Republic of Rwanda

Ministry of Health

Rwanda National Tuberculosis and Other Respiratory Communicable Diseases

Annual Report

2016-2017

RWANDA BIOMEDICAL CENTRE

A Healthy People. A Wealthy Nation

CONTROL OF TUBERCULOSIS, OTHER RESPIRATORY COMMUNICABLE DISEASES AND LEPROSY IN RWANDA

The mission of Tuberculosis (TB) and other respiratory communicable diseases control in Rwanda is:

- To reduce the TB epidemic, by promoting universal and equitable access to quality diagnosis and appropriate treatment of TB, MDR-TB, and TB/HIV patients and by enhancing prevention of the disease.
- Objectively, we aim to:
    - Provide early TB detection in general population and intensify case-finding in prioritized high-risk groups so that the proportion of presumptive cases identified among HRG increases from 11% to at least 30% by mid-2018.
    - Increase treatment success rate from 85% to 87% for bacteriological confirmed TB cases and maintain it at 87% for MDR-TB.
    - Improve TB prevention (TB infection control in health facilities, behavioral change in the general population and prevention by medication) so that the percentage of population with adequate knowledge on TB increases from 56% to 75% by 2018.
    - Improve managerial capacities of the TB program; enhance the monitoring, evaluation system and operational research, by implementing an electronic TB register in all CDTs.

We are also in charge of combating Leprosy in Rwanda. Our 2014-2018 objectives against Leprosy are to:

- Improve the early detection of leprosy and reduce the percentage of new cases with grade 2 of disabilities at less than 10%.
- Improve the completion rate of treatment to 90% for MB cases and 95% for PB cases and handle properly disabilities related to leprosy.
- Strengthen the quality Leprosy control services and improve capacity of health care workers as well as community health workers.
- Facilitate socio-economic reintegration of leprosy-affected people.
- Increase outreach efforts, information and communication, to reduce the stigma and discrimination of people and families affected by leprosy.

The TB and other respiratory communicable disease (TB & ORD) Division is in charge of coordinating development of related strategies, policies and guidelines, their dissemination, provides oversight of implementation at peripheral level and ensure national reporting. Implementation involves national public and private partners as well as international partners.

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FOREWORD

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

This report has been developed based on data provided by the TB and ORD surveillance system from across Rwanda. The annual report provides a comprehensive picture of the occurrence and management of TB, ORD and Leprosy in Rwanda and is structured based on the 2013-2018 Rwanda TB National Strategic Plan (2013-2018 TB NSP) and the 2014-2018 Rwanda Leprosy National Strategic Plan (2014-2018 Leprosy NSP).

Actions needed toward elimination of Tuberculosis, other respiratory communicable diseases and Leprosy in Rwanda will require strengthened and more integrated national and peripheral health services. It ensures consistent, evidence-based prevention, treatment and support to patients, their families and other contacts, as TB, ORD and Leprosy do not exist in isolation from other health and social concerns.

This report represents a collaborative effort between the Government of Rwanda and its partners. Representatives from all groups of stakeholders involved in the national TB response participated in the production of this report.

I would like to acknowledge the efforts of dedicated staff in the various institutions of the Government of Rwanda who worked tirelessly to complete this report. We remain entirely grateful to the inputs and support provided by our Partners. Special thanks to the members of the civil society, local and international Non-Governmental, bilateral organizations as well as Rwandan Government institutions greatly participated in the completion of this report. I would also like to thank all members of technical working group that reviewed and validated the content of this report.

We gratefully acknowledge all those who contributed information at central, intermediate and peripheral levels of the TB, ORD and Leprosy control to Rwanda.

We thank you all for your support in the fight against TB, ORD and Leprosy in Rwanda.

Dr. Diane Gashumba

Minister of Health

ACKNOWLEDGEMENTS

The Ministry of Health and Rwanda Biomedical Center gratefully acknowledge the Government of Rwanda through strong leadership of H.E the President of Republic of Rwanda for the continuous support to fight Tuberculosis and other respiratory diseases in our country.

Our gratitude goes out to:

- The staff from different Health facilities who continue to provide care and treatment to patients and implement activities according to the national policies and guidance.
- To all stakeholders including CSO and NGOs for their great contribution.

We would also thank the following partners: World Health Organization, Global Fund for HIV&AIDS, TB and Malaria, USG PEPFAR and Damian Action who support the government of Rwanda to reach the global targets by ensuring that Rwanda is free of Tuberculosis and Leprosy.

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ABBREVIATIONS

ACF	Active Case Finding
aDSM	Active Drugs Safety Monitoring
ART	Antiretroviral Therapy
CCM-Rwanda	"Country Coordinating Mechanism" of Global Fund in Rwanda
CDT	Centre for Diagnosis and Treatment of Tuberculosis
CHUB	Butare University Teaching Hospital
CHUK	Kigali University Teaching Hospital
CHW	Community Health Worker
CPT	Cotrimoxazole Preventive Treatment
CT	Centre for Treatment of Tuberculosis
CXR	Chest X-ray
DH	District Hospital
DHIS	District Health Information System
DIAMA	Diagnostics for Multidrug-resistant tuberculosis in Africa
DOT	Directly Observed Treatment
DQA	Data Quality Audit
DST	Drug Susceptibility Testing
EAPHLN	East African Public Health Laboratory Network
EDPRS	Economic Development and Poverty Reduction Strategy
EPTB	Extra Pulmonary TB
E-TB	Electronic Tuberculosis surveillance system
FNA	Fine Needle Aspiration
FY	Fiscal year
G2D	Grade 2 Disability
GDF	Global Drug Facility
GFATM	Global Fund for AIDS, TB and Malaria
GLC	Green Light Committee
GoR	Governement of Rwanda
HF	Health Facility
HFN	High False Negative
HFP	High False Positive
HIV	Human Immune Virus
HMIS	Health Management Information System
HRG	High Risk Group
HRTT	Health Resource Tracking Tool
HSSP	Health Sector Strategic Plan
IC	Infection Control
IMCI	Integrated Management of Childhood Illnesses
IPT	Isonizid Preventive Therapy
ISS	Integrated Supportive Supervision
LED-FM	Light Emitting Diode Fluorescence Microscopy
LFN	Low False Negative
LFP	Low False Positive
LTFU	Lost to follow up
M&E	Monitoring and Evaluation
MB	Multibacillary
MD	Medical Doctor
MDR-TB	Multidrug Resistant Tuberculosis
MoH	Ministry of Health
MPPD	Medical Production and Procurement Division
MTEF	Medium Term Expenditure Framework
MTR	Midi Term Review

NGOs	Non Government Organizations
NRL	National Reference Laboratory
NSP	National Strategic Plan
NTPB+	New Pulmonary Bacteriological confirned
NYC	National Youth Council
PAL	Practical Approach for Lung diseases
PB	Paucibacillary
PBF	Performance- Based Financing
PLHIV	People Living with HIV
PMDT	Programmatic Management of Drug Resistant Tuberculosis
QC	Quality Control
QE	Quantification Error
RAM	Random Access Memory
RBC	Rwanda Biomedical Center
RBF	Results Based Financing (of the Global Fund)
RDQA	Routine Data Quality Audit
RH	Referral Hospital
RMH	Rwanda Military Hospital
RRP+	Reseau Rwandais des Personnes vivant avec HIV
RSQA	Rapid Services Quality Assessment
SDGs	Sustainable Development Goals
SMART FMIS	Integrated Financial Management Information System
SOPs	Standard Operating Procedures
SPIU	Single Project Implementation Unit (MoH)
SS-	Sputum Smear Negative
SS+	Sputum Smear Positive
SSo	Sputum Smear Not done
TAF	Treatment After Failure
TB&ORD	Tuberculosis and Other Respiratory Communicable Diseases
TH	Traditional Healer
TSR	Treatment Success Rate
TWG	Technical Working Group
USD	United States Dollars
WHO	World Health Organization

TB screening and diagnosis

There has been an extension of high sensitive TB screening (any cough/X-ray/re-screening of contacts at end of index case treatment) and diagnostic (Xpert machines in all hospitals) tools/strategies, as well as improvements in detection among high risk groups. Implementation of these tools/strategies and active screenings aims to reduce undetected TB cases and promote early diagnosis. As outcome, TB notification targets were reached, and numbers of notified cases remained stable for the last five years, compared to consistent decrease between 2006 and 2012.

Compared results of first round (2013-2014) and second round (2016-2017) of TB active case findings (ACF) in selected high risk groups showed that the TB notification declines after massive X-ray screening, confirming that earlier identification and treatment of tuberculosis reduces TB burden and transmission.

For the 1st time re-screening contacts of infectious cases at end of treatment of index case was initiated to try to cover the long incubation period of TB. Preliminary findings show that additional cases may be found. The strategy will be maintained and strengthened.

Even though sensitive molecular tests to ensure early detection of drug-resistant TB were made more available at decentralized level, some patients consult with delays and died before treatment diagnostic confirmation and treatment initiation.

As we are introducing and expanding new TB diagnostic techniques, control of their quality, as well as monitoring of their use should be also improved.

Community health workers have greatly contributed to bringing TB screening services close to populations in need. However, efforts still need to be provided, especially in Kigali where many TB cases in country are concentrated, through engagement of all community stakeholders.

TB management and treatment outcomes

TB commodities were generally and consistently available at health facilities level for patients' treatment. This was a positive outcome from strategies taken in the technical meeting to accelerate some orders or reschedule the delivery dates based on stock status. Measures taken will allow to avoid some issues faced like a two months Xpert cartridges stock out in 28% Xpert sites. Close monitoring of quantities of drugs and reagents reported by health facilities in the surveillance system is also highly needed.

A good treatment success rate was registered for susceptible bacteriological confirmed new and relapse TB cases (88%) patients, clinically diagnosed patients (79%) and for multi drug resistant (MDR-TB) patients (95%). The targets were achieved at level of 98.9%; 101.3% and 105.6% respectively. As well treatment success rate for patients managed in the community was 93% (target achieved at level of 98%).

All TB/HIV indicators surpassed pre-established targets. More than 99% of presumptive and TB cases have been tested for HIV. Since 2010 a constant decrease in HIV positivity among TB patients is observed. We will particularly monitor this, as the country has now initiated the "treat all strategy". Among HIV+ TB patients, 95% were on ART before TB treatment completion.

For the 1st time analysis of TB death audit reports was conducted and pointed out factors such as delay in screening and diagnosis demonstrated by high bacillary load for died bacteriological positive TB cases and low CD4 for died HIV+ TB cases. Undernutrition was also reported among

died TB patients. The TB death audit system will be strengthened to confirm those findings and specific interventions proposed.

However the target for sputum culture conversion was only achieved at 80% due to a regular percentage (9%) of control cultures not timely done since four years ago and an increasing contamination rate (11% for this year and 6% last year) of control cultures from MDR-TB patients on treatment and, despite the availability of TB medicines at central level, 43/201 CDTs reported stock out during this 2016-2017 fiscal year. We will ensure training/mentorship and close follow up of staff from health facilities with MDR-TB patients on MDR-TB management including the agenda of culture controls. TB&ORD Division will work closely with the NRL Division on how to minimize culture contamination rate.

TB prevention

The TB infection control (IC) practices are differentially implemented by health facilities. Routine surveillance reported that 80.4% of all health facilities were implementing the six basics measures. A more in deep internal assessment revealed that, in overall, 83% of Health Facilities have TB IC Plan. However, many gaps were identified calling for a more clarifications in TB IC implementation and monitoring procedures.

The TB screening among health care workers is implemented in all health facilities. Its implementation was find to be challenging due to lack of clear procedures. Its implementation and monitoring procedures need to be improved and health facilities better informed/mentored on them.

In order to increase the awareness on TB&ORD prevention, different messages were developed and disseminated through various communication channels such as radio program, live talk show program, radio and TV spot, outreach campaigns in the schools, prisons, refugee camps and general population, and more importantly during the 2017 World TB day.

Non-Governmental Organizations (NGOs), Civil Society Organizations (CSOs) as well as other community stakeholders such as peer educators (from prisons and PLHIV) intervene in TB prevention through sensitizations to reinforce mobilization and awareness in the community and TB screening. Monitoring and reporting of their contribution, as well as challenges they are facing need to be further improved.

Initiation of Isoniazide preventive therapy (IPT) was good for children under 5 years, as well as its completion. For PLHIV, IPT initiation is problematic, due to lack of final decision on its extension or close up. However, for those PLHIV who initiated IPT, completion was good.

TB program coordination and management

Periodically, with participation of Ministry of Health Institutions and partners, technical bodies met regularly, in meetings, workshops or through site visits, to revisit TB&ORD guidelines and strategies, their implementation status, their quality and their performance, and clarify/revise them where needed.

With this process, the national TB&ORD strategy was revised and a new GFTAM grant submitted successfully, and technical guidelines on MDR-TB, childhood TB and TB/HIV were revisited.

Capacity of central level and peripheral level staff continued to be improved through formal trainings, internal capacity building activities and participation in sites/practical activities with national and international experts through technical assistance.

The routine surveillance system with aggregate data has been updated to align with new WHO TB cases categorization system.

The electronic TB register (e-TB) implemented since 2014 has improved a lot and has been made more functional through system adjustments, training and mentorship. A strategy to make it more usable is needed.

For the 1st time, TB death audit reports were analyzed and findings (to be further confirmed) are in favor of interventions such as early TB screening and diagnosis through extension of using more sensitive tools and nutritional support.

As well, completed research activities suggested more use of sensitive TB screening and diagnostic tools.

Both paper and electronic TB&ORD surveillance tools were revised to include TB risk factors. In addition, an operation research on TB risk factors has been planned. All this will help to better identify who is really at risk of TB and focus interventions.

For the practical approach to lung health (PAL) system, we focused on the purchase of different equipment required for PAL diagnosis and follow up, training of health care providers and validation of treatment guidelines. The PAL system will continue to work towards setting up a robust M&E system for data collection, continue to train health workers and provide necessary equipment to health facilities.

Leprosy control

Leprosy control has improved significantly due to leprosy active detection, contact investigation, awareness of the general population with emphasis on sensitization campaigns in endemic areas. We also report an improvement of recording and reporting system of leprosy cases into HMIS through a national wide surveillance system instead of surveillance in endemic area only.

Mentorship of CHWs and Health Care Providers with an integration of basic leprosy services into general health services has made diagnosis and treatment of the disease more accessible promoting early detection and treatment as a key strategy to prevent grade 2 disability (G2D).

A total of 39 leprosy cases were reported, among them 30 new cases were diagnosed *(18 Multibacillary-MB and 12 Paucibacillary-PB).* The proportions of females among new cases was 50% while 7% were children. Compared to the last fiscal year that reported 14% with G2D the current year reports 30 % due to the late detection MB cases (7) in non-endemic areas.

The treatment completion rates for MB cases treated from cases registered July 2014 to June 2015 was 89% for new cases, 100% for relapse cases and 50% for retreatment after default cases, while 96% new PB cases notified from July 2015 to June 2016 successful completed treatment which is above the 95% target in the 2014-2018 NSP.

TB&ORD financing

During the Fiscal year 2016-2017 the total budget was USD 11,368,689 from Global Fund, Government of Rwanda, Damian Foundation respectively on rate of 88%, 11% and 1%.

Regarding of total expenditures, the budget execution was 77% of total budget approved. The variance of 23% not used was mainly due to the delay of procurement process of health products and equipment (10%), CDTs laboratory renovation (7%), human resources (2%) and other.

The total expenses were composed manly by medicines, health products and medical equipment paid, human resource, and advance payment on CDTs laboratories renovation and capacity building of employees.

TUBERCULOSIS AND OTHER RESPIRATORY COMMUNICABLE DISEASES CONTROL

I.1. Objective 1: Provide early TB detection in general population and intensify case-finding in prioritized high-risk groups (HRG) so that the proportion of TB cases all forms identified among HRG increases from 14% to at least 24% by mid-2018

I.1.1. Provide early rapid and quality diagnosis for TB, MDR-TB, and TB/HIV

I.1.1.1. Tuberculosis screening

TB screening is based on 5 questions (cough of ≥ 2weeks, fever, night sweats, weight loss, and contact history). Community health workers (CHWs) play a big role in identification and referring potential presumptive TB cases to health centres for early screening,thus bringing TB services to community.

The total number of presumptive TB cases is 155,778 with a positivity rate of 2.8 % (4,361 out of 155,778). This positivity rate increased from 2.6% of the 2015-2016 FY. A potential explanation is that the number of confirmed cases compared to the previous year increased, possibly following the improvement in samples transportation system, as proven by the increase in proportion of Xpert tests done and the increase in number of Xpert machine at HFs (from 16 machine in 2015-2016 to 47 machine in 2016-2017 FY). The decrease of 7.2 % of presumptive (as compared to 2015-2016 FY), may be due to the improvement in quality definition of presumptive TB by health facilities.

CHWs brought 39.5% of all presumptive TB and 25.7% of all sputum smear positive (SS+) TB cases detected. There is a decrease of 5% of presumptive TB case brought by CHWs compared to previous fiscal year. Contribution of CHWs in TB presumption is low in Kigali City [Fig 1].

Table 1 : TB detection and contribution of each screening level, Rwanda, July 2016-June 2017

DETECTION	CDT	CT	CHWs	Total
Presumptive TB cases	52,910	41,227	61,641	155,778
	34.0%	**26.5%**	**39.6%**	
B+ among presumptive TB cases	2,172	1,069	1,124	4,361
	49.8%	**24.5%**	**25.7%**	
Positivity rate	**4.1%**	**2.6%**	**1.8%**	**2.8%**

B+: *bacteriological confirmed cases.*

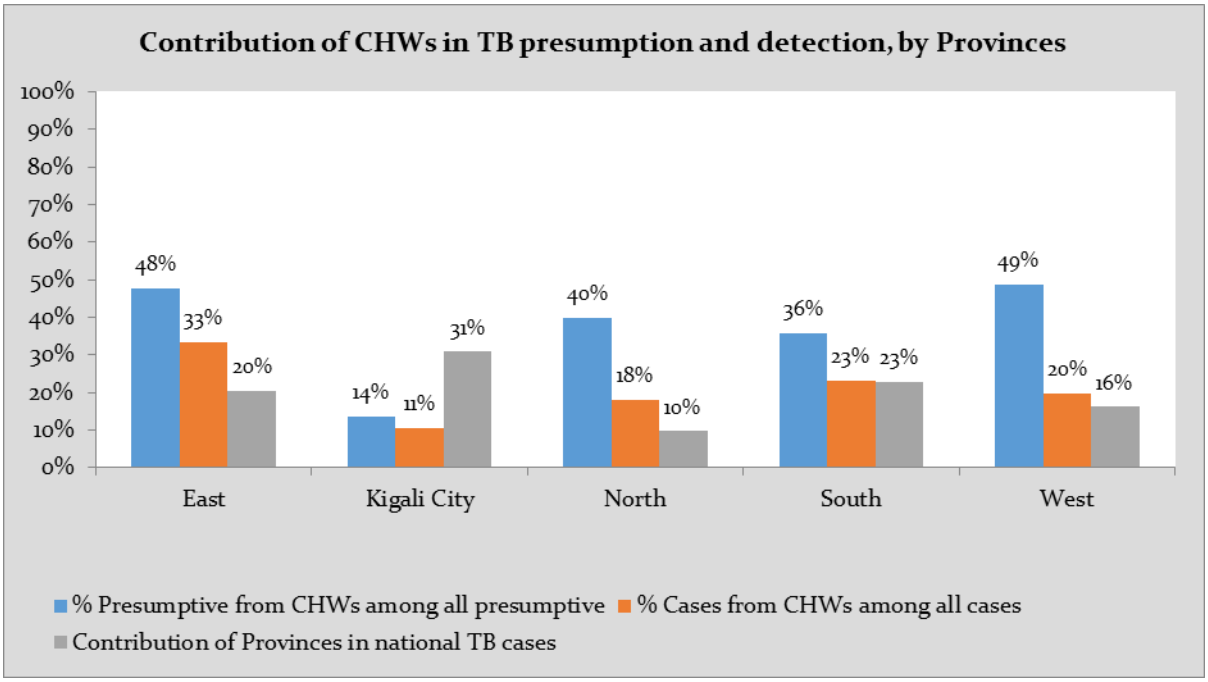

Figure 1 : Proportion of presumptive TB brought by CHWs (blue bars) and Proportion of TB cases brought by CHWs (Orange bars), by Provinces, compared to Provincial contribution in country's TB cases (grey bars), Rwanda, July 2016-June 2017.

