Republic of Rwanda
Ministry of Health

Rwanda Biomedical Centre
Healthy People, Wealthy Nation

Tuberculosis and Other Respiratory communicable Diseases Division

Annual Report

2023/2024

FOREWORD

As we conclude the fiscal year 2023-2024, we proudly present the comprehensive report on Rwanda's tuberculosis (TB) and leprosy control programs. This year, Rwanda achieved significant milestones in TB screening, diagnosis, and treatment. We identified 152,715 presumptive TB cases, with 8,551 TB cases notified and a notable 52% of referrals coming from Community Health Workers (CHWs). Our expanded network of GeneXpert machines and the application of WHO-recommended molecular diagnostics have greatly enhanced early TB detection and drug resistance monitoring. The increase in TB notifications, although variable, highlights our commitment to combating this disease.

The prevention and treatment outcomes have shown promising progress. We maintained a high treatment success rate, improved drug resistance management, and reinforced TB preventive measures, including widespread screening and preventive therapy. Our efforts in leprosy control have also yielded positive results, with significant improvements in early detection and reduced disability levels.

Our strong financial management, supported by both government funds and international donors, has ensured the effective execution of our TB and leprosy programs. The total budget of USD 7.52 million for this fiscal year was utilized efficiently, with high expenditure rates of 97% reflecting our ongoing dedication to enhancing TB and leprosy control.

We extend our gratitude to all stakeholders, including healthcare providers, CHWs, and international partners, whose contributions have been instrumental in our success. Moving forward, we remain committed to strengthening our efforts, addressing challenges, and ensuring continued progress in our fight against TB and Leprosy.

Digitally signed by MOH(Minister)

Dr Sabin NSANZIMANA

Minister of Health

EXECUTIVE SUMMARY

Screening and Diagnostic Approaches

During the fiscal year 2023-2024, Rwanda identified 152,734 presumptive TB cases with a positivity rate of 4%, translating to 6,136 confirmed cases and 52% were referred by CHWs. HIV testing among these presumptive cases showed an 8.6% HIV positivity rate. Enhanced TB case-finding efforts in high-risk areas, such as slums and correctional facilities, showed a higher positivity rate of 7%. Screening in correctional facilities involved 26,959 inmates and led to the detection of 241 TB cases, including 8 multidrug-resistant TB (MDR-TB) cases.

Rwanda expanded its network of GeneXpert machines from 70 to 91 sites to improve rapid TB diagnosis, including drug-resistant TB surveillance and integration of HIV and hepatitis C testing. WHO-recommended molecular diagnostics (WRD) were used as initial testing in 69.1% of all TB cases and 86% among bacteriologically confirm and universal drug susceptibility testing for at least rifampicin resistant (DST) was 95.7% among bacteriologically confirmed TB. The performance of smear microscopy quality control was 96% (155/161) among CDTs that performed smear QC at least three times per year, and 75.6% (155/205) among all CDTs nationwide however 94% (62/66) of GeneXpert sites participating in panel testing achieved passing marks of 80%.

TB Notification

In FY 2023-2024, Rwanda notified 8,551 TB cases, including 92 rifampicin-resistant TB (RR-TB) cases. CHWs played a crucial role in this effort, contributing 31.3% of the notifications, surpassing the national target. TB notifications have fluctuated, with a decrease noted this year, particularly in Rwamagana District. The majority of cases were in males (73.5%) and affected primarily the 25-44 age group. Kigali City reported the highest number of TB cases (27.3%), followed by the Eastern and Southern provinces. Bacteriologically confirmed cases comprised 73% of notifications, with pulmonary TB representing 85%. TB-HIV co-infection was observed in 14% of cases. High-risk groups accounted for 56.5% of cases, with inmates and the elderly being the most affected. Childhood TB cases made up 9% of the total, with mentorship programs improving detection. Drug-resistant TB cases decreased, particularly in Kigali City and Eastern Province.

TB Prevention

TB&ORD surveillance system monitors compliance with TB prevention measures, with 90.8% of health facilities implementing the minimum IC package. Annual TB screening for healthcare workers and CHWs is a key component of this plan. In 2023-2024, 95% of health facility staff and 93% of CHWs were screened, identifying 25 confirmed TB cases.

Contact tracing screening of TB was done among household contacts of TB index cases. Among under five years, achieved a 98% screening rate, resulting in 56 confirmed TB cases and 97% of eligible received tuberculosis preventive therapy (TPT). TPT was also extended to contacts over five years old, with 86% undergoing Tuberculin Skin Test (TST) and 98.1% of those with positive

results receiving TPT. Among people living with HIV (PLHIV), 95.8% on antiretroviral therapy (ART) received TPT by June 2024. Despite these achievements, continued efforts are needed to enhance TB screening and treatment coverage in high-risk populations.

TB Treatment Outcome

The treatment success rate (TSR) for susceptible and drug-resistant TB in Rwanda reached 90% among cohort of TB case notified in 2022-2023 fiscal year, showing improvement from the previous year specifically among drug susceptible. Patients followed by CHWs had a higher TSR of 93%. However, patients with TB/HIV co-infection had a lower TSR of 79% and a higher mortality rate of 13%. Despite these challenges, 93% of TB/HIV co-infected patients-initiated ART during TB treatment.

For children under 15, the TSR was exceptionally high at 96%, compared to 90% for those aged 15 and above. Pulmonary TB had a TSR of 90% with a 5% mortality rate, while extrapulmonary TB had a TSR of 90% and a 7% mortality rate. Drug-resistant TB treatment success also improved, with 91.3% of patients achieving culture conversion after six months. However, MDR-TB patients with TB/HIV co-infection had a lower success rate of 80%. Challenges like high loss to follow-up and the need for improved TB death auditing and reporting persist.

TB Program Management

The TB&ORD Division in Rwanda undertook initiatives to improve TB surveillance and patient management, including training programs for healthcare providers and updating national guidelines. During this 2023-2024 FY, MDR TB guideline was update including the last WHO recommendation on shorter MDR TB treatment. The division supported MDR-TB patients with comprehensive care and prioritized public awareness campaigns in high-risk settings. Annual evaluations and workshops with district TB stakeholders highlighted progress and identified areas for improvement. Research initiatives were strengthened to inform policy adjustments, focusing on cost evaluations, treatment regimens, and diagnostic tests. tools for M&E were developed and distributed to all Health Facilities.
Annual evaluations and workshops with district TB stakeholders highlighted progress, identified challenges, and proposed strategies for improvement. Research initiatives were strengthened to inform policy adjustments, focusing on cost evaluations, treatment regimens, and diagnostic tests to enhance TB management in Rwanda.

TB Supply Chain

The Coordinated Procurement and Distribution System (CPDS) ensures effective TB control by managing forecasting, budgeting, and stock monitoring. In FY 2023-2024, 97.2% of health facilities reported no stock-outs but no patient missed the doses, though data quality issues were noted. Additionally, 72.8% of TB commodities were received, with the remaining in the pipeline

or under review. Active drug-safety monitoring (aDSM) reported adverse events in 0.71% of TB cases, highlighting the need for additional staff training.

Leprosy Control

Leprosy control efforts in Rwanda, led by the RBC/TB Division, focus on early detection, halting transmission, and reducing stigma. Despite reduced funding and challenges due to the COVID-19 pandemic, over 500 healthcare providers were trained, and active case-finding initiatives were conducted in endemic districts.

During 23-24 FY, Rwanda notified 38 leprosy cases, with 95% being Rwandan nationals including one child with no disability. New cases constituted 78%, 45% had multibacillary (MB) leprosy, while 55% had paucibacillary (PB) leprosy. Disability screening among new showed 59% had no disability, 28% had grade 1, and 14% had grade 2. Compared to previous years, there was a decrease in MB leprosy and grade 2 disability, reflecting improved early detection. Regarding the treatment outcome, Paucibacillary cases showed an 80% treatment completion rate, while Multibacillary cases had a 96% completion rate with improved outcomes for most, though those with grade 2 disabilities saw less improvement. Regular follow-up is essential for preventing disability progression, particularly in MB leprosy

Financing and Budget

Rwanda's TB and other respiratory communicable diseases National Strategic Plan (NSP) is funded through government revenues and international donors. For FY 2023-2024, the total budget was USD 7.52 million, with 97% spent. The Global Fund contributed USD 4.9 million, and the Government of Rwanda (GoR) allocated USD 2.3 million. The Rwanda Biomedical Center (RBC) and Ministry of Health utilized tools like the Health Resource Tracking Tool (HRTT) and SMART IFMIS to manage finances. The GoR's and Global Fund's expenditure rates were high, reflecting Rwanda's commitment to effective TB control.

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Chapter 1: TB SCREENING AND DIAGNOSTIC

1.1TB Screening in the general population

In Rwanda, two screening methods (active and passive) are used to identify TB presumptive cases. Passive screening is performed among people attending health facilities for those not classified as high-risk groups (HRG) for TB. The active screening method is performed among people classified as HRG of developing TB. CHWs contribute to the screening by identifying people with symptoms related to TB and referring them to HCs for screening. In addition, chest x-rays is used systematically as a screening tool in correctional facilities and people at transit centres (youth rehabilitation transit centres and refugees entering the country).

In 2023-2024 fiscal year, the total number of presumptive TB cases was 152,734 with a positivity rate of 4% (6,136). Among all presumptive TB cases, 29.8% (45,577), 18.5% (28,309) and 51.6% (78,848) were identified respectively by Center for Diagnostic and Treatment (CDT), Center for Treatment (CT) and Community Health Workers (CHW).

*Table 1:**TB screening by Level.***

DETECTION	CDT	CT	CHW	TOTAL
Presumptive TB cases	45,577	28,309	78,848	152,734
	29.8%	**18.5%**	**51.6%**	
B+ among Presumptive TB cases	2,656	1,112	2,368	6,136
	43.3%	**18.1%**	**38.6%**	
Positivity rate	**5.8%**	**3.9%**	**3.0%**	**4.0%**

Of all presumptive TB, 8.1% (12,343) knew their HIV-positive status and 97.7% (137,130/140,391) of unknown HIV status had been tested during the TB diagnostic. The HIV positivity rate among TB presumptive cases was 8.6% (13,150/152,734). the table below provides more detail:

*Table 2: **HIV testing among presumptive TB***

Total number of presumptive TB	Known as HIV+	Unknown HIV status			Total tested	Total number of HIV+ presumptive TB
		Number to be tested	Number and % of Tested	Proportion of HIV+		
152,734	12,343	140,391	137,130	807	149,473	13,150
	8.1%		97.7%	0.6%	97.9%	8.6%

1.2 TB screening and diagnostic in correctional services and high risk area zone for TB

During the 2023-2024 FY, enhanced case finding was conducted in areas with high TB transmission by using data to identify cells or villages with a high number of TB cases, including slum areas. Hotspots and slums were identified in 12 health center catchment areas, including Nyarugenge District (Cor-Unum, Biryogo, Kabusunzu, Rwampara, and Muhima Health Centers), Gasabo District (Kacyiru, Kagugu, Gatsata, and Remera Health Centers), Kicukiro District (Gikondo Health Center), Musanze District (Muhoza Health Center), Rubavu District (Gisenyi Health Centers), Huye District (Rango and Sovu Health Centers), and Muhanga District (Kabgayi Health Center). Additionally, active case finding using mobile digital chest X-ray (CXR) was conducted in four correctional facilities (Nyanza, Musanze, Muhanga, and Rubavu Correctional Facilities).

1.2.1. Active case finding among hotspots and slums

Active TB screening using TB symptoms for screening was conducted in hotspots and slums of 15 health facilities. A total of 19,927 people were triaged at the community level by community health workers, coming from identified households with a history of contact with an index TB case, as well as elderly and severely ill individuals, among others. Of those screened, 8,628 had at least one TB symptom and were referred to a nurse for further screening according to the TB screening and diagnostic algorithm:

- 5,161 (59.8%) persons were confirmed presumptive TB by a nurse.
- 361 (7.0%) TB cases including 1 MDR TB from Biryogo HC were notified and started TB treatment.
- The positivity rate average (7.0%) from hotspots and slums is higher than the national (4%) average.

*Table 3**: Cascade of TB screening and diagnosis in hotspots and slums***

District	Health facility	# triaged at household	# with TB symptoms	#presuptive TB	# TB case	Positivity rate
Gasabo District	Remera HC	858	370	370	33	8.9%
	Gatsata HC	1292	899	594	15	2.5%
	Kagugu HC	538	354	188	36	19.1%
	Kacyiru HC	2881	1917	1168	21	1.8%
Nyarugenge District	Biryogo HC	1025	845	565	20	3.5%
	Cor unum HC	839	477	269	35	13.0%
	Kabusunzu HC	756	737	451	21	4.7%
	Rwampara HC	535	209	120	16	13.3%
	Muhima HC	255	156	156	8	5.1%
Kicukiro District	Gikondo HC	1857	886	299	64	21.4%
Musanze District	Muhoza HC	6273	772	208	35	16.8%
Rubavu District	Gisenyi HC	338	252	221	15	6.8%
Huye District	Rango HC	504	245	193	22	11.4%
	Sovu HC	799	193	126	5	4.0%
Muhanga District	Kabgayi HC	1177	316	233	15	6.4%
TOTAL		**19,927**	**8,628**	**5,161**	**361**	**7.0%**

1.2.2. Active case finding among inmates

Around 26,959 inmates of Nyanza, Muhanga, Musanze and Rubavu correctional facilities have been screened for TB using TB symptoms and CXR as screening tools:

- among them 18.2% (4,920/26,959) were presumptive TB by chest X-ray suggestive of TB associated with TB symptoms or not, versus 0.5% (145/26,959) presumptive TB by symptoms only.
- 241 TB cases bacteriologically confirmed including 8 MDR-TB were notified with a positivity of 4.8% and all have been treated with anti-TB drugs.
- A total of 272 patients with abnormal CXR and MTB not detected on GeneXpert were clinically diagnosed after medical consultation by a physician (MD Internist) and put on the first line TB treatment. Involvement of the internist medical doctors in this ACF contributed to detection of a good number of clinically diagnosed TB cases, thus to the increased total notified TB cases.

Table 4: Cascade of TB active screening and diagnostic in correctional facilities (CF) during 2023-2024 FY

TB Screening	Correctional facility				Total
	Nyanza	Muhanga	Musanze	Rubavu	
TB Screening					
Population	6667	7193	5430	7669	26959
Total screened positive	1464	1478	638	1485	5065
Symptom only	4	7	3	131	145
CXR only	1411	1427	602	1150	4590
Symptom+ CXR	49	44	33	204	330
TB cases					
Bact confirmed/Symptom only	1	3	0	3	7
Bact confirmed/CXR only	21	46	16	97	180
Bact confirmed/Symptom+ CXR	3	10	9	32	54
Tot cases/Bact confirmed	25	59	25	132	241
Tot cases/Clin diagnosed	74	4	2	192	272
Total cases	**99**	**63**	**27**	**324**	**513**
Total MDR TB	**1**	**0**	**2**	**5**	**8**
Positivity rate rate	**1.7%**	**4.0%**	**3.9%**	**8.9%**	**4.8%**
Notification rate/100000 habitants	**1485**	**876**	**497**	**4225**	**1903**

1.3 Increase access to rapid and accurate detection of TB

To access to rapid TB detection, TB diagnosis using rapid and molecular tests was strengthened, and new GeneXpert machines were introduced into the TB diagnostic network, increasing the number of GeneXpert machine sites from 70 to 91. The newly equipped sites are Nyabikenke District Hospital, Gatonde District Hospital, Nyarugenge District Hospital, Kora Health Center, Nyamirama Health Center, Karenge Health Center, Kinigi Health Center, Bugarama Health Center, Nyundo Health Center, Byahi Health Center, and Rukara HC.

In addition to this achievement, 10 color GeneXpert machines were also introduced and installed in 10 hospitals (Kibagabaga Hospital, Nyarugenge Hospital, Rwanda Military Hospital, Masaka Hospital, Muhima Hospital, Rwamagana Hospital, Kibungo Hospital, Kabgayi Hospital, Ruhengeri Hospital, and Gisenyi Hospital) to support isoniazid resistance surveillance and to be used in routine TB diagnosis as well. Already existing 6-color GeneXpert machines will be redistributed in 10 new GeneXpert testing sites as follow:

Table 5: ***Proposed new Xpert testing sites for network extension and increase accessibility to the molecular diagnostic testing***

Sub-District District	Current Xpert site	Nº	Proposed new Xpert testing sites for network extension and increase accessibility to the molecular diagnostic testing.
KIBOGORA L2TH NYAMASHEKE	KIBOGORA L2TH	**1**	**KARENGERA HC:** Mahembe HC, Kibingo HC, Karengera HC, Hanika HC, Ngange HC and Gatare HC. The remaining HC will be served by the exiting Xpert machine at Kibogora L2TH.
MURUNDA DH RUTSIRO	MURUNDA DH	**2**	**KIVUMU HC:** Nyabirasi HC, Cyimbiri HC, Kinihira HC, Biruyi HC and Bitenga HC. The remaining HC will be served by the existing machine at Murunda DH.
		3	**IWAWA REHABILITATION CENTRE HC:** Isolated on island located in Kivu Lake and hosting TB high risk people.
MUHOROR DH NGORORERO	MUHOROR O DH	**4**	**NYANGE A HC:** It will serve Rususa HC and Kageyo HC and other health facilities will continue to send their sample at Muhoro DH.
KIBUYE RH KARONGI	KIBUYE RH	**5**	**RUBENGERA HC:** It will serve Bubazi HC, Rufungo HC, and Bigugu HC. The remaining will be sending samples at KIBUYE RH.
KIBAGABAGA DH GASABO	KIBAGABA GA DH	**6**	**NDERA NPH:** it is a national reference hospital, and it could also serve surrounding health facilities including Rubungo H.C, Gikomero H.C and Kayanga H.C.
MASAKA DH KICUKIRO	KICUKIRO HC	**7**	**GIKONDO HC:** Health centre with around 900 TB presumptive and 71 bacteriologically confirmed TB cases in 2022-2023 FY. It could also serve the Gikondo Youth Transit Centre, Bethsaida HC and Gatenga HC.
BUTARO L2TH BURERA	BUTARO DH	**8**	**KINONI HC:** 6 other health (Cyanika HC, Rugarama HC, Gahunga HC, Ntaruka HC, Gitare HC and Ruhombo HC) could be covered. Other remaining 13 health facilities will be served by the existing Xpert machine at Butaro DH.

KIREHE DH KIREHE	KIREHE DH	**9**	**MAHAMA REFUGEE CAMP MEDICALIZED CENTRE**: Located far from Kirehe DH and hosting a big number of people. It could also serve other HC in the camp and surrounding health facilities (Bukora HC, and Mahama H.C).
		10	**NYARUBUYE HC:** It could also serve Ntaruka HC, Mushikiri HC, Nyabitare HC, Kabuye HC and Mulindi HC. Those health facilities are located somehow far from Kirehe DH Xpert testing site.

The National Reference Laboratory adopted the integration of early infant HIV diagnostic and hepatitis C viral load testing using the GeneXpert platform to improve the rational use of the GeneXpert machines. As per the WHO recommendation to use molecular tests as the initial diagnostic tool, Rwanda has partially adopted this approach due to the high cost of these molecular diagnostic tests. Currently, only individuals from high-risk groups (HRGs) and all presumptive cases from Kigali City are eligible for GeneXpert as the initial test. In total, 107,825 GeneXpert tests were performed as initial diagnostics and drug susceptibility testing (DST) for smear-positive cases, representing an average utilization rate of 52% (107,825/205,920) for TB testing. If data from early infant HIV diagnostics and hepatitis C viral load testing are included, this utilization rate was increased.

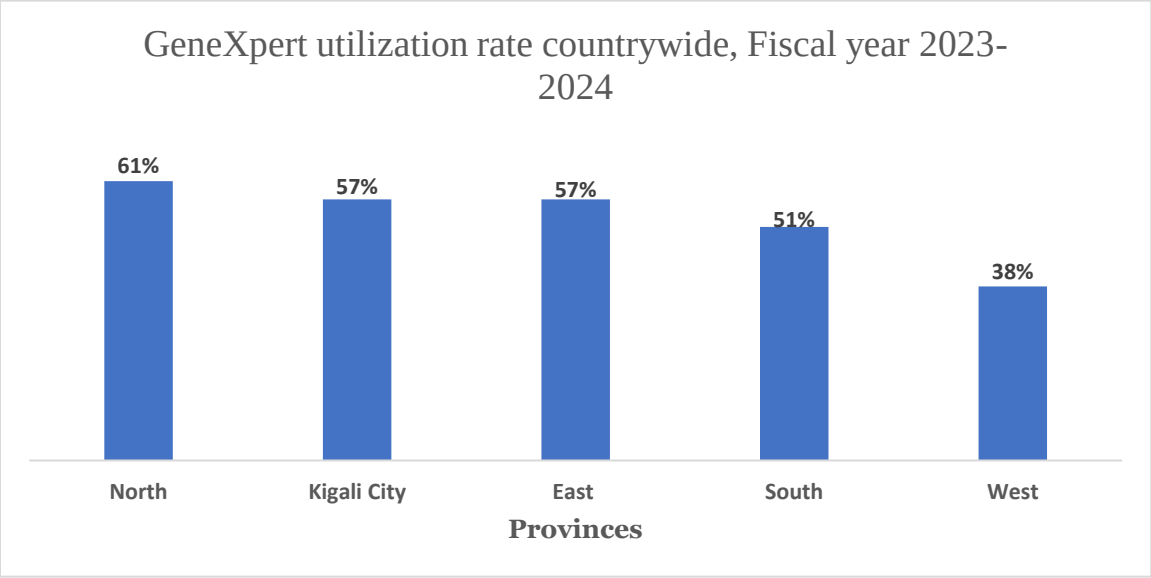

*Figure 1**: Genexpert utilization rate per provinces***

The use of WHO-recommended molecular diagnostics (WRD) as initial testing was 86% (5,314/6,204) among all bacteriologically confirmed TB cases and 25% (592/2,347) among

clinically diagnosed cases. The overall use of WRD as initial diagnostic testing among all TB cases was 69.1% (5906/8551).

