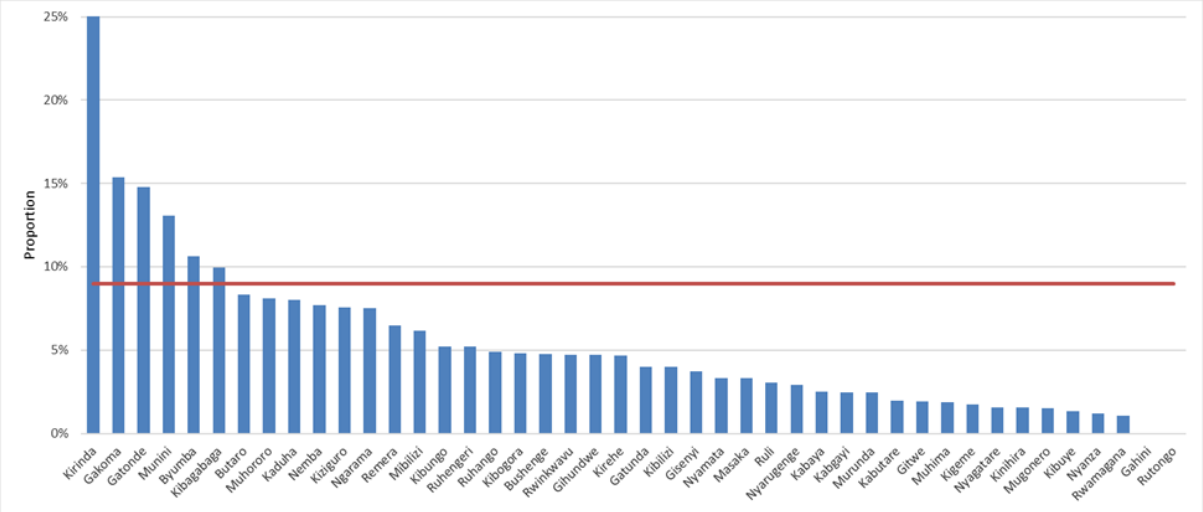


Figure 2: Proportion of TB notification among children by hospital catchment area

The proportion of TB among children was 4.9%. The following hospital catchment areas made a good detection rate (more than 9 % which is the national target) of TB among children: Kirinda, Gakoma, Gatonde, Munini, Byumba and Kibagabaga, while others did not notify any case or had low (below the national target) notification of TB among children under 15 years. We didn't reach the target of 9% and TB program will investigate reasons behind this low achievement.

In line with capacity building on TB detection (screening and diagnosis) among children, a joint mentorship with pediatricians working in different hospitals, transferred knowledge to healthcare providers working in 27 health facilities with 320 children malnourished enrolled in the nutrition service. Among them, 287 were

screened TB, 60 were found TB presumptive and 7 children were notified TB cases and put on TB treatment.

1.3.2. Notification by type, HIV status and tuberculosis history

Table 2: TB notification by type and HIV status, Rwanda, July 2021-June 22.

	All forms	Bacteriological confirmed	Clinically Diagnosed	Previously treated(relapse excluded)	N&R	Pulmonary	(New and Relapse)	TB/HIV co-infection	started 1st line treatment
N	5,538	4,049	1,489	83	5455	4,505	3,976	797	5,422
		73.1%	26.9%	1.5%	98.5%	81.3%	71.8%	14.4%	98.7%

Using WHO classification, 73.1% (4,049/5,538) were bacteriologically confirmed and 26.9% (1,489/5,538) were clinically diagnosed. Considering the site of disease, 81,3% (4,505/5,538) were pulmonary TB cases.
The proportion of New and Relapse patients among bacteriologically confirmed was 98.5%. Among notified TB cases, 98.6% (5,422/5,538) were initiated on the first line treatment.
Almost all notified TB cases (99.9%) were screened for HIV infection. The prevalence of HIV among all notified TB cases decreased from 17,9% (973/5,435) in 2020-2021 FY to 14,4% (796/5,538) in the 2021-2022 FY.

1.3.3. Notification by provinces and districts

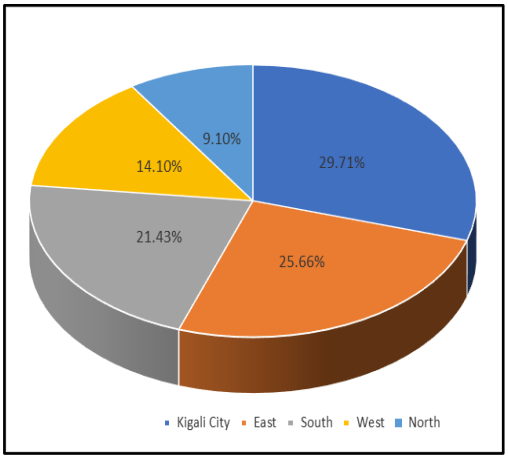


Figure 3: Distribution of TB cases by provinces

Five districts (Nyarugenge, Rwamagana, Kicukiro, Huye, Gasabo and Muhanga) have the highest notification (which is above 58/100,000 incidence, WHO estimation for Rwanda).

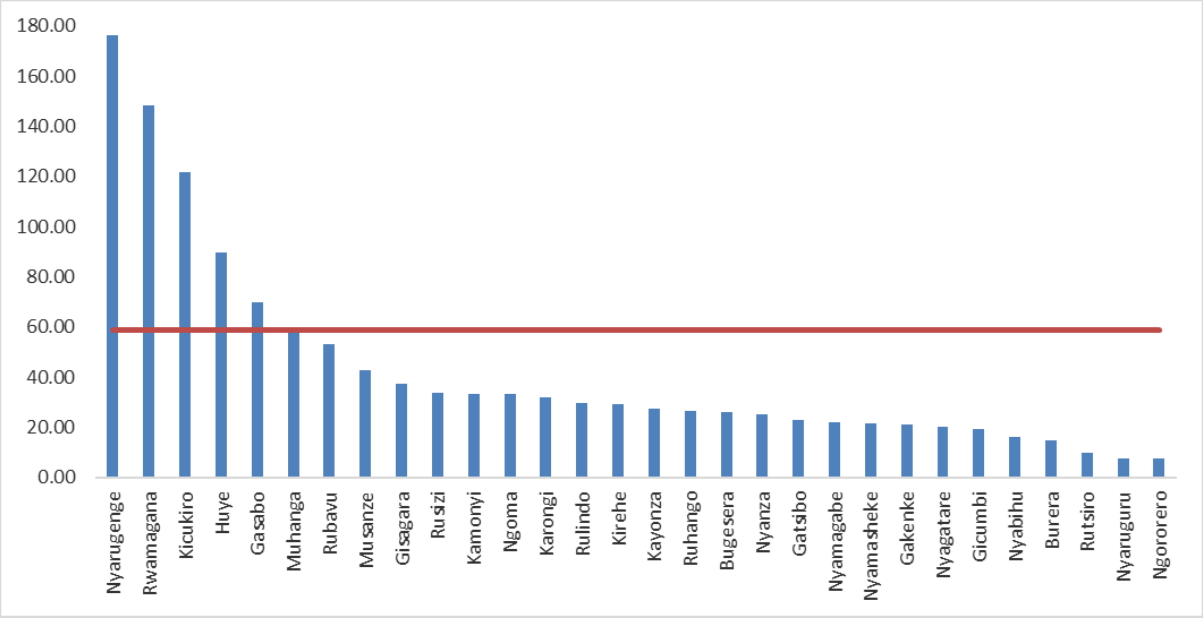


Figure 4: Distribution of TB cases by districts

1.3.4. Contribution of CHWs in TB detection

During the FY 2021 – 2022, the contribution of Community Health Workers (CHWs) in TB cases detection was 27.6% (1,534/5,538). The national target has been reached (>25%) and, compared to the achievement of previous FY (26.3%), community health workers performed well.

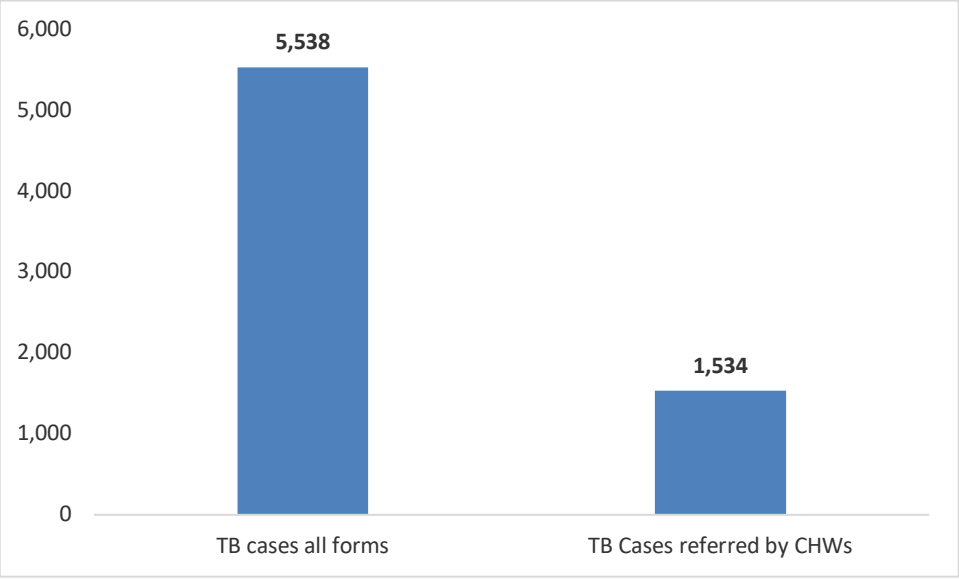


Figure 5: Contribution of CHWs in TB detection during 2021-2022 fiscal year.

1.4. Diagnostic and notification for drug resistant Tuberculosis

1.4.1. Drug susceptibility testing

WHO recommends universal drug susceptibility testing to all TB patients, and to reach this target, there is a need to adopt the use of molecular testing as the first diagnostic test.
To achieve this universal DST, apart from the TB cases diagnosed with GeneXpert as an initial diagnostic test, all smear TB positive, Xpert testing should be performed for rifampicin susceptibility testing.

Drug susceptibility testing was 60.7% and 74.9% respectively for new and previously treated TB cases (see below figure). Considering bacteriologically confirmed TB cases, 75.8% performed DST and overall performance was 62%. The target of 79.0% was not achieved due to breack down of GeneXpert machines and lack of maintenance.

In addition, there was a delay in procuring laboratory supplies due to the repetitive failure of tender for procuring DST and laboratory reagents.

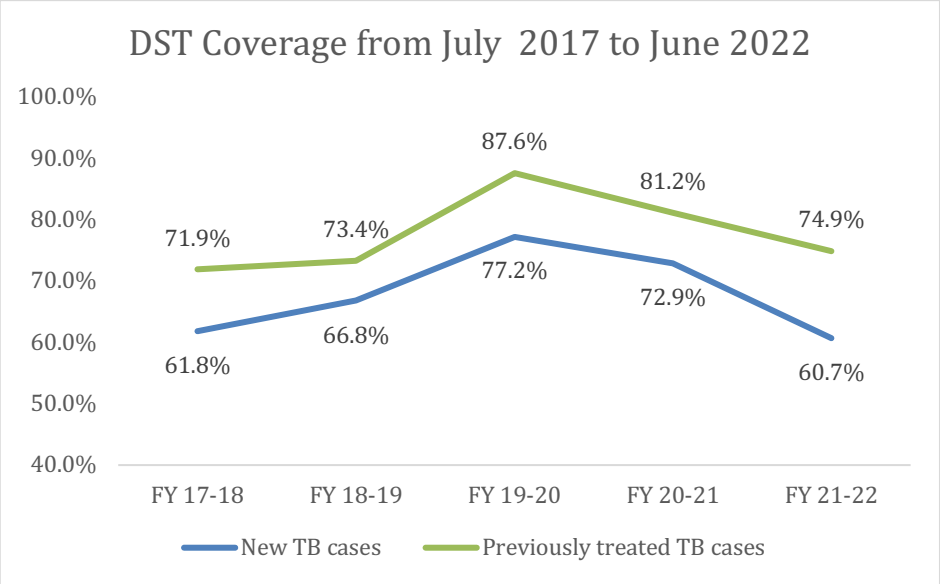


Figure 6: Drug susceptibility testing among TB cases, FY 2021-2022

A total of 3,431 out 5,538 TB cases notified during July 2021-June 2022 fiscal year, have benefited from drug susceptibility testing and 38 cases were rifampicin resistant.

1.4.2. Notification of MDR-TB

A modification on the RR-TB diagnostic and treatment initiation algorithm was made in January 2020 and communicated to all health facilities countrywide. During this reporting period, TB&ORD division collected retrospective data on the implementation on this change and different issues have been identified. Further analysis is planned for the next fiscal year (2022-2023). However, we are expecting less challenges on the use of the Xpert results in the clinical decision-making, since the

new cartridge, ultra, is being implemented countrywide replacing the classic one which was known to report false RR results in low bacilli load samples.

During this July 2021 to June 2022, a total of 39 of DR-TB cases (including one patient empirically put on second-line TB drugs without laboratory confirmation) were notified as DR-TB patients. According to their previous TB treatment history, 74.4% were from people without any previous history of TB drugs use (new cases). The table below shows the distribution of cases by provinces.

Table 3: RR-TB cases notified during July 2021-June 2022, by province.