I.1.1.2. Tuberculosis impact and notification indicators

The World Health Organization (WHO) in its 2016 Global Tuberculosis Report estimated rates of incidence (excluding HIV+ TB) for Rwanda at 56/100,000. Between 2013 and 2016, the incidence has decreased by 19%, from 69 to 56 per 100,000. Average annual decrease between 2013 and 2016 was 10% (TB NSP target of annual decrease was 5%).

During 2016-2017 FY, the TB surveillance system in Rwanda reported 5,760 TB cases, with 67.1% (3,868) being new bacteriologically confirmed pulmonary TB cases (NTPB+). The notification rate is 49 per 100,000 for All-forms TB cases (representing 102 % of the target) and 33 per 100,000 for NTPB+ (representing 115 % of the target). The difference between the positivity in laboratory (B+ table 1) and notified positive cases (table 2) may be explained by some drugs resistant TB cases recorded also in B+ table 1 but not included in the notification table.

The overall pulmonary localisations represented **86.9%** (5,008). TB was more diagnosed among men, with a male-female ratio for all-forms TB cases of **2.3**. The male case predominance was more observed among bacteriologically confirmed cases (new or previously treated).

Of all-forms TB cases, 74**.5%** (4,294) were reported among 15-54 years, while children <15 years represented 6.1% (354) and elderly of ≥55 years represented **19.3%** (1,112).

CHWs contributed up to **20.3 %** (1,173) of all-forms TB cases diagnosed representing 96.6 % of the annual target (table 3).

Table 2: Notification of TB cases by categories, age group and by sex, Rwanda, Jul 2016-Jun 2017

Cases Types	0-4 years		5-14 years		15-24 years		25-34 years		35-44 years		45-54 years		55-64 years		>=65 years		TOTAL			
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	TOTAL	M:F
NTPB+	3	3	35	40	380	270	763	345	640	220	375	125	291	111	192	75	2,679	1,189	3,868	2.3
Relapses	0	0	0	0	23	13	55	18	84	31	65	15	60	12	33	5	320	94	414	3.4
TAF	0	0	0	0	3	2	18	4	15	5	11	3	13	2	10	2	70	18	88	3.9
TALTFU	0	0	0	0	5	4	17	1	6	0	2	0	2	0	0	0	32	5	37	6.4
NTPB-	10	10	7	5	23	15	22	24	30	18	29	19	32	20	37	21	190	132	322	1.4
NTPBo	69	78	21	15	5	5	6	9	14	8	10	7	9	4	12	7	146	133	279	1.1
NEPTB	9	11	21	16	95	58	94	59	64	37	45	37	39	28	33	24	400	270	670	1.5
Others	0	0	0	1	4	2	4	2	15	3	8	5	13	6	10	9	54	28	82	1.9
TOTAL	91	102	84	77	538	369	979	462	868	322	545	211	459	183	327	143	3,891	1,869	5,760	2.1
NTPB+ & Relapse	3	3	35	40	403	283	818	363	724	251	440	140	351	123	225	80	2,999	1283	4,282	2.3
Clin Dg	88	99	49	37	127	80	126	94	123	66	92	68	93	58	92	61	790	563	1,353	1.4
Overall Pulmonary cases	82	91	63	60	439	309	881	401	789	282	492	169	407	149	284	110	3,437	1,571	5,008	2.2

NTPB+ = new pulmonary TB case bacteriological confirmed. TAF: Treatment after Failures.
TALTFU: Treatment after lost to follow up. NEPTB=Extra pulmonary TB.
NTPB-: sputum smear negative. NTPBo: sputum smear not done.
M: male. F: female.

Applying WHO criteria of TB cases classification, **76.5%** (4,407) are bacteriologically confirmed which include new bacteriological confirmed, relapse, treatment after failure and treatment after lost to follow up and **23.5%** (1,353) are clinically diagnosed including TB cases with sputum smear negative, sputum smear not done, extra pulmonary and others. Newly treated TB cases (new bacteriological confirmed, TB cases with sputum smear negative, sputum smear not done, extra pulmonary) represented **89.2%** (5,139) and **10.8 %** (621) were previously treated (relapse, treatment after failure, treatment after lost to follow up and others).

Table 3 : Notified TB cases by 2013 WHO categories and community screening as origin, Rwanda, Jul 2016-Jun 2017

	All forms	Classification based on bacteriological status		Classification based of history of previously treated		Overall pulmonary	Cases brought by CHWs
		Bacteriological confirmed	Clinically Diagnosed	Newly treated	Previously treated		
N	5,760	4,407	1,353	5,139	621	5,008	1,173
%		76.5%	23.5%	89.2%	10.8%	86.9 %	20.3 %

After a constant increase from 2000 up to 2006, the number of all-forms TB cases started to decrease[1]. Until 2012, this trend has been decreasing[2]. With 2013-2014 FY, there was an increase and then later stabilization. This was seen for both all-forms and new pulmonary bacteriological confirmed cases (NTPB+).

During this period, three key interventions have been implemented, and are expected to be the most probable reason of these changes in trends: X-ray screening for prisoners and PLHIV in high

[1] Rwanda MoH/RBC. Tuberculosis National Strategic Plan (TB NSP), July 2013-June 2018. Kigali, August 2014.

[2] Rwanda MoH/RBC. Tuberculosis National Strategic Plan (TB NSP), July 2013-June 2018. Kigali, August 2014.

TB prevalent sites of Kigali City, investigating contacts of bacteriological confirmed cases not only at initiation of treatment of index case but also at the end of his/her treatment, and finally Xpert diagnosis for presumptive TB among those groups.

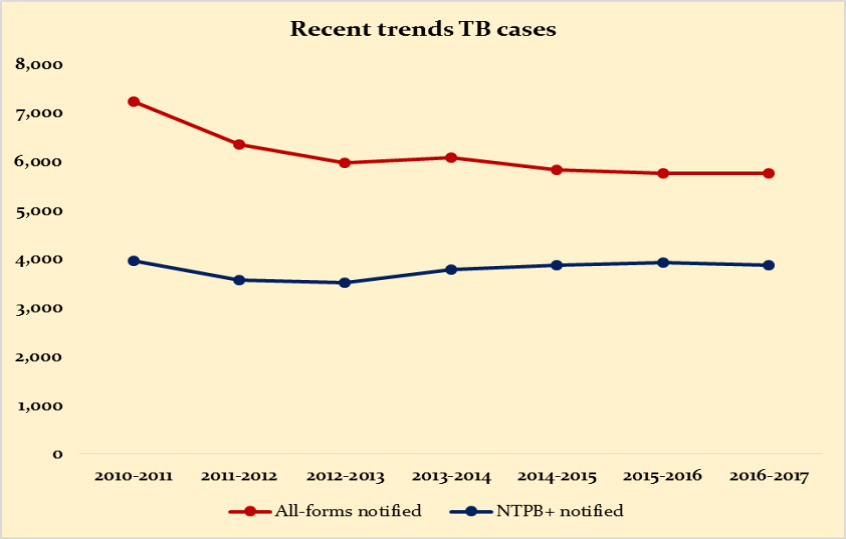

Figure 2 : Trend of TB cases, all-forms (red line) and bacteriological confirmed new cases (blue line), Rwanda, Jul 2016-Jun 2017.

I.1.1.3. Sputum smears microscopy and quality control

In order to improve and sustain the quality control (QC) of smear microscopy, the quality control is conducted quarterly to each CDT. This is done at 2 levels: The National Referral Lab (NRL) does the quality control for all hospitals; and District Hospitals do the same for the Health Centers in their catchment areas.

From 2016- 2017 FY, 194 out of 201 CDTs (96,5%) were controlled at least 3 times a year while 173 out of 200 (86.50%) had been controlled during 2015-2016.

Among 11, 820 slides controlled, 0.4% (46) slides have been found with major errors and 0.3% (37) with minor errors. Some errors have been observed for slides examined from CDTs-Health Centers likely due to the recent introduction of fluorescence technique (FM). This highlights the need for close monitoring for the CDTs implementing FM technique.

Thirty-seven CDTs out of 194 (19.02%), which have been controlled at least three times a year had high major errors representing 19.02% (37 out of 194).

Among the total of 201 CDTs, 157 (78.1%) were controlled at least three times and performed well without major errors, while in 2015-2016 FY, 151 out of 200 (75.50%) were controlled without any major error. The annual TB NSP target established at 96% was not reached (81.3%). Comparing to the fiscal year 2015-2016, there is an increase of CDTs with major errors representing 15.7% (22 out of 140) as seen in the table 5 below, this is due to the FM technique newly introduced in many CDTs. The National Referral Lab is currently putting efforts in mentorship and implementation of the FM technique to address these errors.

Table 4 : Quality control of sputum, Rwanda, Jul 2016-Jun 2017

HFs	CDT controlled at least 3x	Nb of slides controlled				Errors					CDT with High Major errors
		Total	Pos	Scan	Neg	HFP	LFP	HFN	LFN	QE	
CDT-HC	89/93 (95.6%)	5,240	402	45	4793	13	2	3	1	0	Byimana(1)Congo-Nil(1) Cyahinda(1) Gatare(1) Kamonyi(1) Karengera(2) Mayange(1) Mbuye(1) Nyange(1) Nyange A(1) Rukoma-Sake(1) Rusizi(4)
RH, DH, HC with FM	105/108 (97.2%)	6,580	740	107	5733	18	8	12	26	15	Byumba DH(1) CHUK(1) Gahini DH(2) Rwinkwavu DH(2) Kibilizi DH(2) Gihundwe DH(1) Gisenyi DH(1) Ruhango DH(1) Kabgayi DH(2) Kabutare DH(4) RMH(2) Kibagabaga DH(1) Kibuye DH (2) Kirehe DH(1) Muhima DH(2) Rwamagana DH(1) Gitega HF(1) La Medicale(1) Nyagahita HF(1) Carrefour(1)
Total	194/201 **(96.5%)**	11,820	1,142	152	10,526	31	10	15	27	15	

Table 5 : High major errors in controlled CDTs, Rwanda, Jul 2016-Jun 2017

	CDT controlled at least 3x	High major errors	
		HFP	HFN
CDT-HC	89/93 (95.6%)	13	3
RH, DH, HC with FM	105/108 (97.2%)	18	12
Total	194/201 (96.5%)	**31**	**15**

Five hospitals did not achieve 3 times of control in their catchment area as shown in below.

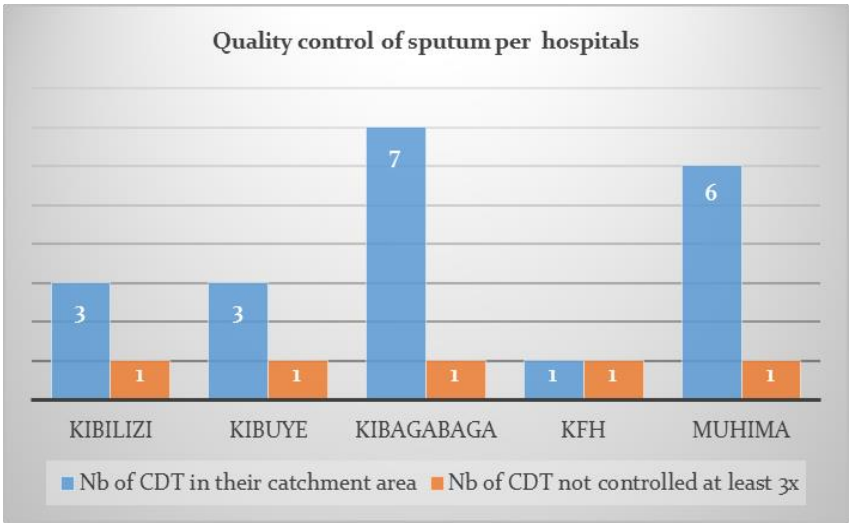

Figure 3 : Quality control of sputum per district hospital, Rwanda, July 2016-June 2017

I.1.1.4. Access to sensitive TB diagnosis tests

I.1.1.4.1. Microscopy

The preferred method of sputum microscopy is Light Emitting Diode Fluorescence Microscopy technique (LED-FM) rather than Ziehl Nelsen (ZN). In the last three years the National Reference Laboratory and TB&ORD Divisions have started phasing out the old technique, ZN and phase in LED-FM.

During the 2016-2017 FY, all 201 CDTs were equipped with functional Fluorescence Microscopy and each CDT had at least 2 trained staff.

I.1.1.4.2. Molecular Test

Forty-seven (47) Xpert machines were functional in the 2016-2017 FY.

The implementation of genexpert is being improved gradually quarter per quarter. This is explained by the additional genexpert machines, increasing geographical accessibility, changes in eligibility criteria and adherence of clinicians to genexpert protocol.

During the July 2016 - June 2017 reporting period, using data from Xpert machines, 29% of all presumptive (45,017/155,778) cases were tested with genexpert. It contributed to detect 80 TB cases with rifampicin resistant which were initiated to TB second line treatment. Of 4,407 TB Bacteriological confirmed, new and retreatment cases registered, 75.2% were confirmed also with genexpert.

Table 6 : Genexpert test performed, by quarter and results, Rwanda, July 2016-June 2017

Genexpert Result	July Sept 2016	Oct Dec 2016	January March 2017	April June 2017	Total	%
Error	335	589	639	492	2,055	4.6%
Invalid	63	149	99	67	378	0.8%
MTB detected; Rif Resistance Detected	20	14	16	30	80	0.2%
MTB detected; Rif Resistance Indeterminate	7	13	14	7	41	0.1%
MTB detected; Rif Resistance Not detected	662	894	891	828	3,275	7.3%
MTB Not detected	7,654	9,426	10,053	11,103	38,236	84.9%
No result	182	324	250	196	952	2.1%
Grand Total	**8,923**	**11,409**	**11,962**	**12,723**	**45,017**	**100.0%**

Among previously treated TB cases notified during 2016-2017 FY, Xpert test was performed for 467 out of 562 (83%) versus 315 out of 448 (70%) for previous FY.

Table 7 : Genexpert coverage by eligibility criteria, Rwanda, July 2016-June 2017

Eligibility Criteria	Total Eligible	GXP done	
		N	%
New SS+	3,616	2,524	70%
Relapse	418	359	87%
TALTFU	40	33	89%
TAF	104	75	85%
HIV+ Presumptive TB	17,717	10,924	62%
Prisoners Presumptive TB	9,168	6,363	69%
Contacts Presumptive TB	4,924	2,688	55%
Children Presumptive TB	20,187	4,944	24%
Elderly Presumptive TB	43,874	19,727	45%

I.1.2. Drug resistant Tuberculosis detection and notification

I.1.2.1. MDR-TB detection process

During July 2016 to June 2017 reporting period, 2778 samples were received at referral laboratories for culture including 603 for MDR-TB controls. Among culture for diagnostic only 39.9% (867/2175) were positive and very few DST (47 for first line and 19 for the second line) performed. The low positivity is difficult to interpret due to lack of TB history in most of the patients (729/2175). More efforts are needed to improve on laboratory recording and reporting to have enough data to inform decision makers.

Table 8 : Culture and DST performance in Rwanda laboratory network, Rwanda, July 2016-June 2017

	Samples received for culture	Samples for MDR-TB culture contrls	Samples for diagnostic			Culture results for diagnostic				Drug Susceptibility Testing		
			New cases	Previously treated	Unknown TB history	Positive	Negative	Contaminated	Pending	LPA (1st line)	DST (1st line)	DST (2nd line)
NRL	2421	603	960	229	629	819	722	175	102	943	47	19
CHUB	100	0	0	0	100	38	56	6	0	38	0	0
CHUK	257	0	257	0	0	10	214	19	14	0	0	0
Total	2778	603	1217	229	729	867	992	200	116	981	47	19

*__Notice__: Data considered for total eligible are in Notification TB cases table

I.1.2.2. MDR-TB Notification

Eighty (80) multi-drugs resistant TB cases were detected, including 79 with bacteriological confirmation of MDR-TB disease and one bacteriologically confirmed TB case with high presumption of MDR-TB disease based on his TB past history and current TB clinical suggestive symptoms. Among them 75 initiated the short (9 months) MDR-TB treatment regimen while 2 cases of relapse of the category IV were put on 20-months treatment regimen. Two patients died and one was lost to follow up before treatment initiation. Among those who initiated MDR-TB treatment 33 (43%) patients were HIV+ and 49 (64%) were men.

Table 9 : Drug resistant Tuberculosis notification and treatment initiation in Rwanda July 2016-June 2017

Number of confirmed MDR-TB cases	Died before diagnostic date	Not yet treated	Number of patients who initiated MDR-TB treatment		
			Kabutare	Kibagabaga	Kibungo
80	2	1	27	50	0
			77		

Table 10 : MDR-TB cases who started treatment during July 2016 - June 2017, by sex and HIV status, Rwanda, July 2016-June 2017

MDR-TB by Gender and HIV status								
	Bacteriologically Confirmed		Clinically Diagnosed		Bacteriologically Confirmed	Clinically Diagnosed	Male	Female
	Male	Female	Male	Female				
MDR-TB patients	49	28	0	0	77	0	49	28
MDR-TB patients HIV Tested	49	28	0	0	77	0	49	28
MDR-TB patients HIV Positive	18	15	0	0	33	0	18	15
MDR-TB patients HIV positive on ART	18	14	0	0	32	0	18	14
MDR-TB patients under 15 years	1	1	0	0	2	0	1	1
MDR-TB patients under 15 years HIV Tested	1	1	0	0	2	0	1	1
MDR-TB patients under 15 years HIV positive	0	0	0	0	0	0	0	0
MDR-TB patients under 15 years HIV positive on ART	0	0	0	0	0	0	0	0
MDR-TB - Extensively Drug Resistance	0	0	0	0	0	0	0	0

I.1.3. Enhance TB case finding in selected and prioritized high risk group

High risk group of TB is any group of people in which the prevalence or incidence of TB is significantly high than in the general population. One of the basic strategy for prevention and control is screening population at high risk for TB, to identify persons with TB active and giving complete therapy and prevent contagious diseases. Based on the 2013-2018 TB NSP, five groups at higher risk of TB disease were identified. These include:

- People living with HIV
- TB contacts
- Prisoners
- People >55 years
- Children 0-14 years

The table below summarizes screening and diagnosis cascade. Numbers in “screened” and “presumptive” columns represent episodes of screening or presumption.

Overall, two thousand three hundred and seventy (2,370) TB cases were confirmed among people at higher risk of TB, representing 41.1% of 5,760 all TB cases. The 2013-2018 TB NSP and the GFTAM target was 22%. The extended NSP 2018-2020 target was reviewed at ≥40%**.**

Table 11 : Summary results of TB screening and diagnosis among selected high risk groups, Rwanda, July 2016-June 2017

Risk group	Screened	Presumptive TB		TB cases
	N	N	%	N
Prisoners	55,181	9,241	16.7%	164
Contacts	13,408	2,226	16.6%	93
HIV+ persons (exclude prisoners, contacts, children <15 years, elderly≥55 years	526,849	14,665	2.8%	902
Children < 15 yrs (exclude children prisoners, children contacts)	1,581,294	11,427	0.7%	270
Elderly≥55 years (exclude prisoners ≥55 years and contacts ≥55 years	1,106,908	35,264	3.2%	944
Total	3,282,546	72,569	2.2%	2,370

I.1.3.1. TB notification among people living with HIV

In 2015, Rwanda recorded a general HIV prevalence of 3% as recorded in the last Demographic and Health Survey. According to the last Tuberculosis prevalence survey of Rwanda, the national Tuberculosis prevalence for Rwanda recorded a national average of 119 in 100,000 for bacteriologically confirmed cases. The diagnosis of Tuberculosis in HIV positive clients requires adequate diagnostic tools. All HIV-positive clients should be screened for active Tuberculosis infection at enrollment and regularly at each visit using TB screening algorithm.