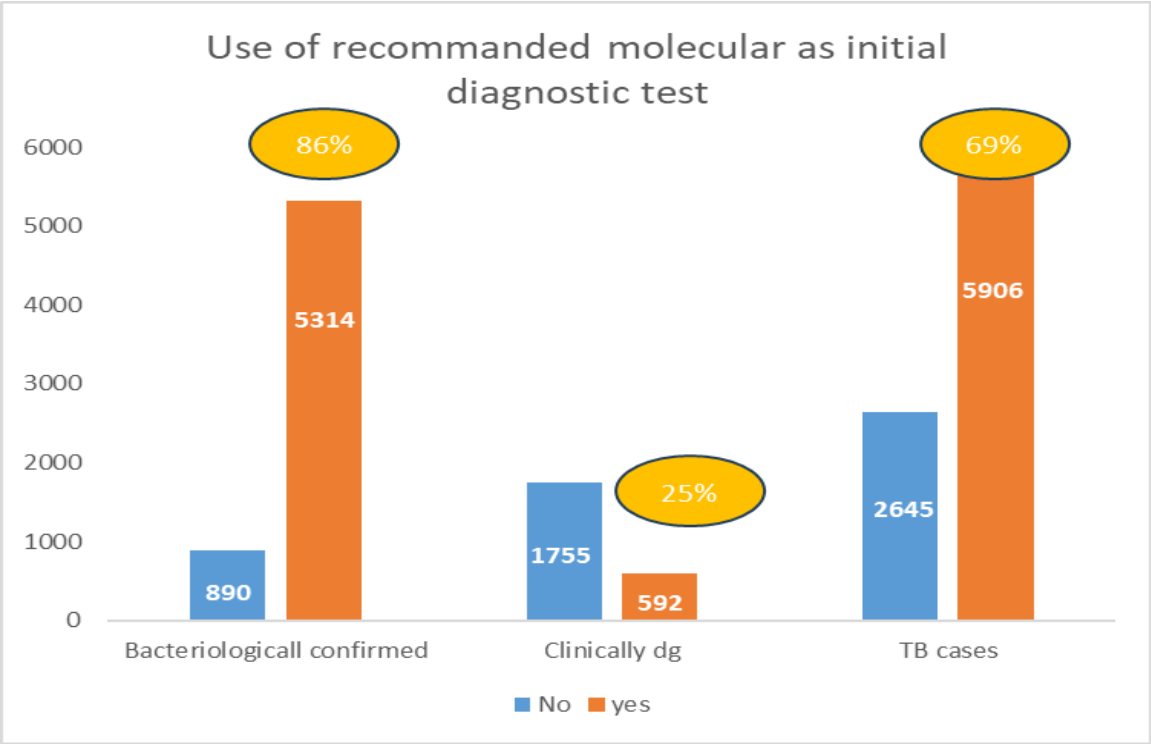

Figure 2: Use of WHO recommended molecular as initial diagnostic test

To improve connectivity, Rwanda is using DataToCare software, a fully customized desktop and web application contextualized to meet the needs of the TB & ORD division. During the 2023-2024 fiscal year, DataToCare software was upgraded from version 3.6.0a to 3.7.3a2, and the DataToCare desktop version was updated from 4.7.2a to 4.7.3a2. Additionally, 12 new GeneXpert sites were installed. However, the use of DataToCare is not optimal, with only 41.4% (2,211/5,337) of MTB detected results being reported. This low performance is mainly due to the incompatibility of the DataToCare desktop version with GeneXpert Dx 6.5, the use of Windows 7 on some desktop machines, while DataToCare requires Windows 10, and some reluctance from users to transition to the updated system.

1.4 Reach the universal access to DST

In Rwanda, three techniques are used to assess access to universal drug susceptibility testing (DST): LPA (Line Probe Assay), phenotypic testing, and GeneXpert molecular testing. LPA and phenotypic testing for first-line drugs are conducted at the National Reference Laboratories and at two university teaching hospitals, CHUB and CHUK. As mentioned earlier, we have already started using Xpert XDR cartridges for second-line drug testing at Kabutare District Hospital, and

recently ten additional hospitals have received 10-color machines to conduct isoniazid (INH) resistance testing. A thorough assessment was conducted at CHUB to improve DST performance. The assessment report was prepared and submitted for review and approval, after which both parties (RBC and CHUB) will begin implementing the recommendations.

1.4.1. Culture techniques

In the fiscal year 2023-2024, a total of 7,206 samples were processed for primary culture. We reported on samples received and processed from April 2023 to March 2024. Of the 7,206 samples, 11.1% (803) tested positive, 82.9% (5,974) tested negative, and 5.9% (429) were contaminated.

Table 6: Primary TB culture results

Samples received during the quarter previous to the quarter of evaluation		**Number**	**Culture results**			
		Registered	**Positive**	**Negative**	**Contaminated**	**Pending**
History of previous TB treatment	Specimens processed	7206	803	5974	429	0
	Samples for DR-TB follow up	768	132	594	42	0
	New cases	5153	502	4325	326	0
	Previously treated cases	84	15	61	8	0
	Unknown history	1201	154	994	53	0

1.4.2. Drug susceptibility for first line drug at NRL and teaching hospital

Among the 803 positive cultures, only 463 were eligible for DST after removing potential duplicate and follow-up samples due to the ongoing studies. However, DST was performed on 75.4% (349/463) due to stock out of LPA kits and Phenotypic DST (pDST) related supplies, the remaining DST were performed late, and results are still pending.

*Table 7**: First line DST results, fiscal year 2023-2024***

History of previous TB treatment	Number registered	Drug Susceptibility Testing (DST)			
		LPA 1st line	DST 1st line	LPA& Phenotypic DST 1st line	Pending
New cases	402	67	127	106	102
Previously treated cases	15	9	1	5	0
Unknown history	46	13	25	8	0
1st Line DST Results	**Susceptible to both R and H**	**Resistance to H but not R**	**Resistance to R but not H**	**Resistance to both H and R (MDR-TB)**	**Not detected/ Contaminated**
New cases	243	10	3	35	1
Previously treated cases	12	1	0	0	0
Unkown history	44	0	0	0	0
Pending	0	0	0	0	0
Total	299	11	3	35	1

1.4.3. Drug susceptibility for second line drug at NRL

For second line drug susceptibility, only phenotypic DST technique was used, 83.3% (57/68) were done and 16.7% (11/68) samples results are still pending. Among new cases, 3 were resistant to second line injectable, 1 sample to clofazimine et 2 samples for linezolid. We are investigating those cases with resistance to second-line TB drugs.

Table 8**: Second line DST results, fiscal year 2023-2024**

History of previous TB treatment	Number registered	Drug Susceptibility Testing (DST)		
		LPA 2nd line	DST 2nd line	Pending
New cases	58	0	56	2
Previously treated cases	6	0	6	0
Unknown history	4	0	0	4
Total	68	0	62	6

2nd Line DST Results	DR samples to 2nd line drugs	NDR samples resistance to FQ (PreXDR-TB)	DR samples resistance to 2LI (PreXDR-TB)	DR samples resistance to Bdq (PreXDR-TB)	DR samples resistance to Cfz (PreXDR-TB)	DR samples resistance to Dlm (PreXDR-TB)	DR samples resistance to Lzd (PreXDR-TB)	Not detected Contaminated
New cases	47	0	3	0	1	0	2	0
Previously treated cases	6	0	0	0	0	0	0	0
Unkown history	4	0	0	0	0	0	0	0
Pending	0	0	0	0	0			
Total	**57**	**0**	**3**	**0**	**1**	**0**	**2**	

1.4.4. Access to universal drug susceptibility testing

WHO recommends universal drug susceptibility testing (DST) for all TB patients. To achieve this target, in addition to TB cases diagnosed with GeneXpert as the initial diagnostic test, Xpert testing should be performed on all smear-positive TB cases for rifampicin susceptibility testing. According to the new WHO TB surveillance guidelines, universal DST should be considered only for bacteriologically confirmed TB cases. The figure below shows significant improvement toward achieving universal DST, with a rate of 95.7% among bacteriologically confirmed TB cases. The observed poor performance during the COVID-19 pandemic was due to more than half of our

Xpert modules being non-functional because of a lack of a maintenance contract, which was resolved in April 2022.

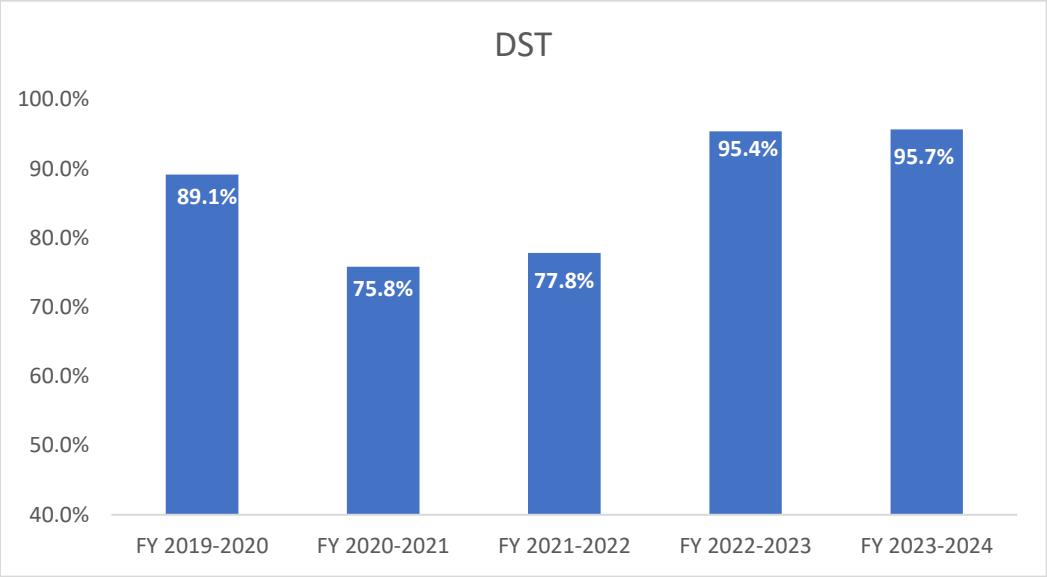

Figure 3: **Trend of Drug susceptibility testing among TB Bacteriologically confirmed for five FYs**

1.5. Strengthen the quality of laboratory services

1.5.1. Smear microscopy quality control

Quality control (QC) for smear microscopy is conducted quarterly at each CDT. The National Reference Laboratory (NRL) performs QC for hospitals, and hospitals conduct QC for CDT health centers within their respective catchment areas. Out of total of 205 CDTs, QC was performed three times at 78.5% (161/205) of the CDTs from July 2023 to June 2024, with 10,389 slides retested. Major errors were identified in six health facilities: Munini DH, Rutongo DH, Gakoma DH, Kabaya DH, Kirehe DH and Ruhengeri referral Hospital. The performance of quality control was 96% (155/161) among CDTs that performed smear QC at least three times per year, and 75.6% (155/205) among all CDTs nationwide. A strong performance was observed among CDTs assessed three times per year, and efforts will be needed to increase overall performance.

Table 9: Quality control of microscopy from July 2023-June 2024.

	CDT controlled atleast 3x	Nb of slides controlled				Nb of Errors					Nb of CDT with Major
		Total	Pos	1-9AFB	Neg	HFP	HFN	LFP	LFN	QE	
	161/205 (78.5%)	10,389	621	126	9,210	3	8	3	8	234	6
CDT with Major	HFP: Munini DH (1), Rutongo DH (1) and Kabaya DH (1) HFN: Gakoma DH (1), Kirehe DH (1) and Ruhengeri RH (1)										
HFP:high false positive,HFN: high false negative, LFP:low false positive, LFN: low false negative,QE: quantification error											

The shows a general decline in the proportion of CDTs without major errors over time, although there are some fluctuations. The overall trend is negative, with the percentage dropping from 84% in the 2017-2018 fiscal year to 79% in the 2023-2024 fiscal year. The most significant drop occurred between the 2020-2021 and 2021-2022 fiscal years during the COVID-19 pandemic, when the majority of laboratories were disrupted by COVID-19 activities. Although performance has started to improve, special attention is needed from the NRL to work closely with laboratory networks to ensure that all CDTs are visited at least three times per year. The reason for not achieving higher performance is that only around 78.5% of CDTs are visited three times per year.

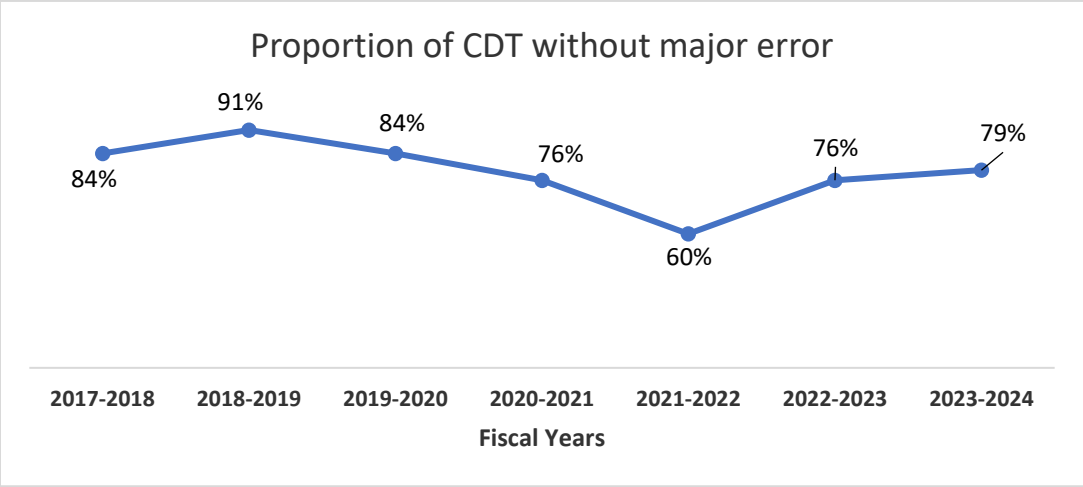

Figure 4: Trend of smear quality control from July 2017 to June 2024

1.5.2. GeneXpert External Quality Control

During the fiscal year 2023-2024, out of 68 GeneXpert machines, 66 (97%) sites received proficiency panels as part of external quality control and quality assurance (EQA) in the first semester from CDC-Atlanta. Among the 66 labs enrolled in GeneXpert PT, 94% (62/66) achieved

passing marks of 80% and above, while 6% (4/66) failed (Cor-unum HC, Kacyiru HC, Rugarama HC, and Rutare HC).

Table 10: Panel testing performed for GeneXpert machines

Period	Xpert Sites (%)	controlled sites (%)	GeneXpert sites With 100%	GeneXpert sites With 85%	GeneXpert sites With 80%	List of GeneXpert sites with 0% (%)
2023-2024	68/68 (100%)	66/68 (97%)	57/66 (86.3%)	2/66 (3%)	3/66 (4.5%)	4/66 (6%)

Key indicators

Indicator	2023-2024		
	Target	Achievements	Level of achievement
Proportion of newly notified patients diagnosed using WHO recommended rapid tests (End TB Top-Ten indicator No 4	75%	69.2% (4683/7643)	92.3%
Proportion of notified patients with rifampicin resistance (RR) of MDR who receive second line DST	100%	100% (90/90)	100%

Chapter 2: TUBERCULOSIS NOTIFICATION

TB notification is a key public health tool that supports the control and eventual elimination of tuberculosis by ensuring that cases are identified, reported, treated, and monitored effectively. During this reporting period 2023-2024, Rwanda notified a total of 8551 TB cases including 92 RR-TB cases. The contribution of CHWs in TB cases detection was 31.3% (2,677/8,551), which is above the national target (>=25%).

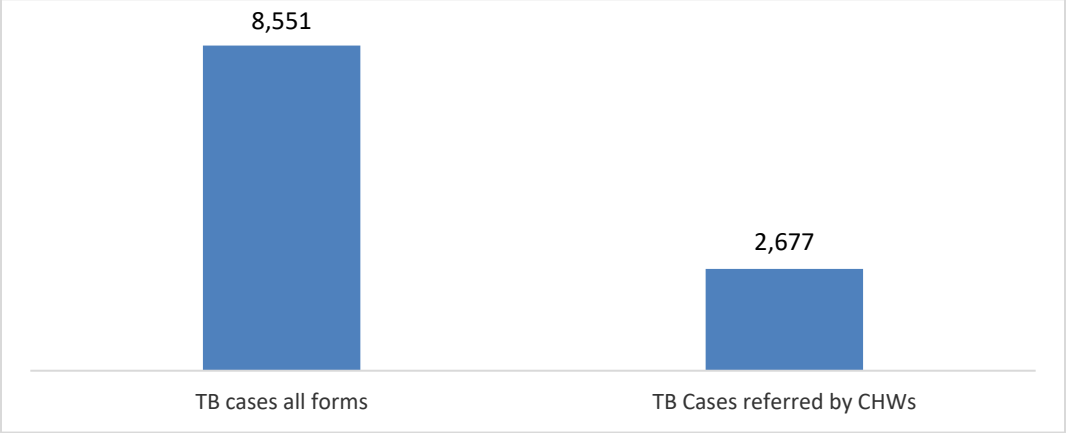

*Figure 5**: Contribution of CHWs on the national TB notification during 2023-2024 FY***

The trend in TB notifications has remained relatively stable, increasing from 5,530 in the 2015-2016 fiscal year to 5,943 in the 2021-2022 fiscal year. It then abruptly rose to 9,422 in the 2022-2023 fiscal year before decreasing to 8,551 cases in the 2023-2024 fiscal year. The overall decrease (-9%) in TB notifications for the reporting period could be attributed to a 70% drop in notifications in Rwamagana District (from 2,559 to 772 cases), a district that accounted for 27% of national TB notifications in the 2022-2023 fiscal year.

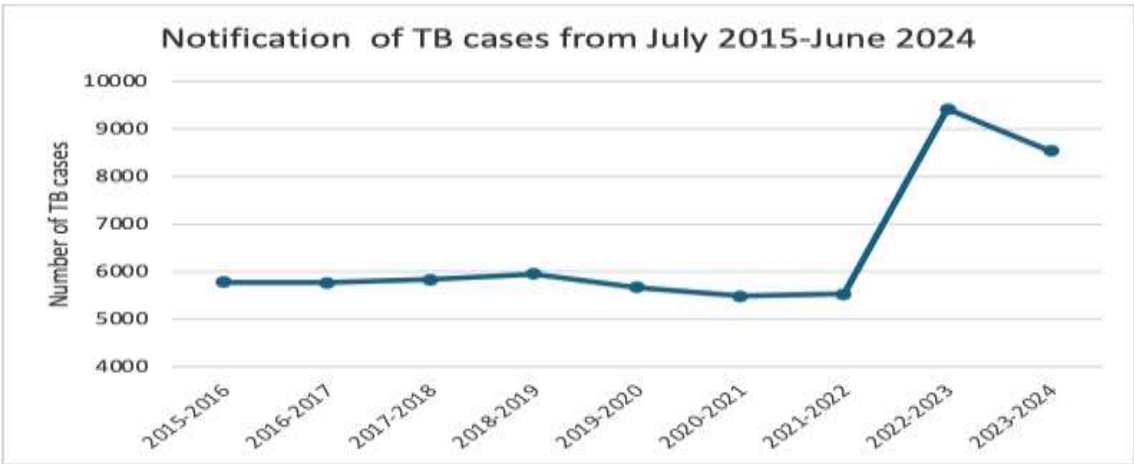

*Figure 6**: TB notification trend in the last nine years in Rwanda.***

2.1. TB notification by sex and age groups

The majority of all notified TB cases were male (73.5%) with male to female sex ratio of 2.8, versus 3.6 in 2022-2023. The disease affected mostly the active population (25-34 and 35-44 age-groups) representing 46.2% of all TB cases.

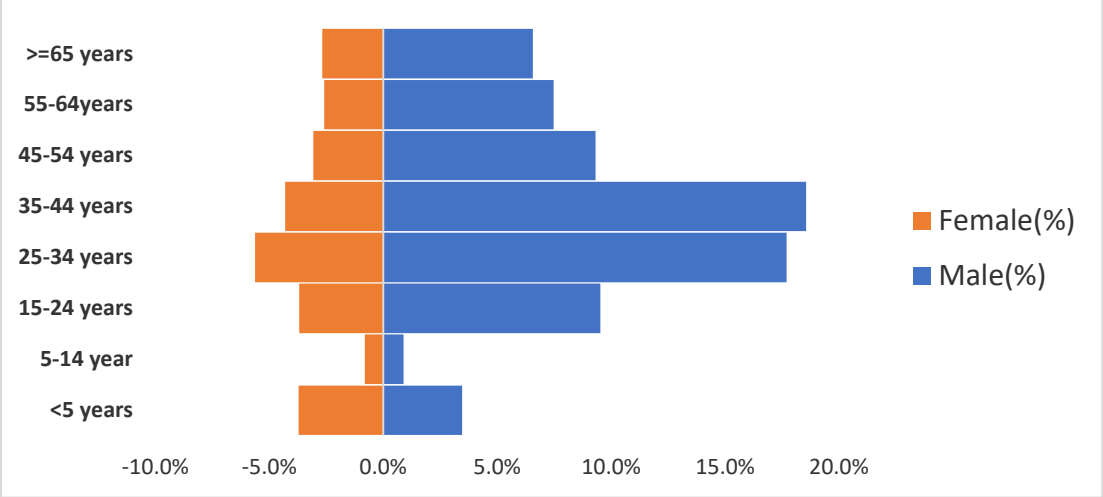

*Figure 7**: Age-pyramid of notified TB cases during 2023-2024 fiscal year***

2.2. Geographical distribution of TB notification

The City of Kigali (27.3%) recorded the highest proportion of TB cases (2332/8551) followed by Eastern Province (2049/8551) and Southern Province (1817/8551); accounting for 72.6% of all notified TB cases during the 2023-2024 fiscal year.