Province		**East**	**Kigali City**	**North**	**South**	**West**	**Total**
RR/MDR-TB cases	**N**	8	17	5	7	2	39
	%	20.5%	43.6%	12.8%	17.9%	5.1%	100.0%

For the second-line drug susceptibility testing we evaluated all 38 patients registered as DR-TB patients from April 2021 to March 2022 and 86.8% have been tested for 2nd line DST (Ofloxacin and Kanamycin). All of them were susceptible to the tested drugs. Among five patients not tested, four patients were negative on primary culture and one patient died before DR-TB disease confirmation.

Regarding the HIV status, all DR-TB patients knew their HIV status and 8 (20.5%) patients were HIV-positive. Thirty-one cases were male which represented 79,5% and sex ratio male to female was around 4.

Table 4: MDR-TB cases by gender and HIV status, July 2021-June2022

Sex	HIV status		
	Negative	Positive	Total
Female	7	1	8
Male	24	7	31
Total	31	8	39

1.5. Quality control for TB diagnostics

Quality control

Quality control (QC) is performed for smear microscopy and conducted quarterly for each CDT. This is done at two levels: the National Referral Lab (NRL) does the quality control for all hospitals; and District Hospitals conduct the quality control for CDTs in their respective catchment areas. From July 2021 to June 2022, quality control was done 3 times in 61,5% (126/205) of CDTs and 9,463 slides were reviewed.

Table 5: Quality control of microscopy from July 2021-June 2022.

	CDT controlled at least 3x	Nb slides controlled				Errors					Nb CDT with major
		Total	Pos	Scanty	Neg	HFP	HFN	LFP	LFN	QE	
	126/205 (61.5%)	9463	580	98	8696	3	0	1	0	71	**3**
CDTs with Major errors	HFP: Cyahinda HC(1), Rwanda Military Hospital(1) , Kirehe DH(1)										
HFP: high false positive, HFN: high false negative, LFP: low false positive, LFN: low false negative, QE: quantification error											

Two health facilities, including one health centre (Cyahinda) and one hospital (Rwanda Military Hospital), had major errors.

The implementation of TB smear microscopy quality control is progressively declining since the last three years as shown on figure 7. Increased workload at health facilities due to Covid-19 related activities could be one of the possible reasons for this decline. An urgent correctional measure is required to re-increase the coverage and consequently ensure quality of TB microscopy results at all TB laboratories.

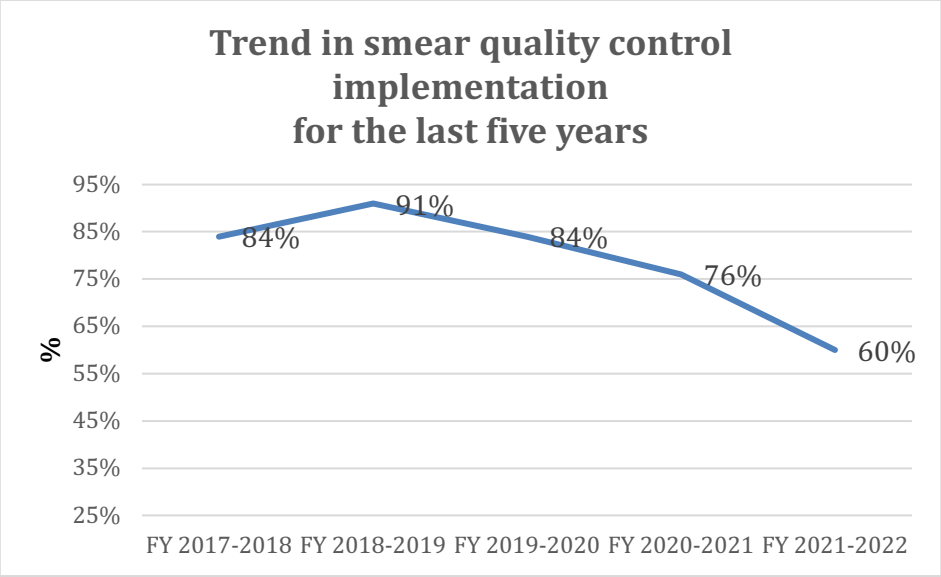


Figure 7: Trend of smear quality control from July 2017 to June 2022

In addition to the internal quality control, TB laboratories are regularly receiving external quality control evaluations.

During this fiscal year, out of 68 GeneXpert machines, 56 GeneXpert machines were included in the external quality control (EQA) and only 23 (41.1%) GeneXpert sites received an external proficiency panel from CDC-Atlanta. The remaining 33 sites (58.9%) were not controlled or evaluated because their GeneXpert machines were out of service and not functional. Out of 23 that received external quality control, 21 (91.3%) had a successful score and this represents only 30.9% of all Xpert sites.

Table 6: External quality control in FY 2021-2022

	GXP sites	GeneXpert sites controlled	GeneXpert sites with pass (≥ 85%)	GeneXpert sites with no Pass	List of GeneXpert sites with no Pass
Number	56	23	21	2	Butaro and Kaduha DHs
%	100%	41.10%	91.30%	8.70%	

Key results

Indicator	2021/22	
	Target	Achievements
TB notification rate new and relapses (per 100,000)	37/100k	41.6/100K 5,447/13104021
Proportion of TB cases notified among high-risk groups (HRGs(Number and Percentage)	55%	51,2% (2790/5446)
Proportion of children 0-14 years notified among TB cases new and relapse	9.00%	5.0% (272/5447)
Proportion of newly notified patients diagnosed using WHO recommended rapid tests (End TB Top-Ten N°4)	65%	43.3% (2178/5030)
DST Coverage for TB patients (End TB Top-Ten indicator N° 7)	79%	61.8% (3418/5530)
Proportion of notified patients with rifampicin resistant (RR) or MDR who receive second line DST	95%	86.8%(333/38)
Proportion of health facilities diagnostic sites scoring pass in EQA for smear microscopy	90%	60.4%(124/205)
Proportion of health facilities Xpert sites scoring pass in EQA for Xpert MTB/RIF	70%	30.9%(21/68)
Proportion of diagnosed TB cases tested for HIV infection (End TB Top-ten indicator N°9)	>95%	99.9% (5523/5530)
Proportion of TB cases (all forms) referred by community health volunteers during the evaluated year.	>25%	27.6% (1529/5530)

Chapter 2: TB TREATMENT FOR SUSCEPTIBLE AND DRUG RESISTANT TB

2.1. Treatment outcome for susceptible TB

This treatment success rate reports cohort from July 2020 to June 2021. For all susceptible TB, the treatment success rate was 88.8% (4,838/5,455). However, the TSR for patients followed by CHW was 93.9% (2,174/2,314).
For clinically diagnosed (CD) and TB/HIV coinfected patients, the treatment success rate was 84.4% (1,132/1,341) and 81,6% (804/985) respectively.

The main unfavorable TB treatment outcome was "death" representing 7.8% of all susceptible TB patients (427/5,455), 12.7% (170/1,341) in clinically diagnosed cases and 13% (128/985) in TB/HIV coinfected patients.

Co-infected TB/HIV persons notified during the 2020-2021 FY were 993; among them 985 were susceptible to TB and 95% (943/985) started ART before the end of TB treatment. We observed an increase in the treatment success rate in PLHIV when compared to the treatment success rate reached during the FY 2020-2021.

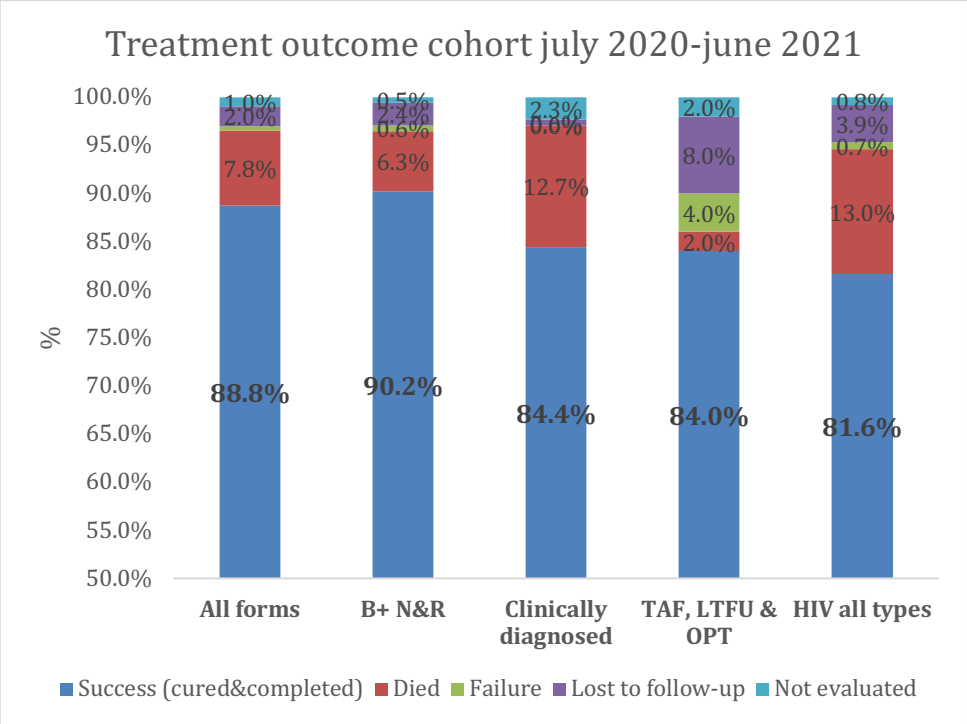


Figure 8: TB Treatment outcomes for the TB cohort registered during July 2020-June 2021, by case category and in special populations.

When comparing the treatment outcomes by district hospital catchment area, 23 hospitals performed well with TSR above 90% for all TB case forms. These hospitals were mentioned (figure 9).

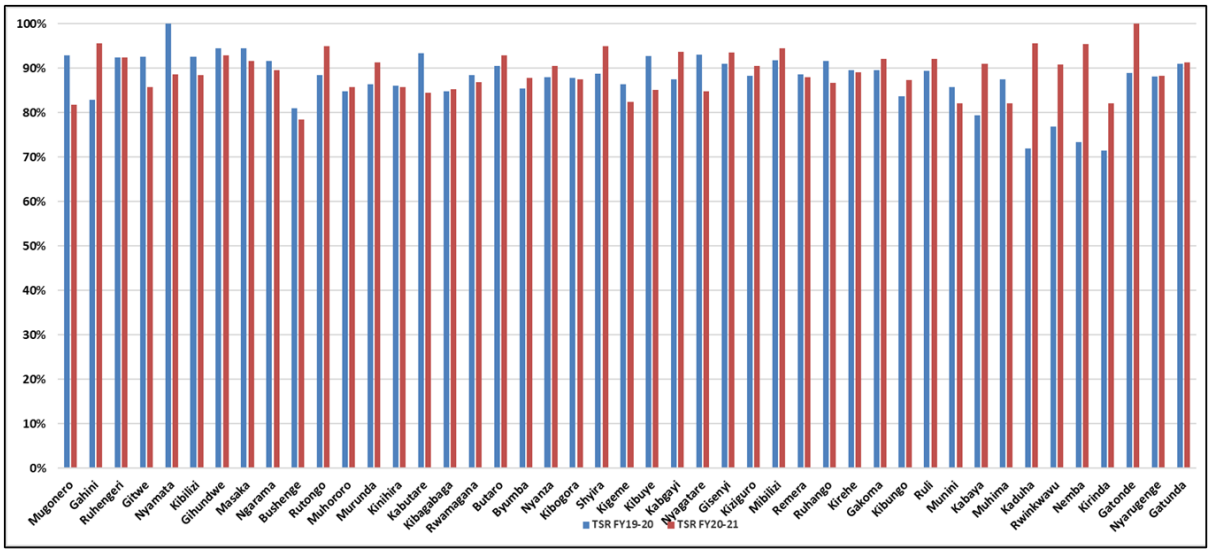


Figure 9: TB treatment outcome by hospital catchment area for the cohort July 2020-June 2021.

The success rate for children under fifteen years registered from July 2020 up to June 2021 is 92.8% (323/348). Other outcomes were death with 4.6% (16/348), 2.0% (7/348) of not evaluated and 0.6% (2/348) of lost to follow-up. No case was moved to 2nd line treatment. The treatment success rate among children under 15 years is higher compared to those above 15 years.

Nutritional support DS

During this 2020-2021 FY, among TB cases notified, 48,1% (2,624/5,455) have moderate and severe malnutrition, around 41,5% of them (1090/2624) received supplemented food composed of Corn-Soya Blend (CSB) and 54% (590/1,090) improved their weight at the end of treatment. In general, 325,835 kg of CSB were distributed to hospitals for TB and HIV patient supports.

All MDR TB patients received nutrition support.

Nutritional, social protection and DR-TB patient support

The TB&ORD Division in collaboration with different stakeholders, has been ensuring:

- Psycho-emotional support.
- Financial support to all MDR-TB patients diagnosed and treated.
- Individual counseling after MDR-TB diagnosis, upon entering the MDR-TB center at district level includes health education on the disease.
- Group counseling led by an MDR-TB psychologist or one of the nurses is carried out weekly during hospitalization.
- Clinical exams, free medical insurance, transportation fees and nutritional support.