The ACF using CXR for screening was initiated in order to improve screening and diagnosis among PLHIV in selected health facilities with higher active HIV+ in ART service. During the 2015-2016 FY nine health facilities were selected and six received ACF. Three remaining were performed in the 2016-2017 FY. This report section describes the ACF using CXR for screening performed in the 3 health facilities (Rwampala, Kabusunzu and Kinyinya).

I.1.3.1.1. TB screening cascade

A total of 4,683 (78%) out of 6,032 people living with HIV+ active in ART health facilities service were screened for Pulmonary Tuberculosis using symptomatic and Chest X-ray screening and 607 (13%) were screened positive. Among those with presumptive TB, 0.3% showed clinical symptoms with normal CXR, 78.1% with suggestive Chest X-rays without symptoms and 21.6% with both symptoms and suggestive Chest X-ray.

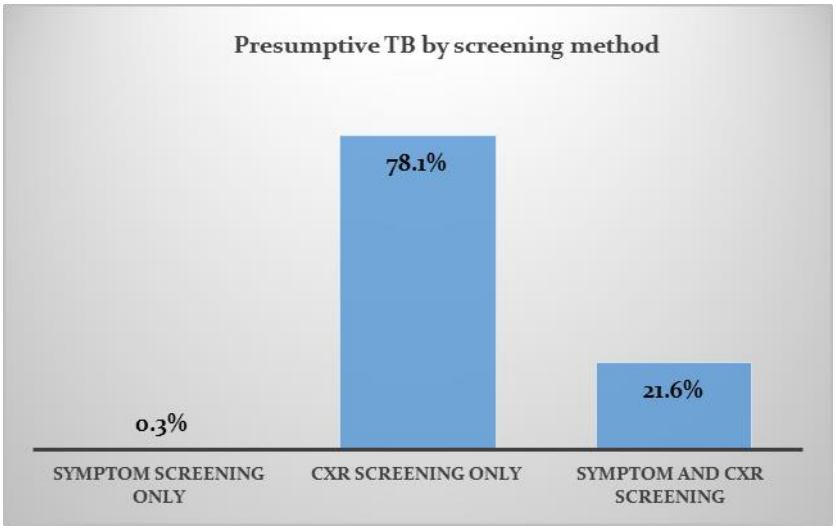

Figure 4 : Presumptive TB by screening method among PLHIV, during ACF, Rwanda, July 2016-June 2017

I.1.3.1.2. Confirmation TB cases and potential impact of x-ray screening

A total of 41 new TPB+ (including 2 MDR TB cases) were detected in people living with HIV+ in 3 health facilities (Rwampala, Kabusunzu and Kinyinya). Among them, 16 TB cases are from presumptive TB by suggestive chest x-rays without symptoms, 25 TB cases were from presumptive TB by both symptoms and suggestive chest X-rays. No TB case from presumptive TB by symptoms having normal CXR. The added value of x-ray screening in all detected TB cases is 39%. The average of TB case notification rate is 680 per 100,000.

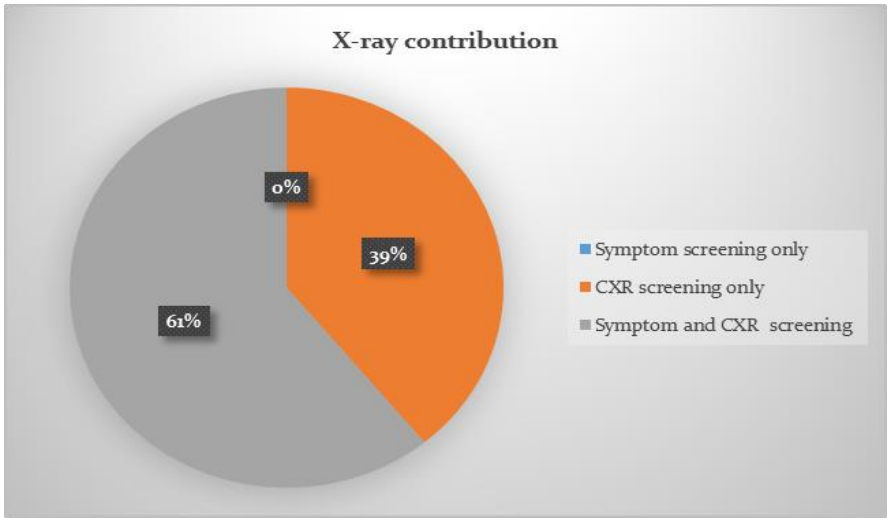

Figure 5 : Diagnosed TB cases among PLHIV, during ACF, by screening approach, Rwanda, July 2016-June 2017

Due to the remarquable contribution of x-ray in the TB screening and WHO recommandation, it has been decided that for every new HIV patient, the TB screening should be based on symptom and/or CXR screening from the fiscal year 2017-2018.

I.1.3.2. TB notification in Prisons

In prisons we are using two case finding strategies; these are passive case finding (PCF) and active case finding (ACF).

In 2013-2015, we initiated ACF among prisons inmates using CXR screening. That 1st round covered all prisons. In 2016, we started implementation of the 2nd round, using symptoms and CXR screening methods and Xpert technique as diagnostics approaches.

By using passive and active TB screening strategies in all prisons, 164 TB cases were detected in prison inmates among them 17 (10.4%) were diagnosed from presumptive TB at the entry in prison versus 147(89.6%) prisoners who were reported during imprisonment.

I.1.3.2.1. Active case finding using mobile digital chest X-ray machines

Prisons constitute an area of high TB bacilli spread, which increase the risk of getting quickly the TB disease. The prevalence of tuberculosis among prisons inmates is 5 times greater than the general population (TB NSP 2013-2018).

It is in this regard, that the TB&ORD Division, in collaboration with Rwanda Correctional Service (RCS) is implementing the ACF using mobile digital x-ray technique in all prisons since December 2013. This calls for a repetitive screening and diagnosis strategy, at least every two years (corresponding to the TB incubation period).

Up to now, the first round was carried out from December 2013 to May 2015 in all prisons of Rwanda where the main technique of screening was only X-ray while in the second round which started by April 2016 up to now. In addition to chest X-ray screening technique, any "TB symptom", has been considered.

During fiscal year 2016-2017, the active case finding was planned to be conducted in 5 prisons (Huye, Musanze, Ngoma, Bugesera and Nyanza) but the activity in Ngoma and Nyanza Prisons were postponed to the next fiscal year. This year, there was a TB screening campaign among youth in Kigali Rehabilitation Transit Center at Gikondo.

This second part of ACF annual report describes the activities performed in 3 prisons (Huye, Musanze and Bugesera) and in Kigali Rehabilitation Transit Center (first and second rounds).

I.1.3.2.1.1. TB screening cascade

A total of 15,264 (97.7%) out of 15,617 prisoners in 3 prisons (Huye, Musanze and Bugesera) were screened for Pulmonary Tuberculosis using symptomatic and chest x-ray screening. Among all 1,866 (12.2%) presumptive TB, 22 (1.2%) were presumptive TB by symptoms with normal CXR, 914 (49.0%) were presumptive TB by suggestive chest x-ray without symptoms and 930 (49.8%) were presumptive TB by both symptoms and suggestive chest x-rays.

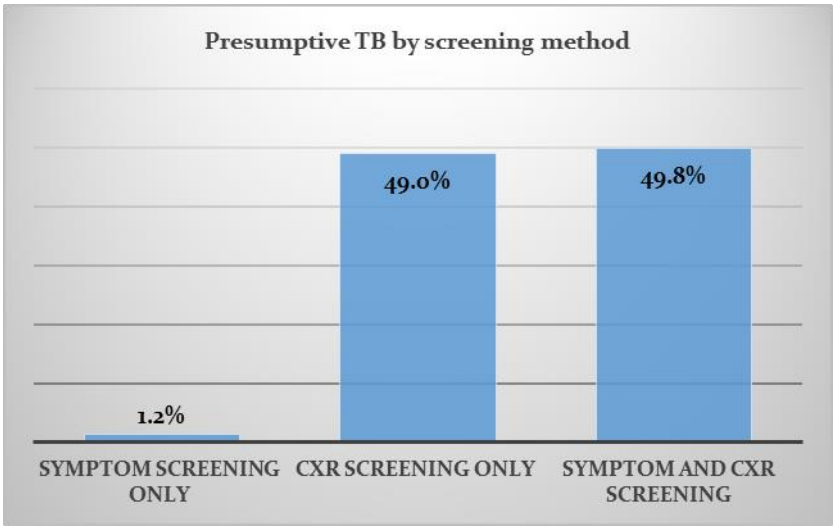

Figure 6 : Presumptive TB by screening method among prisons inmates, during ACF, Rwanda, July 2016-June 2017

I.1.3.2.1.2. Confirmed TB cases among prisoners

A total of 52 new TPB+ including 1 MDR TB case and 1 case TB sensitive from prison local staff were detected. Among them, 21 TB cases were from presumptive TB by suggestive Chest X-rays without symptoms, 31 TB cases from presumptive TB by both symptoms and suggestive Chest X-rays and no TB case from presumptive TB by symptoms with normal CXR. The potential contribution of x-ray screening in all detected TB cases was 40% (21 out of 52).

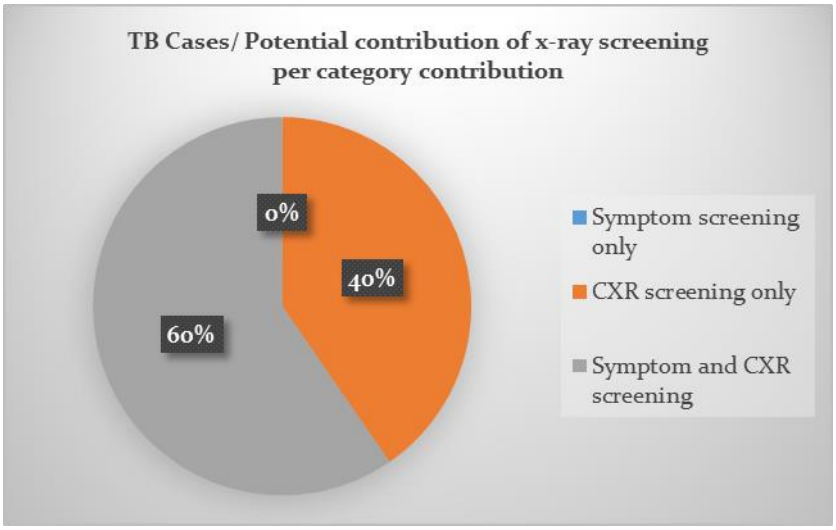

Figure 7 : Diagnosed TB cases among prisons inmates, during ACF, by screening approach, Rwanda, July 2016-June 2017

I.1.3.2.1.3. Potential contribution of ACF in decrease of TB transmission

The results of first round and second round of ACF in prison inmates showed that the TB notification rates per 100,000 population has declined a result of a massive X-ray screening , meaning that earlier identification and treatment of tuberculosis reduce burden and transmission. This shows that ACF using x-ray for screening strategy contributes to reach the TB program objectives.

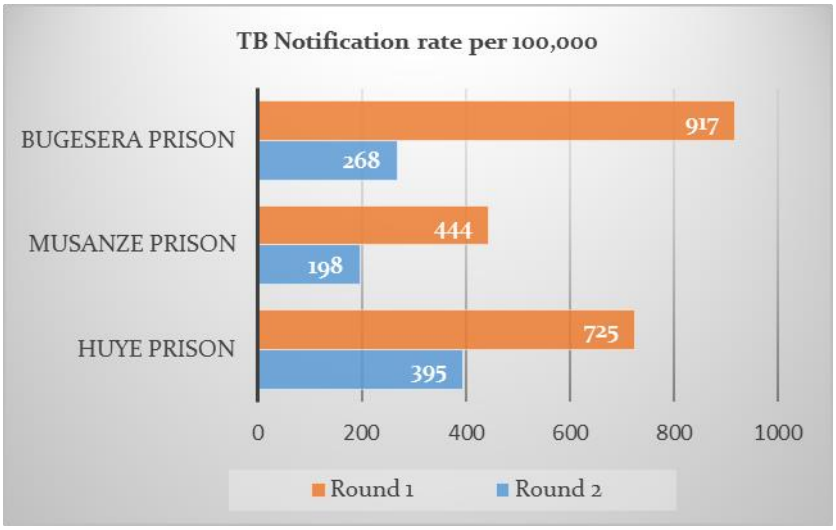

Figure 8 : Comparison of TB notification rates among prisons inmates, during ACF, between 1st round in 2013-2014 (orange bars) and 2nd round in 2016-2017 (blue bars), Rwanda, July 2016-June 2017

I.1.3.3. TB notification in Kigali Rehabilitation Transit Center (KRTC)

I.1.3.3.1. ACF using mobile digital x-ray among youth in Kigali Rehabilitation Transit Center

A total of 2,342 (86%) out of 2,731 youth were screened for Pulmonary Tuberculosis using symptomatic and Chest X-ray screening. Among all 337 (14%) presumptive TB, 6 (1.8%) were presumptive TB by symptoms with normal CXR, 195 (57.9%) were presumptive TB by suggestive Chest X-ray without symptoms and 13 (40.4%) were presumptive TB by both symptoms and suggestive Chest X-rays.

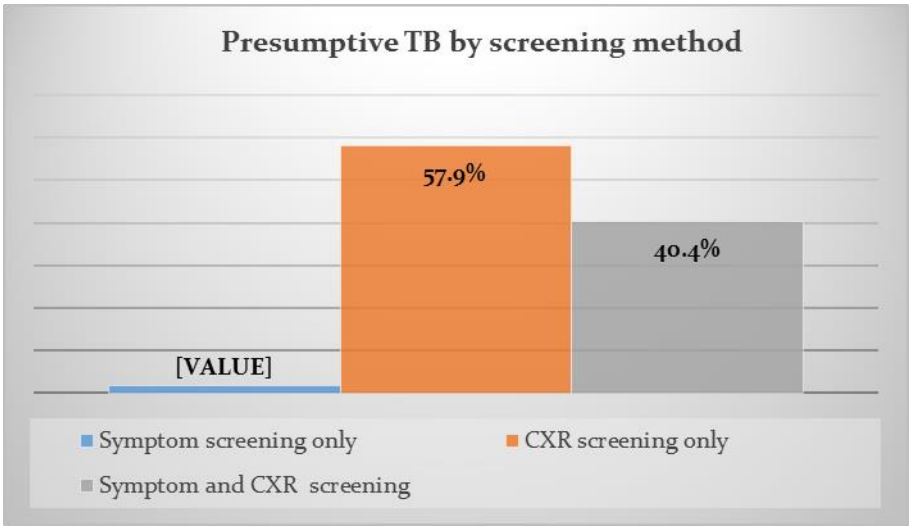

Figure 9 : Presumptive TB by screening method among occupants of KRTC, during ACF, Rwanda, July 2016-June 2017

I.1.3.3.1. Confirmed TB cases

A total of 23 new TPB+ including 1 MDR TB case were detected. Among them, one TB case was from presumptive TB by symptoms with normal CXR. 6 TB cases were from presumptive TB by suggestive Chest X-rays without symptoms and 16 TB cases from presumptive TB by both

symptoms and suggestive Chest X-rays. The potential contribution of X-ray screening is **26%** (6 out of 23). The case notification rate is **842** per 100,000 habitants.

Figure 9: TB cases

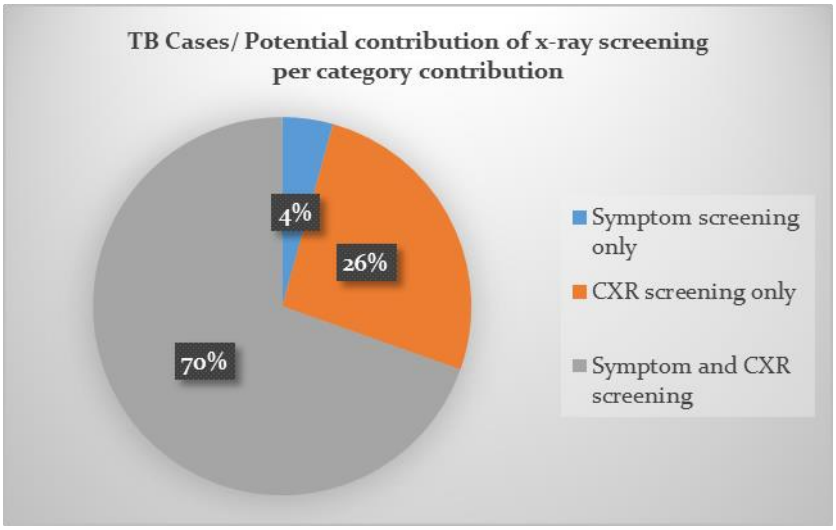

Figure 10 : Diagnosed TB cases among occupants of KRTC, during ACF, by screening approach, Rwanda, July 2016-June 2017

I.1.3.4. Childhood TB

The detection of TB among children remains a challenge requiring special interventions/activities.

During the 2015-2016 FY, IMCI tools integrating TB screening were distributed in health facilities. The RSQA conducted during the 2016-2017 FY assessed their usage of those tools and found that 79.3% (88 out of 111) CDTs health centers were using them vs 62% of the previous fiscal year 2015-2016. Among those Health centers, 77.5% (75 out of 111) performed TB screening in children under 5 years (RSQA Report 2016-2017 FY).

In addition, Childhood TB workshop for Medical Doctors & nurses on childhood TB and for Nutritionists from DH were done to increase their knowledge and skills on the diagnosis and management of TB in children and TB detection especially in malnourished children.

The following cascade describes the achievements in children under 15 years during 2016-2017 FY.

Among a total of 2,152,537 pediatric consultations, 1,579,033 (73%) were actively screened for TB.
In 2016-2017, the surveillance system identified 20,187 pediatric TB presumptive (13% of all presumptive). Among them 4,944 (24%) managed to give sample for xpert examination
A total of 354 TB cases were detected (6.1% of all notified cases).

TB &ORD division data surveillance during the fiscal year 2016-2017 showed that children under 15 years were still undiagnosed but there was an improvement in TB case notification as shown the figure 10 below. An important area to explore further will be the techniques to collect samples in children.

I.1.3.5. TB notification among contacts of infectious TB cases

Due to the long incubation period of TB 1-2 years, the TB NSP suggested to not only screen contacts of infectious TB cases at the initiation of index case treatment, but also re-screen them at the end of treatment, trying to cover as much possible the incubation. For the 1st time the mentioned strategy was implemented during the 2016-2017 FY.

Data presented are from TB & ORD surveillance system. For a starting program, the coverage of re-screening (M12) was good, at 83%(10,645/12,831) for 5 years and above and 88%(1,947/2,225) for under 5 years.

Even though notification rates seem to be low during re-screening (M12) compared to initial (M0), they remain very high compared to those of the general population (at least 6 times).