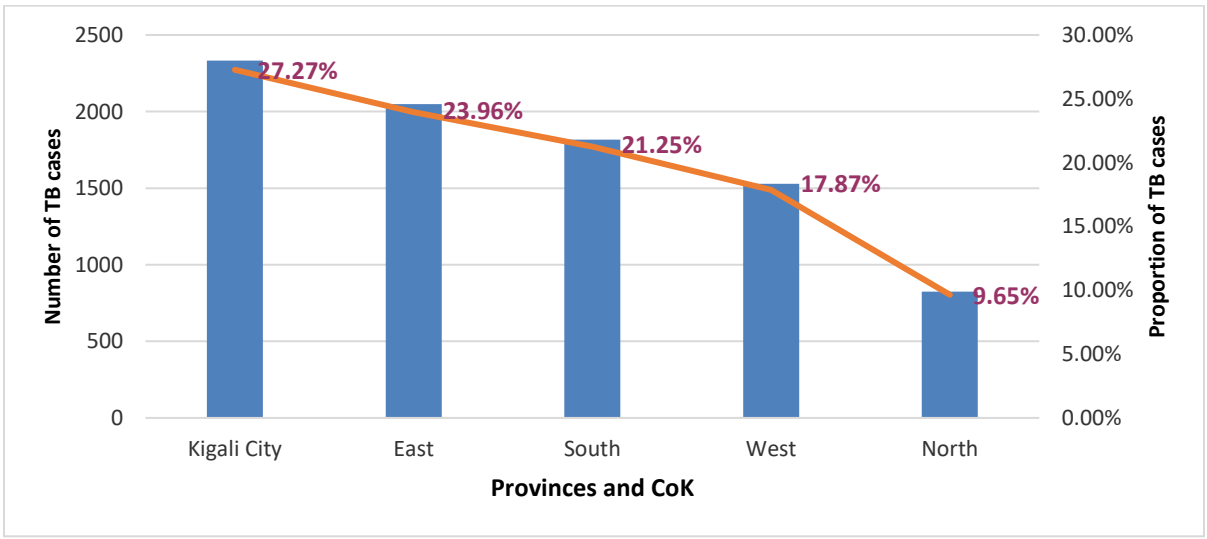

Figure 8: Notification (number and proportion) of TB cases by province

The national TB notification rate was 62.8 per 100,000 populations, ranging from 19 cases per 100,000 in Nyamasheke District to 234 cases per 100,000 in Nyarugenge District. Eight districts (Nyarugenge, Rwamagana, Kicukiro, Rubavu, Muhanga, Huye, Gasabo, and Nyanza), known for their high TB burden, recorded notification rates higher than the national average.

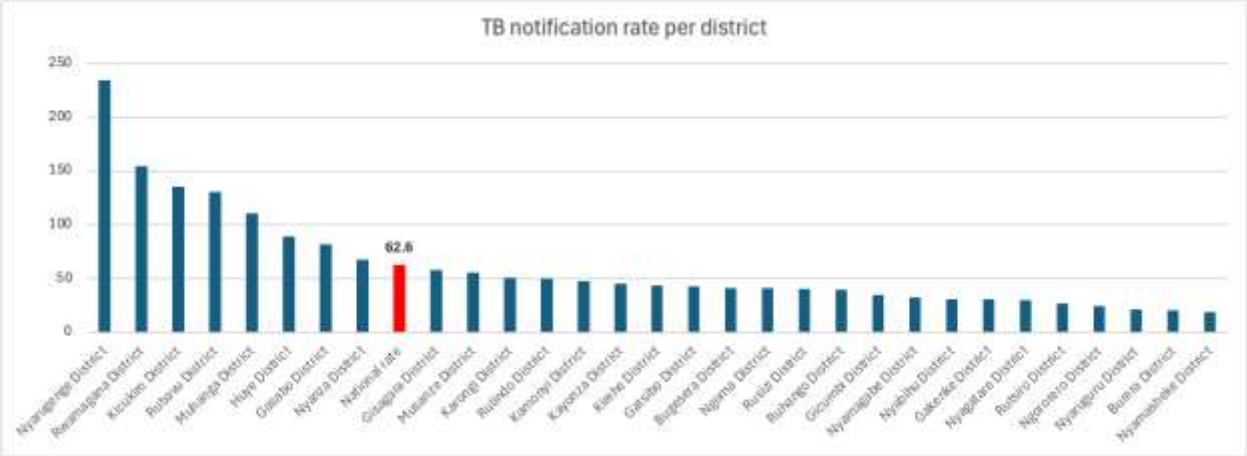

*Figure 9**: Notification rate by districts during the 2023-2024 fiscal year***

2.3. Notification of TB cases according to WHO classification

Using the WHO classification, 73% (6,202/8,551) of cases were bacteriologically confirmed, and 85% (7,293/8,551) were pulmonary TB. The proportion of extra pulmonary TB cases decreased from 20% in 2022-2023 to 15% (1,258/8,551) in 2023-2024, with the most common extra pulmonary localizations being pleural TB (43%), lymphadenitis (13%), skeletal TB and miliary TB with 9% each and peritoneal TB representing 8% of all extra pulmonary TB localization reported during 2023-2024 FY.

New and relapse cases accounted for 98% (8,380/8,551) of all notified TB cases. Drug susceptibility testing for at least rifampicin was performed on 76.3% (6,527/8,551) of all notified TB cases, among whom 92 rifampicin-resistant TB patients were enrolled in the MDR treatment center.

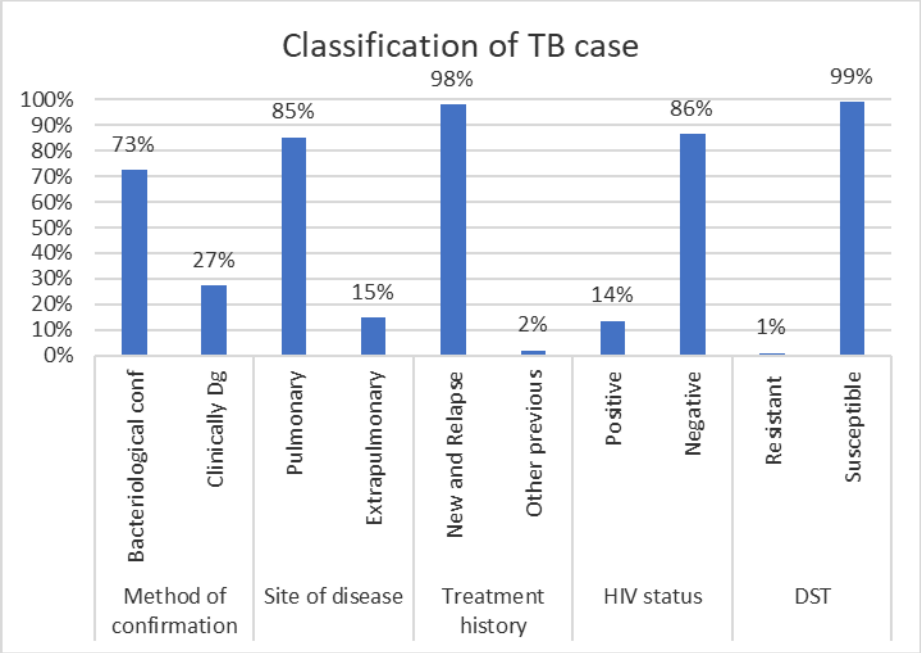

Figure 10: TB cases by WHO classifications

Regarding HIV status among notified TB cases, 14% (1,166/8,551) were co-infected with TB and HIV, and 26.5% (310/1,164) were newly tested HIV positive. The prevalence of HIV among TB cases decreased by 30% since 2019.

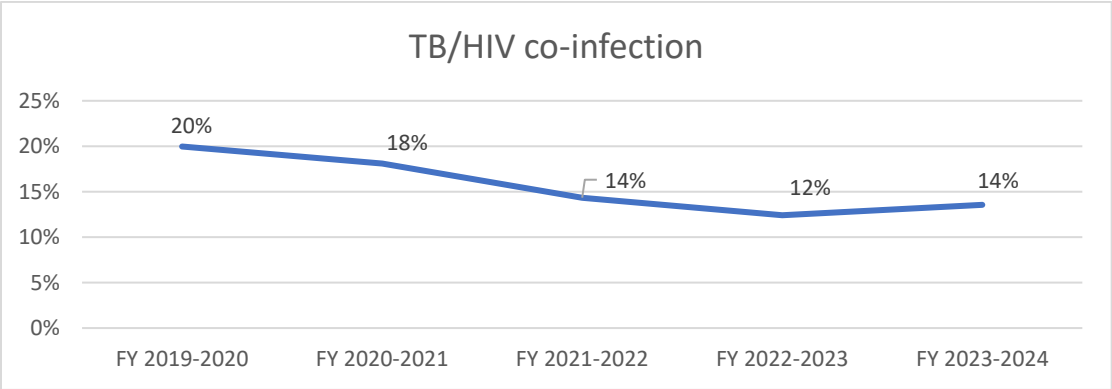

*Figure 11**: Trend of TB-HIV co-infection from July 2019-June 2024***

2.4. TB notified among high-risk groups

TB cases notified from different categories of high-risk groups (HRGs) represented 56.5% (4,835/8,551) of all forms, with the same proportion observed among new and relapse TB cases (4,738/8,379), as they constitute the vast majority of all notified cases during this evaluation period. Among all notified TB cases in HRGs, 27% (1,325) were from inmates& transit center, followed by 22% (1,075) from individuals aged 55 years and above, and 20% (987) from HIV-positive individuals. Note that TB cases are mutually exclusive within these groups, as shown in the table below. The TB program achieved the target set in the extended TB NSP 2019-2027.

*Table 11**: contribution of each group among HRG, Rwanda, July 2023-June2024.***

HRG categories	Number	%
Inmate/ transit center	1325	27%
55 year and above	1075	22%
HIV	987	20%
Under 15 years	632	13%
Contact	627	13%
Refugees	80	2%
Mining	74	2%
Diabetic	35	1%
Total	**4835**	**100%**

NB: HRGs data in the above table are mutually exclusive to avoid double counting.

Twenty-two district hospital zones performed well compared to the national average in terms of proportion of TB notified from high-risk groups. However, the country achieved the target (53% in the NSP) for this 2023-2024 FY.

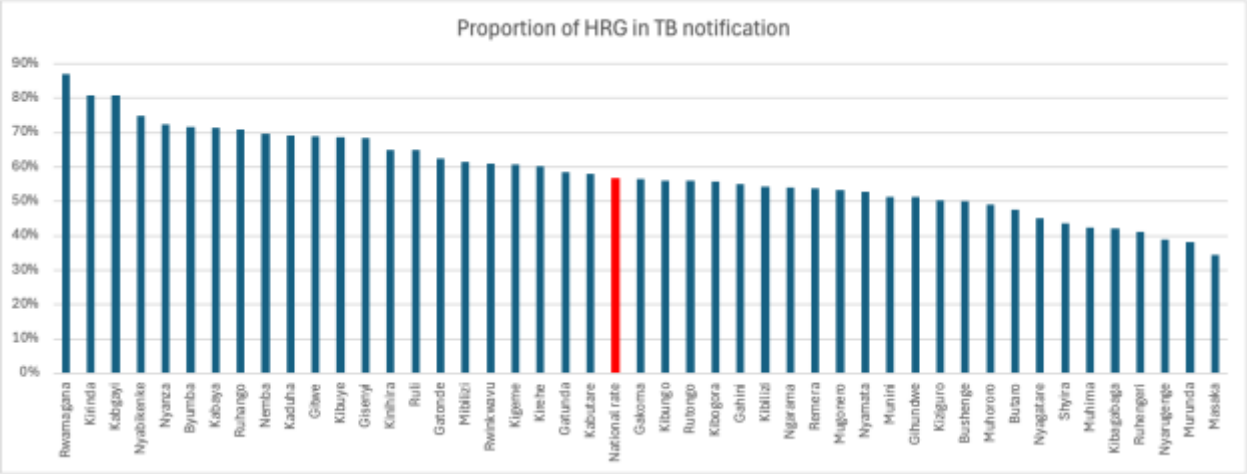

Figure 12: ***Proportion of TB cases among HRGs by sub-district***

2.5. TB notified among children

The proportion of children with TB was 9%(759/8,551) among all TB cases. In total 46.6% (14/30) of hospitals have achieved the national target in TB detection (9% national target) among children. This improvement in childhood TB notification could be associated with the mentorship sessions conducted in 30 out 46 sub-districts: 245 TB cases were notified during this 4week exercise representing 32% of all TB cases among children.

Even if the national target has been reached, we still need to reinforce different strategies to increase TB notification among children (including stool-based technique with GeneXpert, mentorship of health facilities by specialists, TB screening in IMCI, etc.).

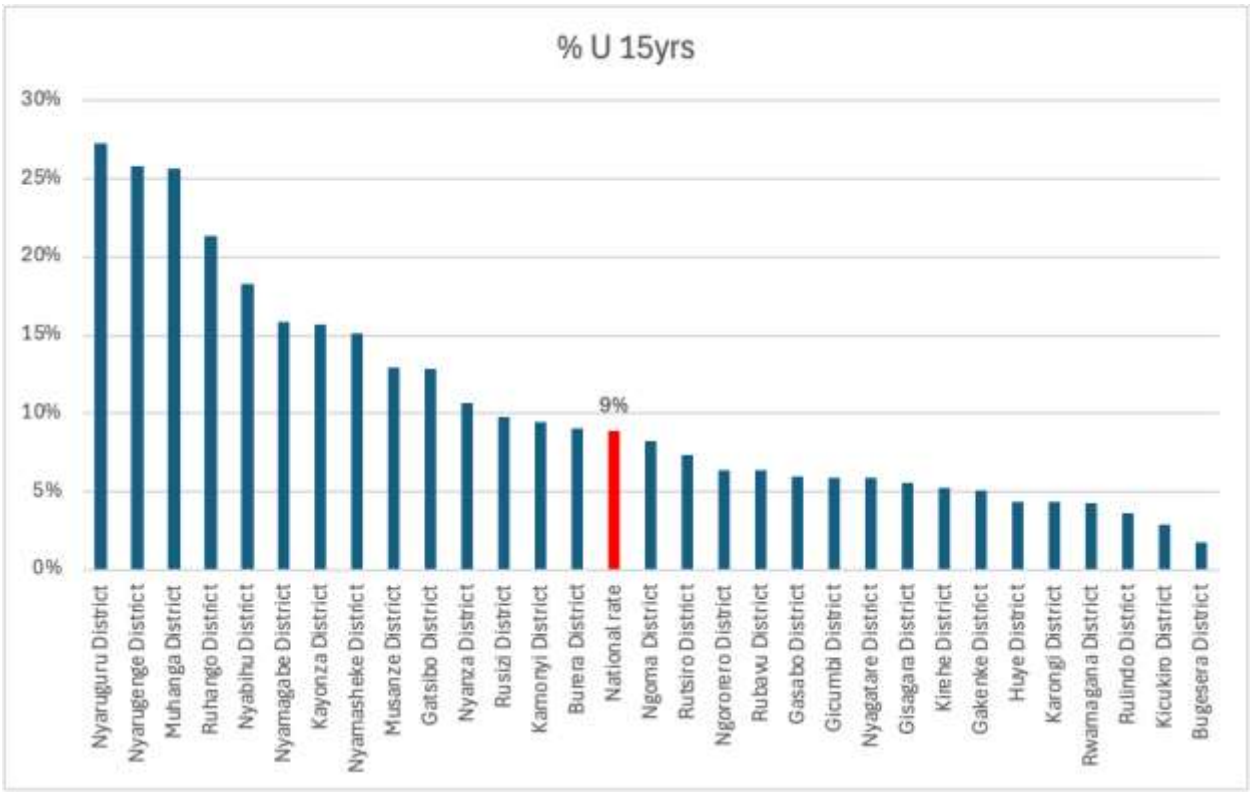

Figure 13: Childhood notification by district

2.6. Active case finding in specific groups

During the fiscal year 2023-2024, active case finding (ACF) was planned and conducted in four correctional facilities identified with high TB case notifications during the previous fiscal year (2022-2023): Nyanza, Musanze, and Rubavu CFs for the third round, and Muhanga CF for the fourth. Additionally, an outreach strategy was planned and executed to enhance case finding among the community, targeting the catchment areas of 15 health facilities with high TB notifications from the previous fiscal year, as detailed in section 1.2 (more details). A total of 874 TB cases were notified through these efforts, representing 10% of the total TB cases notified countrywide.

2.7. Drug resistant TB notification

This notification trend showed an abrupt increase in the 2022-2023 fiscal year, likely due to changes in the DR-TB treatment algorithm and active TB screening in Eastern Province (Rwamagana prison). However, there was a decrease in MDR-TB cases in the 2023-2024 fiscal year, with 92 DR-TB cases notified.

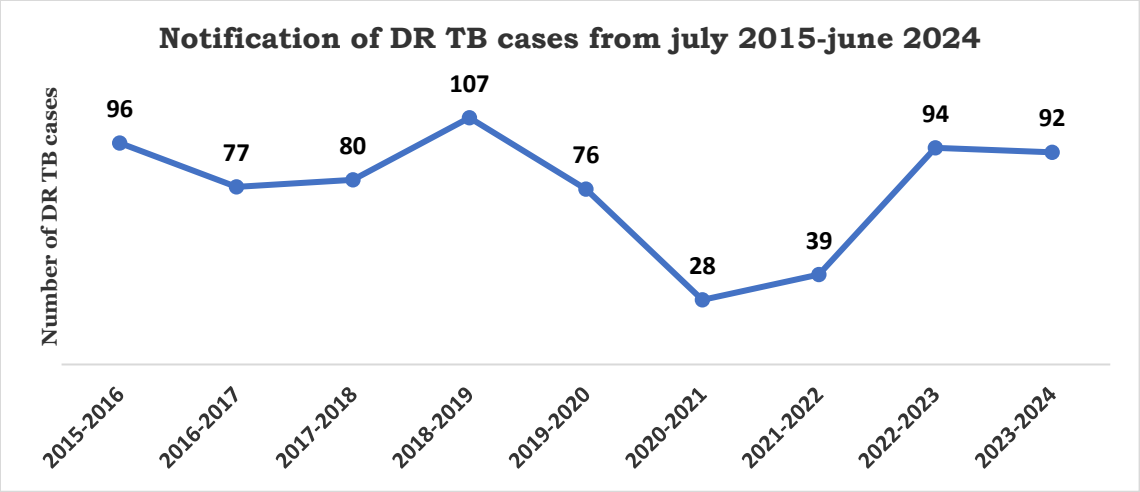

*Figure 14**: Trend of DR-TBB notification during the last 9 years***

2.7.1 DR-TB notification by province

In 2023-2024 FY, we have received a total of 92 DR-TB cases (including one clinical diagnosed pediatric case on second-line anti TB drugs without laboratory confirmation). The findings showed that Kigali City accounted for a high percentage of 31.5% (29/92) compared to the rest of other provinces, followed by eastern province with 29.4% (27/92).

*Table 12**: DR-TB notification by province***

Province	Kigali City	East	South	West	North
DR-TB cases	29	27	12	17	7
Proportion (%)	31.5%	29.4%	13%	18.5%	7.6%

2.7.2. DR-TB notification by gender and HIV status

Regarding HIV status among MDR-TB cases, 18.5% (17/92) were TB-HIV coinfected, higher rate compared to the situation (11.1%) of the 2022-2023 fiscal year. The male to female sex ratio was 2.4 which is 3 times lower than the sex ratio (7.2) from notified DR-TB cases during 2022-2023 FY.

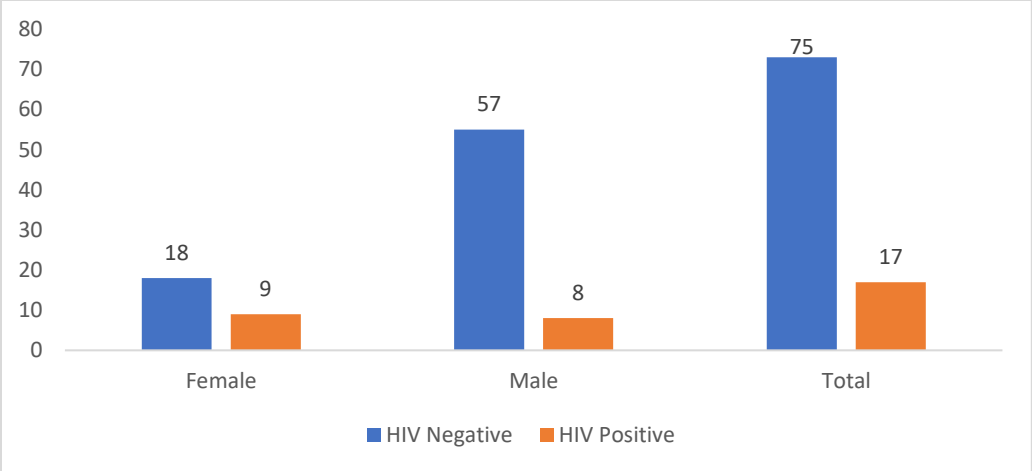

Figure 15: Drug resistance TB notification by gender and HIV status

Key Indicators

Indicator	2023-2024		Level of achievement
	Target	Achievements	
TB notification rate, New and Relapse	49/100,000	60/100,000 (8379/13,648,237)	150%
TB treatment coverage (new and relapse cases notified)	93%	98.4% (8,417/8,551)	109.60%
Proportion of TB cases notified among high-risk groups	53%	56.5% (4835/8552)	105.60%
Proportion of children 0-14 years notified among TB cases new and relapse	6.50%	8.9% (753/8379)	136.90%
Proportion of diagnosed TB cases tested for HIV infection (End TB Top Ten indicator No 9	>95%	99.9% (8547/8551)	105.20%
Proportion of TB cases (all forms) referred by community health volunteers during the evaluated period.	>25%	31.4% (2678/8551)	125.60%

Chap 3: Tuberculosis Prevention

Tuberculosis (TB) remains one of the most significant public health challenges worldwide, causing millions of illnesses and deaths annually. Despite being both preventable and curable, TB persists, particularly in low- and middle-income countries.

This chapter explores and highlights key findings from various strategies in place to combat TB:

- Application of TB infection basic measures at health facility level,
- TB surveillance among health care providers and community health workers,
- TB contacts tracing and Tuberculosis Preventive Treatment among contacts.

3.1. Tuberculosis infection prevention and control

TB infection control plan was designed to ensure prompt detection of infectious TB patients, implementation of airborne precautions, and provision of treatment for those confirmed with TB disease. This helps reduce the risk of Mycobacterium tuberculosis spreading from TB patients to others.