2.2. Treatment outcome for drug resistant TB

During 2021-2022 FY, Rwanda started to implement a full oral regimen as recommended by WHO recommendation, and the following regimens were used:

- Shorter regimen (Newly RR/MDR-TB diagnosed cases):
  4-6**Bdq**-Lfx-Cfz-Pto-H-E-Z/ 2**Bdq**-Lfx-Cfz-E-Z
- Longer regimen (RR/MDR-TB cases not eligible to the shorter regimen):
  6Bdq–Lzd–Dlm–Cfz –Cs/ 12Lzd-Lfx–Cfz or Cs
- Longer regimen fluoroquinolone resistant:
  6Bdq–Lzd–Lfx–Cfz or Cs/ 12Lzd–Cfz–Cs– [Bdq or Dlm]
- Longer regimen for CNS:
  12Bdq–Lzd–Dlm-Lfx–Cfz–Cs–Z–[H or Pto]/6Lfx–Cfz–Cs–Z–
  [Lzd or H or Pto]

Sputum culture conversion is a step on the way to achieve high MDR-TB treatment success rates. Culture conversion at six months is defined as an MDR-TB patient with a negative culture at the end of six months of treatment. 33 cases of MDR-TB patients who initiated 2nd line TB drugs were laboratory confirmed. After six months of treatment, 33 were culture negative.

RR/MDR considered patients who started a shorter regimen from July 2020 to June 2021 plus 16 patients initiated on a longer regimen in 2019-2020 FY. Among 28 RR/MDR cases initiated on the 2nd regimen in 2020-2021 FY, 4 cases were treated with a longer regimen and will be evaluated in the next 2021-2022 FY. The treatment success rate was 97.5% (39/40) including 36 (90.0%) cured. The treatment success rate among HIV co-infected patients was at 100% (12/12).

Table 7: TB treatment outcome for RR/MDR TB cases by HIV status.

outcome	Shorter regimen		Longer regimen	
	Negative	Positive	Negative	Positive
cured	17	6	10	3
Died	0	0	1	0
Treatment completed	0	1	0	2
Total	17	7	11	5

2.3. TB Deaths Audits in the Context of TB control in Rwanda

Data in the TB death audit reports were collected by Nurses and MDs Focal persons for TB in Health Facilities, using a standard form designed by the TB&ORD Division. Information in paper forms was entered and analysed at the TB & ORD Division. All analyses were descriptive, In total, 150 death audits were submitted to the central level between July 2020 and June 2021 over 426(35%) expected death reports.
The key findings are the following:

- Males (71.3%) died more than females, in addition people aged 15-44 years represented 60.7%
- TB is the most attributed cause of death (60.0%).
- Among all death audits submitted, 81,3% (122/150) occurred during the 1st two months of TB treatment.
- More than 60% were pulmonary sputum smear positive
- 97% of smear positive had high bacillary load at the diagnostic date.
- 62% of died TB patients were underweighted (BMI≤18.5) at diagnosis time and HIV-positive were more underweighted than HIV-negative (69% vs 59%).
- 28% of died TB patients are HIV positive and 93% of those with HIV infection have low CD4 levels (<350)
- Proportion of HIV-positive patients progressively decreased from 50.0% in 2017, 43.0% in 2019, 41.0% in 2020, 38.0% in 2021 and 28.0% in 2022 among analysed death reports. The observed deaths were more related to low CD4 count (<350).

2.4. Civil registration and vital surveillance in Rwanda

A well-functioning CRVS system provides essential data, rates, and other quantitative measures for the accurate planning of programs designed to promote the wellbeing of the citizens. The CRVS systems are critically important in designing and implementing the public health measures and considered as the main sources of data for the health sector in the monitoring and evaluation of different health interventions and epidemiological studies. The CRVS system provides details of registration of births, deaths, and causes of death information with unique identification number, and mortality data used to monitor mortality indicators related to TB programs to prevent premature deaths

Key results

Indicator	2021/22	
	Target	Achievements
TB treatment coverage (End TB Top-ten indicator N° 1)	>90%	71.6% (5371/7500)
The proportion of eligible malnourished DS TB patients (BMI<18.5) who have accessed appropriate nutrition support	70%	41.5% (1090/2624)
Treatment success rate (TSR) for all forms of TB cases (DS & DR-TB cases) (End TB Top-ten 2)	70%	88.8% (4873/5490)
Treatment success rate, confirmed RR/MDR-TB	87%	97.5% (39/40)
Treatment coverage new drugs (End TB Top-ten indicator N°8)	95%	100%(38/38)
Proportion of TB treatment cards where ADSM section is completed	40%	99.4% (5370/5401)
Proportion of HIV positive TB cases given antiretroviral therapy during TB treatment	95.00%	94.9%(943/985)
Treatment success rate for TB patients (all forms) receiving DOT through community health workers (CHW)	96.00%	93.9% (2174/2314)

Chapter 3: TUBERCULOSIS PREVENTION

3.1. Tuberculosis infection prevention and control

The Tuberculosis (TB) infection control plan is designed to ensure a prompt detection of infectious TB patients, airborne precautions and treatment of people confirmed with TB disease. So, the risk of the propagation of mycobacterium tuberculosis from TB patients to other people is avoided.

The Rwanda TB&ORD surveillance system is an electronic-based system capturing on a quarterly basis the effective compliance of the implementation of TB prevention measures at the health facility level. Methodologically, health centres are assessed by hospitals and hospitals are assessed by the central level. The minimum package of TB infection control includes six basic measures: the existence of the IC plan, appointment of the TB focal point, Health workers trained on TB; cough triage system and separation of coughers, IEC on the cough hygiene, doors and windows opened in service at risk. According to TB&ORD surveillance, the health facilities that were applying all six basic measures, were 88.5% (510/576) for the last quarter of the 2021-2022 FY (April-June 2022).

Rwanda Health Facilities conduct a systematic TB screening once a year, for their respective health care providers as well as community health workers (CHWs) in their catchment area.

During the fiscal year 2021- 2022, 85.6 % (22,817/26,651) of health facility staff were screened and 2.2% (502/22,817) were identified as presumptive TB and 4 were confirmed as TB cases.

For community health workers (CHWs), 90.9% (50,657/55,701) were screened and 1.2% (596/50,657) were identified as presumptive TB and 6 TB cases were confirmed among them.

The TB screening among the frontline workers has increased for health care providers, as well as for CHWs compared to the previous FY: 83% and 89% respectively, for health facility staff and community health workers.

Table 8: Screening of health care providers and CHWs per district, July 2021-June 22.

District	Health Care Workers						Community Health Workers					
	Number	Screened		TB Presumptive		TB cases	Number	Screened		TB Presumptive		TB cases
		#	%	#	%			#	%	#	%	
Bugesera District	551	296	54%	16	5%	0	1900	1589	84%	6	0.4%	0
Burera District	871	857	98%	1	0%	0	2282	2205	97%	2	0.1%	0
Gakenke District	978	974	100%	4	0%	0	2464	2461	100%	67	2.7%	0
Gasabo District	1840	984	53%	299	30%	1	1344	609	45%	0	0.0%	0
Gatsibo District	1009	1218	121%	3	0%	0	2432	2189	90%	17	0.8%	0
Gicumbi District	707	685	97%	4	1%	0	2422	2366	98%	6	0.3%	0
Gisagara District	695	666	96%	6	1%	0	1996	1896	95%	8	0.4%	0
Huye District	1284	718	56%	8	1%	0	1980	1964	99%	65	3.3%	2
Kamonyi District	517	511	99%	0	0%	0	1161	1105	95%	1	0.1%	1
Karongi District	1034	1029	100%	3	0%	0	1930	1930	100%	12	0.6%	0
Kayonza District	998	924	93%	1	0%	0	1449	1313	91%	25	1.9%	0
Kicukiro District	798	732	92%	25	3%	0	1020	975	96%	23	2.4%	0
Kirehe District	814	724	89%	1	0%	0	2506	1884	75%	9	0.5%	0
Muhanga District	939	865	92%	6	1%	0	1384	1323	96%	2	0.2%	0
Musanze District	800	776	97%	22	3%	0	1809	1715	95%	30	1.7%	2
Ngoma District	748	748	100%	12	2%	1	1948	1897	97%	26	1.4%	0
Ngororero District	652	623	96%	8	1%	0	1604	1429	89%	3	0.2%	0
Nyabihu District	648	617	95%	1	0%	0	1836	1836	100%	3	0.2%	1
Nyagatare District	944	886	94%	1	0%	1	2273	1539	68%	1	0.1%	0
Nyamagabe District	837	828	99%	5	1%	0	2244	2227	99%	5	0.2%	0
Nyamasheke District	1004	918	91%	10	1%	1	2335	2293	98%	128	5.6%	0
Nyanza District	587	561	96%	2	0%	0	1507	1404	93%	1	0.1%	0
Nyarugenge District	2169	844	39%	7	1%	0	1131	1121	99%	8	0.7%	0
Nyaruguru District	602	603	100%	0	0%	0	1323	1321	100%	1	0.1%	0
Rubavu District	623	623	100%	3	0%	0	1692	1567	93%	0	0.0%	0
Ruhango District	821	813	99%	0	0%	0	1996	1906	95%	14	0.7%	0
Rulindo District	917	886	97%	30	3%	0	1976	1913	97%	107	5.6%	0
Rusizi District	945	642	68%	16	2%	0	2233	1846	83%	7	0.4%	0
Rutsiro District	575	548	95%	4	1%	0	1881	1358	72%	1	0.1%	0
Rwamagana District	744	718	97%	4	1%	0	2005	1948	97%	18	0.9%	0
Total	**26651**	**22817**	**86%**	**502**	**2.2%**	**4**	**55701**	**50657**	**91%**	**596**	**1.2%**	**6**

3.2. Tuberculosis preventive treatment among TB contacts

3.2.1. TB preventive therapy among TB contacts

Tuberculosis (TB) contacts are people who have close contact with patients with infectious TB. As they are at high risk for infection, TB contacts must be investigated systematically for TB screening and diagnosis.

Household contacts of TB cases are our focus, and a systematic contact investigation was conducted using a symptoms-based approach, for children under 5 years old and people above 5 years old. TB screening among TB contacts is based on the following symptoms: cough, fever, night sweats, weight loss/poor weight gain). Then they undergo clinical and lab investigation to exclude active TB.

3.2.1.1. TB prevention therapy among TB contacts under 5 years

Under five years old, TB contacts are vulnerable to progression to active TB disease. A systematic screening is conducted for early diagnosis and/or Tuberculosis preventive therapy initiation.

The total under 5 YO contacts during the FY 2021-2022 were 1,196, among them 1,181 were screened, 90.7% (1,047/1,154) were initiated on TPT. Based on data extracted from e-TB, 59 TB cases were under 5 YO household contacts.

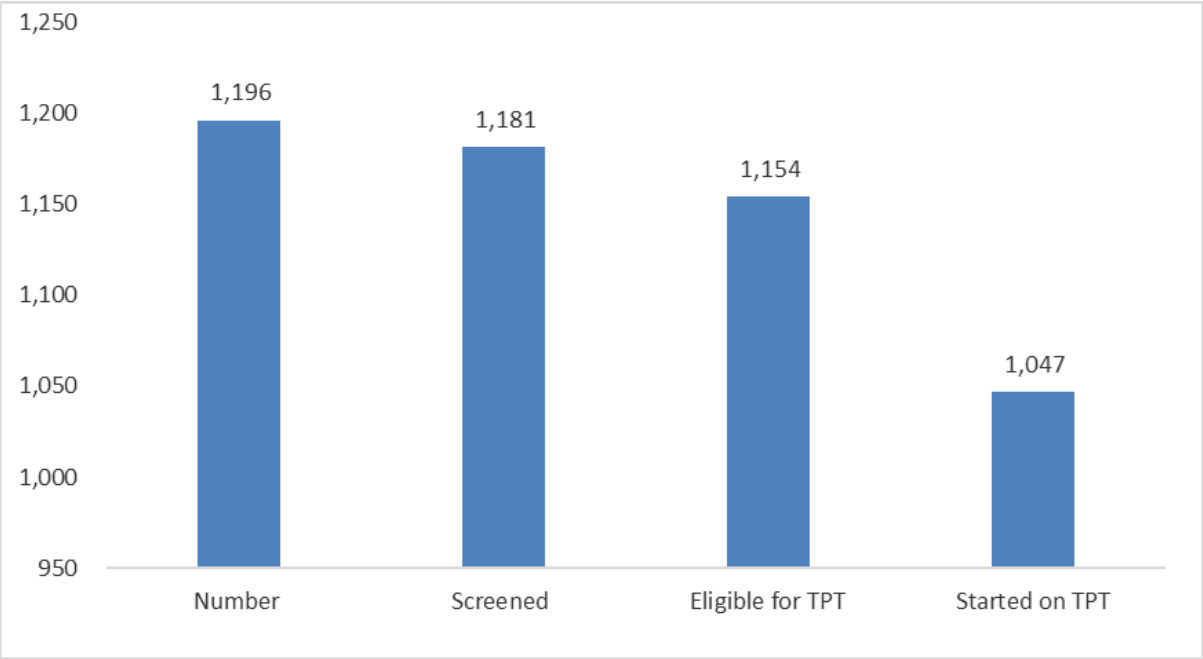


Figure 10: Under 5 years initiated on tuberculosis preventive therapy, July 2021-June 2022.