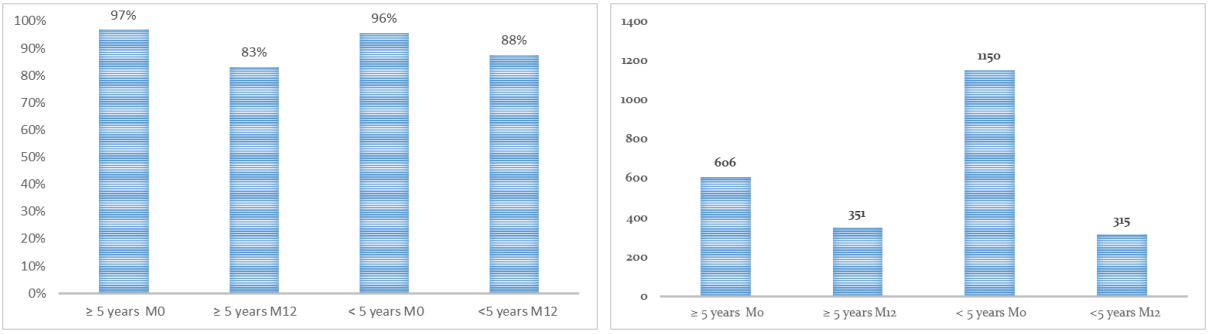

Figure 11 : Coverage of contact screening at the beginning (M0) and at the end (M12) of TB Treatment of index cases (Left graph) and TB notification rates at the beginning (M0) and at the end (M12) of TB Treatment of index cases (Right graph)

I.2. Objective 2: Increase treatment success rate from 88% to 90% for bacteriological confirmed TB cases and maintain it at 87% for MDR-TB

I.2.1. Ensure that at least 97% of CDTs have no stock out in TB medicines

TB national quantification committee led by TB&ORD Division has conducted quantification and quantification review workshops to forecast needs in TB commodities with supply plan. The national TB technical team for management of TB commodities conducted stock monitoring at all levels and regular follow up of shipment of medicine in pipeline to ensure the availability of TB medicines in all health facilities. The monitoring of stock status and pipeline at central level is done in technical meetings and all TB medicines were available at central level during the fiscal year of 2016-2017. However, we faced a stock out of cartridges for GeneXpert in March and April 2017 due to delay in prepayment processes and refusal of GDF to ship quantity equivalent to our credit note.

The strategies taken in the technical meeting to accelerate some orders or rescheduling the delivery dates based on stock status have improved management of TB medicines avoiding stock out of TB medicine for the whole year of 2016-2017.

According to the RSQA reports stocks of TB drugs and reagents were well monitored at the level of 83.1% in all CDTs. TB medicines were available in all CDTs except cartridges in 13 hospitals. Despite the availability of TB medicines at central level other 28 CDTs reported stock out during this 2016-2017 fiscal year. We attribute this to reporting problem related to the understanding of reporting format and it is subject of mentorship of users.

I.2.1.1 Accuracy of TB drugs quantification

The total expected TB cases all forms were 6085. The registered TB cases all forms are 5760 cases which mean that the target was achieved at 94.65%. MDR-TB cases registered for the period of July 2016 June 2017 are representing 76.5% (78/102) of expected cases.

Table 12 : Accuracy of TB drugs quantification, Rwanda, July 2016-June 2017

Treatment category/Regimen	Target in Quantification	Cases registered	%
Cat I	5,249	4,883	93%
Cat II	602	621	103%
Children under pediatrics formulation	234	256	109%
MDR TB Short regimen	100	76	76%
MDR TB Long regimen	2	2	100%

Projected cases were closer to the enrolled cases except number of cases of MDRT-TB shorter regimen which is achieved at 76%. To prevent expires, we opt shipment in two installments and maintain usable stock.

I.2.2. Improve treatment success rate for all forms of TB, specifically to 90% for bacteriological confirmed TB cases by mid-2018

For the July 2016 to June 2017 reporting period, treatment outcomes presented are for the cohort of TB cases registered from 1st July 2015 to 30th June 2016.

Among bacteriological confirmed cases new and relapse (B+ N&R), the treatment success rate (TSR) was **88%(3,696/4,193)**, including **80%** cured and 8%(342/4,193) treatment completed. For clinically diagnosed (CD), the treatment success rate was **79 %(1,098/1,392)**. **The targets for the GFTAM results based model for the mentioned two indictors and for 2016-2017 FY are respectively 89% and 78%, *ie targets were achieved at 98% (88% achieved over 89% targeted) level for B+ New&Relapse and at 101% (79% achieved over 78% targeted) for clinically diagnosed***. For the mentioned two groups, the main unfavourable TB treatment outcomes was "died" which represented **6%(258/4,193)** for bacteriological confirmed cases new and relapse and **16%(216/1,392**) for clinically diagnosed cases. Not evaluated were respectively 2%(65/4,193) and 5%(66/1,392) for B+ N&R and Clinically Diagnosed from July 2016 to June 2017.

When considering the treatment outcomes for all-forms, it was observed that **85%(4871/5702)** were successfully treated; 8%(477/5702) among them were died and 2%(132/5702) were not evaluated. **78%(1,086/1,395)** for all TB patients with HIV infection on ART were successfully treated (cured or treatment completed); 15%(208/1,395) among them were reported died and 3%(40/1,395) not evaluated.

High bacillary load, advanced HIV and malnutrition are the main causes of death among TB cases according to the information from the "Tuberculosis Death Audit Analysis". For more details, see objective 4.

In its Global Tuberculosis Report released end 2016, the World Health Organization (WHO) estimated rates of mortality (excluding HIV+ TB) for Rwanda at 3.8/100,000[3]. The national targets were 6.9/100,000 for the 2016-2017 FY. Between 2013 and 2005, mortality decreased by 43% (against a targeted decrease of 37% between 2013 and 2018). The average annual decrease was 20% (against a TB NSP target of 9%).

[3] 2016 WHO Global TB Report

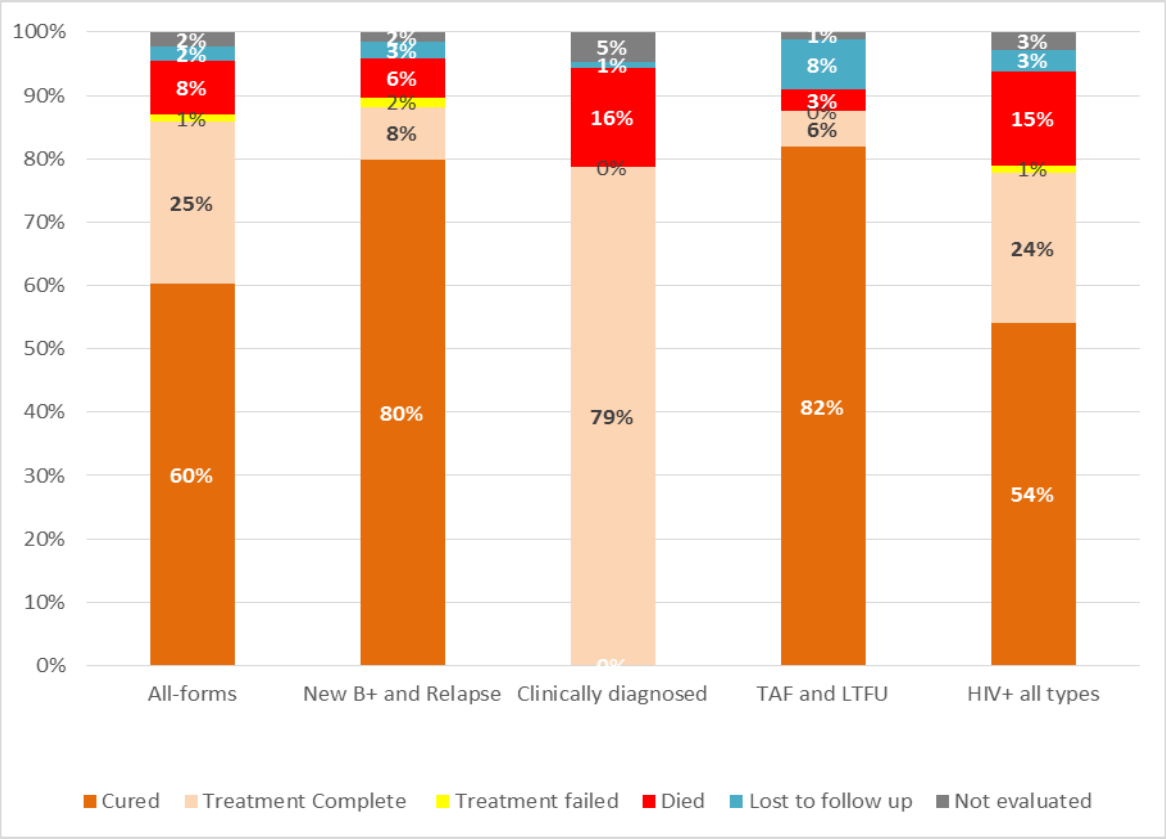

Figure 12 : TB treatment outcomes, Rwanda, July 2016-June 2017

I.2.3. Increase ART coverage among co- infected patients from 81% to 90%

From July 2016 to June 2017, 99%(5,711/5760) of all TB patients were tested for HIV infection and 21%(1,181/5,711) among those tested were found HIV infected. Since 2010 a decrease in HIV positivity among TB patients is observed. We will particularly monitor this, as the country has now initiated the "treat all strategy".

Among those HIV+ TB patients, 97 %(1,140/1,181) were receiving or initiated to Cotrimoxazole preventive treatment; and 87%(1,030/1,181) of them have been receiving ART during same registration quarter (proxy of early ART initiation among HIV+ TB patients).

For the cohort of HIV+ TB patients registered during July 2015 to June 2016, the proportion of HIV+ TB patients on antiretroviral therapy (ART) by the end of TB treatment reached 94,7%(1,343/1,417). The targets for both TB NSP 2013-2018 and GFTAM results based financing model was 90%, so that it was achieved at level of 105%.

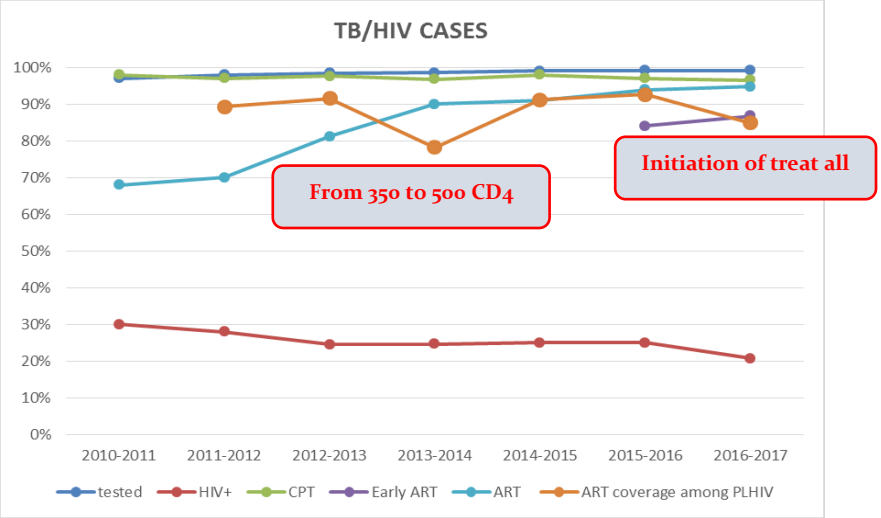

Figure 13 : Trend in TB/HIV indicators, HIV testing (dark blue line), HIV positivity (red line), CPT (green line), early ART initiation (pink line), ART by end of TB treatment (clear blue line) and ART coverage among PLHIV (orange line), Rwanda, July 2016-June 2017

From the total number of TB presumptive referred by CDT, CT and CHWs at the laboratory (155,778), presumptive TB recorded from July 2016 to June 2017, 99% have been tested for HIV (99% of presumptive TB with unknown HIV status at that time of TB presumption have been tested for HIV infection) and 1% among those tested were HIV positive.

Table 13 : HIV Testing among TB presumptive, Rwanda, July 2016-June 2017

Total # of presumptive TB	Known as HIV+	Unknown HIV status			Total tested	Total # of HIV+ presumptive TB
		# to be tested	# and % of Tested	# and % of HIV+		
155,778	16,527	139,251	137,974	1266	154,501	17,793
	11%		99%	1%	**99.2%**	**11%**

I.2.4. Increase to 95% the treatment success rate for patients managed in the community.

The mission of Community health workers (CHWs) in TB control activities is to sensitize communities on clinical features of TB, identify potentials presumptive TB cases and follow up (giving TB treatment) to some TB patients identified by health facilities.

During July 2016 to June 2017 reporting period, out of the 5,760 TB cases notified, 2937 (51%) were entrusted to CHWs for administration and observation of the TB treatment. This strategy is highly appreciated by the patients because who receive DOT close to their homes.

The TB treatment success rate among TB patients registered during July 2015-June 2016 and followed up through the community-DOT (by CHWs) was 93% (2455/2630), slightly under the target of 95%. The number of cases in the community DOT (2630) has increased at 7% compared to the number followed by CHW 2,455 in last year of July 2015-June 2016.

The 3% rate of death among patients managed by CHWs may be seen as high. However, when we looked at deaths audits reports of Jan 2016-March 2017, 17.5% (49/280) of all deaths occurred at home (community).

Figure 14 : TB treatment outcomes for patients managed in community, Rwanda, July 2016-June 2017

I.2.5. Maintain treatment success rate at 87% for MDR-TB patients.

I.2.5.1. Interim outcome for MDR-TB treatment

A good MDR-TB treatment interim result shows how effective the MDR-TB treatment is, and predicts a good final result of MDR-TB treatment. Out of the 85 confirmed patients enrolled on second line anti-TB treatment during October 2015-September 2016, 62 (73%) had both negative culture and smear (**Interim result: conversion rate**).

Among the 23 with unfavorable outcome, 9 had contaminated cultures, eight patients were with sputum cultures not done, five died before six months and one was still culture positive at end of the 6th month of treatment.

The NSP target was 91% (and so was achieved at 80%) due to a regular percentage (9%) of control cultures not timely done since four years ago and an increasing contamination rate (11% for this year and 6% previous FY) of control cultures from MDR-TB patients on treatment. Training of staff from health facilities with MDR-TB and RSQA visits will probably reduce the numbers of control cultures not timeously done. TB&ORD Division will work closely with NRL Division on how to minimize culture contamination rate for sputum samples.

Table 14 : Interim MDR-TB treatment outcome at month 6 of MDR-TB treatment, Rwanda, July 2016-June 2017

Treatment outcome	N	%
MDR-TB Total patients bacteriologically confirmed 9 months ago	85	
MDR-TB Deaths before 6 months of treatment	5	6%
MDR-TB Lost to follow up before 6 months of Treatment	0	0%
MDR-TB patients evaluated at 6 months of treatment	80	94%
MDR-TB Negative smear and culture at 6 months of treatment	62	**73%**
MDR-TB Patients with more than 1 positive smear and - or culture at 6 months of treatment	1	1%
MDR-TB Patients with smear and-or culture not done at 6 months of treatment	8	**9%**
MDR-TB Patients Contaminated culture at 6 months of treatment	9	**11%**

I.2.5.2. Final outcome for MDR-TB treatment

Out of 96 MDR-TB cases initiated on second line TB treatment during July 2014 - June 2015 for the long (one patient was on 20 months) treatment regimen and during July 2015 - June 2016 for the short (95 patients were on 9 months) treatment regimen, the treatment success rate was 95%, with 72% cured and 23% with treatment completed. Five patients (5%) died before completion of the MDR-TB treatment. Almost a 100% of newly diagnosed MDR-TB patients are treated with the shorter (9 months) treatment regimen.

Table 15 : MDR-TB Treatment outcome at end of treatment, Rwanda, July 2016-June 2017

Treatment outcome	Short regimen (12M ago)	Long regimen (24 M ago)	Total	%
MDR-TB Registered patients who initiated the	95	1	96	

treatment				
MDR-TB Patients Cured	68	1	69	72%
MDR-TB Patients Treatment completed	22	0	22	23%
MDR-TB Patients Treatment failed	0	0	0	0%
MDR-TB Patients Died	5	0	5	5%
MDR-TB Patients Lost to follow up	0	0	0	0%
MDR-TB Patients Not evaluated	0	0	0	0%

I.2.6. MDR-TB ambulatory treatment

Patients diagnosed with MDR-TB disease are initiating second-line anti-TB drugs in hospitalization mode in one of the national MDR-TB centres. Once culture converted to negative, they are sent back to their respective nearest health facilities to continue DOT treatment in ambulatory phase.

Table 16 : Management of MDR-TB in specialized centers, Rwanda, July 2016-June 2017

Data element	Value
MDR-TB Cases on treatment at the beginning of the 1st quarter FY 2016-2017 in the specialized unit	24
MDR-TB Cases registered during the fiscal year in the specialized unit	76
MDR-TB cases transferred in during the fiscal year in the specialized unit	2*
MDR-TB cases transferred out in ambulatory during the fiscal year in the specialized unit	68
MDR-TB death cases in the fiscal year in the specialized unit	6
MDR-TB cases on treatment at the end of the fiscal year in the specialized unit	28

*One patient was diagnosed from Uganda-Masaka Hospital and transferred in Kibagabaga center (so registered in registration system), while the second one was initially diagnosed here in Rwanda, had poor treatment adherence and was readmitted to ensure DOT (so not re-registered in registration system).

During 2016-2017 fiscal year, Rwanda MDR-TB centres admitted 78 MDR-TB patients in and 68 have been sent for ambulatory treatment during the same period.

I.2.7. Provide support to MDR-TB patients.

The TB&ORD Division in collaboration with different stakeholders has been ensuring support to all MDR-TB patients diagnosed and treated in Rwanda.

I.2.7.1. Psycho-emotional support is provided throughout treatment

After MDR-TB diagnosis, individual counseling includes health education on the disease, possibility of treatment, duration of treatment and the mode of treatment. The patient is advised to begin treatment as soon as possible. Upon entering the MDR-TB center at district level another individual counseling session is organized. During hospitalization at the MDR-TB center, group counseling led by an MDR-TB psychologist or one of the nurses is carried out weekly. During ambulatory care, the health center providing DOT is mainly responsible for counseling and treatment follow up.

I.2.7.2. Provision of socio-economic support throughout treatment

Hospitalization, clinical exams, drugs, food and hygiene materials are given to patients during hospitalization.

During ambulatory treatment, 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).

The MDR-TB patients' support is key in ensuring patient retention during the treatment, thus improve on the adherence to MDR-TB treatment. This may be one of different factors explaining the high treatment success (95% for 2014-2016 cohorts) in MDR-TB management in Rwanda compared to the worldwide average (around 50%[4]) successful MDR-TB treatment outcomes.

[4] 2016 WHO Global TB Report

I.3. Objective 3: Improve TB prevention (TB infection control in health facilities, behavioral change in the general population and prevention by medication) so that the percentage of population with adequate knowledge on TB increases from 56% to 75% by 2018

I.3.1. Implement a revised package of infection control measures to prevent TB infection

I.3.1.1. Implementation of TB infection control measures

I.3.1.1.1. Routine implementation of TB infection measures in health facilities

The TB infection control (IC) practices are implemented in CDTs since 2009 and in all health facilities since July 2013. The minimum package was defined to monitor the implementation of TB infection control.

The minimum package of TB infection control in Rwanda include following measures: the existence of the IC plan and appointment of the TB focal point, Health workers trained on TB, cough Triage system and separation of coughers, IEC on the cough hygiene and doors and windows opened in service at risk. Methodologically, health centers are assessed by hospitals and hospitals expected to be controlled by the central level.

According to TB&ORD surveillance, hospitals reported that the number and the proportion of Health facilities that were applying all six basics measures remained stable and represent 80.4% (451/561) for the last quarter of the 2016-20017 FY (Apr-Jun 2017), versus 80.1% during 2015-2016 FY.