The Rwanda TB&ORD surveillance system monitors compliance with TB prevention measures at the health facility level. Health centers are evaluated by hospitals, and hospitals are appraised by the central level. The minimum TB infection control (IC) package includes six basic measures: (i) the existence of an IC plan, (ii) appointment of a TB focal person, (iii) training for health workers on TB, (iv) a cough triage system, (v) Information, Education, and Communication (IEC) on cough hygiene, and (vi) ensuring doors and windows are open in high-risk areas.
According to TB&ORD surveillance, 90.8% (524 out of 577) of health facilities implemented all six basic TB infection control measures in the last quarter of the 2023-2024 fiscal year (April-June 2024). However, several sub-districts showed lower performance, including Mibilizi (58%), Kibuye (64%),Nyabikenke (67%), Murunda (74%) and Kabaya (75%). These sub-districts require special attention to address the serious consequences of not effectively implementing basic TB infection control measures.
Additionally, health facilities in Rwanda conduct annual systematic TB screening for their respective healthcare providers and community health workers (CHWs) within their catchment areas. During the 2023-2024 fiscal year, 95% (22,849/24,011) of health facility staff were screened, with 2% (395/22,849) identified as presumptive TB and 13 confirmed TB cases. For CHWs, 93% (52,431/56,077) were screened, with 3% (1,394/52,431) identified as presumptive TB and 12 confirmed TB cases. TB screening rates for healthcare providers increased from 88% to 95% between the 2022-2023 and 2023-2024 fiscal years, while the rate for CHWs decreased compared to FY 2022-2023(94%).

Table 13: ***Screening of health care providers and CHWs per district, July 2023-June 24.***

District	Health Care Staff					Communuty Health Workers				
	Number	Screened	%	TB Presumptive	TB Cases	Number	Screened	%	TB Presumptive	TB Cases
Bugesera	544	412	76%	17	0	1897	1365	72%	99	0
Burera	843	824	98%	2	0	2297	2286	100%	0	0
Gakenke	1002	972	97%	14	0	2453	2357	96%	46	0
Gasabo	1163	1163	100%	11	0	1598	1229	77%	2	1
Gatsibo	890	885	99%	16	2	2316	2310	100%	13	1
Gicumbi	995	921	93%	29	0	2503	2411	96%	68	0
Gisagara	643	638	99%	4	1	2086	1836	88%	0	0
Huye	698	670	96%	52	0	2121	1862	88%	217	1
Kamonyi	557	552	99%	3	2	1237	1214	98%	6	1
Karongi	1098	1096	100%	38	0	2110	2105	100%	67	2
Kayonza	677	667	99%	5	0	1511	1500	99%	7	1
Kicukiro	768	764	99%	14	0	1029	977	95%	147	0
Kirehe	939	926	99%	0	0	2003	1723	86%	6	0
Muhanga	930	692	74%	7	0	1296	1260	97%	4	0
Musanze	871	837	96%	18	1	1873	1844	98%	27	0
Ngoma	752	751	100%	21	0	1968	1968	100%	23	1
Ngororero	658	635	97%	20	1	1545	1406	91%	15	1
Nyabihu	652	652	100%	20	0	1850	1850	100%	155	0
Nyagatare	778	653	84%	10	1	2245	2023	90%	6	1
Nyamagabe	793	768	97%	4	1	1985	1935	97%	12	0
Nyamasheke	909	849	93%	14	0	2141	2127	99%	137	0
Nyanza	625	618	99%	8	2	1713	1712	100%	14	0
Nyarugenge	969	882	91%	25	1	1222	1222	100%	28	0
Nyaruguru	370	322	87%	0	0	1290	1105	86%	0	0
Rubavu	791	767	97%	3	0	1713	1514	88%	2	0
Ruhango	796	782	98%	1	0	2120	2053	97%	3	0
Rulindo	894	894	100%	2	0	1927	1925	100%	12	0
Rusizi	1000	897	90%	30	1	2292	1883	82%	154	0
Rutsiro	585	547	94%	2	0	1778	1480	83%	5	0
Rwamagana	821	813	99%	5	0	1958	1949	100%	119	2
Total	24011	22849	95%	395	13	56077	52431	93%	1394	12

3.2. Tuberculosis preventive treatment among TB contacts

3.2.1. Cascade of TB contacts investigation

TB household contacts are individuals who have been in close contact with infectious TB patients. Given their high risk for TB infection, these contacts must be systematically investigated through TB screening and diagnosis. A systematic contact investigation was conducted that focused on all household members using a symptoms-based approach. TB screening for these contacts is based on symptoms such as cough, fever, night sweats, and weight loss/poor weight gain. Following this, clinical and lab investigations are carried out to rule out active TB.

During the FY 2023-2024, 24,324 contacts of bacteriologically confirmed TB cases were identified. Out of these, 24,135contacts were screened, representing 99.2% of the total. Among those screened, 1.6% (383 individuals) were diagnosed and confirmed with TB disease.

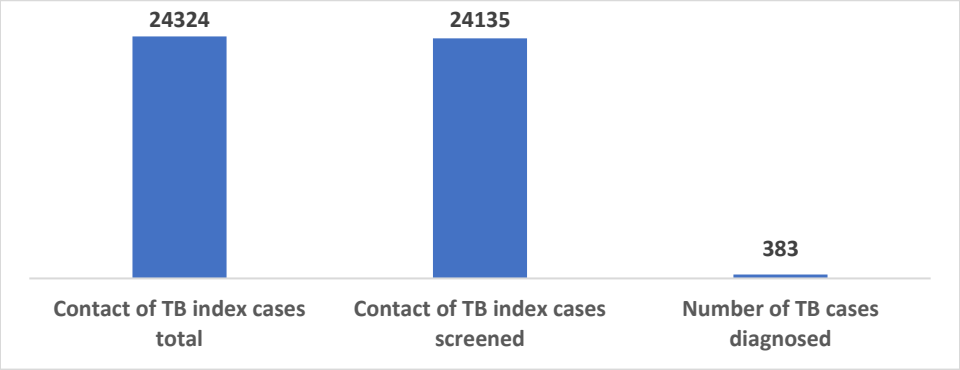

Figure 16: TB contact investigation cascade for FY 2023-2024

3.2.2. TB prevention therapy among TB contacts under 5 years

Children under five years of age who are TB contacts are at high-risk for developing active TB disease. Systematic screening is conducted to enable early diagnosis and/or TPT initiation of tuberculosis preventive therapy (TPT).

During the FY 2023-2024, there were 1,395 contacts under 5 years old. Out of these, 1,363(98%) were screened, and 56 (4.1%) were confirmed with TB disease. Of the total number of under-five TB contacts, 1,339 were eligible for TPT, and 97% (1,301/1,339) were initiated on TPT. This coverage rate is higher than 92.7% achieved in the previous fiscal year, 2022-2023. However, significant efforts are still needed in TB screening, as approximately 3% of under-five TB contacts were not screened.

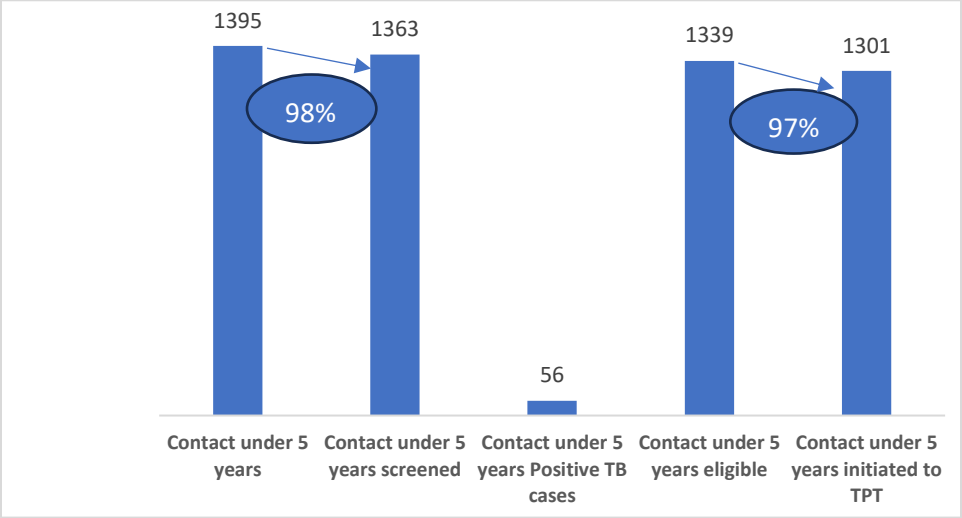

Figure 17: Under 5 years initiated on tuberculosis preventive therapy, July 2023- June 2024.

3.2.3. TB preventive therapy among TB contacts above 5 years

Two and a half years ago, the Rwanda National Tuberculosis Program began implementing tuberculosis preventive therapy (TPT) for contacts of TB patients. According to the TPT Guidelines, contacts over 5 years old must be screened, and those who test negative based on symptoms should undergo a Tuberculin Skin Test (TST) to diagnose latent tuberculosis infection (LTBI). Inmates who are contacts of bacteriologically confirmed TB cases are not eligible for TPT. During FY 2023-2024, 11,253 TB household contacts (excluding prisoners) were reported. Of these, 165 were confirmed as TB cases. Excluding these confirmed cases, 11,088 contacts were eligible for the Tuberculin Skin Test (TST). Of these, 9,545 (86%) underwent TST, with 1,608 testing positive (a 17% positivity rate). Among those with positive TST results, 1,578 were started on tuberculosis preventive therapy (TPT). With an expected 1,731 contacts eligible for TPT based on the positivity rate, the coverage achieved was 91% (1,578/1,731).

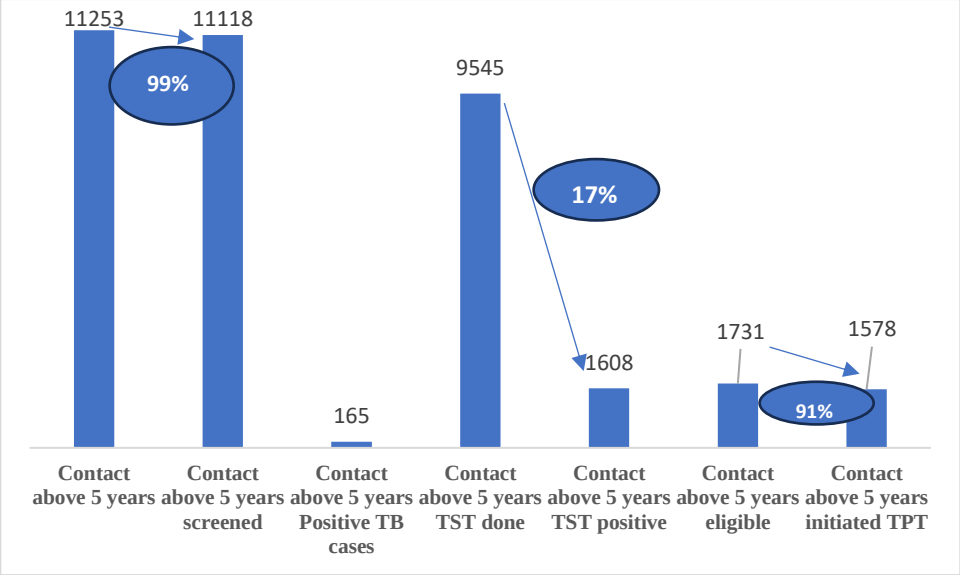

Figure 18: TST and TPT performance among TB contacts above 5 YO. 2023-2024

3.2.4. TB preventive therapy among PLHIV

Since 2019, Tuberculosis Preventive Therapy (TPT) has been integrated into HIV service delivery for people living with HIV (PLHIV). By the end of June 2024, a total of 222,604 PLHIV were receiving antiretroviral therapy (ART), according to data from the HIV Division. All districts have been equipped with the necessary skills and resources to implement TPT through a one-stop shop model. As of June 2024, 95.8% (213,307) of PLHIV on ART had been initiated on TPT. For further details, refer to the HIV annual report 2023-2024.

Indicator	2023-2024		Level of achievement
	Target	Achievements	

Contact investigation coverage (End TB Top Ten N°6)	>95%	99%	104%
Percentage of Health providers screened for TB at least once during the year. (health facility workers)	>= 80%	95%	118%
LTBI treatment coverage among contacts < 5 years (End TB Top ten indicator N°5)	>= 90%	97%	108%
LTBI treatment coverage among contacts > 5 years	50%	91%	182%

Chapter 4: TUBERCULOSIS TREATMENT OUTCOME

In this chapter, we present the tuberculosis treatment outcomes for the cohort of TB cases notified from July 2022 to June 2023 for susceptible TB and drug-resistant TB initiated on a shorter regimen, and from July 2021 to June 2022 for drug-resistant TB initiated on a longer regimen.

4.1Treatment outcome for susceptible TB

4.1.1 Overall treatment outcome for susceptible TB

The overall treatment success rate (TSR) for susceptible TB was 90.5% (8,464/9,351). Notably, the TSR for patients followed by Community Health Workers (CHWs) was 93% (3119/3,352). For patients who were clinically diagnosed (CD) and those with TB/HIV co-infection, the TSRs were 90.2% (2,471/2,740) and 79.3% (921/1,162), respectively. An upward trend in TSR was observed, increasing from 86.7% in the 2021-2022 cohort to 90% in the 2022-2023 cohort for all susceptible TB cases. This improvement was also evident among people with TB/HIV co-infection, whose success rate rose from 74.3% to 79% during the mentioned TB cohorts. For children under 15 years of age reported from July 2022 to June 2023, the TSR was exceptionally high at 96.5% (546/566), compared to 90% (7,916/8,791) for those aged 15 years and above.

Death is the primary unfavorable outcome in TB treatment, accounting for 5.6% (520/9,351) of all susceptible TB cases. The mortality rates were 7.4% (204/2,740) in clinically diagnosed TB cases and 13.2% (154/1,162) in TB/HIV co-infected patients. Among TB/HIV co-infected patients identified during the fiscal year 2022-2023, 92.8% (1,100/1,162) initiated antiretroviral therapy (ART) prior to the completion of TB treatment.

The TSR for pulmonary TB was 90.6% (6,888/7,599), with a death rate of 5.1% (388/7,599). Meanwhile, the TSR and death rate for extrapulmonary TB were 89.8% (1,576/1,752) and 7.5% (132/1,752), respectively.

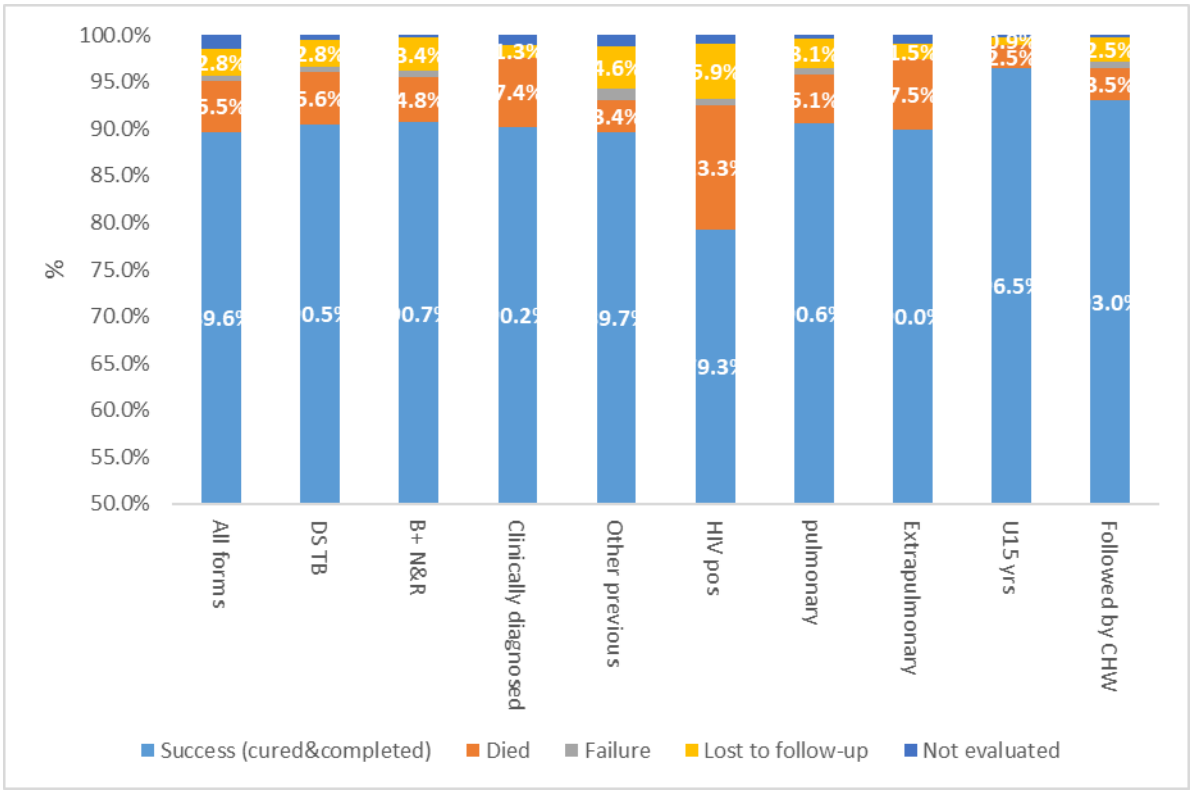

Figure 19: TB Treatment outcomes for the TB cohort registered during July 2022- June 2023, by case category

When comparing the treatment outcomes by sub district catchment area, 20 hospitals performed well with TSR 90% and above for all TB case forms. We noted the high rate of lost to follow up in Muhima sub-district of 13% (32/244), which need further evaluation to know the causes in order to address them. The hospitals were ranked according to their performance

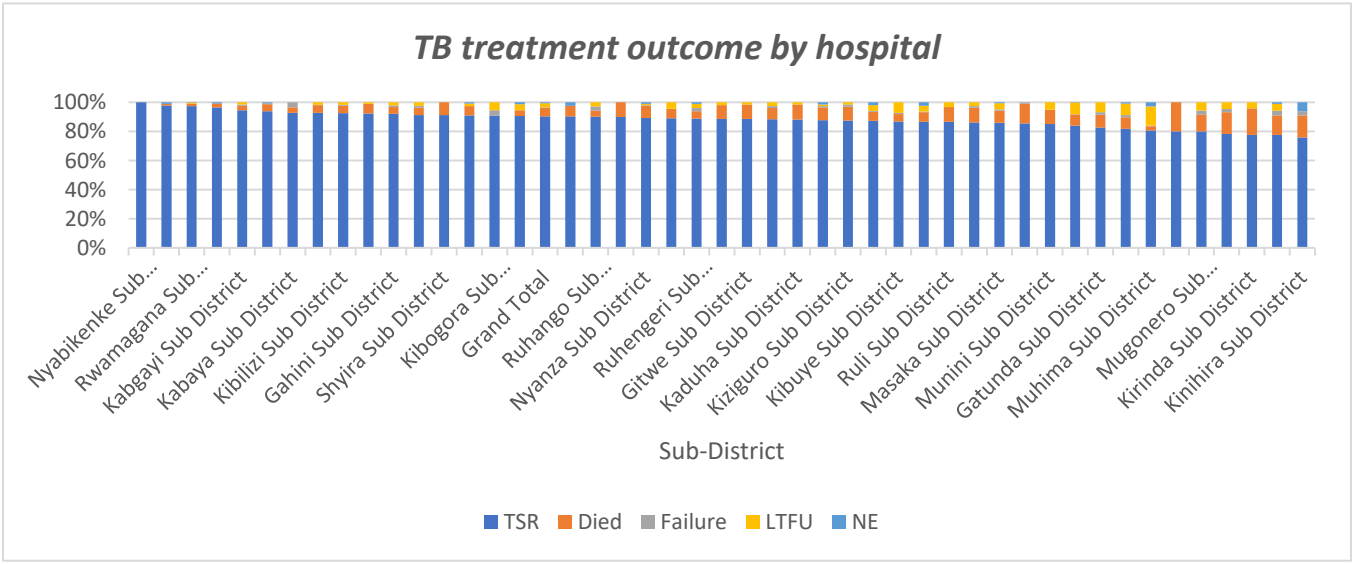

Figure 20: **TB treatment outcome by hospital catchment area for the cohort July 2022-June 2023.**

The overall treatment success rate of DS TB since the last eight years has been increasing from 85% in 2015-2016 to 90% in 2022-2023 despite few fluctuations as shown in the figure below. For the cohort from July 2022 to June 2023, we observed the success rate of 90% (the target success rate for the NSP was ≥ 88%) while 6% and 3 % were deaths and lost to follow-up respectively.

The reasons of this overall good progress in the last eight years are the improvement of individual TB case record and documentation, mentorship on TB death audit in hospitals which enlighten some gaps in TB case management and also according to Rwanda Health Sector Performance Report 2017-2019, the Doctors per population ratio has increased from one doctor/16,001 people in 2010 to 1/8,294 in 2019. However there is still a quiet number of patients who are lost during follow up and its overall rate has been stagnant (around 3%).

There is a need to do a thorough evaluation of causes of this loss of follow up in order to tackle them.

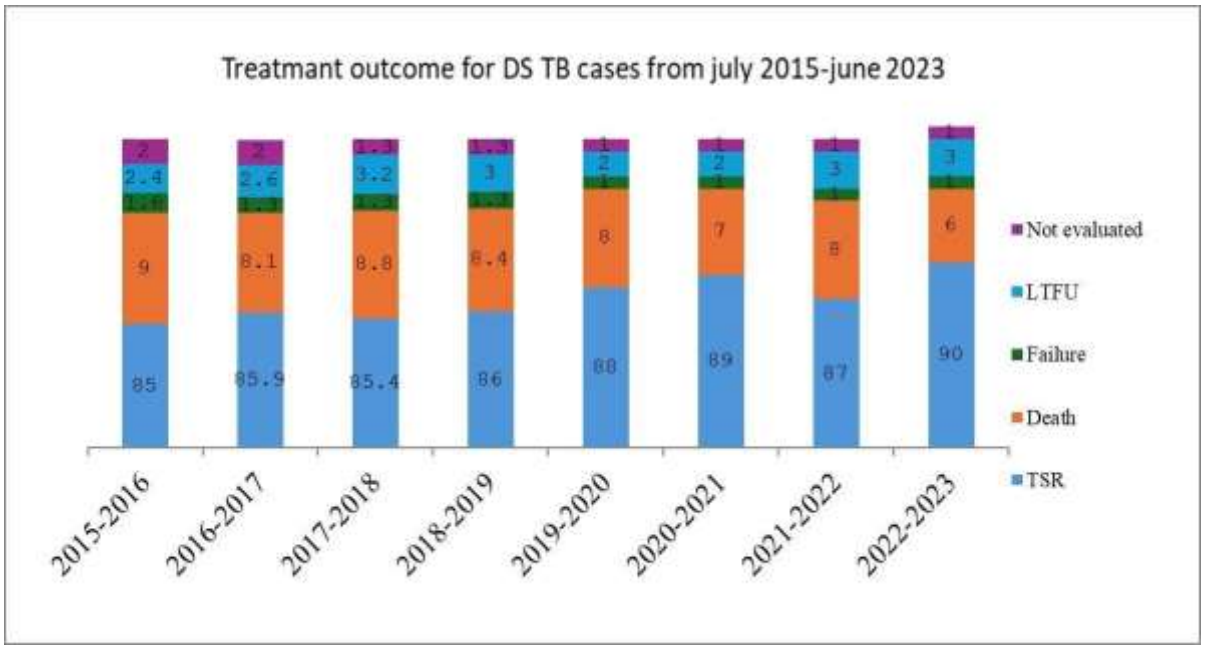

***Figure 21:*Treatment outcome for DS TB cases from July 2015-June 2023**

4.2 TB Treatment Outcome by Age category and Nutritional Status

The treatment success rate for malnourished children under 15 years of age, with a BMI of 18.5 or lower, has been recorded at 95% (479 out of 504), with a mortality rate of only 2.8%. In contrast, all non-malnourished children in the same age group from the 2022-2023 cohort

achieved a perfect treatment success rate of 100% (62 out of 62). There were no instances of treatment failure in either group.