3.2.1.2. TB preventive therapy among TB contacts above 5 years

In November 2021, the Nation Tuberculosis Program started the implementation of TPT among contacts of TB patients. As per the TPT Guidelines, TB contacts above 5 years old must be screened and those screened negative based on symptoms have to undergo Tuberculin Skin Test (TST) for the diagnosis of the latent tuberculosis infection (LTBI). Inmates who are contact of bacteriologically TB cases index are not eligible for TPT intervention.

For an effective implementation of TPT, the TB Program started first empowering health care workers on performing Tuberculin Skin Test and TPT Guidelines as a prerequisite before TPT initiation among TB contacts above 5 years old.
Capacity building on TST and TPT guidelines was done progressively and so far, 28 Hospitals representing 62% of across the country are already trained.

During the FY 2021-2022, 21,357 contact of TB index bacteriologically confirmed cases were identified including 12,674 from prisons. Of them 21,016 contacts were screened which represent 98.4%. Twenty seven percent (5,693/21,016) were identified as presumptive TB and 312 TB cases were diagnosed. TB cases among contact above 5 years represent 88.1% (312/354) of total TB cases diagnosed among contact.

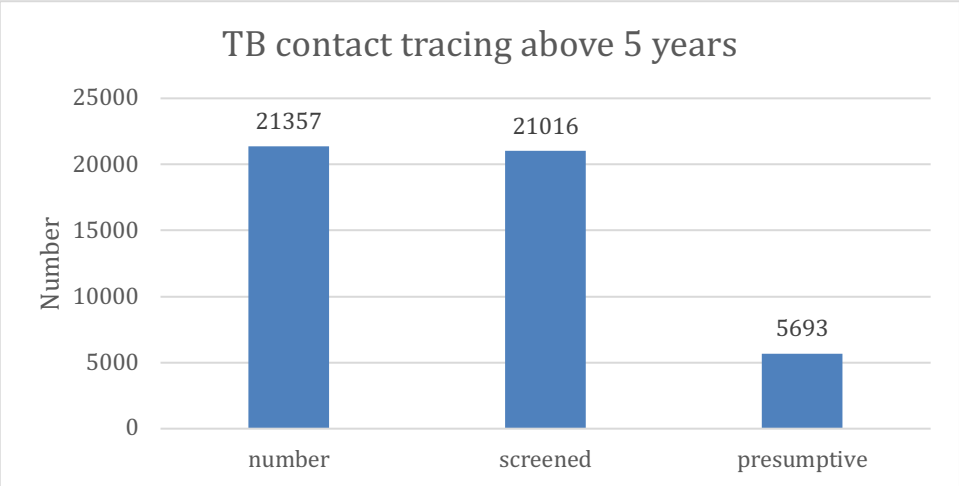


Figure 11: TB contact cascade among over 5 years old during 2021-2022

During this FY, 62% (28/45) of subdistricts have been trained on TPT strategy and 17 out of 28 subdistricts were able to implement this strategy. Consider the policy of TPT implementation among 5 years above, 8,371 contact were eligible for TST, among them 1622 performed TST which represents 19%. In total 440 had positive TST and 427 were initiated on TPT.

To determine the number of contacts above 5 years eligible for TPT, we divided the total number of contacts initiated on TPT by the total number of contact eligible for TST times TST positivity rate. The proportion of contact initiated on TPT was 19%. This low performance was mainly due to insufficient fund to train HCPs on this approach also the delay in procuring TST by RMS.

3.2.1.3. Treatment Outcomes of TB preventive Therapy among Contacts

All contacts under 5 years of age who were contacts of bacteriologically TB confirmed cases started TPT after excluding active TB using symptomatic screening.

We report the treatment outcome for latent TB infection for children under 5 years who were initiated on preventive therapy from July 2020 to June 2021. In total 1,166 children were registered on IPT and 1062 were evaluated for IPT outcome: 93.8% (997/1,062) completed their treatment, 6 were lost to follow up and 9 not evaluated. The graph below shows the outcome for IPT among under 5 years old.
TB &ORD Division should investigate on the outcomes of the remaining 104 children not evaluated.

3.2.2. TB preventive therapy among PLHIV

3.2.2.1. Cascade of TB screening among PLHIV

From July 2021 to June 2022, 610,322 episodes of clinical visits by PLHIV were reported. From these clinical visits, systematic TB screening were performed at the proportion of 95.3% were screened and a total of 6,133 PLHIV were screened positive. For those screened positive 87.2% (5,346/6,133) performed GeneXpert and 652 PLHIV were confirmed TB cases, including 149 clinically diagnosed.

The graph below shows the contribution of different diagnostic approaches in detecting TB cases among PLHIV

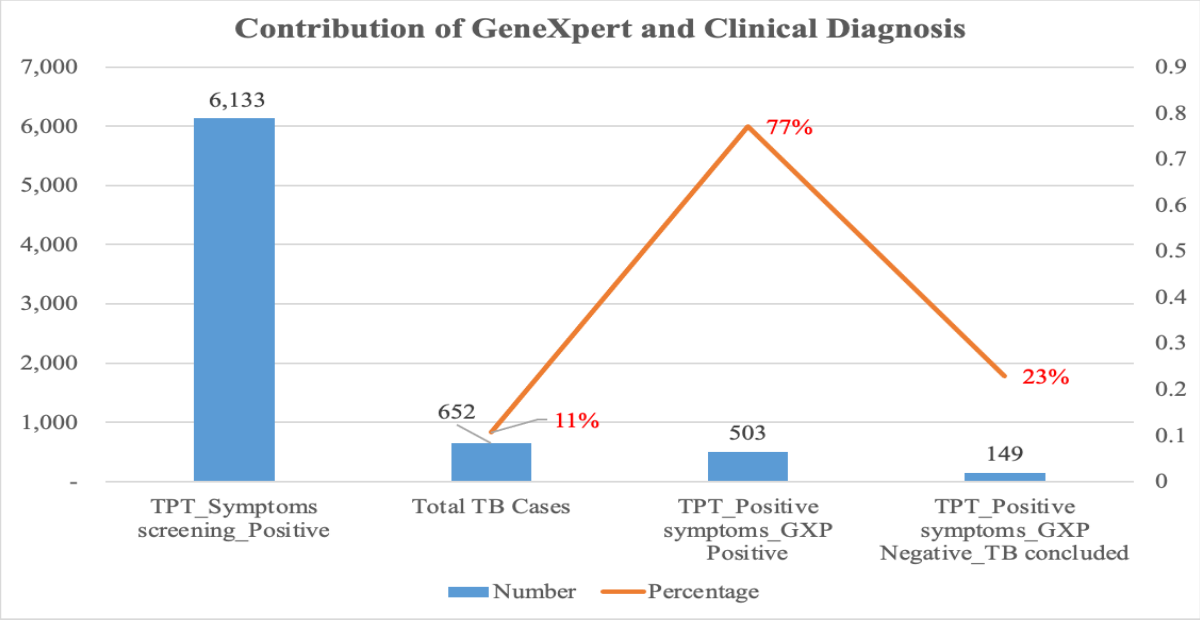


Figure 12: Active TB diagnosis among PLHIV through TPT program

3.2.2.2. TPT initiation among PLHIV

During the FY 2021-2022, 83,213 PLHIV were initiated on TPT, which represents only 53.6% (83,213/155,218 of the expected PLHIV to be initiated on TPT. This denominator of FY 2021-2022 is the difference between the total number of PLHIV and the 53,385 initiated on TPT up to the end of June 2021. The cumulative number of PLHIV initiated on TPT since its implementation is 136,598 which represents 63.8% (136,598/214,073) of all PLHIV enrolled in Rwanda's HIV Programs.

The expected target of 80% of PLHIV to be initiated on TPT by the end of June 2022 was not achieved due to the unavailability of TPT commodities where we experienced a delay of the shipment of drugs, mainly explained by one manufacturer who had to supply TPT drugs worldwide, having a huge command.

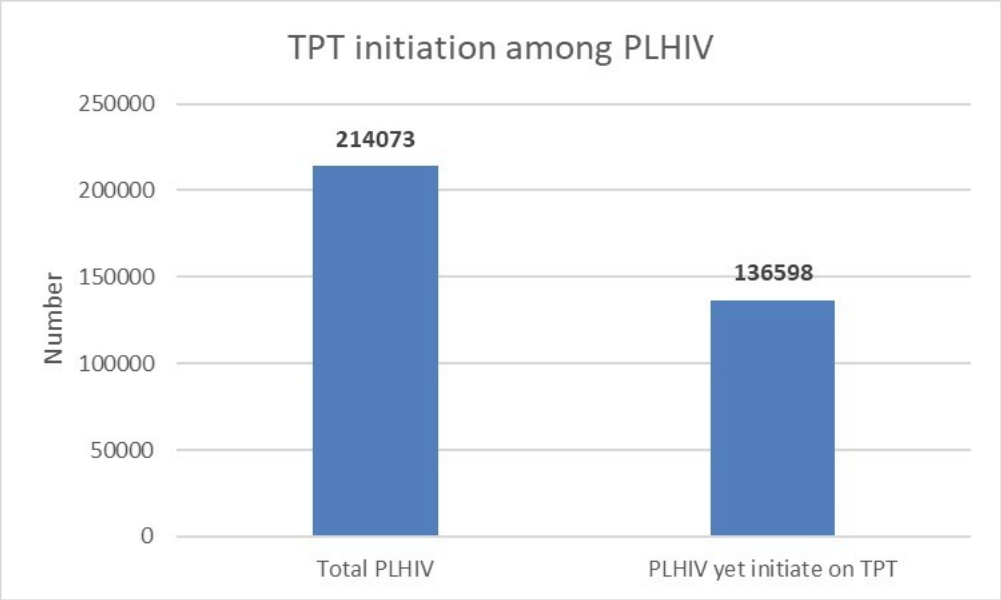


Figure 13:TPT coverage among PLHIV up end June 2022

3.2.3. TB Preventive Treatment outcomes among PLHIV

A good completion rate is an indicator of the quality of care provided by healthcare professionals. As we are reporting the FY 2021-2022, TPT outcomes findings shall consider PLHIV that were initiated one year prior, which means those who were put on TPT from July 2020 up to June 2021. We highlight that TPT outcomes among PLHIV, the reporting period is for 8 months after initiation. Thus, the extraction of TPT outcomes data considered the period of March 2021 to February 2022.

The completion rate for the cohort of PLHIV initiated on TPT from July 2020 up to June 2021 is 95.9% (59,061/61,579). However, it has decreased compared to the completion rate for those initiated during the previous FY was 97.2%. Around 1% defaulted from the TPT and 2% were not evaluated.

The poor outcomes for TPT include discontinuation of treatment due to different reasons such as development of TB, adverse drug reaction, lack of follow up, death and not being evaluated.

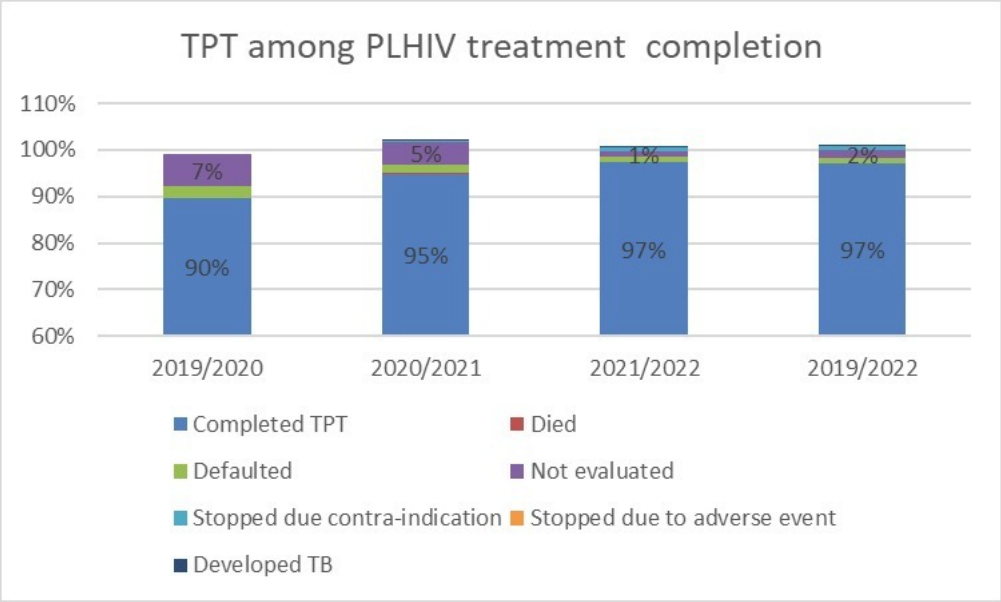


Figure 14: Comparison of TPT outcomes among PLHIV for the last 3 years

Key results

Indicator	2021/22	
	Target	Achievements
Contact investigation coverage (End TB Top-Ten N°6)	>90%	98.4% (22186/22585)
Proportion of eligible PLHIV initiated on TPT	80%	63.8% (136598/214073)
Percentage of Health providers screened for TB at least once during the year. (health facility workers)	79.00%	85.6% (22817/26651)
LTBI treatment coverage among contacts < 5 years (End TB Top-ten indicator N°5)	90%	90.7% (1047/1154)
LTBI treatment coverage among contacts > 5 years	30%	18.8%(427/2260)

Chap 4: TUBERCULOSIS PROGRAM MANAGEMENT

This strategic function is responsible for providing synergy, consistent management, and greater visibility for the program. It contains capacity building, TB tools, health promotion, community and stakeholder engagement, and media campaigns.