I.3.1.1.2. Internal assessment of implementation of TB infection measures in health facilities by central level

The TB NSP 2013-2018, planned to conduct an external evaluation of IC implementation to assess infection control practices, highlighting existing gaps and provide recommendations. During the 2016-2017 fiscal year, delays in funding of the external evaluation led to internal assessment in the meantime to ensure continual TB IC improvement.

Sample concerned 50% of the District Hospitals and 20% of the health centers selected from a total population (health facilities) of 563 including 42 District hospitals (Kacyiru Hospital excluded as it doesn't have a TB package). The main objective was to assess the level of TB IC measures implementation at health facilities.

We observed that 83% of HFs have TB IC Plan and 66% of HFs have functional TB IC committee but 44% lack TB IC focal point and only 34% conducted regular monitoring of TB IC plans. While the triage system is available in 89% of HFs, only 52% of the HFs have permanent staff in charge of triage system. The TB cases are separated from non-TB patients during hospitalization in almost all the Health Facilities (99%). However, 61% do not know that susceptibility TB can be separated from TB drug resistance. The majority of health facilities (75%) do not have a safe place for sputum production and 12% observe TB presumptive when producing sputum. It is also important to mention that 23% of the HFs are still providing the sputum examination results beyond 3 days and 59% of HFs initiate the TB treatment to the diagnosed TB cases within one day after diagnosis. During this assessment, 86% of staff interviewed in HFs were found to have knowledge on the existing Personal Protective Equipment. However, only 41% and 50% of staff in Laboratory and TB service respectively can properly use the respiratory masks.

I.3.1.1.3. TB surveillance among Health Facilities Workers

The surveillance of TB among health facility workers (HFWs) started in the beginning of July 2015 and the screening is suggested to be done once a year by end of Jan-Mar quarter, for each health facility worker.

The TB&ORD surveillance for the quarter of January-March 2017 reported 23,716 health facility workers. Among them 12,842 (53%) were screened for TB. This level of screening may be biased as some health facilities may not be respectful with the national guidance for once a year screening. Therefore, the implementation and monitoring procedures should be improved.

During the entire 2016-2017 FY, 8 HFWs were diagnosed as TB cases; giving a notification rate of 34/100,000.

I.3.2. Increase awareness and commitment in TB fighting

I.3.2.1. TB sensitization in general population

IEC/BCC messages were aired on local private, public (Community radios and National Radio), on international radio stations and in media papers, to increase awareness of the general population. During this past fiscal year, 49 radio programs, 18 live talk show program, radio and TV spots were given and covered the following topics: importance of TB screening among health care workers; knowledge on cause, transmission, symptoms, screening and diagnostic of TB; TB among children; detection and diagnosis of TB in health centers; extra pulmonary TB; early screening and treatment of TB; Follow up of TB patients; Current situation of multi-drug resistant TB; follow up of MDR-TB patients at home (Prevention of transmissions to household, nutrition, adherence to treatment and bacteriological follow up) ; The national TB drugs resistant prevalence survey; role of CHWs in TB control and testimonial of TB patients on TB treatment.

As part of the celebrations of the World TB Day (WTD) on March 24, 2017 in Nyarugenge District, an event attended by more than three thousand people, the focus was to increase awareness and enhance knowledge of population about TB symptoms, how to prevent TB and the importance of early diagnostic and treatment. The theme of this year's World TB Day is: "*Unite to End TB*".

Picture 1 : During the 2017 WTD in Nyarugenge District: the Minister of Health Representative awarding the best performing CHW, Rwanda, July 2016-June 2017.

I.3.2.2. Sensitization in schools

In collaboration with the National Youth Council (NYC), sensitizations campaigns were conducted in 404 secondary schools in 8 districts Rusizi, Rustiro, Nyamasheke, Nyabihu, Kamonyi, Ruhango, Muhanga, Huye and Iwawa Rehabilitation and vocation skills development centre where a TB sensitization and active screening was performed.

One Hundred Ninety Thousand Four Hundred and Seventy-Nine 180,479 (100%) students were sensitized and among them 6,152 (3,4%) students were TB presumptive cases from whom 18 TB cases (10/100,000) were identified.

Picture 2 : TB outreach activities in Schools and IWAWA Centre by the National Youth Council, Rwanda, July 2016-June 2017

I.3.2.3. TB sensitization in refugee's camps

Sensitization campaigns were conducted twice per year in 6 refugee's camps (Kiziba, Kigeme, Mugombwa, Gihembe, Nyabiheke and Mahama). 633 (99.7%) out of 641 peer educators were sensitized/trained from the six refugee camps and TB leaflets distributed to increase awareness among the refugees. Peer educators conducted coughers triage, which identified 59,317 (46.8%) coughers out of a population of 126,590. Coughers were then referred to the health posts, and 1,360 TB presumptive identified by health care providers. Fifty five (55) TB cases were diagnosed (43/100,000).

I.3.2.4. TB sensitization in Prisons

Sensitization campaigns were conducted in 14 prisons (Nyagatare, Rwamagana, Ngoma, Bugesera, Gicumbi, Musanze, Rubavu, Rusizi, Nyamagabe, Huye, Nyanza, Muhanga, Nyarugenge and Mageragere). 1,317 (98.2%) out of 1,340 peer educators were trained on TB symptoms and transmission. The aim of the peer education in the prisons is to sensitize the inmates on tuberculosis and when there is cough, cases are referred to the health facilities for screening.

I.3.2.5 TB sensitization in PLHIV associations

Rwanda network for People living with HIV (RRP+) is an umbrella organization that coordinates all activities related to people living with HIV. They contribute to increasing TB knowledge, identification and reference to health facility of TB presumptive cases.

RRP+ conducted supervision in 132 health facilities in 22 District; each district has 60 peer educators from 6 health facilities.

To monitor the achievement of peer educators through the community mobilization and awareness, the aim of those supervisions were to identify challenges of peer educators. So far the reporting system in terms of TB presumptive and cases brought by peer educators have to be

improved by using TB tools available in the health facilities in order to be able to measure their contribution in TB prevention and control. On the other hand, there is need to explore way how to track presumptive and cases brought by HIV peer educators, among those brought through community initiatives.

I.3.2.6. Civil Society in fight against TB

The Country Coordinating Mechanism of Global Fund in Rwanda (CCM-Rwanda) submitted a 2.5 years' concept note to the Global Fund for HIV & TB (2015-2017). CCM selected 2 NGOs per province. NGOs received induction through an orientation meeting organized by the RBC Single Project Implementation Unit in collaboration with RBC TB for the selected NGOs. In this year, the NGOs participated in the coordination meeting for reviewing the implementation.

These NGOs worked in collaboration with health facilities and community health workers to increase the knowledge of people /community vis a vis TB infection.

The NGOs participation is oriented in the sensitization of High Risk Groups including TB contacts, elderly, and diabetics.

The NGOs identified the diabetics in the community and encourage the creation of the associations. So far forty tree diabetic associations have been created around the health facilities. These associations facilitated the sensitizations of the diabetic patients and 4,763 were sensitized. Some of them have already initiated the income generating activities, resulting in members in some associations covering their family medical insurance. Apart from the sensitization sessions carried out in associations, NGOs met the diabetics patients at health facilities when they come to the medical follow up.

The NGOs also advocate for linkage between diabetic patients and health facilities, which organizing a TB screening among of Diabetic patients.

I.3.3. Preventing TB through medication

I.3.3.1. Isoniazid Preventive Therapy (IPT) for children under 5 years

Rwanda started to implement the WHO recommendation for all child contact to be screened for TB and either referred for diagnosis and treatment if they have symptoms of the disease. The contact investigation policy recommends screening all sputum smear positive contacts at the beginning and at the end of TB treatment of the TB index case. It also recommends to initiate the Isoniazid Preventive Therapy (IPT) for children under 5 years without TB disease.

During the 2016-2017 year, 96% (1,578/1,652) of all children under 5 years who were contacts of tuberculosis bacteriologically confirmed cases were screened for TB. Of these 9% (137/1,578) were identified as presumptive TB cases and 19 were confirmed as TB cases (1,150/100,000).

The percentage of children that initiated IPT was 96%.

Table 17 : Cascade of TB contact screening and initiation of isoniazide preventive therapy (IPT) among children under 5 Years, Rwanda, July 2016-June 2017

IPT by Provinces	Number of contact	Contact screened for TB		TB Presumptive TB among screened contacts		TB Cases among children t <5years		Eligible on IPT		Contacts of TPB+ < 5 years put on IPT	
	Number	Number	%	Number	%	Number	per 100,000	Number	%	Number	%
East	436	402	92%	28	7%	2	459	434	99.5	407	93.8
Kigali City	382	376	98%	33	9%	8	2094	374	97.9	361	96.5
North	194	189	97%	20	11%	3	1546	191	98.5	182	95.3
South	374	369	99%	44	12%	5	1337	369	98.7	360	97.6
West	268	244	91%	12	5%	1	373	267	99.6	253	94.8
Total	1,654	1,580	96%	137	9%	19	1149	1,635	98.9	1,563	95.6

I.3.3.1.2. Outcome of children under 5 years put on IPT for cohort registered 2015-2016 Children under 5 years put on IPT received treatment for six months by Provinces

Children under 5 years put on IPT received treatment for six months. During the fiscal year 2015-2016, 1,358 children under 5 years received IPT, 1,328(97,7%) had treatment completed, 2 children died, 5 were lost of follow up and 12 were not evaluated. Reasons of this situation include death or lost to follow up of parent index case (so that the child on IPT stopped visits to the health facility), referral to other health facilities, etc.

Table 18 : IPT completion status for under 5 years put on IPT, Rwanda, July 2016-June 2017

Provinces	IPT under 5years Registered	Under 5 years on IPT move to SLD		Under 5 years IPT treatments Completed treatments		Under 5 years IPT Died		Under 5 years Lost follow up		Under 5 years Non evaluated	
	Number	Number	%	Number	%	Number	%	Number	%	Number	%
East	354	0	0%	344	97%	0	0%	0	0%	0	0%
Kigali City	347	0	0%	337	97%	1	0%	2	1%	7	2%
North	115	0	0%	114	99%	0	0%	1	1%	0	0%
South	361	0	0%	358	99%	0	0%	0	0%	3	1%
West	183	2	1%	175	96%	1	1%	2	1%	2	1%
Total	1,360	2	0%	1,328	98%	2	0%	5	0%	12	1%

I.3.3.2 Isoniazid Preventive Therapy (IPT) for PLHIV HIV

Currently, HIV infection is still the most powerful known risk factor for reactivation of latent tuberculosis infection (LTBI) to active tuberculosis (TB) disease. WHO recommends IPT as part of the TB/HIV collaborative activities since 2004 but it is since the publication of the 2010 guidelines for Intensified TB case-finding and IPT for people living with HIV (PLHIV) in resource-constrained settings that there has been a gradual increase in its implementation by the countries affected by both TB and HIV. TB and HIV Division selected 3 sites: Kabgayi DH, Kivumu HC and Kimironko HC, based on the geographical location, level of performance of the HIV service and a combination of district hospital and health centers.

This report summarizes the implementation process and results of IPT from the beginning of July 2016 until June 2017

I.3.3.2.1. IPT Initiation for PLHIV

A total of 205 patients were enrolled in the IPT program at the 3 selected sites between July 2016 and June 2017. There has been low coverage with only 41%. The TB/HIV TWGs decided that new enrollment on IPT should stop; but the final decision is still waited from upper level.

Table 19 : Enrollment of PLHIV on IPT, Rwanda, July 2016-June 2017

IPT Site	Newly enrolled in the HIV Program	TB cases after screening		Newly enrolled on IPT program	
	N	N	%	N	%
Kabgayi DH	23	0	0	12	52
Kivumu HC	81	2	2	66	81
Kimironko HC	392	17	4	127	32
Total	515	19	4	205	41

I.3.3.2.2. IPT Completion for PLHIV

Using the IPT register, of 214 patients who enrolled in IPT between July 2015 to June 2016, 203 (94.8%) completed 6 months of treatment, 1 was lost to follow up within the first 6 months and (5) 15.8 % stopped IPT due to side effects(3). Two cases developped TB disease during IPT. None of the patients died.

Table 20 : IPT Completion for PLHIV, Rwanda, July 2016-June 2017

	# enrolled in IPT	Results at the end of the first phase (6 months)				Stopped IPT because of side effects	Developed TB	Data missing
		INH/ TT	LTFU	Transf. out	Died			
Kabgayi DH	35	31	1	0	0	3	0	0
Kivumu HC	58	55	0	2	0	0	1	0
Kimironko HC	121	117	0	3	0	0	1	0
TOTAL	214	203	1	5	0	3	2	0

I.4. Objective 4: Improve managerial capacities of the TB program; enhance the monitoring, evaluation system and operational research by implementing and make functional an electronic TB register in all CDTs.

I.4.1. Strengthen Political commitment and advocate for domestic and external commitment

This section reports on activities related to TB&ORD coordination and planning.

1.4.1.1. TB evaluation meetings with hospitals and health centers to validate data and to review TB&ORD performance

Every quarter, staff of the TB&ORD Division conducted "quarterly evaluation meetings" with participation of all Referral, Provincial, District hospitals and all health centers representatives, to review the quality and validate TB & ORD data of outgoing quarter, by confronting pre-established aggregate reports and source documents such as registers, etc. Validated data were entered in the HMIS aggregate system and constituted the basis of the current TB & ORD Annual Report. The meetings served also to track progress of indicators whereby corrective measures are developed on time for the indictors which have low performance.

1.4.1.2. MDR-TB patient selection committee meetings

During the 2016-2017 fiscal year (FY), 8 MDR-TB patient selection committee meetings were held at Kabutare, Kibagabaga and Kibungo MDR-TB Specialized Centers.
Key points discussed were about specific questions raised by health facilities or MDR-TB Specialized Centers on better management of MDR-TB patients, discussions on specific cases presented by health facilities, to improve individual MDR- TB recording and quarterly MDR-TB reports through R-HMIS and update of the national MDR-TB guidelines.

1.4.1.3. Revision of the 2012 national MDR-TB guidelines.

To take into account and introduce new WHO drug resistant TB treatment drugs, a process to revise the 2012 MDR-TB guidelines was initiated.

Key changes introduced are: active drugs safety monitoring (aDSM), shorter regimen for MDR-TB patients, treatment for pre- and XDR TB disease and introduction of new MDR-TB drugs (Linesolide, delamanide and bedaquiline).

The revised guideline is under review by experts from national and international (WHO-GLC).

1.4.1.4. Childhood TB Technical working group

Two childhood TB Technical working group meetings were conducted during the 2016-2017 FY. Among key outcomes of these meetings, TST indications were revised and classified and and advocated to integrate TB components into ICCM monthly report. In addition, we phased out isoniazide 60 mg (INH60) and retreatment regimen for children and phased in of pediatric formulation (Isoniazide 75 mg - INH 75).

1.4.1.5. TB/HIV technical working group meeting

To ensure more effective collaboration between national TB and HIV programs, a national TB/HIV coordinating body was established in Rwanda in 2005. During the 2016-2017 FY, TB&ORD and HIV Divisions organized TB/HIV technical working group meetings, where participated other TB/HIV stakeholders such as health centers, district and university hospitals, WHO, CDC, etc.

Among key decisions, enrollment of new PLHIV on isoniazide preventive therapy (IPT) were suggested to be stopped; Based on recent findings from TB ACF among PLHIV, where systematic Xray screening shown that many cases are missed by current routine symptoms screening. Final orientations on this program will be provided by senior leadership. In addition, we phased out category 2 treatment (Streptomycin molecule and 8 months treatment duration) for retreatment cases.

1.4.1.6. Submission of new GFTAM grant

During the 2016-2017 FY Rwanda submitted the concept note to Global fund against Tb/ HIV/AIDS and Malaria (GFTAM), based on the global funds board decision in November 2016 on the allocation resource for the 2017-2019 allocation period. The allocation amounts have been determined primary based on disease burden and income level. The Ministry of Health through Rwanda Bio-medical Center/ Tuberculosis and other communicable respiratory diseases Division (TB&ORD) decided to submit their application in the open window of finding cycle of three years in March 2017. To access the allocation amount, funding requests (formerly called concept notes) must be developed through inclusive and evidence-informed country dialogue and be based on national disease strategies and health plans. The government decided to submit the combine TB/HIV concept note. The funding request was based on the Global Fund approach named "Tailored Approach to National Strategy Pilot Application Stream" where the funding is based on the national strategy, the programmatic and financial gap analysis and the performance framework. As the TB NSP 2013-2018 was coming to an end, there was a need to develop NSP which covered the funding period and it was decided to develop an extension of TB National strategic plan up to 2020 due to fact that many national strategic document (HSSPIII&EDPRS2) will end by June 2018 while waiting the development of the new EDPRS3 and HSSPIV that is why three years extension period was motivated. On 20th March 2017, the TB/HIV concept note was successfully submitted to Global fund and on 16th May 2017 the Global fund secretariat notified to Rwanda that the funding request was passed by the independent Technical Review Panel (TRP) and recommends to proceed for the grant making. The TRP applauds the applicant for this comprehensive, exemplary and high quality funding request

The extended national strategic plan is a comprehensive update of the 2013-2018 TB-NSP aimed at implementing recommendations of NSP Mid-Term Review (MTR) conducted in November 2016 and to align to the global End TB Strategy of the World Health Organization. Rwanda's vision is to eliminate TB and attain the Sustainable Development Goals (SDGs) by 2030 and to eliminate TB in Rwanda by 2035.

Main strategic changes were: XPert MTB/RIF adopted as initial diagnostic test for all presumptive TB cases in a phased manner; Radiological screening systematic for all new PLHIV and all TB contacts at the beginning of treatment of the index case; universal access to DST; Introduction of mentorship program on childhood TB, the establishment of an active drug safety monitoring and management system (aDSM), the provision of nutritional support for the moderate and severely malnourished drug-susceptible patients, the introduction of new drugs for defined category of MDRTB patients, and the transition to individual case-based electronic reporting system.

The estimated total budget for the 3-year plan is US$ 22 million of which 22% are already committed by the Government of Rwanda, 64% by the Global Fund and remaining by other donors.

Based on that extended NSP for January 2018 to December 2020, we developed and submitted a new GFTAM grant request for the same period. The total amount requested was 14 million USD, for activities highlighted above in the extended NSP.

I.4.2. Develop human resources and capacity building

I.4.2.1. Capacity building for the central level staff

The TB&ORD Division through RBC, has recruited the following staff who are now in service: the Radiology Technician for TB ACF and TB provincial coordinator for Eastern Province, based at Nyamata district Hospital.

In addition, to improve the quality of TB services, TB&ORD staff were provided with internal capacity building. Among topics covered we can list: practical skills of TB data management and analysis, for data of both aggregated system (HMIS) and individual system (e-TB), PAL strategy, Childhood TB integrated with IMCI, MDR-TB case management, TB&ORD data quality assessment, TB active case finding (ACF) intervention, etc. TB&ORD staff were also made aware of current TB diagnostics landscape through a scientific presentation of the content of a journal article[5].

I.4.2.2. Capacity building for decentralized level staff

The TB&ORD Division revised the national guideline according to WHO recommendation and prepared the **updated trainings materials** (power point presentation) to be used during the trainings of health care providers countrywide.

In collaboration with partners (like the University Teaching Hospitals, Rwanda Radiologist Society, Rwanda Society of Pathologists, etc), the TB&ORD Division has conducted different trainings. The table below captures trainings conducted during 2016-2017 FY.