Treatment outcome by nutrition status doesn't considered children under 5 years because we are not measuring the MUAC to assess their nutrition status but we are using weight and height to calculate the BMI for 5 years and olds. For patients 5 years old with a BMI lower to 18.5, 30%(1163/3842) received nutrition support and among them 47%(541/1163) improved their nutrition status from BMI< 18.5 to BMI ≥ 18.5.

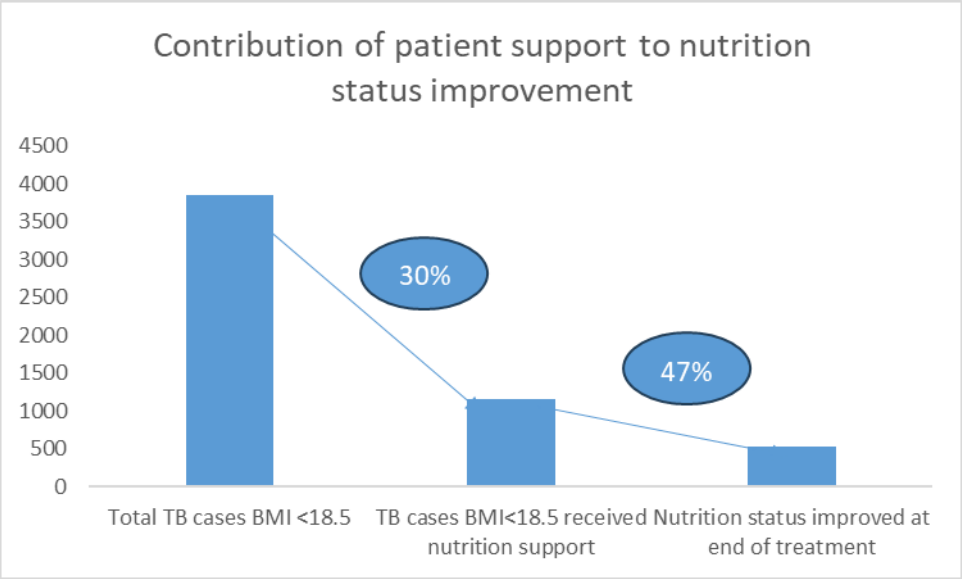

Figure 22: Contribution of patient support to nutrition status

We observed also a good treatment outcome among TB cases with BMI<18.5 at the treatment initiation who received nutrition support compared to those who didn't received it by using their BMI at the end of the treatment. Among 1163 with BMI low than 18.5, 541 improved their nutrition status at the end of treatment. The TSR among TB cases with BMI≥ 18.5 was 97%(526/541) vs 80%(497/622) with BMI<18.5 and death rate was 15% among TB cases with BMI<18.5 compare to 1% for TB cases with BMI≥ 18.5

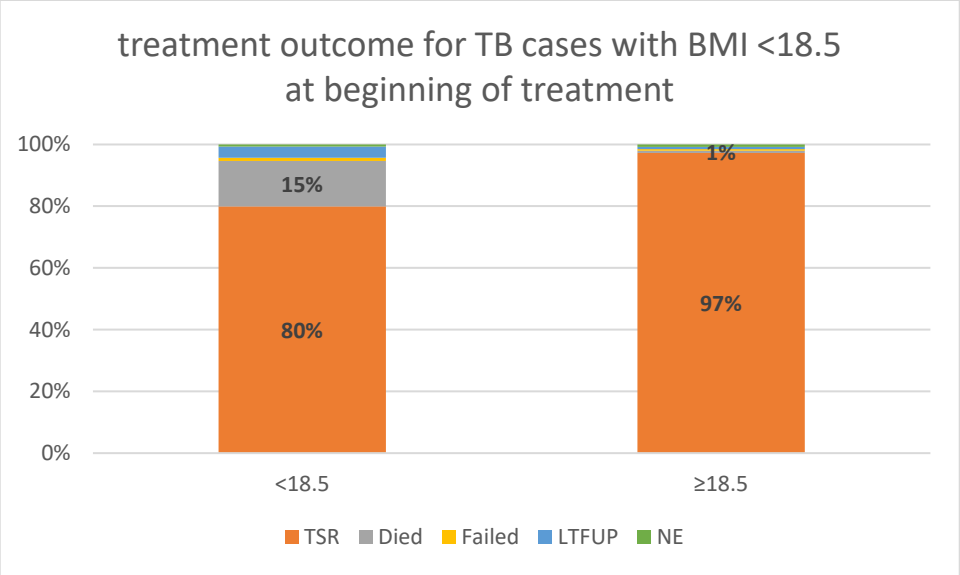

Figure: Treatment outcome for TB cases with BMI<18.5 at beginning of TB treatment

4.3 TB Treatment Outcome among PLHIV by Sub district

Among PLHIV, the treatment outcome by comparing all hospitals catchment area, only 7 hospitals have achieved the target TSR of 88%. The overall treatment success rate among PLHIV was 79.1% (921/1,164), death rate was 13.2% (154/1,174) and loss for follow up was 5.8% (68/1,164). However half of subdistrict had death rate above the national average of 13%and particular attention should be done to all subdistrict with death rate >15%. The detailed hospitals performance illustrated in TSR, death, failure, loss to follow up are presented in the following figure.

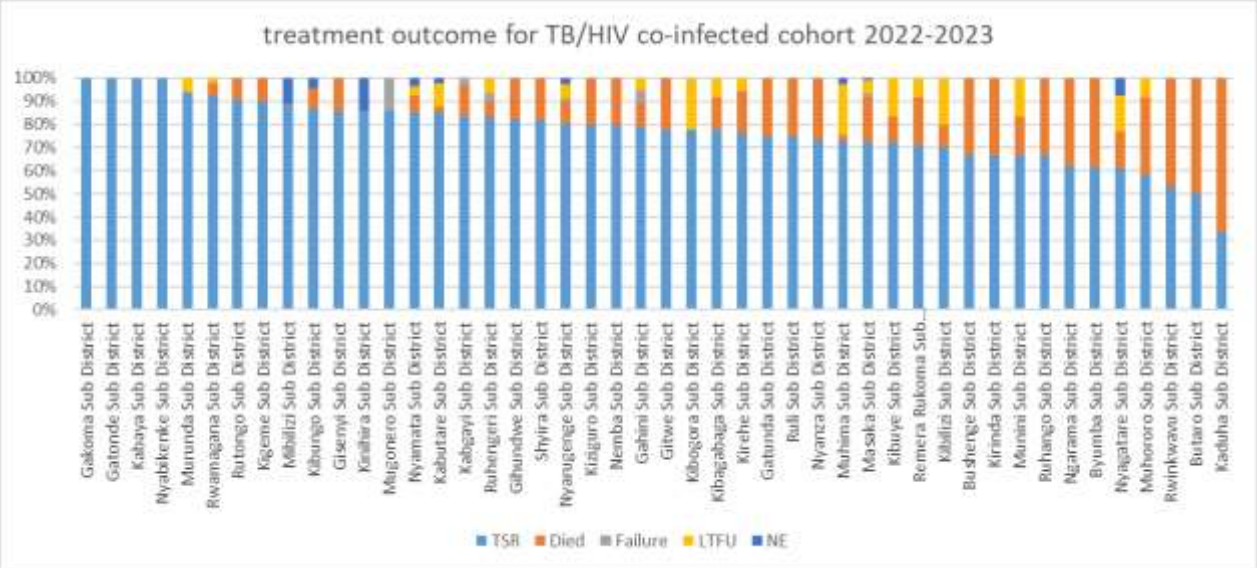

Figure 23: TB Treatment Outcome among TB-HIV Cases by Sub district

4.4 Treatment outcome for drug resistant TB

The management of patients with drug-resistant TB involves the administration of comprehensive all-oral treatment regimens as per the guidelines established by the World Health Organization (WHO). The shorter oral regimen is preferred for newly diagnosed drug-resistant TB patients, who have not been previously treated with second-line TB drugs.

Achieving sputum culture conversion is a critical milestone in realizing favorable treatment outcomes for multidrug-resistant TB (MDR-TB). A patient is considered to have achieved culture conversion at the six months if he/she presents a negative culture result at the end of this treatment period. From October 2022 to September 2023, a total of 92 MDR-TB patients have been initiated on second-line TB treatment, all were confirmed through laboratory testing. At the six-month evaluation, 91.3% (84/92) of these patients had negative culture results, while 4.3% (4/92) did not undergo culture testing, 3.3% (3/92) were lost to follow-up prior to the six-month assessment, and one patient unfortunately died before completing the six-month second-line treatment regimen.

Table 14: ***MDR-TB interim outcome (October 2022 to September 2023)***

Nb confirmed MDR-TB	Deaths before 6 months	Lost to follow-up before 6 months	Negative smear and culture	≥ 1 positive smear and/or culture	Smear and/or culture not done	Contaminated culture
92	1	3	84	0	4	0
	1.1%	3.3%	91.3%	0.0%	4.3%	0.0%

We are evaluating the final treatment outcomes for 1 patient who initiated the longer regimen during the 2021-2022 fiscal year and 88 patients who were on the shorter regimen for the 2022-2023 fiscal year. The overall treatment success rate was 89.9% (80/89), with a death rate of 7.8%. The treatment success rate among TB/HIV co-infected patients was 80% (8/10). We observed a lower success rate of 80% in MDR-TB patients who are HIV-positive compared to 91% in MDR TB patients who are HIV-negative.

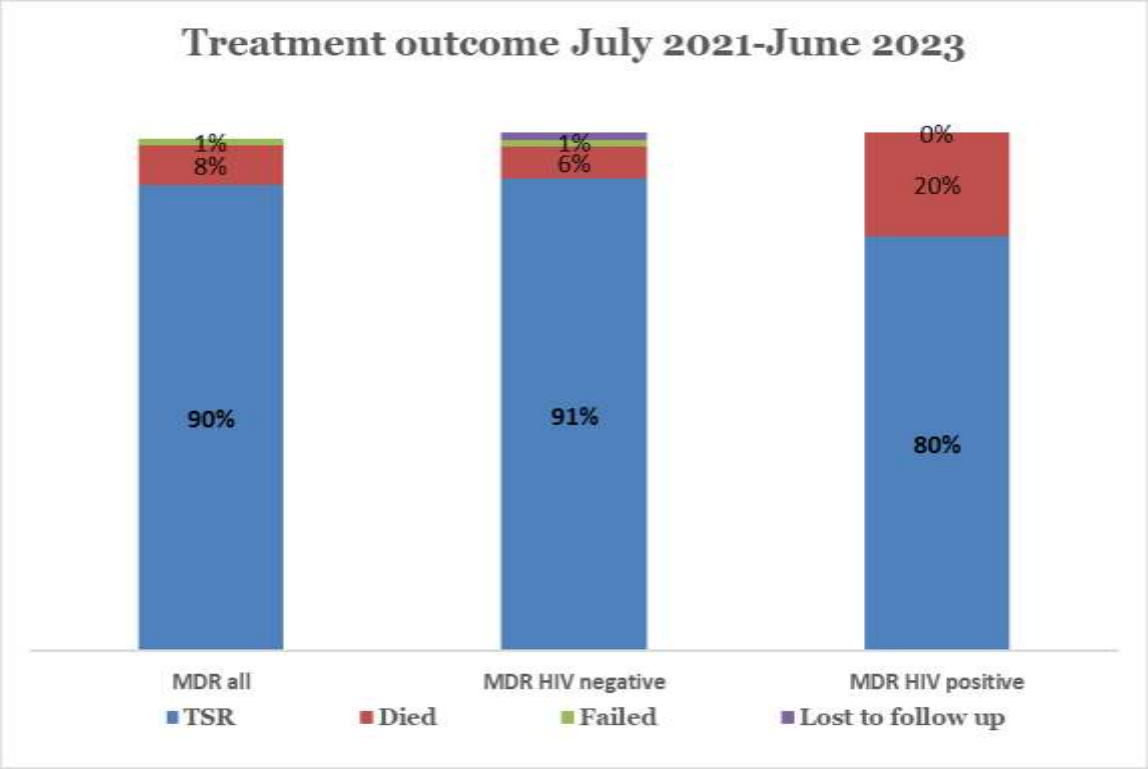

Figure 24: Treatment outcome for all MDR cases

4.5 Treatment outcome for TPT among contact of TB index cases

The treatment outcome for TPT among contact of TB index cases are subdivided into two categories according to the age, we have under five children and above five.
In the category of children under five years of age, we have observed 98% (1,327/1,349) completion rate. Only 0.2% were lost to follow up, we have seen 0.9% (13/1,349) who were not evaluated. In the category of patients above five years of age, we have found the TPT completion rate of 99% (1,619/1,636), 1.1% (19/1,636) were not evaluated and 3 cases lost to follow up.

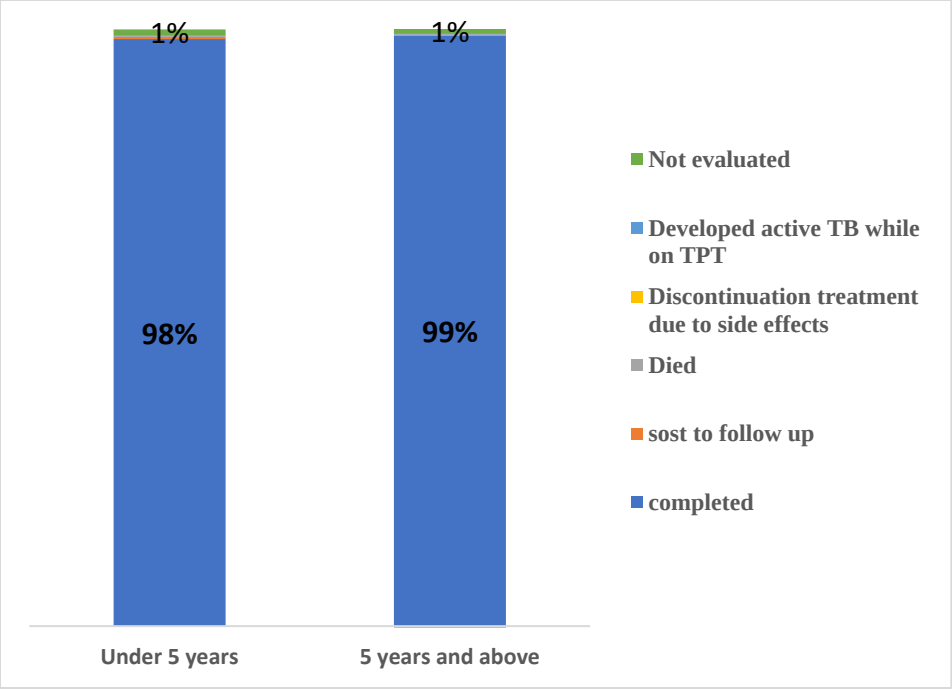

Figure 25: TPT outcomes among TB contact

4.6 Treatment outcome for TPT among PLHIV

As we are reporting the FY 2023-2024, TPT outcomes findings shall consider PLHIV that were initiated one year prior, which means those who were put on TPT from July 2022 up to June 2023. 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 2023 to February 2024.

The completion rate for the cohort of PLHIV initiated on TPT is 97% (56661/58144). It is almost similar to the completion rate for those initiated during the previous FY (97%). Around 0.7% were defaulted from the TPT and 1.1% were stopped due to the side effects.

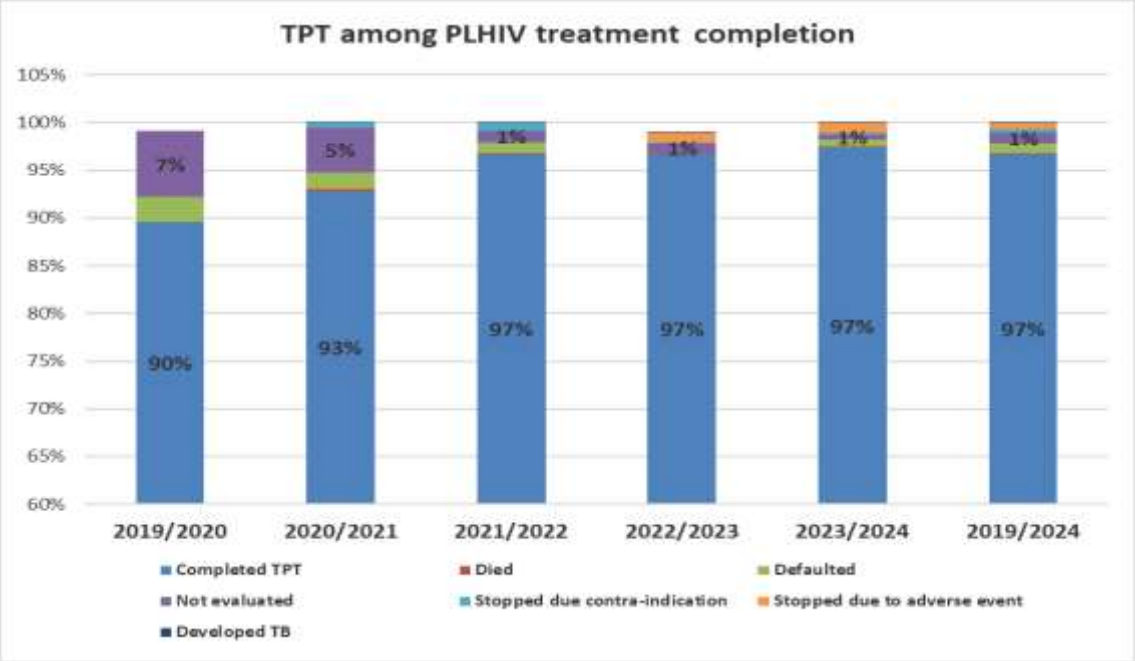

Figure 26: TPT completion among PLHIV

4.7 TB deaths audits in the context of TB control in Rwanda

Data in the TB death audit reports were collected by Nurses and Medical Doctors (MDs) who are the focal persons for TB in health facilities using a standard form designed by the TB&ORD Division. Information in paper forms was entered and analyzed at the TB & ORD Division.
The TB death audit report stage in e-TB has been customized since May 2023 to allow the availability of data in real-time to the TB & ORD Division to get a better understanding of TB death causes through analysis of death audit data which should identify specific interventions likely to reduce the causal factors.
For this analysis, submitted death audit reports to the central level and those reported in e-TB between July 2022 and June 2023 were extracted for analysis.
In total, 272 death audits were analyzed over 511 (53%) expected death reports, among them 82 (30,1%) were submitted on hard reports and 190(69,9%) were submitted via e-TB. Among the 190 reported in e-TB, 12 were available both in e-TB and hard copies and only hard copies were analyzed. Other than 190 reported deaths through e-TB, we have also 22 TB death audit reported in e-TB but not analyzed due to missing values. The submitted death audit reports increased compared to the previous years (22% in 2019, 29% in 2020, 17% in 2021, 35% in 2022 and 53% in 2023). This means we have to put more effort in TB death reporting through E-TB system.
Among all death audits submitted, 79,4% (216/272) occurred during the 1st two months of TB treatment. 63% of died TB patients were underweight (BMI≤18.5) at diagnosis time and 33% of died TB patients were HIV positive.

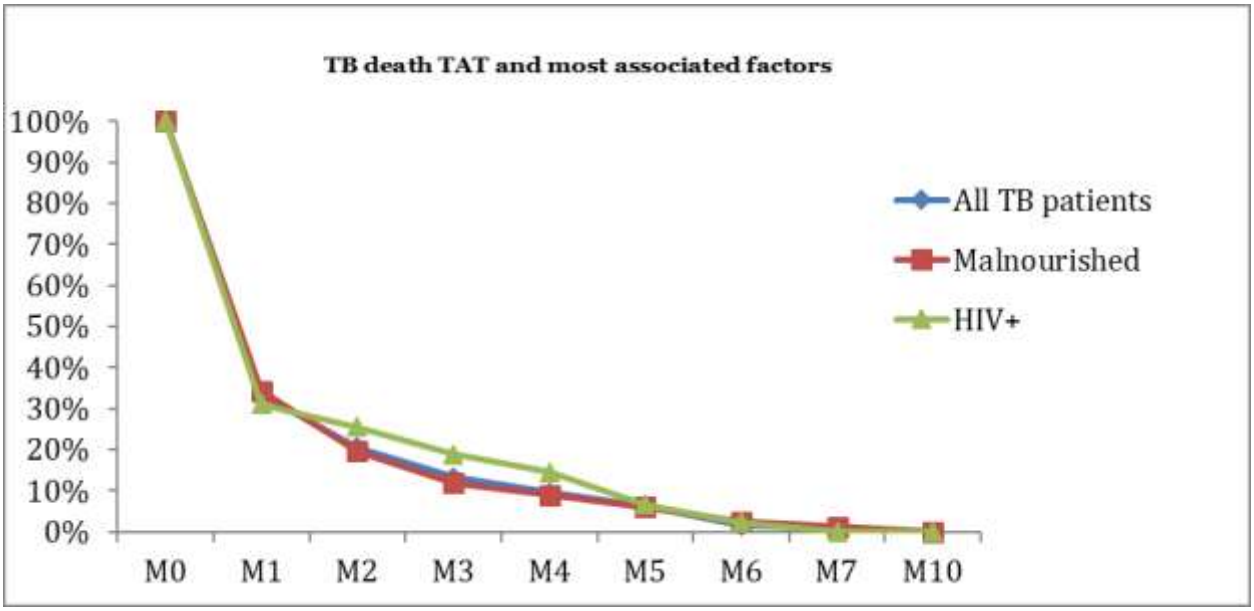

*Figure 27**: TB death Turn Around Time (TAT) and most associated factors***

The following other findings were also identified during data analysis:

- More males (66.9%) died and the majority (61.8%) were people aged between 15-54 years.
- TB was the most attributed cause of death in 74.0% of cases. This has been increasing compared to 62% reported from the 2021-2022 cohort .
- More than 55.5% were pulmonary sputum smear positive compared to 46.5 % reported from the 2021-2022 cohort.
- Bacillary load was not interpreted,92% (139/151) of bacteriologically confirmed were diagnosed with X-pert MTB as initial test but there is no variable related to X-pert MTB result allowing us in interpretation of semi quantitative result. We wish in near future to increase the Xpert MTB generated data interpretation (High, medium, low, etc.) as provided by machine.