4.1. Capacity building

Table 9: Capacity building of the health professionals and peer educators

Type	Topics	Area	Observation
Mentorship	Death audit	Byumba, Ngororero, Huye, Karongi, Kayonza hospitals	Health care providers were mentored to improve the management of TB and how to properly use the death audit checklist with the support of TB staff at the central level in collaboration with Internists TB experts.
	Childhood TB management	Mibilizi, Kaduha, Ruhengeri, Nemba, Ruhango, Kibuye, Kabgayi, Kabutare, Kabaya, Nyagatare, Kiziguro, Gatonde, Muhororo and Gihundwe	Results of the clinical mentorship on Childhood TB received 320 children, among them 287 were screened, 60 were found TB presumptive and 7 children have been notified as TB cases and put on TB treatment.
Workshop	TB infection control for health care providers	National wide	83 focal points from CTs of the North Province were trained on TB IC measures. Development of a plan for TB IC was emphasized.
	Annual Evaluation meeting with	National wide.	247 participants attended the workshop held at the Muhanga district

	TB stakeholders		
	Building research capacity of TB staff.	Study on long-term outcomes among multi-drug resistant tuberculosis (MDR-TB) patients who successfully completed MDR-TB treatment under the Rwanda TB program	Data entry was already done. The data cleaning, analysis, and reporting are to be conducted in the next fiscal year.
	Individual case-based surveillance system (e-TB)	National wide	42 participants attended
	TB death audit	National wide	23 participants, internists, TB supervisors and TB&ORD staff adjusted the TB national death audit policy related to the WHO new policies which will be integrated into DHIS2
	development of algorithm on lateral flow urine lipoarabino mannan assay (LF-LAM) technique	National wide	32 participants developed the TB LAM algorithm for inpatient and outpatient and Testing Procedure guide on the use of Lateral-flow Lipoarabinomannan (LF-LAM) for diagnosis of Mycobacterium Tuberculosis (MTB) in human Urine in Rwanda. The updated report on Tuberculosis deaths audit has been integrated into the e-

			TB system by HMIS developers.
Training	Tuberculin Skin Test practical training and TPT guidelines	25 Hospitals	358 health providers were trained on TST and TPT Guidelines for household contacts of TPB.
	Data managers on E-leprosy	Endemic zones: Rusizi, Gisagara, Bugesera, Ngoma and Nyaruguru	19 data managers were trained
	Transmissio n, symptoms, screening and prevention of TB	366 health facilities including	2,637 Peer educators working in the PLHIV associations through the support groups

TB&ORD Division in collaboration with World Health Organization/The Special Programme for Research & Training in Tropical Diseases (WHO/TDR) organized a practical on "Drug-Resistant Tuberculosis Management in Rwanda" and on the "All-oral shorter treatment regimen for multidrug- and rifampicin-resistant tuberculosis (MDR/RR-TB): Evaluating its effectiveness, safety and impact on the quality of life of patients in Rwanda" (ShORRT) research protocol implementation.

The training aimed to integrate the management of DR-TB into the routine activities of the TB control program at the decentralized level and establish an effective monitoring and evaluation system. It has three specific objectives:

- To improve participants' knowledge on drug resistant tuberculosis management.
- To extend the DR-TB management capacity at the peripheral health facilities.
- To strengthen the quality of care for DR-TB at peripheral health facilities.

Ten clinical staff from two district hospitals (Kabutare and Kibagabaga) hosting MDR-TB treatment centres participated in this training. These include 2 Clinical Psychologists, 4 Nurses Focal Persons for TB (2 DR-TB focal persons and 2 DS-TB

focal persons) and 4 Medical Doctors (2 MDR-TB focal persons and 2 from internal medicine departments).

4.2. TB Tools printing and distribution

The TB program needs to monitor and evaluate the implementation of Tuberculosis activities for quality improvement. The TB guidelines and data collection tools were reviewed and revised due to harmonization and printed in 2021-2022. Tools were distributed during quarterly evaluation meetings and then the TB focal points at hospital level were mandated to distribute the tools to all HFs.
During FY 2021-2022, different TB tools were printed out as per the details in the table below:

Table 10: TB tools printed and distributed from July 2021-June 2022

Items	Quantity	Donors	Period of Printing
TB Algorithm	1215	CDC/COAG	May-21
TPT Patient files	114000	CDC/COAG	Aug-21
TB Case Register for HFs	455	CDC/COAG	Aug-21
Carnet de Labo TB	8400	GF	Aug-21
TB patient files	7000	GF	Aug-21
Register for tuberculosis screening among health care workers	1130	CDC/COAG	Aug-21
Registre des traitement preventif de la tuberculose	1130	CDC/COAG	Aug-21
TB Hand book: French version	3768	CDC/COAG	Sep-21
TB Hand book: English version	6990	CDC/COAG	Sep-21
MDR TB patient files	23	WHO	Apr-22
TB algorithms (Boite à image)	23	GF	Apr-22
TPT Guidelines English	1021	GF	Jun-22
TPT Guidelines French	1350	GF	Jun-22
TB Program materials M&E Tools	1350	CDC/COAG	May-22

4.3. Health promotion, community, and stakeholder engagement

4.3.1. Sensitization in refugees' camps and prisons

TB&ORD division in collaboration with hospitals organized and led an awareness campaign on the prevention, detection and treatment of TB and leprosy for community health workers from refugee camps with the aim of reducing TB incidence rate. These awareness campaigns took place from 6-10 September 2021 in 6 refugee camps and

involved 438 peer educators. Further, peer educators in refugee camps were also trained on TB prevention, symptoms, and screening.
Twice a year, in August 2021 and March 2022, the TB&ORD Division conducted awareness campaigns in all 13 prisons of Rwanda and 1,200 peer educators were refreshed on the same topics mentioned above.
For the first time, we conducted an active case finding after the refresher training and 38 TB cases were identified from those 13 prisons.
This approach is recommended for the next planned TB awareness campaign.

4.3.2. TB awareness through mass media Campaigns

TB&ORD Division conducted several activities for increasing TB awareness in the general population and TB sensitization through radio and TV talks during the fiscal year 2021-2022 performed as follows:

- 19 live talk show programs on different channels: Flash FM, Isango Star, Umucyo Radio, Imanzi Radio, RBA, Huguka Radio, Isano Radio, Kigali Today, VoA.
- 10 TV programs on different channels: RBA, Pachis TV and TV 1.
- 14 TB sensitization messages and TV spots through radio and TV channels
- Airing of radio spots in 29 Radio local markets and in 17 Radio local bus stations across the country.
- Mentions in the popular talk show on 6 broadcasting Radios: RBA, B&B FM Umwezi, Radio One, Radio 10
- TB awareness through social media platforms (Twitter and YouTube); by RBC, Mico the Best, WHO Rwanda, CDC Rwanda and HDI.
- Articles were published in different newspapers: Igihe.com, The New Times, IMVAHO NSHYA.
- Below are topics related to tuberculosis awareness (diagnosis and prevention) covered during this fiscal year:
- Importance of TB screening among health care workers
- Knowledge on cause, transmission, symptoms, screening and diagnostic of TB
- Tuberculosis in children
- Detection and diagnosis of TB in health centers: extra pulmonary TB, early screening and treatment of TB and follow up of TB patients
- Peer to Peer social media campaign against Tuberculosis

4.3.3. Celebration of the World TB Day 2022

Apart from the above-mentioned TB awareness through mass media channels, TB&ORD Division celebrated the World TB Day 2022. In previous years, it was often celebrated out of Kigali City, conducting TB screening among high-risk population in a specific district chosen based on predefined criteria by the TB Program. However, given the uncertainty period due to COVID-19 pandemic, the World TB Day 2022 was

celebrated through a press conference in which different newspapers, radio and TV channels were invited.

The press conference was held on 24 March 2022, with the participation of various newspapers, radio and TV channels including: Igihe.com, The new Times, RBA, KTN, TV1, Isano radio, IMVAHO NSHYA, ISANGO Star, Huguka Radio. The panelists discussed national TB epidemiology and key TB interventions towards End TB in Rwanda. Moreover, the panelists provided responses and clarifications to questions raised by journalists and participants of the conference.

4.3.4. Rwanda network of People Living with HIV (RRP+)

RRP+, through their peer educators, conducted a sensitization of people living with HIV in order to prevent coinfection of HIV-TB. This focused on the following topics: TB symptoms, TB prevention methods, COVID-19 symptoms and its relation with TB and COVID-19 prevention measures. A total number of 159,096 people living with HIV were followed up through peer education program by 4,780 peer educators. This was implemented in 366 sites supported by Global Funds and 182 sites by CDC.

Peer education was organized during group supports and home visits to the PLHIV. Among 96,239 (60.4%) PLHIV participating in the education sessions on TB prevention, 64 clients are under anti-tuberculosis drugs followed-up by peer educators in the sites covered by the two donors mentioned above.

Key results

Indicator	2021/22	
	Target	Achievements
Proportion of first level health facilities that have at least one staff trained to provide PAL services	30%	94%
Percentage of population with adequate knowledge* on TB symptoms, transmission and prevention	NA	NA
Proportion of public health facilities where at least one staff has participated in training on TB	NA	NA

Chap 5: SUPPLY PLAN CHAIN MANAGEMENT AND COMMODITIES

5.1. Coordinated Procurement and Distribution system

To ensure logistics for TB control, RBC through TB&ORD has conducted an annual forecast and budget required to diagnose, treat and prevent TB and other respiratory disease in collaboration with the national quantification team (MOH, RBC, RMS, Referral hospitals and partners). After this exercise, a report was produced for procurement purposes. This activity was done through the integrated quantification under the lead of the Coordinated Procurement Distribution System (CPDS). Therefore, quantities of TB health related products needed for 2021-2024 were determined and supply plans for 2021-2022 FY were reviewed and the plan for 2022-2023 FY was developed. This integration is cost effective by integrating health commodities of different diseases and effective uses of time and resources. For TB medicines availability, we have conducted a close stock monitoring at all levels and regular follow up of shipment of medicine in pipeline via RMS. Almost all TB medicines and commodities were available at central level except some items for TB diagnostic such as sputum container.

We have conducted validation of all TB requisition from RMS branches to ensure that medicines are distributed according to number of TB cases notified in the district during this FY.

According to the e-LMIS reports, 94.6 % reported no stock out during the fiscal year of 2021-2022 and we noticed a quality issue of data reported in e-LMIS. Although some health facilities reported stock out in the e-LMIS due to poor recording, but TB drugs were available at the health facilities and no patient missed his/her doses.

5.2. Procurement status of TB products at end of June 2022

For TB commodities products planned during the fiscal year 2021-2022, 42% were received, 28% in pipeline and 30% are still under evaluation.

The figure below provides detailed information on procurement status of different categories of TB commodities during the reporting period.

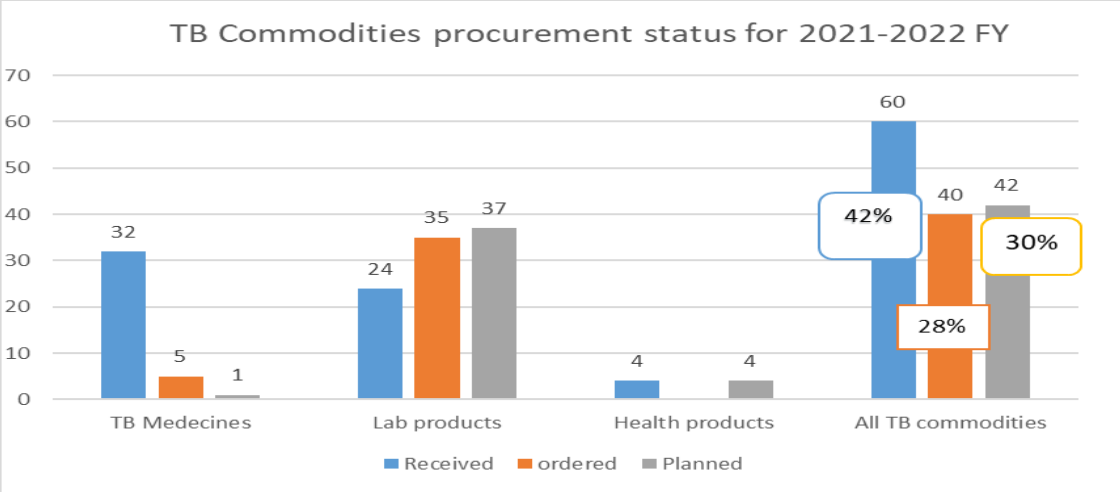


Figure 15: Procurement status of TB products, FY 2021-2022

5.3. Forecasted accuracy of TB medicines

The analysis of forecast accuracy from July 2021 to June 2022 showed that in general the forecast accuracy is good for adults first line medicines. However, we noticed the decrease of DR-TB notification and pediatric cases which requires to review their expected numbers of cases for 2022-2023 FY and to monitor the stock levels.