Table 21 : Trainings of health facilities staff on different aspects of TB&ORD, Rwanda, July 2016-June 2017

Type of training	TB program	Type of participants	Number of participants
CXR reading	TB care and treatment	MDs & MDs clinical mentors	50 (hospitals country wide were covered)
Integrated training on Infectious diseases for clinical mentors (trained on key TB control strategies such as RSQA, death audit, TB ACF, MDR-TB, TB IC, childhood TB)	TB care and treatment	Clinical mentors (MDs&Nurses)	97 (all hospitals covered except one)
TB, TB/VIH and leprosy diagnosis and management	TB care and treatment	MDs post graduate from teaching hospitals	30
	TB care and treatment	Nurses of DH Mibilizi (23), Nemba (25) Ruhango (16),Kirehe (35),Nyamata (42),Muhima (30),Kabgayi (37) and Ruhengeli (23)	239
Use of Fine Needle Aspiration (FNA)	TB care and treatment	MDs	47 (hospitals country wide were covered)
Childhood TB workshop for MDs	TB care and	MDs&Nurses	35 MDs and 37 nurses

[5] Pai M, Schito M. **Tuberculosis diagnostics in 2015: landscape, priorities, needs, and prospects.** J Infect Dis. 2015 Apr 1;211 Suppl 2:S21-8. doi: 10.1093/infdis/jiu803.

and nurses (TB diagnosis among children)	treatment		(target was to cover 45 hospitals)
Childhood TB workshop for hospital nutritionists (TB diagnosis among malnourished children)	TB care and treatment	PH, RH and DH nutritionists	39 nutritionists (target was to cover 45 hospitals)
e-TB data managers	e-TB data entry	Data managers	556
e-TB	E-TB data entry	TB supervisors	39
Programmatic management of drug resistante TB	TB drugs management	Nurses	41
PAL: diagnosis and treatment of respiratory diseases	ORD	MDs&Nurses	70/84 MDs and 109/115 nurses (target was to train 2 MDs hospitals all over the country) (for nurses targets were to cover HFs of western, Kigali and 4 districts in South)

I.4.3. Enhance monitoring and evaluation system

I.4.3.1. Development and update of the routine aggregate TB surveillance system

The number of entities reporting on TB&ORD in the surveillance system: The number of centers of TB diagnosis and treatment (CDT) became 201, as we created one new CDT (Nyarugunga HC) in Kicukiro District of Kigali City, for to improve TB diagnostic services accessibility. The number of centers of TB treatment (CTs) was 362. Three centers were reporting on MDR-TB cases registration and treatment initiation. These were Kabutare, Kibagabaga and Kibungo district hospitals.

TB&ORD monitoring tools: TB cases register and TB treatment files were revised, mainly to replace former cases categories to align with the new WHO cases categorization system. These tools are in use in health facilities since July 2017.

The Reporting format of TB surveillance data was revised. Following considerations were taken into account to review it: the 2013-2014 WHO new definitions on TB cases definition and reporting framework (ages disaggregation, treatment outcome to remove those started on 2nd line TB treatment), the 2015 WHO revised TB/HIV M&E Guidelines (treatment outcome disaggregated for TB/HIV New and Relapse), the WHO end TB strategy indicators (registered who initiated treatment), the TB screening and diagnosis among high risk groups approach (contact investigation cascade at end of treatment of index case), the current country Xpert scale up activities (tests by each Xpert site), and the 2013-2018 TB NSP monitoring and evaluation plan indicators (all-forms cases from community).. Validation rules introduced were also made functional.

Regarding **completeness and timely report of HMIS aggregated reports for TB&ORD**, these seem to be different according to type of data set. The completeness was good, however timely report still to be improved.

Table 22 : Report on completeness and timeliness of the TB HMIS, Rwanda, July 2016-June 2017

Dataset	Expected Reports	Actual Reports		Reports On Time	
		N	%	N	%
Treatment outcome report (CDT only)	804	800	99.5	692	86.1
Registration of TB Cases (CDT only)	804	798	99.3	707	87.9
Presumptive examined by microscopy techniques(CDT only)	804	798	99.3	699	86.9
HIV Testing among TB Cases, Laboratory and Smears examined (CDT only)	804	797	99.1	701	87.2
TB Drug Management (CDT only)	804	795	98.9	656	81.6
TB/HIV and TB among people at high risk of TB and Community DOTS, Screening	2,272	2,243	98.7	1,964	86.4
Genexpert coverage and results by eligibility criteria	2,272	2,239	98.5	1,951	85.9
TB_Infection Control Evaluation form	2,300	2,263	98.4	1,950	84.8
TB surveillance among health facility workers	2276	2231	98	1,963	86.2
HIV Testing among TB Cases, Laboratory (CT only)	1492	1461	97.9	1,312	87.9
Coughers triage compilation report	2,312	2,252	97.4	1,951	84.4
Xpert tests performed (Xpert sites only)	200	190	95	82	41

Table 23 : Report on completeness and timeliness of the MDR-TB and Leprosy HMIS, Rwanda, July 2016-June 2017

Dataset	Expected Reports	Actual Reports		Reports On Time	
		N	%	N	%
MDR-TB Registration and by Case category and by HIV status	12	12	100	4	33.3
TB - Bacteriological conversion, Suspicion of MDR TB and Management of MDR TB cases	2,268	2,123	93.6	1847	81.4
MDR-TB case management-Bacteriological Conversion-Treatment Outcomes	12	11	91.7	3	25
Leprosy notification and detection	2,616	2,232	85.3	2,023	77.3
Leprosy patients Under treatment-Treatment Outcome and Disability assessment	2,324	2,203	94.8	1,785	76.8

I.4.3.2. Making the electronic individual TB register (e-TB) functional and usable

e-TB is the electronic TB register, implemented in Rwanda since 2014 under the DHIS-2 platform. It records individual level data on presumptive TB, TB cases. MDR-TB cases and leprosy cases. Since, it has passed different levels of assessment/update/improvement, including lastly the mid-term review (MTR) of the 2013-2018 TB NSP.

During the 2016-2017 FY, The e-TB reporting form has been updated considering recommendations from the MTR of the 2013-2018 TB NSP and it is now fitting with TB reporting form. Key solved issues include: increase the RAM memory of the server from 4GB to 7GB to deal with the issue of slowness; Updating the DHIS2 versions from 2.21 up to 2.26, which brought a greater solutions on the highlighted issues such as tabular, deleting user, event report applications can now show reporting rate.

During FY2016-2017 refresher training on e-TB data entry was provide to all data managers from all country's health facilities to improve their skills and familiarize them with the new features of

DHIS 2.26 version. In addition, mentorship, was provided to selected district hospitals which had a low level of coverage.

As outcome, compared to the FY 2015-2016 the data entry of TB presumptive cases have been increased in FY 2016-2017 from 68% to 73% as well as the records of TB case were also increased from 31% to 68% due to the corrective measures which include correct errors, improve data quality and delete duplicate records.

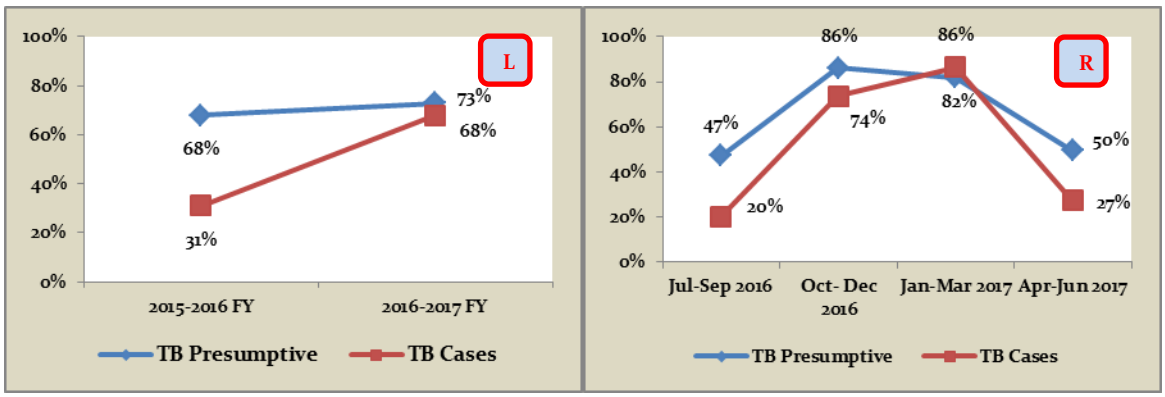

Figure 15 : Evolution of e-TB coverage between 2015-2016 and 2016-2017 FY (L) and during the 2016-2017 FY (R), Rwanda, July 2016-June 2017

One important remaining issue is to create a unique patient identifier for all TB presumptive and TB cases.

The fact that increase in coverage occurred essentially after refresher trainings and mentorships demonstrate that the system is functional but also call for creating need to use this system. In fact current reports are developed from HMIS aggregated data. A regular analysis of e-TB data and feedback is a step forward to start introduce the use of e-TB data in the decision making.

I.4.3.3. TB Deaths Audits analysis

Reduce the death rate is one of the TB&ORD NSP priorities, especially in HIV-positive patients and clinically diagnosed patients. Knowing potential causes of deaths among TB patients may help us to identify specific interventions to be implemented to reduce the burden.

The TB death audit system has been implemented and improved progressively since 2014.

We are summarizing key findings of first ever analysis of TB death audit reports in Rwanda from all over the country, for TB patients registered between January 2015 and March 2016 and for whom "died" was as TB treatment outcome between January 2016 and March 2017. Findings are that:

- More than 2/3 of deaths among TB patients occur during the 1st two months of TB treatment;
- Almost a half of died TB patients had smear positive pulmonary TB and their risk of dying increases with bacillary load;
- Close to 2/3 of died TB patients were underweighted (BMI≤18.5) at diagnosis time and HIV+ were more underweighted than HIV- (70% vs 55%);
- Close to a half of died TB patients are HIV positive and more than ¾ of those with HIV infection have low CD4 levels (<350).

All this indicates that probably TB disease is screened with delay, at an advanced stage and that early screening and diagnosis strategies should be reinforced, using X-ray screening and xpert diagnosis especially for high risk groups. We may also start think and explore about some other interventions such as nutrition support for not only drug resistant TB but also drug sensitive TB patients in need.

We however still need to ensure all reports are made (as we only analyzed 47% of expected reports) and quality is improved, before final decisions.

I.4.3.4. Supervision, data quality assessment and Mentorship for TB control activities at decentralized level

Improving the quality of TB & ORD services requires regular visits to Health Facilities, to mentor health care providers especially in District Hospitals which have the mandate to monitor the health centers. Empowering staff at District level will help program to sustain activities at decentralized level.

I.4.3.4.1. Integrated Supportive Supervision and Data Quality Assessment

The Integrated Supportive Supervision coupled with Data Quality Assessment, (ISS/DQA) has been adopted as an improvement measurement framework and a key enabler to achieve the sustained quality of care provided to the Rwandan population in the Health Sector Strategic Plan III (HSSPIII) of the Ministry of Health (MOH). Under this framework, two rounds of ISS&DQA have been conducted by MOH in collaboration with Rwanda Biomedical Center (RBC) at District and Provincial Hospitals, Health Center levels, the first one from 21st November to 16th December 2016 and the second one from 19 June to 14 July 2017. While the results of the second ISS&DQA are being analysed, at HF levels, during the first ISS&DQA, TB data showed (for selected indicators) 94% of HF had an average discrepancy less than 1%. Taking into account that the DQA for TB data has considered data reported for the quarter of July-September 2016.

As part of data quality assessment, a desk review for the period from (July 2014 to sept 2016) was also conducted for TB datasets reported in HMIS by all public Health Facilities that provide TB services where completeness, timeliness and non-missing values were calculated for the following datasets: (i) TB - HIV Testing among TB Cases, Laboratory (CT only) at HC level; (ii) TB - Registration of TB Cases (CDT only) at HC, DH, and RH levels; and (iii) TB - Treatment outcome report (CDT only) at HC, DH, and RH levels. As results, the monthly submission completeness at national level was above 98% from July 2014 to September 2016. Regarding with timeliness, monthly submission at national level experienced a consistent increase from 84% in July-September 2015 to 94% in July-Sept 2016. Regarding with non-missing values for TB reports, the rate was kept above 99.8 % from July 2014 to Sept 2016.

I.4.3.4.2. Rapid Service Quality Assessment (RSQA)

During 2015-2016 FY, RSQA visits were conducted in centers of TB diagnostics and treatment (CDTs) countrywide in February and May 2016. In the 2016-2017 FY, the same exercise was repeated countrywide in September 2016 and May 2017 except Kigali City, as part of assessing if RSQA are producing some improvements in quality of TB services. We added questions to assess the implementation of PAL Strategy and to monitor MDR TB patients' management in ambulatory phase. During the RSQA sessions we mentored staff of hospitals and Health Centers by discussing and providing solutions to challenges identified.

We visited 151 and 148 centers of TB diagnosis and treatment (CDTs) Countrywide respectively during 2015-2016 and 2016-2017 FYs.

In overall, there has been an improvement of scores in 2016- 2017 compared to the results obtained in 2015-2016. As example score for active TB screening among high risk groups improved from 48% to 73%. As well score for lab results availability improved from 77% to 84%. However, some domain areas need particular attention. Those are knowledge on TB infection control, evaluation of infection control plans and availability of leprosy screening posters.

Some questions newly introduced in September 2016, related to MDR-TB management and Approach to Lung Health (PAL) strategy are observed having low score and hope that improvements will be detected during next RSQA visits .

I.4.3.5. Program review: Annual TB performance review meetings with Districts

As per previous years, an annual evaluation meetings between TB&ORD Division with Hospitals Directors, M&E officers, Data Managers, Mentors and TB Supervisors or TB focal person. We discussed achievements, progress, challenges as well as recommendations to overcome challenges for TB control in Rwanda. It was also opportunity of Hospitals to share best practices.

Some key recommendations were as follow:

- As the Xpert is called to be the initial TB diagnostic test in Rwanda, replacing the conventional microscopy, it has been recommended to speed up the transmission of TB laboratory results, for GeneXpert. As an implementation outcomes, from TB&ORD RSQA reports, it is shown that Xpert results are available at requesting health facility within 3 days in 64% of HFs in 2016-2017 FY versus 25% in 2015-2016 FY. This was a result of expansion of Xpert testing sites and close follow up of this issue during mentorship and quarterly evaluation meetings.
- One strategic intervention for the 2013-2018 TB NSP and in absence of a vital registration system, it has been recommended "To reinforce quality of death audit reports, and start analyzing them". We conducted analysis of deaths reports up to third quarter of 2016-2017 FY, looking at both quality of reports and producing preliminary hypothesis on deaths risk factors. Findings ware shared during QEM of April-June 2017. With identified issues of quality, the death audit format was revised to improve commitment of both district level and central level staff to quality of those reports.
- For better implementation of agreed on recommendations, it has been recommended that "Leadership of hospital should be involved in monitoring activity of TB management and own quarterly evaluation meeting". The monitoring system is yet to be improved to capture the involvement of the hospital leadership during this activity.
- SPIU should send an official communication to hospital managers on use of budget in "Plan Type" with emphases on fees for quarterly evaluation meeting and supervision. Workshop held with SPIU, M&E officers and GFTAM accountants of all hospitals and were provided

I.4.3.5. Program review: The mid-term review of the 2013-2018 TB NSP

In November 2016, the Rwanda Biomedical Center, through its TB&ORD Division conducted a mid-term review of the 2013-2018 TB NSP, to assess its achievement and its current relevance in line with the new end-TB strategy. The review involved national and international stakeholders and was led by WHO team, and visited central level institutions, conducted field visits in health facilities and community. Below are key recommendations:

- Introduce CXR as routine screening tool for high risk groups to compliment symptom-based screening; adopt Xpert as initial diagnostic test for all presumptive TB cases , and for all previously treated TB cases;.
- Mentoring in Childhood TB and build capacity on the diagnosis procedures;
- Institute active drug safety monitoring (aDSM) system; and Phase out Streptomycin-based treatment regimen for previously treated TB cases
- Update knowledge of CHWs through refresher training and provision of structured guidance for community sensitization on TB;
- Conduct periodic TB screening for CHWs
- Increase the usage of eTB to transition from reporting through aggregate data to case based data

I.4.4. Enhance operational research

The vision of the Ministry of Health is to provide better quality health services through evidence based policy and planning. The TB & ORD Division has responded to this vision by conducting operational research and/or using findings of research implemented by other stakeholders in the field of TB, to inform TB&ORD its planning.

I.4.4.1. Monitoring of the 2013-2018 TB NSP Operational Research agenda

No	Title	Status
1	Characteristics of presumptive TB cases confirmed as TB cases	These two topics were merged. One study will be conducted and will take into account both objectives. The study entitled "Associated risk factors for TB diseases in patients attending health facilities in Rwanda", a case control-study where cases will be TB cases and controls will come from presumptive TB not confirmed TB cases. The protocol was approved by national ethics committee and will be implemented during 2017-2018 FY.
2	Risk factors of TB disease among men in Rwanda	
3	TB knowledge, attitude and practices (KAP) survey	The final database of the 2014-2015 DHS was availed. A request to NISR to access and conduct secondary analysis of DHS data on TB KAP was made and approval obtained. Analysis and report will be done in 2017-2018 FY.
4	Cost-effectiveness of a TB active case finding program in high risk group (prison)	With the extended TB NSP 2018-2020, the new orientation was to conduct a comprehensive survey on costs bearded by TB patients, as per the end TB strategy.

I.4.4.2. Summary findings from operation research on TB in Rwanda

I.4.4.2.1. Improving TB screening and diagnosis

From findings of TB prevalence survey conducted in 2012-2013, it has been clear that current TB screening and diagnostic tools, based on symptoms screening and microscopy diagnosis, are less sensitive, and may miss half of prevalent cases.

Regarding TB screening, among PLHIV, one research undertaken years ago was completed[6] and concluded to a poor performance of the routinely use symptoms screening tool.

Additionally, two researches, one by Ngabonziza JC et al[7] and a second one by the East African Public Health Laboratory Network (EAPHLN) project[8], were completed and analyzed potential

[6] Turinawe K, Vandebriel G, Lowrance DW, **Uwinkindi F**, Mutwa P, Boer KR, **Mutembayire G**, Tugizimana D, **Nsanzimana S**, Pevzner E, Howard AA, **Gasana M**. **Operating Characteristics of a Tuberculosis Screening Tool for People Living with HIV in Out-Patient HIV Care and Treatment Services, Rwanda**. PLoS One. 2016 Sep 29;11(9):e0163462. doi: 10.1371/journal.pone.0163462. eCollection 2016.

yield of Xpert diagnostic technique against routinely used microscopy for bacteriological confirmation of TB disease. Both confirmed that Xpert has a high yield over the microscopy technique and, suggested to use Xpert as initial diagnosis test.

With the extended TB NSP 2013-2018, symptoms screening tool remained, but in addition, X-ray screening was suggested for specific TB high risk groups, including PLHIV and contacts of TB infectious cases. As well, Xpert was suggested for TB diagnosis among TB presumptive from TB high risk groups, including PLHIV. Xpert sites were and will continue to be increased.

In 2016-2017 a new study, called DIAMA, in full "diagnostics for multi drug resistance tuberculosis in Africa" was initiated, aiming at introducing and evaluating efficacy of a rapid molecular test (xpert) in MDR-TB follow up compared to routinely used conventional culture and, introducing a new rapid molecular test able to detect sensibility to more than one molecule (LPA compared to Xpert testing rifampicin only).

I.4.4.2.2. Exploring risk factors of TB disease

The TB epi-assessment conducted in 2013-2014 concluded to fact that the TB epidemic in Rwanda is becoming concentrated, in some groups. This means that resources may be wasted if interventions are not targeting specific groups at higher risk of TB disease. Therefore it became obvious that we should assemble evidence on who is really at risk.

TB 2012-2013 prevalence survey conducted in Rwanda, was also conducted in many other countries, such as Malawi, Mongolia, Myanmar, the Philippines, Tanzania, Viet Nam and Zambia. International Experts and country program leaders analyzed those databases, to assess the relationship between household socio-economic level (SEL), both relative and absolute, and individual tuberculosis (TB) disease[9]. Overall, a strong and consistent association between household SEL and individual TB disease was not found. However, throughout the extended TB NSP 2018-2020, the NTP planned to routinely assess health insurance coverage and nutritional status of TB patients for better advocacy and better setting of specific and relevant intervention.