4.8 TB death recorded in the civil registration and vital statistics system (CRVS)

The government of Rwanda has launched the Civil Registration and Vital Statistics (CRVS) system to monitor the impact of investments in disease control. Building systematic mortality surveillance systems that comply with global standards for reporting deaths and causes of death (CODs) is crucial for strengthening health systems and the CRVS system. Consequently, the government embarked on formal processes for measuring and monitoring mortality levels at community and health facility levels to improve the CRVS system. Information is sourced from hospital and community death surveillance systems using the WHO-recommended verbal autopsy instrument.

A survey conducted in 2019 indicated that 30% of deaths occurred in health facilities while 70% occurred in the community (NISR, 2019). Based on these findings, capacity building efforts were undertaken to train individuals at the cell level to conduct verbal autopsies. As a result, the CRVS report for 2023 shows a decrease in deaths occurring outside health facilities, from 70% in 2019 to 53.8% in 2023, with a total of 32,853 deaths reported in 2023.

By observation in Rwanda Vital statistics report 2023 (CRVS data), Tuberculosis is among the first 10 leading cause of death in Rwanda and TB death reported in the community and Health facilities are ranked 7th (3.5%) and 9th respectively.

*Table 15**: Top 20 leading cause of death in community, both sexes , all ages 2023)***

Annex 5: Top 20 leading cause of death in community, both sexes, all ages (2023)

S/N	Causes of death	Number of deaths	Percentages
1	Other and unspecified cardiac dis	2,311	15.00%
2	HIV/AIDS related death	1,467	9.50%
3	Digestive neoplasms	1,343	8.70%
4	Acute cardiac disease	1,298	8.40%
5	Stroke	831	5.40%
6	Diabetes mellitus	629	4.10%
7	Pulmonary tuberculosis	539	3.50%
8	Acute resp infect incl pneumonia	524	3.40%
9	Assault	453	2.90%
10	Diarrheal diseases	392	2.50%
11	Road traffic accident	381	2.50%
12	Reproductive neoplasms MF	364	2.40%
13	Other and unspecified neoplasms	276	1.80%
14	Liver cirrhosis	266	1.70%
15	Chronic obstructive pulmonary dis	229	1.50%
16	Respiratory neoplasms	212	1.40%
17	Acute abdomen	208	1.40%
18	Epilepsy	173	1.10%
19	Malaria	168	1.10%
20	Severe malnutrition	166	1.10%

*Table 16**: Top 20 leading cause of death at health facilities, both sexes, (2023)***

Annex 3: Top 20 leading causes of death at health facilities, both Sexes (2023)

Top 20 Leading COD, both sexes, all ages			Top 20 Leading COD, both sexes, 0 -4 Years		
Rank	Cause	%	Rank	Cause	%
1	Prematurity and low birth weight	9.6	1	Prematurity and low birth weight	31.6
2	Birth asphyxia and birth trauma	4.1	2	Birth asphyxia and birth trauma	13.2
3	Cerebrovascular disease	3.3	3	Congenital heart anomalies	3
4	Nephritis and nephrosis	2.7	4	Lower respiratory infections	2.7
5	HIV	2.4	5	Protein-energy malnutrition	1.6
6	Lower respiratory infections	2.2	6	Abdominal wall defect	1.5
7	Diabetes mellitus	2.1	7	Diarrhoeal diseases	1.1
8	Endocrine disorders	2	8	Endocrine disorders	1.1
9	Tuberculosis	1.9	9	Down syndrome	0.6
10	Road traffic accidents	1.8	10	Meningitis	0.4
11	Protein-energy malnutrition	1.1	11	Spina bifida	0.3
12	Congenital heart anomalies	1	12	Leukaemia	0.2
13	Liver cancer	0.9	13	Skin diseases	0.2
14	Lymphomas and multiple myeloma	0.9	14	Iron deficiency Anaemia	0.2
15	Diarrhoeal diseases	0.9	15	Lymphomas and multiple myeloma	0.2
16	Leukaemia	0.8	16	Road traffic accidents	0.2
17	Hepatitis B	0.8	17	Epilepsy	0.2
18	Inflammatory heart diseases	0.7	18	Nephritis and nephrosis	0.2
19	Stomach cancer	0.7	19	Chronic obstructive pulmonary disease	0.1
20	Hepatitis C	0.7	20	Cerebrovascular disease	0.1

Chapter 5: 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.

5.1. Capacity building

Tuberculosis and other respiratory communicable diseases had conducted several types of capacity building to improve the surveillance of TB and patient management. The following approach was used:

- Mentorship is done by people with knowledge and competency to improve knowledge and management of health care provider on TB. We conducted mentorship in collaboration with Pediatric association and Internist working in teaching and district hospitals. Following domains were covered:
    - Contact investigation and TPT inititation: 298 HCWs were mentored
    - Improve the quality of Death audit: 5 Hospitals were mentored;
    - childhood TB/HIV management in 3 sessions: 58 hospitals were mentored.
- Training toward capacity building of HCP in different domain of TB as mentioned:
    - Childhood TB-HIV management: 45 nutritionnists trained;
    - Childhood TB diagnosis and Simple One Step Stool techniques: 17 Pediatricians, Lab managers, TB Supervisors and Nurses working in Kigali hospitals;
    - Childhood TB-HIV training among HCPs countrywide for IMCI: 35 IMCI National trainers;
    - Lateral flow urine lipoarabinomannan assay (LF-LAM) technique to improve diagnostic of TB among PLHIV: 236 HCPs from all hospitals;
    - Practical training on abdominal ultrasound in the diagnosis of extrapulmonary TB and chest x-ray reading: 81 Medical Doctors;
    - ToT onTB management: 56 TB supervisors from DH, PH, RH, and Teaching Hospitals;
    - Quality TB care services: 42 Health care providers from private sector were tained;
    - TB prevention among PLHIV: 245 peer educators attended;
    - Improved Capacity on tuberculosis management: 492 health care providers 492 health care providers
    - childhood TB training among HCP: 532 Health Care Providers
- Meeting with specific people to discuss data and experience sharing to improve out TB surveillance:
    - Tuberculosis mortality technical working group with 37 participants from 19 hospitals;

- Childhood TB-HIV technical working group meeting with 22 participants from teaching hospitals, WHO, CDC, RPA, RBC and from hospitals.

5.2. Evaluation by external program reviewers

The annual regional Green Light Committee (WHO-rGLC) conducted an evaluation mission in December 2023 and it was focused on the implementation of active drug-safety monitoring and management (aDSM) in DR-TB patient's management in Rwanda. It showed that drug-safety is actively monitored in DR-TB patients and identified drug-related side effects are properly managed and documented in the patients' files which are not well recorded (classification missing) nor reported to the competent authorities for analysis and decision-making.

*Table **17**: Key recommendation from WHO-rGLC*

No.	Recommendation	Timeframe	Responsible person/organization
Case finding strategies and Laboratory testing			
1	Improve paediatric case finding	Nov-24	NTP
2	Introduce molecular testing as first-line tests for all TB presumptive individuals if results of the feasibility study currently conducted permit	Nov-24	NTP
3	Provide DST results for RR-TB patients within 2 to 3 weeks of treatment start	Aug-24	NRL and Partners
4	Establish proportion of patients who are smear negative prior to treatment start in the country	Aug-24	NRL and Partners
5	Establish proportion of individuals who are smear negative after 2 months of treatment	Jun-24	NRL
6	Diversify testing molecular TB diagnostic	Dec-24	NTP, NRL and Partners
Treatment and care of patients			
7	Revise definition of DR-TB treatment failure	immediate effect if possible	NTP
8	Provide enhanced social support package to DR-TB patients	immediate effect if possible	NTP
9	Provide more entertainment areas for DR-TB patients at Kabutare Hospital	With effect immediate	NTP
10	Publish TB catastrophic cost study	Nov-24	NTP and Partners
Pharmacy			
11	Review drug quantification in line with introduction of BPaLM regimen.	With immediate effect	NTP
12	Purchase required drugs for the new treatment regimens, particularly pretomanid.	With immediate effect	NTP
Operational research			
13	Consider conducting a 6-month regimen for DR-TB using amikacin and current oral agents	Dec-24	NTP and Partners
WHO			
14	Provide technical assistance to support introduction of BPaLM regimen.	Jul-24	WHO
15	Provide support for a study tour to a country using BPaLM regimen.	Nov-24	WHO

5.3. Update of guideline and strategic national plan

5.3.1. TB National Strategic Plan extension

During 2023-2024 FY, TB&ORD finalized the extension of TB NSP up to June 2027 which was approved by RBC and Ministry of Health senior management. The reason to extended was that Rwanda applied for GF grant cycle 7 where the fund is supported the NSP.

The extension of the NSP Followed the mid-term review and epi-review conducted in October 2022, the team from NTP and partners worked together to adjust the find from these reviews in

the extended NSP and decided to maintain the four gaps identified in the current NSP. To identify the Gap in this current NSP 2019-2024, an external desk review was conducted at the end of May 2019 before a kick-off partners workshop with more than 30 international, national and local stakeholders to review the evidence for each planning step: (1) Problem Prioritization, (2) Root Cause Analysis and (3) Strategic Intervention optimization. The NTP established a national writing committee composed of the NTP central unit team, Rwanda Biomedical Center (RBC) divisions and partners. The TB-NSP was validated through a stakeholder meeting and a data consolidation exercise using the data entry and visualization tool of the People Centered Framework (PCF) for TB planning and programming. The extended TB NSP reviewed some indicator in our M&E and introduced the new available impactful strategies and innovation to help improve the management of TB patient and achieving target for End TB.

5.3.2. Update of guideline

World Health Organization (WHO) has recently recommended countries to implement a shorter all-oral treatment regimen for treatment of RR-TB and XDR-TB patients. This new regimen includes the use of Pretomanid (Pa), a new drug that has never been used in Rwanda.
TB&ORD Division with support from TB Alliance has been working with Peer Link on updating the national DR-TB guidelines and including the WHO-recommended shorter regimen (**6Bdq-Pa-Lzd-Mfx**) commonly known as **BPaLM** regimen. The same new guidelines also recommend the use of digital adherence technologies (DAT) in DR-TB treatment adherence monitoring. The guideline was updated and final draft available waiting for approval at RBC senior management team.
The updated national DR-TB guidelines was effectively implemented starting by 01st July 2024.

5.4. DR-TB patient support

MDR-TB patients received the psycho-emotional, financial support and medical care aiming to increase adherence to the treatment as the main issues faced are acceptance to separation of the family during the period of high contamination, side effects, duration of DR-TB treatment, the mode of DR-TB treatment and the patient is advised to begin treatment as soon as possible.
During hospitalization at the MDR-TB centre, group counseling led by an MDR-TB psychologist and in ambulatory care, the health center is providing counseling and treatment follow up.
Hospitalization, clinical exams, drugs, food, and hygiene materials are given free of charge to DR-TB patients during the hospitalization period. During the ambulatory treatment period, patients are provided with drugs, clinical exams, free medical insurance (that covers all medical costs, including 90% of costs for family members), transportation fees and nutritional support (food packages).
Rwanda adopted the use of digital adherence treatment **t**o avoid further spread of the TB strains in the neighborhood of the patient, monitoring of the TB treatment adherence, directly observed treatment (DOT), could allow the TB programs to achieve the internationally set targets but it is

sometimes not friendly (ex. time consuming) in some patients, and it could be associated with risk of stigma towards the patients.
The World Health Organization recommends TB programs to introduce other patients-centered approaches for TB treatment adherence monitoring including use of digital adherence technologies (DAT). Rwanda TB program is working closely with KNCV and Rwanda HISP in the implementation of one of the DAT options, Smart Pills Boxes (SPB), in the DR-TB treatment adherence monitoring. Some (50 pieces) SPB are arriving very soon in Rwanda, and they will be ready for use for the above-mentioned purpose.

5.5. TB Tools printing and distribution

M&E tools help organizations track the implementation of their activities to ensure Supporting Strategic Planning, quality improvement and enhancing Accountability. After printing, tools were distributed to hospitals during quarterly evaluation meetings and then the TB focal points at hospital level were mandated to distribute the tools to all HFs.

During FY 2023-2024, different TB tools were printed out as per the details in the table below:

Table 17: TB tools printed and distributed from July 2023-June 2024

Items	Quantity	Donor
Fiches de traitement TB	11700	CDC/COAGA
TPT Patient Files	12000	CDC/COAGA
Fiches Dot communautaires , Fiches recto verso	13000	CDC/COAGA
Registers Labo CT	565	CDC/COAGA
Registers Labo CDT	445	CDC/COAGA
Registers Case CT	365	CDC/COAGA
Registers Case CDT	545	CDC/COAGA
Carte de TB malade	12000	CDC/COAGA
Register Prisons (Entrée & Sortie) 13 Prisons	100	CDC/COAGA
Register for TB screening among Health Facility Workers	570	CDC/COAGA

5.6. Health promotion, community, and stakeholder engagement

Sensitization in refugee and congregated settings is crucial to improving knowledge and reducing the risk of TB transmission in these areas, which are at high risk. We conducted sensitization sessions twice a year in 13 correctional facilities and six refugee camps, where peer educators are responsible for educating people and referring those with TB symptoms to clinics. The refresher training covered basic tuberculosis information, including causes, symptoms, modes of transmission, and prevention measures. We emphasized the importance of screening among the sensitized inmates, early detection, and effective communication. Inmates are educated about TB symptoms and the importance of reporting them to healthcare staff.

In total 2000 peer educators we refreshed on TB knowledge in correction services and refugees camps and the result of assessment after refresher training showed an improvement on their knowledge.

This strategy requires a multi-faceted approach that addresses the knowledge gaps, misconceptions, and stigmas surrounding the disease. By educating the public, promoting early diagnosis, and supporting treatment adherence, BCC can significantly contribute to reducing TB transmission and improving patient outcomes. It's a communication strategy which encourages individual or community to change their behavior, and promoting changes in knowledge, attitudes, norms, and beliefs.

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 2023-2024. IEC/BCC messages were aired on radios (Community, National Radio and international radio stations) and in newspapers. There were performed as follow:

- 13 newspapers, Rwanda News, Ijambo.net, Kivu 24, Africana Post, The New Times, Bwiza Ltd, Rwanda Tribune, Kigali Today, Umuseke, Isano, Mama Urwagasabo, The Inspirer, Rwanda News Agency,
- 9 Radios: Ijwi ry'Amerika, Flash radio, radio10, RBA, Radio Maria, radio 1, Isango Star radio, Umucyo Radio,Kigali today.
- 8 TVs: Umunsi TV, Amizero TV, BTN TV, Flash TV, TV10, RTV, TV 1, Isango Star TV,
- Radio and TV spot on Radio Rwanda, 5 community radios (Huye, Nyagatare, Rusizi, Musanze and Rubavu), RTV, Isango radio, Isango TV, Radio 10, Radio 1.

Below are topics related to tuberculosis awareness during this fiscal year:

- Knowledge of transmission, symptoms, screening and diagnostic early of Leprosy and prevention
- Knowledge on cause, transmission, symptoms, screening and diagnostic of TB
- Importance of TB screening early among health care workers,
- Role of CHWs in TB control and testimonial of TB patients on TB treatment.
- Follow up of MDR-TB patients at home (Prevention of transmissions to household, nutrition, adherence to treatment and bacteriological follow up),
- Childhood TB,
- importance of Leprosy screening early.

The World Tuberculosis Day is commemorated on March 24th each year, and it's designed to build public awareness for fighting against TB, as TB remains an epidemic in much of the world. Rwanda often joins the rest of the world celebrating annually the TB Day, raising awareness in the general population so they may be informed on TB prevention, diagnosis and treatment.

The theme **"Yes! We Can End TB"** for World Tuberculosis Day 2023 is a powerful and optimistic rallying cry aimed at galvanizing global efforts to combat tuberculosis (TB). It reflects a commitment to the goal of eliminating TB as a public health threat and emphasizes that with collective action, innovation, and sustained effort, the world can indeed end this disease.

Best CHWs receiving awards of bicycles

Partnerships with civil society organizations (CSOs) are crucial for the success of World Tuberculosis Day. In 2023, these partnerships played a significant role in amplifying efforts to raise awareness, mobilize communities, and advocate for
stronger political commitment to ending tuberculosis. The celebration of the World TB Day 2024, gathered different officials and high guests: WHO, CDC, Rwanda NGOs Forum, RRP+, FXB Rwanda, Strive Rwanda, AHF Rwanda, etc…

***Dr.* Albert Tuyishime, Head of HDPC/RBC**

During the world TB day, we were honored by the presence Guest of Honor form RBC and partners. Following the people responded: the Head of department of , the Head of HIV/AIDS Disease Prevention and Control(HDPC): **Dr TUYISHIME Albert**, Director of CDC in Rwanda: Dr Thierry Roles and **WHO country representative Dr Brian Chirombo**

***Dr.* Brian Chirombo, WR**

5.7 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. A total number of 165,995 people living with HIV were followed-up through peer education program by 4,836 peer educators (2,600 from GF sites and 2,236 CDC sites).
This was implemented in 365 sites supported by Global Funds and 182 sites by CDC. About 78% of 159,096 PLHIV participated in the education sessions on TB prevention; 156 PLHIV (0.1%) from 547 sites were put on treatment and followed-up by peer educators in the sites covered by the two donors mentioned above.
In this fiscal year, 246 Peer educators from 25 sites supported by global fund (Musanze and Rubavu districts) were trained on TB symptoms and prevention measures, TPT, peer education and reporting tools to empower them on their tasks.
Shortage of the counter-referral forms was the main challenge experienced; the printing is planned in the year 2024-25. This form is integrating TB-HIV components under peer educator's follow-up.

Key results

Indicator	2023/24	
	Target	Achievements
Proportion of first level health facilities that have at least one staff trained to provide PAL services	(437/569) 76.8%	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 6 SUPPLY PLAN CHAIN MANAGEMENT AND COMMODITIES

6.1. 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 diseases in collaboration with the national quantification team (MOH, RBC, RMS, Referral hospitals and partners). This activity was done through the integrated quantification under the lead of the Coordinated Procurement Distribution System (CPDS). Therefore, the forecasted quantities of TB commodities needed for 2023-2029 were determined. The supply plan has been reviewed and the plan of 2024-2025 FY was developed accordingly. The integration of quantification for health commodities of different programs is cost effective.

Stock monitoring and regular follow up of quantity to order and shipments of TB commodities were used to alert any issue related to shortage of TB commodities. Almost all TB commodities were available at central level except some items for TB laboratory like BD products, TB Lam, potassium permanganate, SD Bioline, LJ powder and LPA Kit, antibiotics standards for HPLC...

We conducted the validation of all TB commodities requisition from RMS branches to ensure that they are distributed according to the number of TB cases notified in the health facilities during 2023-2024 FY.

According to the e-LMIS reports, (97.2 %) health facilities reported no stock out during the fiscal year of 2023-2024 but we noticed a data quality issue reported in e-LMIS. Some health facilities reported stock out in the e-LMIS due to poor recording, but TB drugs were available in all health facilities and no patient missed his/her doses.

6.2 Procurement status of TB products at end of June 2024

For TB commodities products planned during the fiscal year 2023-2024, 72.8% were received, 12.4% in pipeline and 7.6% are still under process and the 5.7% cancelled during supply plan review exercise after considering actual trend of consumption and existing stock on hand. The table below provides detailed information on the implementation of supply plan of TB commodities during the reporting period.

Table 18: Procurement status of TB products, FY 2023-2024

Shipment status	Count of Shipment status	%
Received	150	71.4
Partial received	3	1.4
Ordered	26	12.4
Hold	3	1.4
Cancelled	12	5.7
Planned/GF	16	7.6

Grand Total	**210**	**100**

6.3 Forecasted accuracy of TB medicines

The analysis of forecast accuracy from July 2023 to June 2024 showed that in general the forecast accuracy is good for second line medicines. However, we noticed the increase of DS-TB notification and pediatric cases which required to review their expected numbers of cases for 2024-2025 FY and to monitor the stock levels. The table below shows the details on forecast accuracy for TB medicines.

*Table 19**: Forecast accuracy for TB medicines***

Regimen	Target in Quantification	Cases registered	%
Patients under first-line adult medicines	6965	7788	111.8%
Children under paediatrics formulation	392	660	168.4%
Rwanda FL regimen Rifabutin Based	40	3	7.5%
Rwanda FL regimen Separate molecules	10	2	20.0%
DR TB Cases	90	90	100.0%
TPT Contacts less 2years (6H or 3HR)	510	525	102.9%
TPT Contacts Above 2years (3HP)	2452	2338	95.4%
TPT PLHIV	23460	19583	83.5%

6.4 Drug safety monitor

To ensure the quality of medicines used, we sent samples of anti TB drugs for quality control testing as we have a contract with a global fund pre-qualified laboratory to ensure the quality of the products received or stored at our warehouses. We sent 18 anti TB products for testing and all passed the quality control test.

6.4.1 Active drug-safety monitoring and management (aDSM)

The aDSM 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 was an urgent need to implement aDSM in Rwanda. In this regards the workshop on implementation of aDSM in TB program was done with the objective of introducing participants on active drug, safety monitoring and management with emphasize on adverse events recording and reporting. We reviewed the current TB aDSM recording and reporting systems (eTB and Rwanda FDA online ADR reporting system) and evaluate the possibility of interoperability in order to avoid double report by one joint reporting system to be agreed upon.

The aDSM is implemented in all health facilities involved in management of TB patients. Health care providers are requested to regularly evaluate TB treatment response, record and report on any identified TB drugs adverse effects to the patients on TB treatment. Patient files for both DS and DR-TB management have specified place for aDSM on the hard copies as in the individual electronic TB case surveillance system. Report is generated from the information collected in the last one.