Table 11: Forecast accuracy for TB medicines

Regimen	Target in Quantification	Cases registered in July 2021 to June 2022	%	Comments
Patients under first line adult medicines	5333	5343	100.2	
Children under paediatrics formulation	332	202	60.8	Due covid 19, no campaign conducted for use of tuberculin to screen children with TB.
Rwanda FL regimen Rifabutin Based	40	0	0	This product was not available at the market and was available from March 2022 through GDF
Rwanda FL regimen Separate molecules	10	9	90%	
DR TB Cases	73	39	53.4	There was an issue of maintenance of GeneXpert machines which has an impact on the diagnostic capacity because Xpert is widely used to detect RR. Based on the trend of the last two years, the forecasted number was reviewed.
TPT Contacts	4451	1118[FB1]	25	The implementation of TPT delayed due to lack of budget allocated to the capacity building of HCWs as well the stock out of tuberculin reagent.
		[FB1]To review the data with prevention unit (94 put on TPT for contacts>= 5 years)		
TPT PLHIV	78804	83213	106	

5.4. Drug safety monitor

5.4.1. Active drug-safety monitoring and management (aDSM)

The a-DSM stands for the Active TB Drugs-Safety Monitoring and Management, intending to monitor patient safety prevent and manage adverse drug reactions (ADRs) to relieve patient suffering and improve treatment outcomes.

With introduction of new TB drugs and new treatment regimens for DR-TB management, there is an urgent need to implement aDSM in Rwanda.

Eleven out 39 DR-TB cases notified reported side effect during this reporting period: two were grade 3(severe), 8 cases with grade 2 (moderate) and 1 case with grade 1 (mild).

For susceptible TB cases we monitored the side events recorded in all patients treated during 2020-2021 fiscal year. The table below shows that 0.8% of patients developed side effects on first-line TB drugs, which shows general tolerance of these drugs.

Table 12: Adverse events reported among TB cases

N=5,377 (total TB DS & DR cases registered during the FY 2020-2021)	Total reported	Percent
Reported on a-DSM	5345	99.40%
Side event recorded	44	0.80%

5.1.1. Therapeutic drug monitoring (TDM)

Plasma levels of Anti-TB (Isoniazid, Rifampicin and Pyrazinamide) determination using HPLC-DAD is currently possible at the National Reference Laboratory. The method was developed and intends to perform Therapeutic Drug Monitoring (TDM) for TB patients presenting with positive control C2 and C5, Relapse and HIV-TB coinfection.

A number of samples (60) were collected from different health centers in Kigali and were analyzed at NRL using HPLC-system. The samples were collected at two time points per patient: early morning before the daily drug administration and 2 hours after drug administration.

Challenges

During the reporting period two main challenges were noticed and affected implementation of TDM. Stock out of nitrogen gas and capacity of users to sample processing and analysis and clinician for interpretation of results.

Technical team requested support to avail nitrogen gas and to strengthen the health professional skills for better performance of their work.

Key results:

Indicator	2021/22	
	Target	**Achievements**
Percentage of CDT with no stock out of FL tracers (RHZE and RH ad) drugs of experienced in the last 12 months	99%	94.6%(194/205)
Percentage of MDR TB centers with no stock out of SLD in the last 12 months	100%	100% (1/1)

Chap 6: TUBERCULOSIS MONITORING, EVALUATION AND RESEARCH

6.1. Data review meeting

The TB &ORD Division organized every quarter data quality checking and performance review with DH and HC with the aim to check and to validate the data recorded in HMIS by health facilities. During this meeting, participants discussed the key findings by identifying the challenges and propose recommendations to improve general management in data quality and TB control.

The central level team extract TB data from the electronic TB-base surveillance system and aggregated data from HMIS to check for completeness and accuracy of data. Identified possible errors and/or missing information are communicated to the hospitals M&E team at district level. The last should work with health facilities in the catchment area on corrections. A meeting with all data managers and TB focal persons is then organized at the hospital to:

- crosscheck entered in the system with source of information
- identify discrepancies between individual case-base system and aggregated TB data
- validate the data
- discuss achievement on key TB indicators
- identify challenges on TB key indicators and formulate recommendations accordingly

The common identified challenges are the following:

- Lack of ownership of TB data by health facilities management team
- Preliminary TB data checking between CDT and its CTs is not done before reporting data in the system
- Delays in recording quarterly TB data in HMIS for some health facilities: deadline is the fifth day following the reported quarter.
- Most of health facilities do not enter data in the individual case-base system in real time
- Incompleteness of some stages in the individual case-base system (Bacteriological follow-up, Contacts investigation, DST, etc.)
- Discrepancies between data reported and sources of information
- Turn-over of health facilities staff (data managers, TB focal persons, etc.)

6.2. Quality service assessment

To improve the management of TB and ORD diseases, TB&ORD assess and evaluates the quality of TB services in all centers of TB diagnosis and treatment (CDT) using a standard checklist. TB Rapid Service Quality Assessment (RSQA) was conducted

together with hospitals TB supervisors as mentorship approach, to make sure they will be able to replicate the same for lower-level health facilities and identified challenges are immediately solved.

In 2021-2022 FY, the TB RSQA was conducted in two periods: from 31st August to 11th September 2020 and from 22nd February to 05th March 2022. During this fiscal year, an updated TB RSQA checklist was used based on new protocols and guidelines of TB&ORD management.

During the period of 22nd February to 05th March 2022, a new approach was used where both CDTs and CTs were visited.

We are here reporting comparative results of the findings from the TB RSQAs, to check if progresses were made by health facilities between two consecutive fiscal years.

During the reported FY, RSQA was conducted in 94 out of 270 health facilities located in Eastern and Southern provinces. we mentored staff of hospitals and Health Centres by discussing and providing solutions to challenges identified.

Overall score has increased from 70.0% to 74.3% during 2020-2021 and 2021-2022 FYs respectively. Kirehe, Gitwe, Ruhango, Kabgayi and Nyagatare hospitals catchment areas need particular attention and close follow up for improvement in almost all the evaluated areas.

Regarding the impact of TB RSQA on the control and surveillance of TB&ORD program, we recommend that this activity continue in order to strengthen the capacity of Health Care providers at decentralized level and close follow up of the recommendations through mentorship and trainings.

The following table present the average scores of RSQAs for CDTs visited two times in 2020-2021 and 2021-2022.

Table 13: Average scores from RSQA for CDTs visited two times in 2020-2021 and 2021-2022 fiscal years

Area covered	2020-2021	2021-2022
Active drug safety monitoring and management (aDSM)	60.90%	62.30%
Are algorithms for TB screening, TB diagnosis and TB treatment available and displayed in health facilities?	90.60%	91.70%
Are patients with multi drugs resistant TB (MDR-TB) in ambulatory phase controlled (microscopy and culture) for effectiveness of their treatment?	77.80%	88.60%
Are rooms where TB services are provided well ventilated and Health workers personal protection existing and used?	73.00%	76.50%
Are stocks of TB drugs and reagents well monitored?	79.20%	75.80%
Are TB diagnostics continuously functional (microscopy and Expert) and their results available timely (microscopy, expert and culture)?	63.70%	50.10%
Are TB monitoring tools existing, update and well used; Supervisions and internal trainings conducted?	86.70%	83.60%
Are TB patients early initiated on TB treatment and on ART (if indicated), and their bacteriological control performed according to guidelines?	91.70%	80.70%
Are there personnel trained on Practical Approach to Lung Health (PAL) strategy and PAL instruments available for use?	47.50%	94.70%
Does TB infection control plan exist, implemented and its implementation monitored?	70.90%	70.40%
Does the BMI monitored for TB Patients and nutritional support provided to the eligible patients?	60.80%	72.90%
Is active case finding conducted in TB high risk groups?	78.20%	68.60%
Is the general population informed on cough hygiene, coughing patients separated from others, health facilities workers screened for TB?	79.00%	78.40%
Grand Total	**70.6%**	**74.3%**

6.3. Research

Rwanda Biomedical Center through TB & ORD division in collaboration with partners has committed to build and strengthen the research skills and capacity development of its staff. We organized a workshop to build staff capacity of development of articles using programmatic data. During the workshop, staffs developed some protocols, drafted, and submitted some articles in international journals. Following are steps for different studies:

a. Research Protocol under development

- Latent Tuberculosis Infection prevalence in Rwanda (To measure prevalence of Tuberculosis in Rwanda)
- In country evaluation for clinical performance of the Determine TB Lam Ag Rapid in a non-laboratory setting:
- Preventing Acquired Resistance: Strengthen TB treatment by adding Amikacin in the first treatment week of multidrug-resistant tuberculosis (Stake)
- Innovate to reduce rifampicin-resistant tuberculosis in Rwanda and beyond (InnoR3TB): Study is in good progress with patient enrollment with objectives.

b. Research Studies ongoing

- TB Catastrophic cost survey entitled: “An evaluation of costs borne by TB-affected households in Rwanda”. Data collection is ongoing and around 80% of participants are already recruited. The main challenge was the low recruitment of MDR-TB participants due to changes on the RR-TB diagnostic algorithm.

- Clinical and social long-term outcomes among multi-drug resistant tuberculosis (MDR-TB) patients who successfully completed MDR-TB treatment under the Rwanda TB program. Data entry were already done. But cleaning, analysis and reporting are planned to be done during 2022 -2023 fiscal year.
- Culture free diagnosis and follow-up of MDR-TB (DIAMA): Close to complete, final analysis, manuscript drafting ongoing.
- All oral shorter treatment regimen for multidrug and Rifampicin resistant tuberculosis (MDR-TB): Evaluating its effectiveness, safety and impact on the quality of life of patients in Rwanda. Data collection ongoing.

c. Paper submitted in internal journal in peer review process

- Risk factors associated with TB diseases in patients attending health facilities in Rwanda (American Journal of Tropical Medicine & Hygiene)
- Assessment of factors associated with tobacco smoking among pulmonary TB patients attending health facilities in Rwanda (BMC journal)
- Substantial added value for chest x-ray followed by Xpert MTB/RIF test in early detection of tuberculosis among people living with HIV in Rwanda (Open Forum Infectious Diseases journal)

d. Paper published

- Continuous surveillance of drug-resistant TB burden in Rwanda: a retrospective cross-sectional study was published in International Health 2022; 0: 1–8 https://doi.org/10.1093/inthealth/ihac039.
- Multidrug-resistant tuberculosis control in Rwanda overcomes a successful clone that causes most disease over a quarter century published in Journal of Clinical Tuberculosis and Other Mycobacterial Diseases (Volume 27, May 2022, 100299: https://doi.org/10.1016/j.jctube.2022.100299.

6.4. Implementation of individual case-based surveillance

The TB&ORD Division has been working with its stakeholders to improve the use and performance of the TB case-based surveillance system established under the DHIS2 platform.

Since the TB case-based surveillance system started to be used as a single source of information for TB notification in July 2019, the users have enjoyed the benefits of this system but still face challenges when it comes to analyzing data and data quality.

In This fiscal year 2021-2022 the TB case-based surveillance system has been upgraded from version 2.35 to 2.36.11. DHIS2 version 2.36.11 is out with many new features, improvements, bug fixes (Support API versioning in new tracker APIs, Data visualizer app bugs etc. Click for 2.36.11 Release Note) and the improvements are leading to lower support request, faster database queries and less memory consumption.

Different activities were performed to enhance and support the implementation of TB case-based surveillance, Leprosy patient tracker and Leprosy Contact tracing based on end-user feedbacks and updates in reporting forms. In addition, the death audit report form has been customized in the TB case surveillance system and shall be online available for use in fiscal year 2022-2023.

6.5. M&E plan performance

During this FY, 32 indicators on M&E have been evaluated less than half achieved the target and the most reason of not achieving is due to issue of genexpert, delay in initiation of TPT among contact and low TB detection rate in HRG and children under 15 years. The figure below show the performance. The annex 1 shows detail of each indicators.

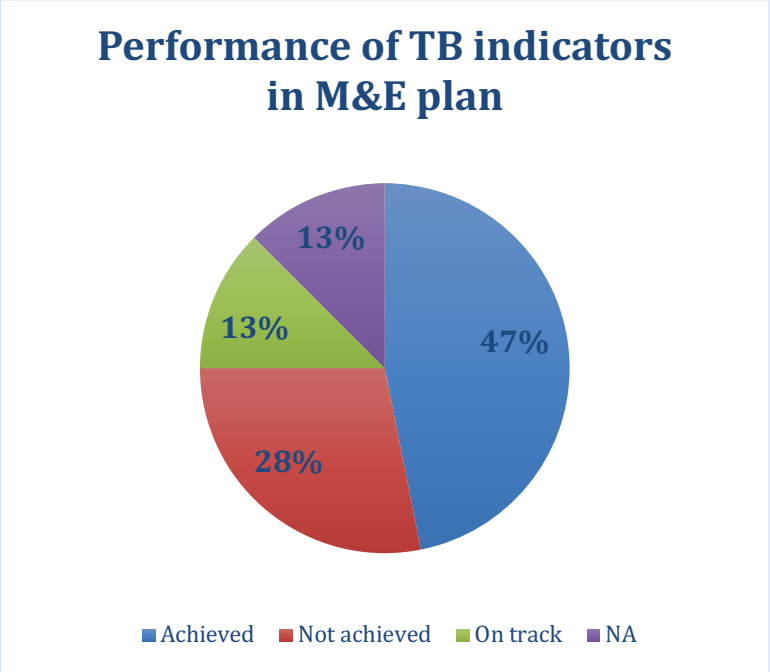


Figure 16: Performance of TB M&E indicators 2021-2022FY

Chap 7: Leprosy management

Most efforts in Rwanda targeted at reducing the leprosy burden and its complications. Early diagnosis of leprosy cases in endemic and non-endemic locations, as well as prompt treatment had a favourable influence on leprosy disease prevention and control weakened the transmission of leprosy disease, and averting the physical deformity due to leprosy. Our goal is to detect all potential cases of leprosy in the community, adults and children under 15 years old, both without visible deformities or impairment due to leprosy.