I.4.5. Provide technical assistance

The Green Light Committee (GLC) is supporting the TB program for the provision of high quality second line TB drugs. This approval by the GLC is conditional upon annual monitoring visits to ensure adherence to WHO guidelines and policies.

The monitoring and evaluation visit took place from 11th to 20th July 2017and have been conducted by a Consultant from WHO, Dr Norbert NDJEKA, from South Africa.

The main objectives of the visit were to assess implementation of PMDT and to evaluate current achievements, and provide input to the new Drug-Resistant Tuberculosis treatment guidelines.

During this mission, health facilities have been visited; staff asked some question about TB and MDR-TB management, patients' files reviewed, TB drugs management discussed and recording and reporting system evaluated. A two days pre-visit has been carried out at Kabutare MDR-TB

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[7] **Ngabonziza JC**, Ssengooba W, Mutua F, Torrea G, **Dushime A**, **Gasana M**, Andre E, Uwamungu S, Nyaruhirira AU, Mwaengo D, Muvunyi CM. **Diagnostic performance of smear microscopy and incremental yield of Xpert in detection of pulmonary tuberculosis in Rwanda**. BMC Infect Dis. 2016 Nov 8;16(1):660.

[8] East African Public Health Laboratory Network (EAPHLN) project. **Impact of new TB diagnostics on patient health outcomes: an East Africa multi country proposal**.

[9] Siroka A, Law I, Macinko J, Floyd K, Banda RP, Hoa NB, Tsolmon B, Chanda-Kapata P, **Gasana M**, Lwinn T, Senkoro M, Tupasi T, Ponce NA. **The effect of household poverty on tuberculosis**. Int J Tuberc Lung Dis. 2016 Dec;20(12):1603-1608.

centre and at the TB laboratory of the Butare University Teaching Hospital (CHUB) to evaluate the progress status on implementation of recommendations from 2016 WHO-GLC report.

After the visit a debriefing has been organized, firstly at WHO Rwanda Country Office, then after at Rwanda Biomedical Centre where NRL and TB Divisions participated and discussed with the WHO-GLC Consultant on the findings and recommendations.

Main recommendations from this visit were:

- Work on extension plan of using molecular test as initial TB diagnostic test for all presumptive cases, place all GeneXpert machines in a network and perform first and second line LPA for all RR-TB patients.
- Introduce an individualized regimen for all patients who are not eligible for the short regimen. This regimen needs to include new and repurposed drugs (Bedaquiline, Delamanid, Linezolid).
- Order new and repurposed drugs for DR-TB treatment (Bedaquiline, Delamanid, Linezolid) and Strengthen pharmacovigilance reporting mechanism.
- Finalize PMDT guidelines and print pocket size document and

TA from WHO to NRL Division (recruitment of an accreditation agency, GeneXpert implementation,etc) and to TB&ORD (training and document lessons learned in the field of MDR-TB in Rwanda).

I.4.6. Ensure logistics for TB control activities

1.4.6.1. Ensure logistics for TB medicines, reagents, consumables and equipment

To ensure logistics for TB control, the national quantification team under lead of Rwanda Biomedical Medical centre/TB&ORD has been established to forecast needs and budget required to diagnose, treat and prevent TB for the period of July 2016-June 2017. After this exercise, a report was produced for procurement purposes.

The procurement of TB medicines, reagents, consumables and equipment was conducted in accordance with both global fund requirements and national procurement regulations. In case of conflict of those different guidelines, the global fund requirements prevailed. Medicines to treat multi-drug resistant tuberculosis, some single molecules difficult to get from other sources and genexpert commodities were purchased through GDF.

The purchased products are in two categories: laboratory commodities and drugs. The drugs category brings together all medicines, medical consumables and equipment. In general 85% of the planned products in this category were delivered versus 93.2% reported last year. 9% of the planned items are in pipeline, 3% are partially delivered while 3% are under installation (equipment).

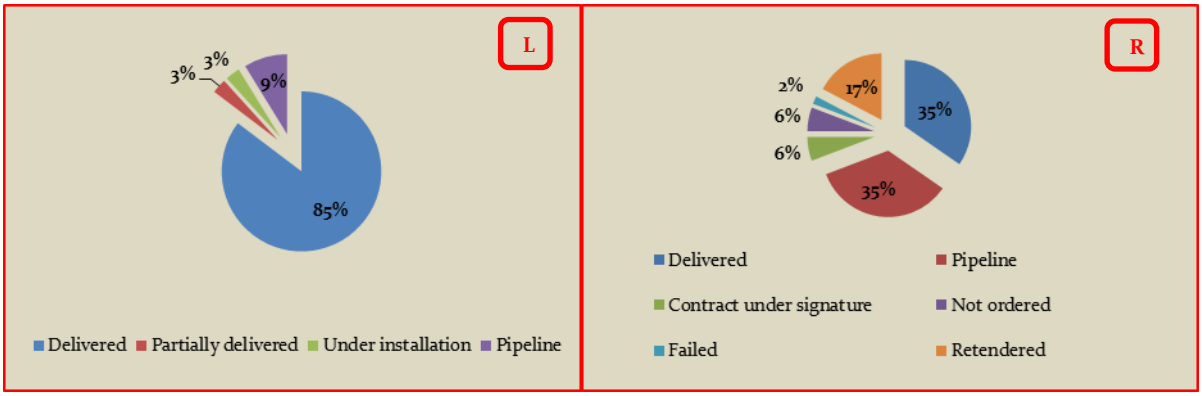

Figure 16 : Procurement status for TB medicines, medical consumables and equipment (L) and for TB laboratory commodities (R), by end of 2016-2017 FY, Rwanda, July 2016-June 2017

For laboratory commodities, 35% of planned items were delivered, 35% are in pipeline, 17% are under retendering process, 6% are under contract signature, 6% are not yet ordered and 2% failed. Even though the procurement performance is likely to be poor, we did not face stock out. Indeed, there was enough stock for the reported period and the only need products were purchased. The short shelf life for some laboratory commodities, pushed us to adjust the delivery period according to the consumption trends and available stock. This leads in general to the suspension or delay of deliveries or procurement process. Usually, there are two stocks of laboratory commodities: one of NRL and the other one for MPPD. It was found that it is not easy to properly monitor those two stocks and therefore a fluctuation of the procurement plan was observed. For this reason, next year we will keep one stock of MPPD and all TB commodities will always be integrally considered in one quantification, procurement and monitoring of stock.

Furthermore, the procurement of TB commodities in this fiscal year 2016-2017 was done through e-procurement system as RBC is among the institutions in pilot phase. As system in pilot phase, it is challenging both procuring entities and bidders and this impacted the procurement performance. However, it will bring more benefits in terms of time, management and transparence of procurement processes.

1.4.6.2. Challenges in procurement and supply chain management of TB commodities

Many challenges are met in procurement and supply chain management of TB commodities:

- Delays in delivery of TB commodities: the delivery period may take up to 5 months and longer
- Fluctuation of MDR TB and pediatric cases/regimen that may lead to expiries or stock outs
- Single source suppliers which are not favorably responding on time including GDF mostly for acquisition of cartridges.

1.4.6.3. Strategies for challenges mitigation

The following strategies have been adopted to ensure regular supply of TB commodities and prevent expiries:

- To conduct quantification review of all TB commodities with different stakeholders involved in TB case detection, procurement and supply chain management every quarter.

- To continue to use framework contracts to reduce time for procurement proceedings.
- To procure through GDF, items for which prequalified manufacturers are not interested to send their quotations and GDF to provide prompt responses to our requests
- To conduct monthly technical meeting between MPPD, NRL and TB&ORD Divisions to monitor stock status and pipelines.
- To integrate procurement plan of lab reagent and consumables in one document with TB medicines to speed up the initiation of procurement processes and facilitate monitoring of procurement status for all TB commodities

1.4.6.4. Ensure logistics for TB program management tools

Table 24 : TB tools printed, Rwanda, July 2016-June 2017

Tools Reviewed	Quantity expected to be printed	Tools Printed	Comment
Carnet de bon de labo	**4,195**	**4,195**	Done and was been distributed in July 2017
Fiche de traitement TB	**7,000**	**7,000**	Done and was been distributed in July 2017
Fiche Dot Communautaire	**3,295**	**3,295**	Done and was been distributed in July 2017
Fiches Malades TBMR	**150**	**150**	Done and was been distributed in July 2017
Algorithmes (Posters)	**3,195**	**3,195**	Done and was been distributed in July 2017
Register Laboratoire CDT	**342**	**342**	Done and was been distributed in July 2017
Registre de triage de tousseur	**704**	**704**	Done and was been distributed in July 2017
Registre de cas de TB	**697**	**697**	Done and was been distributed in July 2017

I.4.7. Performance Based Financing system (PBF)

The main objective of PBF TB strategy is to improve quality of TB services. Second objective is to improve the coverage of selected TB indicators especially the new interventions and the ones with low performance.

The evaluation of PBF TB Indicators is usually conducted on quarterly basis by a team from hospital or administrative district, both mandated by the District Steering Committee. All health facilities are evaluated on quantity and quality of pre-defined program indicators.

During this FY 2016-2017, the PBF TB indicators have been evaluated and remunerated on quarterly basis in all health facilities under financial contribution of RBF TB. In the upcoming fiscal year we will improve quarterly monitoring of validated quantities (indicator definitions, monitoring tools, etc.).

I.4.8. Implementation of the Practical Approach to Lung Health

The primary health-care concept is embodied in integrated, decentralized general health services that provide primary preventive measures as well as treatment and care for the community's most commonly occurring priority respiratory health problems. General health services in primary health care settings offer valuable opportunities for the diagnosis and management of Tuberculosis in a timely manner. Case detection, treatment and follow-up are enhanced when TB services are provided within the primary health care settings as service delivery points. Facilitating factors include improved access to diagnostic and treatment services, reduction of stigma and simplified contact tracing.

The WHO initiated a practical approach to lung health (PAL) strategy in early 1998 a patient-centred approach to improve the quality of diagnosis, treatment and management of common

respiratory illnesses in primary healthcare settings. PAL emphasizes priority respiratory illnesses, particularly TB, acute respiratory infections and chronic respiratory diseases, with a focus on asthma and chronic obstructive pulmonary disease. Improving general respiratory care increases the quality of the identification of TB cases among respiratory patients. This is the basic principle according to which the PAL strategy has been developed and incorporated in the Stop TB Strategy.

Rwanda like other countries in the region, limited data exists detailing the quality of general adult and adolescent primary care delivered for respiratory conditions, according to the Rwanda Ministry of Health, Annual Health Statistical Booklet 2015 using HMIS data; Acute Respiratory Infections represent 26.4% of causes of morbidity in health centers and 4.1% in District and Provincial hospitals.

Some of the strategies employed in the gradually scale up of the practical approach to lung health in Rwanda are:

I.4.8.1. Training activities for PAL implementation

Rwanda has PAL as one of its existing health policies for lower level health facilities and is in the process of a continued implementation through human resources development which involves education and training for health care staff in district hospitals and health centers (Medical Officers and nurses working in Out Patient Departments and other wards and clinics, TB Focal persons and TB provincial supervisors), availability of basic equipment for diagnosis and treatment of respiratory conditions (pulse oxymeters, peakflow meters, spirometers, Nebulizers and oxygen concentrators) and availability of essential drugs supplied to district and other decentralized pharmacies .

In the 2016-2017, through two TOT training sessions, we were able to train 179 health care workers who are 109 nurses from Out Patient and clinical departments and 70 Medical Officers. This TOT was a strategy focusing on the important skill transfer of health care workers to enable them be able to provide further training to other counterparts in their respective departments in health facilities.

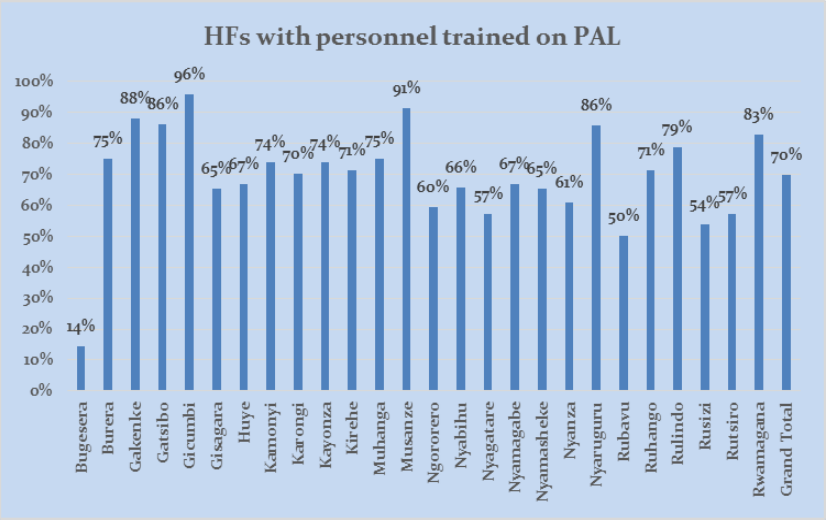

Figure 17 : Districts with personnel trained in PAL and have basic equipment available, Rwanda, July 2016-June 2017

I.4.8.2. Purchase of essential equipment for PAL activities in PHCs

- 126 nebulizers
- 2100 Adults mask for nebulizers
- 2100 Paediatrics mask for nebulizers
- 2000 Plastic mouth pieces for spirometer
- 2000 Singe use paper mouth spirometer
- 45000 Single use paper mouth for peak flow meter.
- 13 Oxygen concentrating apparatus

The nebulizers and masks were procured with a contract clause that ensured the supplier distributed the equipment to 42 district hospitals and trains health care workers in the use of this equipment. This ensures that the equipment is effectively delivered to the health facilty and used correctly.

I.4.8.3. Setting up the Technical Working Group for the Practical Approach to Lung Health

The main mechanism of coordination to involve multiple players and stakeholders is the establishment of a national working group on PAL to guide and support the initial activities and to foster the involvement of ministerial and other institutions in the planning and implementation of the PAL strategy. The TWG includes members who can bring together a rich variety of experience in technical, managerial, advocacy and educational matters relating to TB, HIV/AIDS and other respiratory diseases, and ensure linkages with related programmes of the MOH, RBC and other institutions. The membership of the TWG includes: Technical Staff of TB&ORD and other related divisions, clinical specialists from referral and university teaching hospitals, doctors from district hospitals and other organizations (WHO, NGOs etc)

The main objectives of the Technical Working Group includes the following:

- To coordinate the adoption, adaptation and implementation of PAL policy in Health Facilities of Rwanda
- To guide and support the initial activities and to foster the involvement of government and partner institutions
- Involvement in planning, implementation and funding of the PAL strategy as an extension of the NTP.

I.4.8.4. Review and validation of the PAL clinical guidelines

Guidelines need to be targeted to suit health care workers with standardized diagnostic procedures and patient management and details of correct and timely referral procedures. PAL clinical guidelines should contain details about the syndromic approach for diagnosis, alert signs to rule out emergencies, guidelines for clinical management and when and where to refer patients from primary health care settings. Guidelines need to be tested in real situations and modified if necessary and endorsed by the necessary administrative and technical structures.

The 2013-2018 TB NSP has a specific strategic intervention on PAL earlier in 2013 a draft Guidelines for the mentioned PAL strategy was developed. The activity was focused on the objective to validate the draft PAL guidelines developed earlier in 2013. A two-day review and validation workshop focused on re-reading, updating and correcting the PAL Clinical guidelines with experts from University Teaching Hospitals, District Hospitals and RBC.

I.4.8.5. Research and evaluation of the Practical Approach to Lung health strategy

During the past fiscal year, the ORD unit had planned to conduct an assessment of the Practical Approach to Lung Health (PAL) activities in selected primary health care facilities in Rwanda and produce a comprehensive report based on a qualitative and quantitative assessment of those activities. The aims of this assessment was to look at the relevance, effectiveness of the PAL strategy, assess the extent of PAL activities achievement, levels of training and integration at central and decentralized levels, document lessons learned and provide programmatic recommendations.

Due to lack of local capacity in this specific programmatic area, we were unable to get a consultant in time and this activity was moved into the 2017-2018 fiscal year.

I.4.8.6. Challenges to the implementation of the PAL strategy

The scale up of the practical approach to lung health still faces some challenges that need to be resolved as we move forward. The most pressing need for the PAL strategy is setting up a robust M&E systems to allow clear, accurate and timely capture of all necessary data to help inform the program and allow evidence based policy in PAL implementation. We also face challenges of trained staff turn over and availability of enough equipment in primary health facilities.

CHAPTER II: LEPROSY CONTROL

For the 2016-2017 fiscal year, the leprosy report includes activities that were conducted in different health facilities that are currently considered endemic areas. Leprosy prevention and control activities were also carried out in some non-endemic areas

II.1. Improve early detection of leprosy and reduce the proportion of new cases with grade 2 disabilities less than 10%, by 2018

II.1.1. Conduct leprosy active cases finding activities in endemic area

Leprosy control has been significantly improved through active case finding, awareness campaigns in several endemic areas. The integration of basic leprosy services in general health systems has made diagnosis and treatment accessible. Continuous mentorship of health care providers on leprosy diagnosis, follow up of patients under treatment and former cases was systematically given to ensure early detection and prevention of worsening of disabilities in patients.

During the July 2016- June 2017 fiscal year, we diagnosed a total of 30 cases. 19 out of 30 (63%) new cases were diagnosed through passive case detection and 11 cases (37%) were diagnosed through active case finding in endemic sites. Of these, 18 Multibacillary (MB) and 12 Paucibacillary (PB) were new leprosy cases reported. The proportion of females among new case was 50% while 7% were children. Compared to the last fiscal year report with G2D evaluated at 14%, the current year has increased to 30 %.

Table 25 : Notification of leprosy cases, Rwanda, July 2016-June 2017

LEPROSY CASES	MB	PB	Total	%
New cases (NC).				
Number of new cases (NC)	**18**	**12**	**30**	
Proportion of children among new cases (0-14 years)	**0**	**2**	**2**	**7%**
Proportion of women among new cases	**8**	**7**	**15**	**50%**
Number of cases evaluated for their disability at diagnosis	**18**	**12**	**30**	**100%**
Number with grade 1 disabilities	**1**	**1**	**2**	**7%**
Number with grade 2 disabilities	**8**	**1**	**9**	**30%**
Retreatment cases				
Number of relapses	**2**	**2**	**4**	
Number of retreatment after default	**3**	**2**	**5**	
TOTAL OF CASE	**23**	**16**	**39**	

In addition to the data above, 7 of the 9 (78%) new cases diagnosed with G2D were reported in the April-June 2017 period. This may be a reflection of a delayed diagnosis in non-endemic areas but also shows increased awareness in non-endemic areas. This new report shows an increase to 30% for G2D (target is 10%) from 14% reported in the previous fiscal year.