From 9456 patients registered during 2023-2024 FY, adverse event stage has been reported on 9345 that represent 98.83%. Among the reported cases 66 patients presented at least one side effect and represent 0.71%. The table below summarizes the findings about adverse events among TB cases.

Table 20: Adverse events reported among TB cases

N= 9456 (total TB DS & DR cases registered during the FY 2023-2024)	Total	Percent
	Reported	
Reported on a-DSM	9345	98.83%
Patient with side event recorded	66	0.71%

6.4.2 Grading of adverse events

For 66 cases reported as having the side effects, the grading of them was reported on 35 cases and represent (53%). The most identified grade is mild observed on 15 cases that represent 43% among the graded cases. The following table shows all reported cases and their proportions:

Table 21: Grading of adverse events reported among TB cases

Grade of adverse event	**DS-TB**	**DR-TB**	**Total**	**% graded among reported cases**	**% graded among graded cases**
Unknown grade	31	0	31	47%	
Mild	15	0	15	23%	43%
Moderate	9	1	10	15%	29%
Severe	5	5	10	15%	29%
Life threatening	0	0	0	0%	0%
Total	**60**	**6**	**66**	**100%**	

Considering the reported cases and the proportion of graded cases it seems that Staff capacity building on aDSM is still needed to improve on its effective implementation in Rwanda.

Key results:

Indicator	2023/24		
	Target	Achievements	level of achievement
Percentage of CDT with no stock out of FL tracers (RHZE and RH ad) drugs of experienced in the last 12 Months	100%	97.20%	97.20%
Percentage of MDR TB centers with no stock out of SLD in the last 12 months	100%	100%	100%

Chap 7: TUBERCULOSIS MONITORING, EVALUATION AND RESEARCH

7.1. Data review: Quarterly Data Quality Checking, Validation, and Performance Review

Quarterly evaluation meetings are pivotal for ensuring the accuracy and sustainability of data quality and validation within healthcare services. Since July 2019, the national TB program has utilized the e-TB case-based surveillance system for comprehensive TB data collection and analysis. The process involves TB Focal Points and Data Managers entering real-time data into the e-TB and HMIS systems, with data submission due by the 5th day of the month following each quarter. The TB&ORD Division organizes quarterly data quality checks and performance review meetings with hospitals and health centers. These meetings validate the data reported and are critical for maintaining the integrity of the TB program. The most recent Quarterly Evaluation Meeting (QEM) for the 2023-2024 fiscal year was held country wide to improve the accuracy and reliability of TB and TB/HIV data collected from healthcare facilities. This involves identifying and rectifying discrepancies and missing values to improve the overall quality of the RDHIS2 dataset.

Challenges:

- Data quality issues, some inconsistencies of data in e-TB reporting and data entry errors and missing values that affect the reliability of TB notification data, outcomes, TPT and TB-HIV co-infection data,
- Difficulty in reaching and effectively screening high-risk groups (HRGs
- Limited access to rapid diagnostic tests (e.g., GeneXpert) in all healthcare facilities.
- Variability in the use of available rapid tests across district hospital catchment rea and facilities.
- Incomplete and inaccurate data affecting the ability to monitor and respond to TB-HIV co-infection trends effectively
- Low TB notification rate in the majority of health facilities.

Recommendations

1. Improve the accuracy and completeness in e-TB data reporting
2. Strengthening reporting mechanisms and Data Collection
3. Need for more effective outreach strategies to improve TB notification rates among HRGs.
4. Ensuring all facilities have access to and use rapid tests
5. Strengthen strategies to improve TB notification rate
6. Monitoring and accurately reporting TB cases

7.2. TB &ORD assessment (RSQA)

Rapid Service Quality Assessments (RSQA) and Data Quality Audits (DQA) were done during the FY 2023-2024, They were conducted across the East, North, West, and South regions from February 19 to March 1st 2024. During this exercise, the electronic individual case-based surveillance system in all the health facilities as a new reporting system. The aim of RSQA is to ensure data accuracy, reliability, and completeness of TB data by examining and verifying data to identify discrepancies, errors, and inconsistencies.

Table 22: Rapid Service Quality Assessments per selected indicators in Eastern, Northern, Western and Southern provinces, February 19 to March 1, 2024.

#	Summary	%
1	Are algorithms for TB screening, TB diagnosis and TB treatment available and displayed in health facilities?	96%
2	Are TB patients early initiated on TB treatment and on ART (if indicated), and their bacteriological control performed according to guidelines?	91%
3	Are stocks of TB drugs and reagents well monitored?	90%
4	Are rooms where TB services are provided well-ventilated and Health workers personal protection existing and used?	86%
5	Are TB diagnostics continuously functional (microscopy and Expert) and their results available timely (microscopy, expert and culture)?	85%
6	Are there personnel trained on Practical Approach to Lung Health (PAL) strategy and PAL instruments available for use?	84%
7	Are TB monitoring tools existing, update and well used; Supervisions and internal trainings conducted?	82%
8	Active drug safety monitoring and management (aDSM)	81%
9	Is the general population informed on cough hygiene, coughing patients separated from others, health facilities workers screened for TB?	78%
10	Does TB infection control plan exist, implemented and its implementation monitored?	77%
11	Does the BMI monitored for TB Patients and nutritional support provided to the eligible patients?	75%
12	TPT Implementation	70%
13	Are patients with multi drugs resistant TB (MDR-TB) in ambulatory phase controlled (microscopy and culture) for effectiveness of their treatment?	24%
14	Is active case finding conducted in TB high risk groups?	23%
15	Leprosy control	14%
Average		73%

Challenges were observed on following area that needed to be improved:

- Active case finding conducted in TB high risk groups (23%), TB (MDR-TB) in ambulatory phase controlled (microscopy and culture) for effectiveness of their treatment (and Leprosy Control (14%): Leprosy control measures are significantly lacking
- Use of TB Monitoring Tools: Consistent use of TB monitoring tools and implementation of active drug safety monitoring and management (aDSM) need to be improved.
- Public awareness and infection control measures, including cough hygiene and TB screening for healthcare workers, need strengthening, with compliance rates at 78% and 77%, respectively.

Recommendations

- Improve screening TB among active case finding in high-risk groups to identify and treat TB cases early.
- Develop and implement comprehensive leprosy control
- Strengthen control and monitoring mechanisms for MDR-TB patients to improve treatment effectiveness

7.3 PAL strategy assessment

Since 2015, the TB division has begun implementing the Practical Approach to Lung Health (PAL) as recommended by WHO. This year's assessment and mentorship took place on 10-14 June 2024 in Musanze and Kibuye Referral Hospitals, and Kirehe, Kigeme, Nemba, Kibungo, Kabutare, Murunda, Kinihira, Rwinkwavu, Kibilizi Gisenyi, Rutongo, Gahini, Nyanza, Kabaya, Byumba, Rwamagana, Shyira, and Kabgayi District Hospital. Five Medical Doctors trained in the PAL TOT in November 2023 were part of the team that implemented this activity. The aim was to evaluate the impact of the 2023 training of trainers on skills and knowledge of the management of respiratory illness, assess the adherence to the new guidelines and the use of key tools to manage respiratory NCDs and provide an onsite mentorship for NCDs and OPD nurses on different aspects of respiratory illnesses and leprosy.

Sixty per cent of respondents were familiar with the strategy. General training sessions remain one of the main channels for clinicians to gain technical and practical knowledge on different topics; 67% of respondents learned about the PAL through these face-to-face training sessions, 17% through on-the-job sessions, and the rest through various academic programs. Application of Disease Categorization by degree of severity in patient management remains low as in 100 files reviewed, 40 % of patients' files had no disease categorisation, undermining the rationale for the management plan for that proportion of patients.

Eighty per cent of respondents were familiar with some of the usual tools used in respiratory illness management, however, this familiarity is lacking in practical skills and results interpretation of spirometers and peak flow meters. This is because some tools are unavailable at the hospital, For instance, except for Rwinkwavu and Kirehe hospitals out of 20 hospitals, no other facility had at least one spirometer.

Presentations focused on the PAL strategy, emphasising its potential to optimise TB management of TB and respiratory illnesses in Rwanda. The material was shared with clinicians and managers of the NCD and outpatient departments for refresher sessions and personal use. The materials included slides, protocols and educational video links on spirometry and peak flow meter use. In Gisagara and Ngoma, known leprosy endemic districts, discussions include Leprosy clinical manifestations, diagnosis and management. The assessment team highlighted the need for clinicians to be aware of the disease and systematic screening for every patient with dermatological complaints.

This activity underscored the need for continuous capacity building to ensure technical knowledge in respiratory illness management reflected by guidelines' adherence and the use of adequate tools to manage respiratory illnesses at all of Rwanda's healthcare levels. The Division offers guidance on the PAL to ensure that respiratory illness care aligns with the country's vision regarding respiratory illness care especially the chronic ones on the rise. In addition, facilities are responsible for procuring or advocating for the availability of key diagnostics tools used in respiratory illness management.

7.4. Annual Evaluation Workshop with District TB Stakeholders

The Ministry of Health, through the RBC/HDPC/TB&ORD Division, organizes an annual evaluation workshop with district TB stakeholders involved in the Tuberculosis Surveillance System. This workshop aims to share annual TB achievements, discuss challenges, and strategize for improved TB control. The 2022-2023 fiscal year workshop, held in Muhanga District, at Lumina Hotel from for 4 days (12-15 February 2024. This meeting aims to share findings, discuss on challenges, and agree on the way forward on different topics. In total 46 out of 50 participants attended the workshop and discussion was focused on our indicator performance, built capacity on how to enhance data quality and analysis skills and how the TB supervisors can monitor it every quarter. In addition, we presented TB NSP extended 2019-2027. After presentation and discussion, following recommendation were made:

- Continue investing in capacity-building initiatives to strengthen data management and analysis skills.
- Advocate for increased resource allocation and support for TB and respiratory disease management.

- Establish regular monitoring and evaluation mechanisms to assess the progress and ensure accountability.

7.5. Research Strengthening

Strengthen TB operational research is on of TB NSP extended 2019-2027 which aims to improve program implementation and inform for policy adjustment along evidence-based findings. During the reported FY, following activities have been conducted in term of research

- TB Catastrophic cost survey entitled: “An evaluation of costs borne by TB affected households in Rwanda’’: Data collection and analysis was done and preliminary result is available which need to be discuss with MoH and Minecofin before publication.
- Pragmatic clinical trial on the short treatment regimen for rifampicin sensitive TB - Preventing Acquired Resistance: Strengthen TB treatment by adding Amikacin in the first treatment week of multidrug-resistant tuberculosis (Stake): data collection was done and analysis is ongoing. Manuscript was developed and submitted for peer review.
- Latent Tuberculosis Infection Prevalence survey : data collection was done and blood collection and result available. The report will be developped in September and draft also the manuscript for publication
- In country Evaluation of Determinant LAM Ag Rapid Test in a Non-Laboratory Setting: data collection started but delayed due to availability of LAM test and meeting the inclusion criteria for the participant. We expect to finish the enrollment in September then develop the report and manuscript for publication
- Innovate to Reduce Rifampicin-Resistant Tuberculosis (InnoR3TB): data collection is ongoing.
- Digitally-Supported Integrated Community Screening and Expanded TB Case Finding: data collection done and data cleaning and analysis are ongoing. The full report will be available in October.

Chapter 8: Strengthening leprosy surveillance and response

Leprosy control is integrated from primary healthcare to other levels of healthcare in Rwanda. RBC/TB Division is responsible for conceiving, directing, and coordinating leprosy control activities while providing technical support and necessary resources. The long-term goal is the elimination through early detection to halt leprosy infection transmission and adequate psychosocial support to ensure zero stigma and discrimination for every leprosy-affected person.

A recent decrease in the leprosy-related activities funding affected key aspects of leprosy prevention especially the much-needed social support for leprosy-affected persons to enhance community integration and decrease the stigma associated with this illness. Despite this challenge, the Division kept equipping healthcare providers with knowledge and skills in leprosy clinical presentation and management. For instance, about 500 medical doctors and nurses benefited from training on Leprosy and other respiratory disease management in FY 23-24 alone. In addition, case-finding initiatives are implemented in endemic and non-endemic districts. There has been a steady decrease in the detection rate over the last five fiscal years; Rwanda has averaged 21 new cases. Of note, however, in 2020 Rwanda saw a 50% decrease from that average. The period coincides with the COVID-19 pandemic, highlighting the effects of such health events on health programs including Leprosy programs in many parts of the globe.

8.1. Improve the leprosy surveillance system

An online case-based information system provides routine information for evaluating some indicators allowing better assessment of Leprosy epidemiology and planning activities based on the settings. This year, we conducted 2 sessions of on-the-job mentorship on e-Leprosy patients and the Leprosy Tracker online platform to ensure that all captured surveillance data is accurately reported in endemic zones. To link the two platforms, we added the index Auto Generated number to enable easy analysis of data on contact tracing. In addition, paper-based documents were distributed in facilities in endemic zones to be used as source documents. Furthermore, the program submitted the 2023 Leprosy surveillance data for the WHO's Global NTD Annual Report.

8.2. Leprosy screening and diagnostic

Leprosy screening involves two ways as the passive screening that identifies individuals who present with skin conditions through outpatient department, and active case finding in both leprosy-endemic areas and non-endemic areas with a leprosy case in the last 10 years. The clinical features like definite loss of sensation on skin patch, the thickened or enlarged peripheral nerves with associated sensory loss or muscle weakness, or microscopic detection of bacilli in a slit-skin smear. The sensitization on leprosy signs and symptoms were carried out in the visited sites with the aim to be part of screening through the channel of announcement in the churches, and CHWs.

Leprosy case-finding

In FY 23-24, four hundred forty one (441) individuals reported to different sites for active case-finding (ACF), 81% (359/441) had patches suggestive of leprosy, of the 11% (38/359) were presumed to have leprosy, and 85% (23/38) were confirmed to have leprosy. The ACF remains a substantial strategy to attain undiagnosed leprosy cases in the community. The proportion of leprosy cases diagnosed during active screening by the central-level staff initiated centers warrants more similar initiatives by local HCs reaching communities for early leprosy screening in endemic zones, underscoring the need for continuous capacity building for healthcare providers at all levels.

Table 23: Leprosy active case-finding cascade, FY 23-24

	# of People coming for ACF	# of People with patches screened	# of Presumptive leprosy case	Leprosy case detected	
	441	359	38	11 MB	12 PB
Proportion		81%	11%	29%	32%

Source: Field visit report of ACF in endemic and non-endemic area, FY 2023-2024

Contact tracing

In FY 2023-2024, contact screening conducted among household contacts of leprosy index cases, with 34 out of 48 individuals (71%) being screened, , 88% (30/48) of them were eligible to PEP and 8% (4/48) were presumed to have leprosy (Table 23). This proportion can potentially increase with improvement in contact tracing which is paramount to leprosy elimination in Rwanda. Additionally, former leprosy patients' contacts were regularly screened for early detection and treatment.

Contact screening among household contacts of leprosy index case, by health facility, from July 2023 to June 2024

Organization unit name	Number of contacts	Screened	Eligible to PEP	Presumed Leprosy
Bugarama (Rusizi) CS	2	2	0	2
Gikundamvura CS	26	19	19	0
Gishubi CS	8	1	1	0
Jarama CS	2	2	2	0
Nyabitimbo CS	1	1	0	1
Nyakabuye CS	3	3	3	0
Nzangwa CS	6	6	5	1
Total	**48**	**34**	**30**	**4**

Considering the screening being done among the contacts and community living in high-risk endemic zone and non-endemic zone of leprosy, thirty-seven cases were diagnosed throughout passive and active approach (Figure 28). Effort to strengthen contact screening should be intensified to improve disease prevention and control among affected individuals.

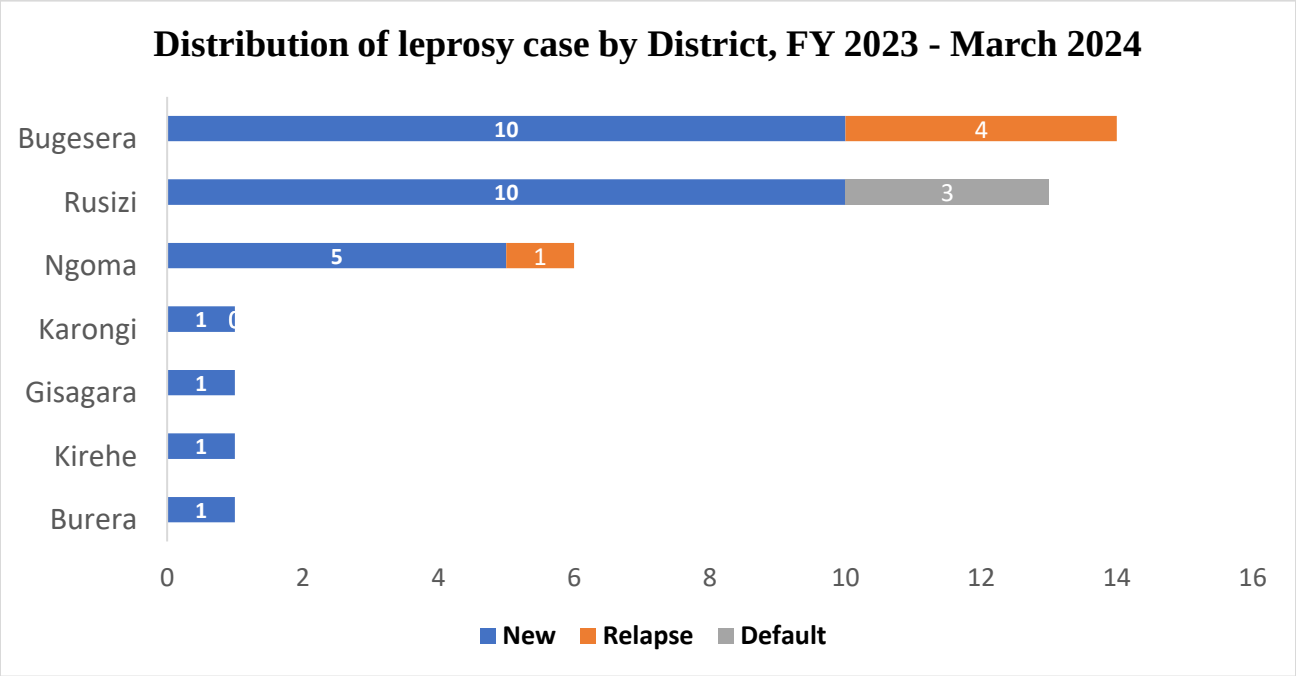

Figure 28: ***Distribution of leprosy case by District, FY 23-24***

8.3. Leprosy notification

The program registered 38 leprosy cases in FY 23-24 of which 95% were Rwandan nationals, and in two instances, refugees from Burundi and Eritrea in Mahama and Gahora. New leprosy cases accounted for (78%) 29/38 with a male/ female ratio of 1.3 and 1 child aged 10 years with PB leprosy without any leprosy-caused disability accounted for 3% of all new cases. In the same period, the program reported four relapse leprosy cases and three cases in which MDT had abruptly stopped in previous fiscal years. Forty-five per cent (13/29) of new leprosy cases had the multibacillary form of the disease versus 55% with the Paucibacillary form. The results of disability screening at the beginning of MDT showed that 59% of all new cases had no leprosy-related disability, 28% (8/29) had grade 1 disability and 14%(4/29) had grade 2 disability. A relative decrease in the proportion of new cases with MB leprosy and grade 2 disability compared with the last three FYs indicates an improvement in leprosy early detection averting complications associated with advanced forms of the disease. Over the years, males have consistently accounted for the majority of leprosy-related disability. For instance, in FY 23-24, males made up 50% of all new cases with G1 and G2 disability and 75% of new cases with G2 disability, underscoring the

need for integrated approaches to reach this part of the population, as there is no one size fits all when it comes to strengthening leprosy care and support.

Table 23: Leprosy notification, FY 23-24

LEPROSY CASES	MB	PB	Total
New cases (NC).			
# of new cases (NC)	13	16	**29**
# of children among new cases (0-14 years)	0	1	**1**
# of women among new cases	6	6	**12**
# of new cases detected during active case finding Campaign	11	12	**23**
# of new cases evaluated for their disability at Diagnosis	13	16	**29**
# with grade 1 disabilities	3	5	**8**
# of children with visible deformities (G2D)	0	0	**0**
# of all-new cases with visible deformities (G2D)	4	0	**4**
# 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	5	0	**5**
# of retreatment after default	3	0	**3**
Total cases	21	16	**37**

8.4. Leprosy treatment outcome

Donated by Novartis through the WHO, Multi-Drug Therapy (MDT) made of Clofazimine, Dapsone and Rifampicin is available at all healthcare levels, nationwide. Facilities in endemic zones keep the medication in their pharmacies and those in non-endemic areas request MDT upon case enrollment.

In FY 22-23, the program enrolled five new Paucibacillary Leprosy cases including one child aged 2. Of these, 80% (4/5) completed the treatment and 20% (1/5) was lost to follow-up. Disability assessment was consistent at the beginning and end of MDT, as 80% (4/5) of cases who had no disability completed the program without developing new disabilities, and a 38-year-old female case who had a G1 disability was lost to follow-up before developing new disabilities.

The program registered 27 MB Leprosy cases, with a male predominance of 59% in FY 21-22, and they were due for the outcome this year. At the beginning of MDT all cases were assessed for disability, 63% (17/27) had no disability, while 11 % (3/27) and 26% had grade 1 and 2 disability, respectively. 60 %(6/10) of cases with disability were male and 83 % of them had grade 2 disability at the time of enrollment. Ninety-six (26/27) of all MB cases enrolled in FY 22-23 completed the treatment while one male patient was lost to follow-up in 2022, but rejoined the program in this fiscal year and is being followed up at Nzangwa Health Center. All cases had a disability assessment upon treatment completion, 70% of cases had a grade 1 disability, no patient

had a grade 2 disability and 30% had no disability at all. Six per cent (1/17) patient who had a G0 disability had developped a G1 disability by the end of MDT, 67% (2/3) who had a G1 disability improved and completed the program with a G0 disability. Upon program completion, 87 % (six out 7) of patients with a G2 disability at diagnosis still had disability grade 2, while 1/7 improved from a G2 to a G1 disability. This displays the impact of early Leprosy detection on the outcome and undoubtedly on other aspects of Leprosy care. As highlighted below patients enrolled with G2 disabilities had less improvement in terms of disability assessment, highlighting the need for regular follow-up to prevent disability from worsening, especially in patients with MB Leprosy.