7.1. Strengthening leprosy surveillance and response

7.1.1. Improve leprosy surveillance system

The leprosy is a program integrated in the health system. The tools such as leprosy disability registers (10), contact investigation and chemoprophylaxis (10) were distributed to health centers located in endemic areas. The adoption of electronic leprosy individual case-based reporting systems has significantly improved leprosy monitoring and evaluation over time. Rule validations that allow minimizing errors and missing information were fixed in a workshop that took place in Musanze District, at Fatima Hotel, from May 23-26, 2022. To this end, the Data Managers and Nurses were refreshed on data entry, analysis in order to improve data quality, and fill in all the e-leprosy stages' program by the cases from 2009 up to the last current cases reported. In addition, leprosy contact tracing tracker were developed to manage the program of contact tracing and post-exposure prophylaxis. Note that each health facility has the right to enter the data for both systems after signed the confidentiality agreement.

7.1.2. Leprosy surveillance in non-endemic areas

According to the leprosy NSP 2019-2024, the surveillance of leprosy in non-endemic areas that have been notified at least one or more cases in last ten years were a subject of investigating whether there are no new cases in the community, especially household contacts of these former patients. Because leprosy has a lengthy incubation period, we presumably assumed new cases of leprosy may develop at any time, which is why a continual sight of preventive and control efforts was conducted in the determinable places. In this context, an active case findings were conducted and took place in the districts of Rubavu (Nyundo, Busasamana), Huye (Mbazi HC), Rulindo (Tare HC), and Musanze (Gasiza HC), and no cases were discovered. Surprisingly, with help with internist specialist three cases of leprosy were reported, one PB from Nyagatare (Nyakigando HC), 1 MB in Nyabihu (Bigogwe HC), and 1 MB in Ruhengeri (Rwaza HC).

7.2. Leprosy screening and notification

There were two ways to screen leprosy patients. A passive screening was carried out alone by the health facilities, while an active screening conducted by central level in close collaboration with the health centers and the hospital. All people with skin patches were examined as part of the screening process. Among people who attended the active screening activity, 33% (162/493) of patients with patches were screened. Of these 26% (42/162) were presumptive cases. Eighteen cases of leprosy (42.9%) were identified during the reporting fiscal year (Table 12).

Table 14: Cascade of leprosy screening from leprosy active detection in endemic and non–endemic areas, FY July 2021- June 2022.

Cascade of leprosy screening	Frequency	%
People coming for ACF	493	
People with patches screened for leprosy	162	33%
Presumptive leprosy screened for leprosy	162	100%
Presumptive with leprosy were excluded among all Presumptive examined	42	26.00%
Leprosy case detected out of all presumptive examined	18	42.90%

7.2.1. Leprosy notification

In all, thirty-four cases of leprosy were reported in the fiscal year of 2021/2022. Of these, 88, 2% (30/34) were newly diagnosed leprosy while 11.8% (4/34) were relapsed cases. Looking at the new cases detected, 76.7% (23/30) were MB, and 23.3% (7/30) depicted PB cases. Male (56.5%) outnumbers females (43.5%) in this fiscal year. The appraisal of grade 2 disability among newly cases detected at the beginning of treatment showed that the proportion is very high either 30% (9/30) compared to the target set in leprosy NSP(<10%), and all were occurred in the Multibacillary form. This indicated a late detection of infectious cases in the community, while diagnosed children (6.5%) demonstrated a persistence of transmission in community (Table 13). New cases reporting by location revealed some cases found in endemic areas such as Rusizi (9); Ngoma (5), Bugesera (6), Gisagara (7), and Nyaruguru (1), in non-endemic districts areas, there were only four cases: Burera (2), Nyagatare (1), Musanze (2) and Nyabihu (1).

Table 15: Leprosy notification. July 2021-June 2022

LEPROSY CASES	MB	PB	Total
New cases (NC).			
# of new cases (NC)	23	7	30
# of children among new cases (0-14 years)	2	0	2
# of women among new cases	10	4	14
# of new cases detected during active case finding Campaign	12	6	18
# of new cases evaluated for their disability at Diagnosis	23	7	30
# with grade 1disabilities	1	1	2
# of children with visible deformities (G2D)	0	0	0
# of all-new cases with visible deformities (G2D)	9	0	9
# of foreign-born new cases notified in Rwanda for less than 15 years at the time of diagnosis	0	0	0
Retreatment cases			
# of relapses	4	0	0
# of retreatment after default	0	0	0
Total cases	27	7	34

7.2.2. Trend of leprosy notification

The figure below shows number of new cases and detection rate per 100,000 inhabitants, which was 0.22. Thus, we observed that there a constant increase of MB cases from FY 18/19 until FY 21/22 compared to the previous three fiscal years (FY 13/14 to FY 15/16). Conversely, building of the current population, the estimates detection shows linear regression of cases per 100,000 population, proxy of leprosy incidence.

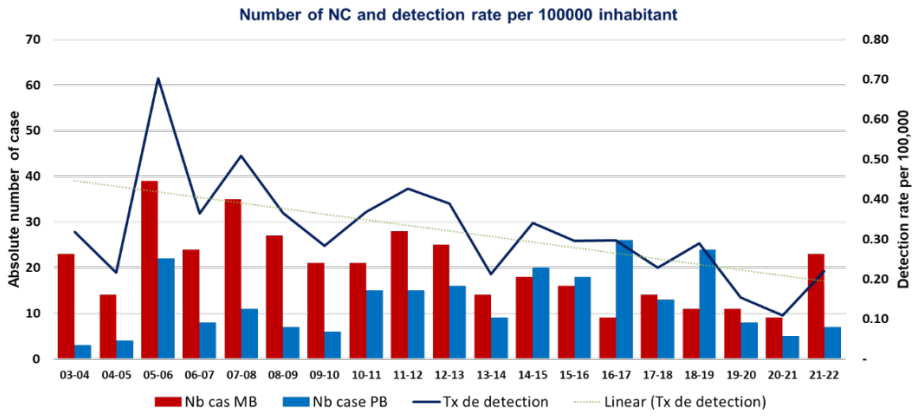


Figure 16: Number of new cases by case category and leprosy detection rate over time, Rwanda, July 2003 to June 2022

7.3. Leprosy treatment outcome

All leprosy cases were treated with an adequate multidrug therapy (MDT) that currently was recommended by WHO in the treatment of paucibacillary and multibacillary by administrating three drugs MDT (Clofazimine, Dapsone, Rifampicin). The treatment success rate was 100% for both PB and MB cases recorded in FY 2020/2021 and FY 2019/2020 respectively. Disability assessment at the end of treatment were performed at 100%, and no reaction due to leprosy was observed among patients cohort of reporting fiscal year.

Table 16: Leprosy treatment outcome for cohort July 2021-June 2022

Outcome	New cases		Relapses		Retreatment after default	
	MB	PB	MB	PB	MB	PB
Registered	11	5	0	0	0	0
Completed Treatment	11	5	0	0	0	0
Lost to follow up	0	0	0	0	0	0
Deaths	0	0	0	0	0	0
Non evaluated	0	0	0	0	0	0
Treatment success (%)	100%	100%	-	-	-	-
Number of patients having developed leprosy reactions during treatment	0	0	0	0	0	0
Number of patients assessed for disabilities at least both at the beginning and end of treatment	11	5	0	0	0	0
Proportion of patients assessed for disabilities at least both at the beginning and end of treatment	100%	100%	-	-	-	-
Number of patients having developed new disabilities during treatment	0	0	0	0	0	0

7.4. Leprosy preventive therapy among household contacts

This reported fiscal year, we officially launched the leprosy preventive therapy among household contacts that involved the health facilities located in leprosy endemic areas. This is ongoing implementation process, which started by identifying and tried to trace possible household contacts registered in the last 10 years compared to the years 2019 up to now. However, all contacts whom were fulfilled eligibility criteria have to get started a Single Dose of Rifampicin post-exposure prophylactic therapy (PEPT). The inclusion criteria will reject all those who have active TB and active, or other contraindication of use Rifampicin drug.

Several studies showed that the use of a single dose of Rifampicin had a great potential effect to reduce the risk of developing leprosy by 50%-60% among contacts of leprosy patients[1]. To this end, monitoring and evaluation will be done every quarter via the current functional leprosy contact-tracing tracker. After being initiated on PEPT will require a maximum of five years for follow-up.

According to the table below reflected a total number of one thousand and one (1001) contacts assumed and supposed to be baseline for implementing the post-exposure prophylaxis therapy among household contacts. Of course, the list line is not exhaustive, so that the contacts who were unreachable at the beginning of this valuable activity, they will be updated at the end of the day with contacts identified.

Table 17: Assumption of SDR needs in favor of household contact, from January 2009 to June 2022

Health Facility	Former patients	Household contacts identified	Reserved Stock (25%)	Security stock	Quantity forecasted
Bugarama Islamic	7	30	25%	8	38
Bugarama HC	17	40	25%	10	50
Gikundamvura HC	30	145	25%	36	181
Nyabitimbo	24	82	25%	21	103
Jarama	45	156	25%	39	195
Gishubi	44	322	25%	81	403
Nyundo	13	26	25%	7	33
TOTAL	**180**	**801**	**25%**	**200**	**1001**

1 *Mohammed et al. : Effectiveness Analysis of Single Dose Rifampicin for Preventing Leprosy transmission. JPHTCR. Vol. 4. No. 2 (2021)*

Chap 8: Finance

8.1. Funding Sources for TB Expenditures in Rwanda FY 2021-2022

The Ministry of Health and the Rwanda Biomedical Centre in collaboration with its partners worked on the design and development of the Health Resource Tracking Tool (HRTT), where all health sector actors (Government institutions and development partners) report on a periodic basis. The system is designed to collect expenditures and budgets on a quarterly and annual basis.
To facilitate the collection of financial information for this year's report, a separate data collection process was adopted using SMART IFMIS (Integrated Financial Management Information System) for Global Fund grant and Government contribution.

8.2. Public and external funding sources for TB NSF

The Global Fund for AIDS, TB and Malaria (GFATM) contributed USD 4 311 588; the GoR contributed USD 3 069 560 and WHO contributed USD 20 891 to give a total budget of USD 7 402 038 for fiscal year 2021/2022.

The TB/NSP total spending amounted to USD 6 822 027 (92,2%) as follows: Global Fund spent USD 3 835 511; GoR expenditures were USD 2 973 065 and WHO expenditures were USD 13 451.

NB: PEPFAR contribution to support TB activities is captured in the HIV financial report

Table 18: Contribution of Different Funding Sources for the year ended 30 June 2022

Donor	Budget in USD for FY 2021/22	Expenditures in USD FY 2021/22	Budget execution rate in%
Global Fund	4 311 588	3 835 511	89%
GoR (Recurrent budget)	3 069 560	2 973 065	97%
WHO	20 891	13 451	64%
Grand Total	7 402 038	6 822 027	92,2%

8.3. Government contribution to TB National Strategic Plan

Methodology used to estimate the GOR allocations to various health programs

The GoR funds are allocated to different health programs during the annual planning and budgeting process, which entails prioritisation by the Ministry, RBC and decentralised levels based on HSSP III and different disease program strategic plans serve as guiding documents.

Apart from program specific financing, the estimation of GoR contribution takes into consideration all other health related programs costs, categorised as health systems strengthening costs in the MTEF Chapter of (i) Compensation of employees; (ii) Use of Goods & Services; (iii) Subsidies; (iv) Grants; (v) Social assistance and (vi) Other expenditures; (vii) Inventory and (viii) Fixed tangible non financial Assets.

Table 19: GoR TB NSP budget and expenditure per MTEF chapter for the year ended 30 June 2022

MTEF Chapter	Budget for FY 2021/22 in USD	Expenditures for FY 2021/22 in USD	Variance in USD	Performance in %
21 Compensation of employees	1 340 835	1 337 660	3 175	100%
22 Use of goods and services	313 376	307 637	5	98%
25 Subsides	73 852	68 920	4	93%
26 Grants	152 700	162 927	- 10	107%
27 Social assistance	303 262	299 626	3	99%
28 Other expenditures	514 580	449 117	65	87%
33 Inventory	1 096	896	200	82%
34 Fixed tangible non financial Assets	369 858	346 282	23 575	94%
Total	3 069 560	2 973 065	96 494	97%

As the table shows for FY 2021-2022, the GoR is contributing to TB expenditures the total amount of USD 2 973 065 with TB Expenditures by MTEF budget category of USD 3 069 560 representing 97 % of the total budget planned for Fiscal year 2021-2022.

8.4. The Global Fund contribution

For the Global Fund contribution, the budget for the year 2021–2022 was out of this budget, a total of USD 3 835 511 has been effectively spent by the sub-recipients representing 89 % of the total budget for the TB NSF GF grant.

Table 20: GF TB NSP budget and expenditure per GF budget categories for the year ended 30 June 2022

GF Budget categories	Budget approved in USD for FY 2021-2022	Expenditures in USD for FY 2021-2022	Variance in USD for FY 2021-2022	Performance rate in %
1.0 Human Resources (HR)	744,297	650,571	93,726	87%
10.0 Communication Material and Publications (CMP)	59,926	41,203	18,723	69%
11.0 Indirect and Overhead Costs	137,984	136,526	1,458	99%
12.0 Living support to client/ target population (LSCTP)	126,633	57,031	105,602	35%
13.0 Payment for results	628,348	635,310	6,963	101%
2.0 Travel related costs (TRC)	299,983	333,372	33,389	111%
3.0 External Professional services (EPS)	25,000	25,000	-	100%
4.0 Health Products - Pharmaceutical Products (HPPP)	405,684	353,985	51,700	87%
5.0 Health Products - Non-Pharmaceuticals (HPNP)	1,676,956	1,509,649	86,307	95%
7.0 Procurement and Supply-Chain Management costs (PSM)	170,777	11,864	158,912	7%
Total	**4,311,588**	**3,835,511**	**476,076**	**89%**

The table above shows the TB NSP budget execution per NSP cost category for the period of July 2021 to June 2022 representing a total rate of 89%. The unspent budget of USD 476 076 for mainly activities like: payment of RMS management fees and salary payment .

Table 21: GF TB NSP budget and expenditure per Budget agencies for the period of July 2021 to June 2022

Budget agency	Budget approved in USD FY 2021-2022	Expenditures in USD FY 2021-2022	Variance in USD FY 2021-2022	Performanc %
CHUB	25 506	26 201	-695	103%
CHUK	25 506	26 240	-734	103%
MOH	628 348	635 310	- 6 963	101%
RBC	3 632 228	3 147 761	484 468	87%
Total	4 311 588	3 835 511	476 076	89%

Chap 9: Conclusion

During the FY 2021-2022, the TB&ORD Division with partners continued effort for fighting against TB and other respiratory diseases. A summary of findings regarding TB screening, diagnostic, treatment, and prevention and key achievements are found below:

- We observed a decrease in TB presumptive cases, mainly patients referred by CHWs. However, the positivity rate increased, and it may be due to the improved TB screening at the community level. There is a decrease in first-line DST coverage among bacteriologically confirmed TB due to a delay in the maintenance contract of Gene X-pert machines. There is an increase in RR-TB notifications compared to the previous FY as the new cartridge, ultra is being implemented countrywide replacing the classic one which was known to report false RR results in low bacilli load samples. The notification of childhood TB is still low compared to the national TB program target which need to improve by reinforcing capacity building and work closely with pediatrician association to improve the diagnostic.

- The treatment success rate for TB in all forms for both susceptible and drug-resistant tuberculosis reached the NSP target (2021-2022 FY). We observed an increase in treatment success rate for bacteriologically confirmed and clinically diagnosed TB compared to the previous FY and almost half (22 out of 45) of hospitals reached the national target for treatment success rate. It was also observed an improvement fatality rate among TB/HIV co-infection from 15% in 2019-2020 to 11% in 2020-2021 FYs which may be due to TPT approaches and high viral load suppression among PLHIV. Among TB cases notified having moderate and severe malnutrition only around a half of them received supplemented food and a half improved their weight at the end of treatment. Analysis of 35% of the verbal TB death audits reports was done and revealed a progressively decreased among HIV-positive patients and the observed deaths were more related to low CD4 count.

- During this reporting FY 2021-2022, the Nation Tuberculosis Program started the implementation of TPT among contacts above 5 years old of TB patients. We observed a decrease in TPT coverage in under 5 years of household contacts compared to the previous FY.
- The TPT among PLHIV is progressing well with 64% of all PLHIV already initiated and with very good completion rate at 96%.

- All leprosy cases were treated with an adequate multidrug therapy (MDT) that currently was recommended by WHO in the treatment of paucibacillary and multibacillary with very good rate of treatment completion. However, we observed a notification of new case in non-endemic leprosy zone which need

to reinforce the surveillance. The adoption of electronic leprosy individual case-based reporting systems has significantly improved leprosy monitoring and evaluation over time.

- An amount of 6,822,027 US dollars have been used to fight TB and leprosy. The main contributors are the Government of Rwanda, the Global Fund for AIDS, TB and Malaria (GFATM), and WHO. The Ministry of Health through the National TB Program is advancing toward TB elimination as a common Worldwide vision. PEPFAR also contributed to fight TB and their contribution is accounted in the HIV financial report. As the TB incidence is low in Rwanda, to reach the target set by End TB will need more resource that is why there is need to advocate for more resource while majority of donors are supported country based on the TB disease burden. In additional, the advocacy to increase domestic fund is also needed.

Based on the key successes and challenges mentioned above, Rwanda needs to work hard to achieve the 2025 milestone as it remains only 3 years. Digitalization of TB will continue to be strengthen by improving TB and leprosy case-based surveillance systems and introduce use of new technology like computed aided diagnostic and video observance treatment which showed an improvement in TB management and control. To reduce the gap in missed TB cases, active case finding will be enhanced in some specific high-risk groups.

ANNEXES

Annex 1: TB Indicators in Monitoring and evaluation framework, Rwanda from July 2021 to June 2022.

GOALS for 2024 as compared to 2015:				
· 35% reduction of TB incidence rate · 57% reduction of TB deaths · Reduction of TB-affected families facing catastrophic costs due to TB (to be determined after the survey).				
	Indicator	**Purpose**	**2021/22**	
			Target	**Achievements**
1	Percentage of reduction of TB Incidence rate (per 100,000 hab)	**Impact**	27.20%	5.20%
2	Percentage of reduction of TB Deaths rate	**Impact**	44.30%	12.20%
3	Percentage of TB-affected families facing catastrophic costs due to TB (End TB Top-ten indicator N°3)	**Impact**		
4	Proportion of first level health facilities that have at least one staff trained to provide PAL services	process	30%	94.00%
5	TB notification rate new and relapses (per 100,000)	Outcome	37/100k	41.6/100K (5,447/13104021)
6	TB treatment coverage (End TB Top-ten indicator N° 1)	Outcome	89%	71.6% (5371/7500)
7	Contact investigation coverage (End TB Top-Ten N°6)	Coverage	>90%	98.4% (22186/22585)
8	Proportion of TB cases notified among high-risk groups (HRGs(Number and Percentage)	Process	55%	51,2% (2790/5446)
9	The proportion of eligible malnourished DS TB patients (BMI<18.5) who have accessed appropriate nutrition support	Process	70%	41.5% (1090/2624)
10	Proportion of children 0-14 years notified among TB cases new and relapse	Output	9.00%	5.0% (272/5447)

11	Proportion of newly notified patients diagnosed using WHO recommended rapid tests (End TB Top-Ten N°4)	Output	65%	43.3% (2178/5030)
12	DST Coverage for TB patients (End TB Top-Ten indicator N° 7)	Coverage	79%	61.8% (3418/5530)
13	Proportion of notified patients with rifampicin resistant (RR) or MDR who receive second line DST		95%	86.8%(333/38)
14	Proportion of health facilities diagnostic sites scoring pass in EQA for smear microscopy		90%	60.4%(124/205)
15	Proportion of health facilities Xpert sites scoring pass in EQA for Xpert MTB/RIF		70%	30.9%(21/68)
16	Treatment success rate (TSR) for all forms of TB cases (DS & DR-TB cases) (End TB Top-ten 2)	Outcome	87%	88.8% (4873/5490)
17	Percentage of CDT with no stock out of FL tracers (RHZE and RH ad) drugs of experienced in the last 12 months	coverage	99%	94.6%(194/205)
18	Percentage of MDR TB centers with no stock out of SLD in the last 12 months	coverage	100%	100% (1/1)
19	Proportion of eligible PLHIV initiated on TPT	coverage	80%	63.8% (136598/214073)
20	Treatment success rate, confirmed RR/MDR-TB	Outcome	87%	97.5% (39/40)
21	Treatment coverage new drugs (End TB Top-ten indicator N°8)	Coverage	95%	100%(38/38)
22	Proportion of TB treatment cards where ADSM section is completed	Output	40%	99.4% (5370/5401)
23	Proportion of diagnosed TB cases tested for HIV infection (End TB Top-ten indicator N°9)	Output	>95%	99.9% (5531/5538)
24	Proportion of HIV positive TB cases given antiretroviral therapy during TB treatment	Output	95.00%	94.9%(943/985)

25	Treatment success rate for TB patients (all forms) receiving DOT through community health workers (CHW)	Outcome	96.00%	93.9% (2174/2314)
26	Percentage of Health providers screened for TB at least once during the year. (health facility workers)	Coverage	79.00%	85.6% (22817/26651)
27	LTBI treatment coverage among contacts < 5 years (End TB Top-ten indicator N°5)	Coverage	90%	90.7% (1047/1154)
28	LTBI treatment coverage among contacts > 5 years	Coverage	30%	18.8%(427/2260)
29	Percentage of population with adequate knowledge* on TB symptoms, transmission and prevention	Outcome	NA	NA
30	Proportion of TB cases (all forms) referred by community health volunteers during the evaluated year.	Output	>25%	27.6% (1529/5530)
31	eTB coverage in CDT and CT proxy of Timeliness of routine reporting	Process	97%	100%
32	Case fatality ratio (CFR) (End TB Top-ten indicator N° 10)	Outcome	6.00%	5.7% (426/7500)
33	Number of standard criteria met using WHO TB standard and benchmarks checklist		8	NA
34	Proportion of public health facilities where at least one staff has participated in training on TB		NA	NA
35	Percentage of people diagnosed with TB who report stigma in health care settings that inhibited them from seeking and accessing TB services		NA	NA

Annex 2: RBF achievement, from July 2021 to June 2022.

Coverage/Output indicator	NSF Target	Program Results		Level of achievement
	2021-2022	2021-2022		
	%	N# D#	%	
Percentage of HIV-positive new and relapse TB patients on ART during TB treatment	95%	943 993	95.0%	99.96%
Percentage of PLHIV on ART who initiated TB preventive therapy among those eligible during the reporting period	74%	136,598 214,073	63.81%	86.23%
Treatment success rate- all forms: Percentage of TB cases, all forms, bacteriologically confirmed plus clinically diagnosed, successfully treated (cured plus treatment completed) among all TB cases registered for treatment during a specified period, new and relapse cases	87%	4,877 5,495	88.75%	102%
Proportion of people (>5 years) in contact with TB patients who began preventive therapy	30%	427 2,260	18.89%	62.98%
Proportion of TB cases notified in high-risk groups among all TB cases	55%	2,793 5,538	50.43%	91.70%
Percentage of new and relapse TB patients tested using WHO recommended rapid tests at the time of diagnosis	79%	2759 5538	49.82%	63.06%
Treatment success rate of RR TB and/or MDR-TB: Percentage of cases with RR and/or MDR-TB successfully treated	86.75%	39 40	97.50%	112.39%
Case notification rate of all forms of TB per 100,000 population - bacteriologically confirmed plus clinically diagnosed, new and relapse cases	40/100000	5472 13104021	41.7/100000	96%

Annex 3: Leprosy Indicators in Monitoring and evaluation framework, Rwanda from July 2020 to June 2021.

	Indicator	2021-2022	
		Target	Achievement
1	Number of children diagnosed with leprosy and visible deformities (G2D)	0	0
2	Rate of newly diagnosed leprosy patients with visible deformities (G2D)	0,4 per million	0,7 per million (9*1000000/13104021)
3	Availability of web-based, case-based reporting system allowing disaggregation by age, sex, place of residence and other relevant criteria	Jul-21	Yes
4	Percentage of endemic health facilities that have had at least 2 supervisory visits from district hospital in the reporting year	100%	100%
5	WHO certification of leprosy elimination in Rwanda (prevalence < 1 case per 10.000 habitants)	Jul-21	No
6	New case-detection (number and rate per 100000)	28	30
		(0,22)	0,23 (30*100000/ 13104021)
7	Leprosy prevalence rate per 10000.	0,016	0,023
			(30*10000/13104021)
8	Proportion of G2D cases among total new cases detected.	≤ 14%	30% (9/30)
9	Proportion of child cases among total new cases detected.	6%	6.7% (2/30)
10	Proportion of MB cases among total new cases detected.	41%	76.6% (23/30)
11	Proportion of female cases among total new cases detected.	< 45%	46.7% (14/30)
12	Proportion of contacts screened.	80%	74.2% (95/128)
13	Proportion of foreign-born among total new cases detected	NA	0
14	MDT completion for new PB	> 95%	100% (5/5)
15	MDT completion for new MB	> 95%	100% (11/11)
16	Proportion of new PB patients assessed for disability status at least both at beginning and at end of treatment	> 90%	100% (5/5)
17	Proportion of new MB patients assessed for disability status at least both at beginning and at end of treatment	> 87%	100% (11/11)

18	Number and proportion of new PB patients who have developed new disabilities during the course of treatment	≤ 1 case	0 case
		(≤ 5%)	0%
19	Number and proportion of new MB patients who have developed new disabilities during the course of treatment	≤ 2 cases	0 case
		<10%	0%
			(0/11)
20	Number of cases treated (new and retreatment) having developed leprosy reactions during treatment	≤ 4 cases	0 case
21	Number and proportion of retreatment cases over the total leprosy cases notified	≤ 12%	11.8% (4/34)
22	Existence of an association of patients affected by leprosy in the endemic sectors	(2/8)	(2/8)