Table 24: Leprosy treatment outcome (Enrolled in FY 21-22 for MB and FY 22-23 for PB cases)

Outcome	New cases		Relapses		Retreatment after default	
	MB	PB	MB	PB	MB	PB
Registered	**23**	**5**	**4**	**0**	**0**	**0**
Completed Treatment	22	4	4	0	0	0
Lost to follow up	1	1	0	0	0	0
Deaths	0	0	0	0	0	0
Non evaluated	0		0	0	0	0
Treatment success (%)	**96%**	**80%**	**100%**	-	-	-
Number of patients having developed leprosy reactions during treatment	1	0	0	0	0	0
Number and proportion of patients assessed for disabilities at least both at the beginning and end of treatment	22	4	4	0	0	0
	96%	**80%**	**100%**	-	-	-
Number of patients having developed new disabilities during treatment	0	0	0	0	0	0

8.5. Leprosy chemoprophylaxis

From the FY 22-23, the program started implementing an SDR for every Leprosy household contact in endemic sectors. A retrospective approach was used to distribute chemoprophylaxis to individuals who had close contact with Leprosy index cases and had been enrolled in the program from 2019 onwards. Every contact for whom active TB and Leprosy infections have been ruled out is educated on PEP. Consenting contacts are then enrolled in the program, receive a single dose of Rifampicin, and are reviewed at least once a year for 5 years to evaluate any development of Leprosy symptoms.

Over the last three FYs, 97% (369/382) of screened contacts were eligible for PEP. Only 28% of those eligible for PEP received it. This is accounted for by the fact the initiative is relatively new, and the lack of an adequate mechanism to ensure follow-up in the community and awareness. This

warrants adapted approaches to leverage the active case-finding initiative and CHWs to ensure a sustainable channel for chemoprophylaxis for the Leprosy contact community.

Table 25: Contact screening and PEP distribution for the last three FYs cascaded by health facility

Health facilities	Number of contacts	Screened	Presumed Leprosy	Leprosy cases		Eligible to PEP	Received PEP
				PB	MB		
Bugarama (Rusizi) CS	63	53	1	0	0	52	19
Butaro CS	12	0	0	0	0	0	0
Byahi (Rubavu) CS	1	0	0	0	0	0	0
Gacuba II CS	1	0	0	0	0	0	0
Gikundamvura CS	256	198	2	0	0	196	56
Gishubi CS	39	32	2	1	0	30	23
Islamic (Bugarama) CS	11	11	0	0	0	11	4
Jarama CS	43	37	2	0	2	35	2
Kigembe CS	6	6	0	0	0	6	0
Nyabitimbo CS	43	30	0	0	0	30	0
Nyakabuye CS	9	8	0	0	0	8	0
Nzangwa CS	25	7	6	5	0	1	0
Total	**509**	**382**	**13**	**6**	**2**	**369**	**104**

CHAPTER 9: FINANCING THE NSP TB

9.0 Introduction

The TB National Strategic Plan (NSP) is a key instrument to guide TB control work in Rwanda in accordance with the most recent World Health Organization (WHO) international guidance.
The major funding sources for the Rwanda TB programs are:

- Government Revenues
- Development Partners contributions through General and Sector Budget Support and Donor funds, partially on budget as seen in the development budget, and partially earmarked and project related. These include the Global Fund for HIV & AIDS, TB and Malaria, World Health Organization and CDC – COAG.

9.1. Funding Sources for TB Expenditures in Rwanda FY 2023-2024

The Ministry of Health and the Rwanda Biomedical Center 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.

9.2. Public and external funding sources for TB NSF

The Global Fund for AIDS, TB and Malaria (GFATM) contributed USD 5 061 433; the GoR contributed USD 2 459 123 to give a total budget of USD 7 520 556 for fiscal year 2023-2024
The TB/NSP total spending amounted to USD 7 277 011 (97%) as follows: Global Fund spent USD 4 966 086 representing 98% of total budget; GoR expenditures were USD 2 310 925 representing 94% of planned budget for Fiscal year 2023-2024.

Table 26: Budget execution by source of fund

BUGDET AGENCY	Opening balance in USD	FY 2023-2024 in USD			Variance in USD end June 2024	Performance in %
		Initial budget	Revised budget	Expenditures		
Global Fund for AIDS, TB and Malaria (GFATM)	916,761	4,144,672	5,061,433	4,966,086	95,347	98%
GoR (Recurrent budget)			2,459,123	2,310,925	148,198	94%
Total	**916,761**	**4,144,672**	**7,520,556**	**7,277,011**	**243,545**	**97%**

9.3. 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 prioritization process by the Ministry, RBC and decentralized levels basing on HSSP III and different disease program strategic plans serve as guiding documents.

A part from program specific financing, the estimation of GoR contribution takes into consideration all other health related programs costs, categorized 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, (viii) Fixed tangible non-financial Assets.

As the table below shows for FY 2023-2024, the GoR is contributing to TB expenditures the total amount of USD 2 459 123 with TB Expenditures by MTEF budget category of USD 2 310 925 representing 94 % of total budget planned for Fiscal year 2023-2024.

*Table 27**: GoR TB NSP budget and expenditure per MTEF chapter for the year ended 30 June 2024***

Budget Agency	FY 2023-2024 in USD		Balance end June 2024 in USD	Performance rate in %
	Approved Budget	Committed Amount		
21 Compensation of employees	1,490,398	1,343,349	147,049	90%
22 Use of goods and services	373,612	379,391	(5,779)	102%
25 Subsides	49,780	49,776	4	100%
26 Grants	122,992	120,762	2,230	98%
27 Social assistance	173,617	171,196	2,421	99%
28 Other expenditures	19,207	19,120	87	100%
33 Inventory	8,256	8,220	36	100%
34 Fixed tangible non-financial Assets	221,262	219,112	2,150	99%
Total	**2,459,123**	**2,310,925**	**148,198**	**94%**

As reflected in the table below, the GoR budget per budget agency is USD 2 459 123 whereas the expenditure is USD 2 310 925. The type of budget agencies with the highest budget ceiling is Districts hospitals with USD 1 089 044, RBC with USD 509 056 and Ministry of Health with USD 488 263. The expenditures were respectively USD 943 046 for Districts, USD 513 970 for RBC and USD 484 309 for Ministry of Health.

Table 28: GoR TB NSP budget and expenditure per Budget agencies for the year ended 30 June 2024

Budget Agency	FY 2023-2024 in USD		Balance end June 2024 in USD	Performance rate in %
	Approved Budget	Committed Amount		
CHUB	87,807	87,807	-	100%
CHUK	115,868	115,868	-	100%
Districts	1,089,044	943,046	145,998	87%
HNN	48,111	48,111	-	100%
MINISANTE	488,263	484,309	3,954	99%
RBC	509,056	513,970	(4,914)	101%
RMH	94,669	94,652	17	100%
RWANDA FDA	26,305	23,162	3,143	88%
Total	**2459123**	**2310925**	**148198**	**94%**

9.4. The Global Fund contribution

For the Global Fund contribution, the budget for the year 2023–2023 was USD 5 061 433 out of this budget, a total of USD 4 966 086 have been effectively spent by Global Fund cost categories representing 98 % of total budget for RBF TB grant.

Table 29: GF TB NSP budget and expenditure per NSP cost category for Fiscal Year 2023-2024

BUGDET AGENCY	Opening balance in USD	FY 2023-2024 in USD			Variance in USD end June 2024	Performance in %
		Initial budget	Revised budget	Expenditures		
1.0 Human Resources (HR)		763,622	593,254	588,668	4,587	99%
2.0 Travel related costs (TRC)	736,716	328,883	1,065,599	1,065,599	-	100%
3.0 External Professional services (EPS)		25,000	25,000	25,000	-	100%
4.0 Health Products - Pharmaceutical Products (HPPP)		367,168	388,037	388,037	-	100%
5.0 Health Products - Non-Pharmaceuticals (HPNP)	180,045	1,510,463	1,695,863	1,695,864	-	100%
6.0 Health Products - Equipment (HPE)		56,843	67,836	67,835	-	100%
7.0 Procurement and Supply-Chain Management costs (PSM)		134,360	144,817	144,817	-	100%
10.0 Communication Material and Publications (CMP)		19,847	3,837	3,838	-	100%
11.0 Indirect and Overhead Costs		133,778	102,114	102,114	-	100%
12.0 Living support to client/ target population (LSCTP)		162,633	333,001	333,001	-	100%
13.0 Payment for results		642,074	642,074	551,314	90,760	86%
Total	**916,761**	**4,144,671**	**5,061,432**	**4,966,087**	**95,347**	**98%**

As reflected in the table below, the revised budget is USD 5 061 433 whereas the expenditure is USD 4 966 086. The type of budget agencies with the highest budget ceiling is Rwanda Bio Medical Centre with USD 4 368 346 and Ministry of Health with USD 642 074.

Table 30: GF TB NSP budget and expenditure per Budget agencies for the period of July 2023 to June 2024

BUGDET AGENCY	Opening balance in USD	FY 2023-2024 in USD			Variance in USD end June 2024	Performance in %
		Initial budget	Revised budget	Expenditures		
CHUB		25 506	25 506	23 127	2 379	91%
CHUK		25 506	25 506	23 298	2 208	91%
MOH		642 074	642 074	551 314	90 760	86%
RBC	916 761	3 451 585	4 368 346	4 368 346	0	100%
Total	**916 761**	**4 144 672**	**5 061 433**	**4 966 086**	**95 347**	**98%**

CHAPTER 10: Conclusion

Considering the comprehensive insights and achievements outlined in this annual report, it is evident that Rwanda has made substantial progress and advancements in fighting tuberculosis and leprosy. The following conclusion summarizes the fundamental results and significant milestones that RBC through Tuberculosis and other respiratory diseases realized in the 2022-2023 Fiscal year:

- TB Diagnostic and notification efforts: Rwanda made significant strides in tuberculosis (TB) control, maintaining the good detection rate of over 90% which demonstrate impact of targeted interventions to enhance case finding and focus on high-risk group. Community Health Workers (CHWs) played a pivotal role, referring 52% of these cases and contributing to 31.4% of TB notifications, exceeding national targets. The country expanded its GeneXpert network to 91 sites, facilitating rapid TB diagnosis and drug resistance testing which contibuted to reach the universal drug susceptibility testing among bacteriologically confirmed TB cases. Despite a fluctuation in TB notifications, including a decrease in Rwamagana District, Rwanda maintained robust surveillance, with 95.7% of bacteriologically confirmed cases undergoing drug susceptibility testing. Most of the cases occurred among males in the productive age life, with Kigali City recording the highest incidence. TB-HIV co-infection remained a concern, and there was a notable decrease in drug-resistant TB cases, especially in Kigali City and the Eastern Province.
- TB prevention: Significant ignificant advancements have been made in identifying and managing tuberculosis (TB) among household contacts of confirmed TB cases. This includes using a symptom-based approach to rule out active TB and employing the tuberculin skin test to detect latent TB infection among contacts aged 5 years and older. Enhanced contact investigations have led to higher coverage rates for preventive therapy among both children under 5 years old and those 5 years and older. Additionally, integrating tuberculosis preventive therapy (TPT) among people living with HIV has been a crucial part of Rwanda's TB control strategy, facilitating widespread access to preventive therapy and significantly reducing TB incidence in this high-risk group. Despite these successes, the program recognizes the need for ongoing efforts to ensure comprehensive coverage and address gaps in screening and the initiation of preventive therapy. Continued focus on these areas will be essential for sustaining progress and further reducing the TB burden in Rwanda.
- TB treatment outcomes: The overall treatment success rate (TSR) for tuberculosis (TB) in Rwanda has shown steady improvement, reflecting the country’s

commitment to enhancing TB care and management. This significant progress in TSR is largely due to improved follow-up of patients at health facilities. The upward trend in TSR, particularly among TB/HIV co-infected patients, demonstrates the effectiveness of integrating TB and HIV services, which ensures that more patients receive comprehensive care. Despite these advances, challenges persist, especially in addressing mortality and loss to follow-up, which continue to impact overall outcomes. Additionally, the treatment outcomes for multidrug-resistant TB (MDR-TB) patients, especially those co-infected with HIV, highlight the need for ongoing support and tailored care strategies. The consistent completion rates for tuberculosis preventive therapy (TPT) among contacts of TB patients, particularly among people living with HIV (PLHIV), further underscore the effectiveness of Rwanda's TB controlefforts.

- Tuberculosis management and supply chain: Rwanda aligned the management of TB patients with the latest WHO recommendations by updating the MDR-TB national guidelines to include the most recent WHO recommendations for MDR-TB treatment. Targeted training programs were implemented to enhance the quality of care provided to TB patients. Annual evaluations and workshops facilitated collaboration among district TB stakeholders, enabling a comprehensive review of progress and identification of areas needing further attention. Research initiatives were crucial in shaping policy and refining treatment regimens, diagnostic tests, and cost evaluations. Findings from research led to changes in the algorithm for diagnosing MDR-TB in Rwanda. The Coordinated Procurement and Distribution System (CPDS) ensured a consistent supply of TB medications, although some products faced challenges in the tender process. Active drug-safety monitoring (aDSM) highlighted the importance of ongoing staff training to effectively manage and prevent adverse events.
- Leprosy control: Active case-finding, especially in leprosy-endemic areas, has been crucial for identifying undiagnosed cases, thus reducing the risk of disease transmission and progression. Sensitization campaigns, including outreach through churches and community health workers, have been vital in raising awareness and encouraging participation in screening efforts. However, challenges remain, particularly with the effective implementation of preventive treatment for contacts of leprosy patients. The introduction of single-dose rifampicin (SDR) for household contacts is a significant advancement, but its success hinges on overcoming barriers such as follow-up mechanisms and community awareness. The program's findings underscore the ongoing need for continuous capacity building among healthcare providers to enhance screening accuracy and treatment outcomes, especially for advanced leprosy cases. The high prevalence of leprosy-related disabilities among

males highlights the need for targeted approaches to effectively reach this demographic. While progress in leprosy control has been made, further efforts are needed to strengthen contact tracing in non-endemic zones and improve preventive treatment coverage.

- Financing for TB and other respiratory communicable diseases has been a collaborative effort, involving contributions from multiple sources. The total expenditure for the TB/NSP program reached nearly 97% of the allocated budget, showing improvement from the previous fiscal year 2022-2023. The program received significant support from the Global Fund. Expenditures were primarily directed towards district hospitals, the Rwanda Biomedical Center, and the Ministry of Health. Both the Global Fund and Government of Rwanda budgets were managed effectively and closely aligned with the planned allocations

To sustain the achieved progress and enhance performance, TB&ORD will prioritize on the following areas:

- Expand the use of molecular testing as an initial diagnostic test by adopting the pool approach
- Monitor regularly the quality control for smear microscopy
- Scale up the use of stool samples for diagnosing TB in children
- Enhance active case finding in correction service and other HRG people
- Continue to advocate for nutrition support of TB patient
- Continue the mentorship on TB childhood
- Improve early leposy detection in endemic areas and contact investigation in non endemic area.
- Maintain the achievement reached.

In summary, Rwanda's dedicated efforts to tackle TB and related diseases have resulted in notable advancements in diagnosis, treatment, prevention, and coordination. Although challenges remain, the country’s commitment to data-driven decision-making and research demonstrates a proactive approach to managing these health concerns.

Annex 1: TB Indicators in Monitoring and evaluation framework, Rwanda from July 2023 to June 2024.

Data used was mainly extracted in etracker on 06 august 2024

Indicator	2022/23 (Target)	2022/23 (performance)	level of performance	2023/24 (Target	2023/24 (performanc	level of performanc
Proportion of first level health facilities that have at least one staff trained to provid	90%	0%	0%	90%	79%	88%
TB notification rate new and relapses (per 100,000)	165 (38.5/100	0%	112%	49/100K	60/100K	150%
TB treatment coverage (End TB Top-ten indicator N° 1)	89%	0%	80%	93%	98%	105%
Contact investigation coverage (End TB Top-Ten N°6)	>95%	0%	109%	95%	99%	104%
Proportion of TB cases notified among high-risk groups (HRGs(Number and Percent	58%	0%	93%	53%	57%	107%
The proportion of eligible malnourished DS TB patients (BMI<18.5) who have acces	80%	0%	59%	80%	30%	38%
Proportion of children 0-14 years notified among TB cases new and relapse	10%	0%	56%	7%	9%	139%
Proportion of newly notified patients diagnosed using WHO recommended rapid te	S1:75%	0%	67%	65%	68%	105%
DST Coverage for TB patients (End TB Top-Ten indicator N° 7)	83%	0%	78%	85%	96%	113%
Proportion of notified patients with rifampicin resistant (RR) or MDR who receive se	100%	0%	91%	100%	91%	91%
Proportion of health facilities diagnostic sites scoring pass in EQA for smear microsc	95%	0%	67%	90%	79%	87%
Proportion of health facilities Xpert sites scoring pass in EQA for Xpert MTB/RIF	80%	0%	44%	80%	94%	117%
Treatment success rate (TSR) for all forms of TB cases (DS & DR-TB cases) (End TB	S1> 88%	0%	102%	89%	91%	102%
Percentage of CDT with no stock out of FL tracers (RHZE and RH ad) drugs of experie	100%	0%	96%	100%	97%	97%
Percentage of MDR TB centers with no stock out of SLD in the last 12 months	100%	0%	100%	100%	100%	101%
Proportion of eligible PLHIV initiated on TPT	65%	0%	80%	90%	95%	105%
Treatment success rate, confirmed RR/MDR-TB	88%	0%	112%	92%	91%	99%
Treatment coverage new drugs (End TB Top-ten indicator N°8)	>95%	0%	105%	95%	100%	105%
Proportion of TB treatment cards where ADSM section is completed	60%	0%	249%	85%	99%	116%
Proportion of diagnosed TB cases tested for HIV infection (End TB Top-ten ind	>95%	0%	105%	95%	98%	103%
Proportion of HIV positive TB cases given antiretroviral therapy during TB treatment	95%	0%	100%	95%	93%	98%
Treatment success rate for TB patients (all forms) receiving DOT through communit	96%	0%	98%	96%	93%	97%
Percentage of Health providers screened for TB at least once during the year. (healt	80%	0%	108%	80%	95%	118%
LTBI treatment coverage among contacts < 5 years (End TB Top-ten indicator	90%	0%	101%	90%	97%	108%
LTBI treatment coverage among contacts > 5 years	40%	0%	66%	75%	83%	111%
Percentage of population with adequate knowledge* on TB symptoms, transmissio	NA	0%	NA		NA	NA
Proportion of TB cases (all forms) referred by community health volunteers during	>25%	0%	110%	25%	31%	126%
eTB coverage in CDT and CT proxy of Timeliness of routine reporting	98%	0%	103%	60%	100%	167%
Case fatality ratio (CFR) (End TB Top-ten indicator N° 10)	6%	0%	95%	5%	N/A	N/A
Number of standard criteria met using WHO TB standard and benchmarks checklist	tbd	0%	NA	1000%	N/A	N/A
Proportion of public health facilities where at least one staff has participated in trai	78%	0%	NA		N/A	N/A
Percentage of people diagnosed with TB who report stigma in health care settings t	TBD	0%	NA		N/A	N/A

Annex 2: RBF achievement, from July 2023 to June 2024.

Coverage/Output indicator	NSF Target	Program Results		Level of achievement
	2023-2024	2023-2024		
	%	N# D#	%	
Percentage of HIV-positive new and relapse TB patients on ART during TB treatment	95%	1079 1162	92.%	97.6%
Percentage of PLHIV on ART who initiated TB preventive therapy among those eligible during the reporting period	93.30%	213,307 222,604	95.80%	100%*
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	89%	8464 9351	90.5%	100%*
Proportion of people (>5 years) in contact with TB patients who began preventive therapy	50%	1578 1731	83%	100%*
Proportion of TB cases notified in high-risk groups among all TB cases	60%	4960 8551	50%	96.6%
Percentage of new and relapse TB patients tested using WHO recommended rapid tests at the time of diagnosis	85%	5802 8380	69.2%	81%
Treatment success rate of RR TB and/or MDR-TB: Percentage of cases with RR and/or MDR-TB successfully treated	88.50%	80 88	91%	100%*
Case notification rate of all forms of TB per 100,000 population - bacteriologically confirmed plus clinically diagnosed, new and relapse cases	31	60 1E+05	60	100%*

* means target below 100%

Annex 3: Leprosy Indicators in Monitoring and evaluation framework, Rwanda from July 2023 to June 2024.

	Indicator	2023-2024	
		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)	0,3 per million	0.29 per million (1*1000000/13,797,269)
3	Availability of web-based, case-based reporting system allowing disaggregation by age, sex, place of residence and other relevant criteria	21-Jul	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)	21-Jul	No
6	New case-detection (number and rate per 100000)	27	29
		(0,20)	0,21
			(29*100000/ 13,797269)
7	Leprosy prevalence rate per 10000.	0,014	0,02
			(29*10000/13,797269)
8	Proportion of G2D cases among total new cases detected.	≤ 12%	14% (4/29)
9	Proportion of child cases among total new cases detected.	5%	0.0% (0/29)
10	Proportion of MB cases among total new cases detected.	38%	44.8% (13/29)
11	Proportion of female cases among total new cases detected.	> 45%	55.2% (16/29)
12	Proportion of contacts screened.	85%	75% (382/509)
13	Proportion of foreign-born among total new cases detected	0	7% (2/29)
14	MDT completion for new PB	> 95%	80% (4/5)
15	MDT completion for new MB	> 95%	96% (22/23)
16	Proportion of new PB patients assessed for disability status at least both at beginning and at end of treatment	> 90%	80% (4/5)
17	Proportion of new MB patients assessed for disability status at least both at beginning and at end of treatment	> 90%	96% (22/23)
18	Number and proportion of new PB patients who have developed new disabilities during the course of treatment	0 case	0 case
		0%	0%
19	Number and proportion of new MB patients who have developed new disabilities during the course of treatment	≤ 1 case	0 case
		(≤ 5%)	0%
20	Number of cases treated (new and retreatment) having developed leprosy reactions during treatment	≤ 3 cases	0 case
21	Number and proportion of retreatment cases over the total leprosy cases notified	≤ 10%	22 % (8/37)
22	Existence of an association of patients affected by leprosy in the endemic sectors	(2/8)	(2/8)