Table 26 : Active leprosy screening carried out in endemic sites, Rwanda, July 2016-June 2017

Period	Endemic area visited	General observation
17 -18/08/2016	Bugesera and Ngoma districts *(Nzangwa & Jarama)*	• ACF conducted with technical assistance from Damian action expert Dr Nimer and ORD staff, 2 PB initiated MDT and 3 cases were retreated. • 16 contacts of active leprosy cases as well 38 former cases of leprosy were examined.
05-09/09/2016	Rusizi & Gisagara district	• Visiting Bugarama, Nyabitimbo, Gikundamvura & Kirarambogo • Two MB new cases were detected and 2 retreated.
13-16/09/2016	Gisagara & Nyamagabe, Kibuye, Gatsibo districts	• Active screening of leprosy and TB were carried out in Kigeme, Kiziba, Nyabiheke, Mugombwa, Gihembe and Mahama refugees camps • We also carried out training for peer educators. There was no new case of leprosy found other than an old case of leprosy identified at Mugombwa.
31/10/- 4/11/ 2016	Rusizi district	• Mentorship on e-leprosy together with active case finding and follow up of former cases of leprosy were carried out in Nyabitimbo, Gikundamvura and Bugarama.
28/11/- 2/12/2016	Gisagara district (Kirarambogo)	• Active case finding activities were carried out and 2 new PB cases were diagnosed and initiated treatment
5–9 /12/ 2016.	Bugesera & Ngoma district	• Mentorship on e-leprosy was carried out and we re-examined former cases of leprosy.
20-23 /02/ 2017	Bugesera and Ngoma (Jarama, Sangaza)	• Active case finding was conducted and advisory meeting with COAIJA and TB staff, Head of Jarama HC to renew the leadership of the cooperative committees.
20-23 /03/ 2017	Gisagara (Kirarambogo) & Nyaruguru	• At Kirarambogo a contact case was diagnosed as new PB case and 1PB relapsed.
12-16 /06/ 2017	*Bugesera and Ngoma*	• Two PB cases were diagnosed in Nzangwa and Jarama.

Cases of leprosy above were mostly diagnosed during active case finding in endemic areas, through health facilities. Other cases were diagnosed in non-endemic areas such as Gatsibo *(Kiziguro),* Nyamagabe *(Mugano),* Ngororero *(Muhororo) and* Ruhango *(Mbuye)* by staff from decentralized levels as they received regular mentorship from the central level.

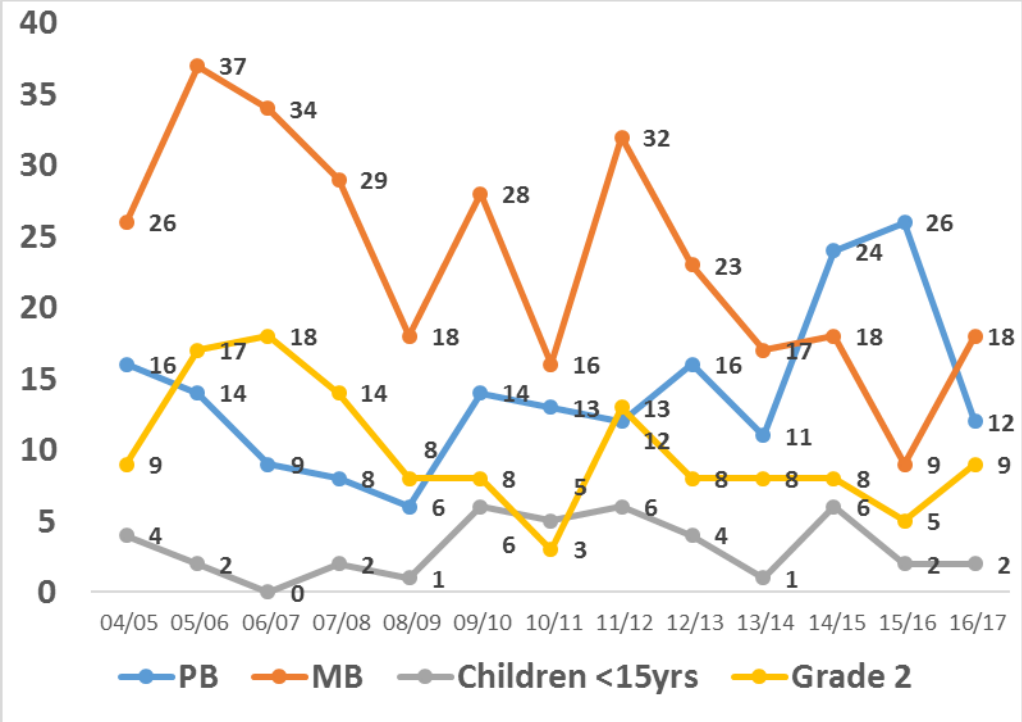

Figure 18 : Trends in leprosy notification, by case category, Rwanda, July 2004 to June 2017

II.2. Quality control services against leprosy and capacity building of health care providers and community health workers

In addition to mentorship activities routinely done in the different endemic areas where active case findings were carried out, various other skills on leprosy control were provided to different health care providers:

From July 2016, all health facilities are now required to provide leprosy report through the HMIS system. All data managers in heath facilities received training on how to report leprosy data in the HMIS system. We also trained health care workers in Rusizi, Gisagara, and Bugesera districts on an edited patient file that contains more information applied to e-leprosy tracker. We are also using the paper based system to review data as we continue to strengthen the online reporting system with HMIS

During TB&ORD annual evaluation meetings with districts, presentations on leprosy signs, cause, complications were given to enhance the capacity and knowledge of Directors of hospitals, Supervisor of TB/Leprosy, M&E officers, medical mentors and other health care providers and also shared the strategy against leprosy that could be applied to their respective districts *(IEC, passive detection, active detection and contact examination).*

This report shows an increase in G2D cases (8 new cases) in non-endemic areas this may be a reflection of increased awareness of health care providers in non-endemic areas of Rwanda. However, it may also show late diagnosis of these MB cases that already show advanced disease and have already developed disability. We will continue to put new emphasis on increasing awareness of leprosy beyond endemic areas

In the 2016-2017 fiscal year, we integrated leprosy training in sensitization of peer educators in six refugee camps in Rwanda since we have refugees from endemic countries like Burundi and the

DRC. We were able to train 633 peer educators (99.7%) in different refugee camps. These peer educators were then charged with sensitizing and screening the refugee population and community with regard to leprosy. Then 241 nurses from different districts were trained as well.

RSQA activities were used to collect data on availability of leprosy screening and diagnosis tools at health facilities for sensitization, diagnosis, and treatment and follow up. The 2016-2017 fiscal year shows improved availability of tools in most health facilities

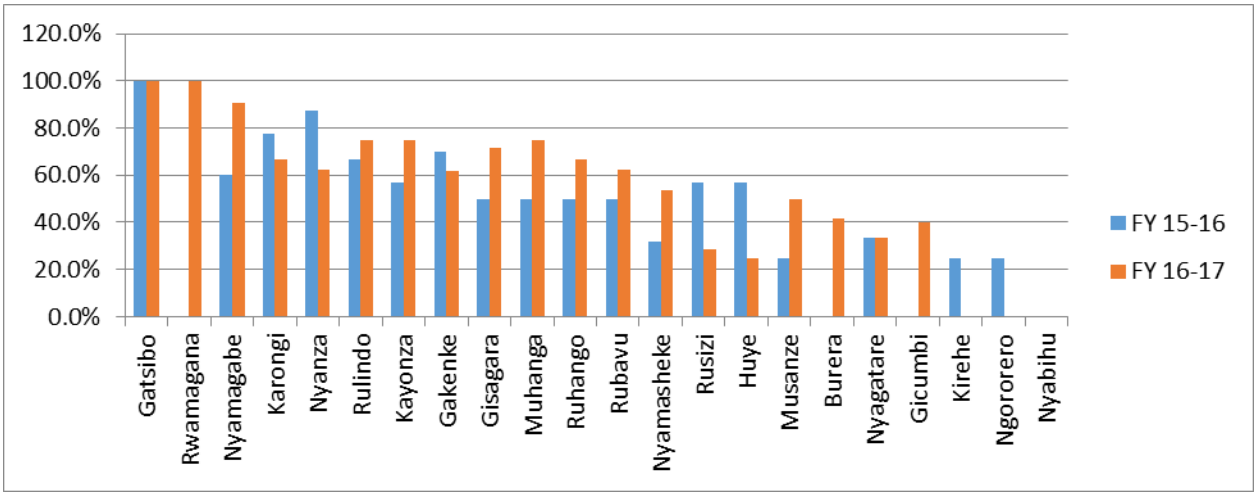

Figure 19: Availability of leprosy screening and diagnosis tools in CDTs visited twice in 2015- 2016 and 2016-2017

A special training held at Muhanga district from **26th to 30th September, 2016** which strengthened the competence of all TB&ORD staff on data entry, data analysis in HMIS, e-TB tracker as well as e-leprosy tracker. A leprosy quarterly reporting form was integrated into the reporting format and can be downloaded from the HMIS system

A new medical advisor from the Damian Foundation Headquarters provided technical support to leprosy activities, during his visit, we had a meeting with the WHO representative, head of IHDPC, TB&ORD Division Manager, DF Project Manager, Leprosy Senior Officer and specialist in dermatology at Rwanda Military Hospital, and in which we discussed prophylactic treatment to leprosy contacts and prolongation of relapse treatment course. The expert participated in a field visit to Jarama, Mazane and Nzangwa health centres during which an active case finding activity was carried out in addition to building capacity of the staff involved in that activity. During the visit we also discussed the possibility of some leprosy related research in the program.

II.2. Objective 2: Increase the rate of completion of treatment to 90% for MB cases and 95% for PB cases and properly support disabilities of leprosy

II.2.1. Leprosy treatment outcomes

As highlighted in the table below, the treatment completion rates for MB forms treated from July 2014 to June 2015 was 89% for new cases, 100% for relapse cases and 50% for retreatment after default cases, while 96% new PB cases notified from July 2015 to June 2016 successful completed treatment which is above the 95% target in the 2014-2018 NSP.

Table 27 : Outcomes of treatment for Leprosy cases, Rwanda, July 2016-June 2017

Cases	New cases		Relapses		Retreatment after default	
	MB	PB	MB	PB	MB	PB
Registered	18	27	2	0	2	0
Treatment completed	16	26	2	0	1	0
Discontinuation of treatment	1	1	0	0	0	0
Died	1	0	0	0	0	0
Non evaluated	0	0	0	0	1	0
Treatment success (%)	89%	96%	100%	-	50%	-
Disability Grade 2 after treatment	6	0	1	0	0	0

II.2.2. Improving prevention and management of disabilities

These combined strategies promote early detection of leprosy in the community. When they are fully applied by every health facility we increase detection and prevent disability and aggravation such as claws, lagophtalmos, deformities as well as ulcers and others.

A systematic post treatment follow up is recommended for all those who had been evaluated in G1D and G2D to prevent aggravation or complication of disabilities,

The evaluation made at the end of treatment should show no aggravation in comparison of total score at the time of initial treatment for all reported cases.

II.2.3. Facilitate medical rehabilitation and socio-economic reintegration of patients affected by leprosy

II.2.3.1. Surgery for leprosy patients with physical disabilities

This report shows an increase from 14% to 30% for G2D but there have been a reduced number of patients with permanent disability that have an actual need for surgery and rehabilitation. RBC and HVP Gatagara are in the process of renewing a Memorandum of agreement (MOA) between both institutions to allow patients to continue to receive services from the specialized centre. We currently have six patients who need specialized care from new fitting prostheses, care for chronic ulcers and other needs.

II.2.3.2. Socio-economic reintegration of vulnerable groups who suffered leprosy

Socio-economic support to vulnerable population affected by leprosy is a continuous activity. During active case finding activities in the population, we endeavor to provide Vaseline to all former cases for skin care and chloramine for self-care for former cases with ulcers. We have also undertaken to create income-generating projects as part of providing sustenance to former cases. We funded a poultry project in Ngoma District for one million three hundred thirty three thousand francs (1,333,000 RWF) for family of two former cases and also funded a small-scale business with one million five hundred thousand (1,500,000 RWF). Nutritional support through health centres for a period of one year was given to two former cases

Table 28 : Social support related to Community Based Health Insurances (CBHI), Rwanda, July 2016-June 2017

District	HFs	People	Amount
Nyaruguru	Nyamyumba	10	30,000
Rubavu	Nyundo	42	126,000
Ngoma	Jarama	147	441,000
Rusizi	Bugarama	197	591,000
Rusizi	Nyabitimbo	165	495,000
Gisagara	Kirarambogo	226	678,000
Bugesera	Mareba	15	45,000
Bugesera	Nzangwa	143	429,000
Ruhango	Kinazi	10	30,000
Huye	Mbazi	6	18,000

Source: DF Financial report July 2016- June 2017

Nine hundred and sixty one (961) persons were funded for Community Based Health Insurance (CBHI) for a total of 2,883 000 Rwf

Table 29 : Social support related to the house renovation for leprosy cases, Rwanda, July 2016-June 2017

District	HFs	Amount	Comments
Ngoma	Jarama	866,100	Renovation house (1)
Bugesera	Mareba	5,128,600	limited renovation and cleanliness
	Rilima	386,000	Pavement and piping of rainwater (1)
	Rilima	386,000	Pavement and piping of rainwater (1)
Huye	Mbazi	542,000	Pavement and piping of rainwater
Kamonyi	Karangara	500,000	Limited renovation and cleanliness
Rusizi	Bugarama	1,104,500	Reconstruction as house destroyed by the earthquake
	Bugarama	1,500,100	Renovation house (1)

A total of 14 houses received renovation for 11,757,300 Frw: 5 houses received extensive renovation and one was rebuilt in Bugarama due to damage by an earthquake and 8 houses limited renovation through pavement and piping of rainwater.

Other materials that were purchased include shoes and basins for three health centres *(Jarama, Bugarama, and Nyabitimbo).* One former case in Remera Rukoma Hospital received a wheelchair

II.5. Increase awareness, information and communication, in order to reduce stigma and discrimination of individuals and families affected by leprosy

Multiple community sensitizations on leprosy prevention and control through different channels were carried out during the reported year. In addition to IEC routinely performed in most health facilities over the country, community sensitization activities were carried in endemic areas where active case findings had been conducted. This allows the local population to be able to have more information and suspect cases can be referred to health care workers.

The live radio talk shows on "***leprosy signs and diagnosis***" were transmitted through different local radio stations according to an annual sensitization plan from the division. On the commemoration of the World Leprosy Day on 1st January 2017, we had a live program on the National Television.

Sensitization of the local communities is also done through community radios where health care workers (heads of health centers, local administrative leaders, former patients) give messages to sensitize the community on knowing Leprosy, Signs and symptoms of leprosy, living with leprosy disabilities, difference between leprosy and other skin conditions, and other areas.

CHAPTER : III FINANCING THE NSP TB

III.1. 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, Damian Foundation.

III.2. Funding Sources for TB Expenditures in Rwanda FY 2016-2017

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 FMIS (Integrated Financial Management Information System) for Global Fund grant and Government contribution.

III.3. Public and external funding sources for TB NSF

The Global Fund for AIDS, TB and Malaria (GFATM) contributed for USD 8,021,009 to NSP budget of FY 2016-2017, The GoR contributed USD 1,257,867 to the NSP budget FY 2016-2017 and Damian Foundation contributed USD 113,335 to NSP budget FY 2016-2017.
Regarding expenditures, with TB/NSP GF grant USD 7,481,696 were spent during the reporting Fiscal Year 2016-2017, GoR expenditures were spent USD 1,177,173 and Damian Foundation spent USD 85,714
For the FY 2016/17, the overall total expenditure for TB was USD 8,744,583 which represents 76.33% of the revised budget of USD 11,455,876.

Table 30 : Contribution of Different Funding Sources for the year ended 30 June 2017

Funder	BUDGET(USD) 2016-2017 (A)	Budget revised in USD (B)	Amount spent (USD) 2016-2017 (C)	Variance in USD at 30 June 2017 (D) = (B)-(C)	Budget execution rate in % (E) =(C)/(B)
Damian Foundation	92,238	113,335	85,714	27,621	75.63%
Global Fund	8,021,009	10,084,674	7,481,696	2,602,978	74.19%
GoR (Recurrent budget)	1,257,867	1,257,867	1,177,173	80,694	93.58%
Grand Total	**9,371,114**	**11,455,876**	**8,744,583**	**2,711,293**	**76.33%**

Table 31 : Damian Foundation expenditures per budget category for the year ended 30 June 2017

CATEGORY	Budget in USD FY 2016-2017	Budget Expenses in USD	Variance	Budget performance in %
Human resources	46,730	35,913	10,817	77%
(Salary & PBF)	46,730	35,913	10,817	77%
Administration overheads	59,546	49,800	9,746	84%
Mission allowances	8,082	5,669	2,413	70%
Communication fees	2,140	1,284	856	60%
Maintenance and repairs of Vehicles, assurance	16,477	10,520	5,957	64%
Fuel	8,987	8,796	191	98%
Bank charges	283	105	178	37%
Social support to the vulnerable	21,425	21,293	133	99%
Stationery and printing consumables	2,152	2,134	18	99%
Training	7,060	-	7,060	0%
Training	7,060	-	7,060	0%
TOTAL	113,335	85,714	27,622	76%

As the table shows, for FY 2016-2017 Damian Foundation is contributing to TB expenditures the total amount of USD 113,335 with TB Expenditures by budget category of USD 85,714 representing 76% of total budget planned for Fiscal year 2016-2017.

Table 32 : GoR TB budget and expenditure per MTEF Program Category for the year ended 30 June 2017

MTEF Program	Budget in USD for 2016-2017 (A)	Expenditures in USD for 2016-2017 (B)	Budget execution rate (D) =(B)/(A)
Administrative and support services	267,214	194,053	73%
Disease prevention and control	45,823	45,823	100%
Financial and geographical health accessibility	262,585	248,659	95%
Health human resources	47,210	46,502	99%
Health quality improvement	9,055	8,742	97%
Health sector planning and information	24,102	24,070	100%
Policy development and health service regulation	11,836	11,078	94%
Specialized health services	170,288	182,875	107%
Earmarked to districts	419,754	415,370	99%
Grand Total	**1,257,867**	**1,177,173**	**94%**

As the table shows, for FY 2016-2017 GoR is contributing to TB expenditures the total amount of USD 1,257,867 with TB Expenditures by MTEF program of USD 1,177,173 representing 94% of total budget approved for fiscal year 2016-2017.

III.4. Government contribution to TB National Strategic Plan

III.4.1. 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 categories of (i) Human resources (salaries) (ii) Infrastructure (including constructions, renovation and equipment) (iii) Quality of services (including Performance Based Financing and accreditation programs (iv) Specialized health services (v) Health commodities (drugs, consumables…) and (vi) Health insurance for indigents

Table 33 : GoR TB NSP budget and expenditure per NSP cost category for the year ended 30 June 2017

GF Category	Budget in USD for 2016-2017 (A)	Expenditures in USD for 2016-2017 (B)	Budget execution rate (D) =(B)/(A)
01. Human Resources	647,222	640,947	99.0%
02. Technical Assistance	58,088	57,174	98.0%
03. Training	459	434	95.0%
04. Health Products and Health Equipment	11,921	11,440	96.0%
05. Medicines and Pharmaceutical Products	3,888	3,643	94.0%
06. Procurement and Supply Management Costs	183,256	112,389	61.0%
07. Infrastructure and Other Equipment	164,740	163,342	99.0%
08. Communication Materials	25,426	25,352	100.0%
09. Monitoring & Evaluation	61,336	61,268	100.0%
10. Living Support to Clients/Target Populations	60,674	60,674	100.0%
11. Planning and Administration	17,920	17,928	100.0%
12. Overheads	22,937	22,582	98.0%
Grand Total	**1,257,867**	**1,177,173**	**94.0%**

The top 4 NSP cost categories with the highest share of expenditure are Human resources; Infrastructure and Other Equipment, Procurement and Supply Management Costs, Monitoring and evaluation.

III.5. The Global Fund contribution

For the Global Fund contribution, the budget for the year 2016–2017 was USD 8,021,009 which was revised to USD 10,084,674. Out of this budget, a total of USD 7,481,696 has been effectively spent by the sub-recipients; that is 74.19% of total revised budget for TB NSF GF grant. The balance of USD 2,602,978 is subject for carry over for the fiscal year 2017-2018.

Table 34 : GF TB NSP budget and expenditure per MTEF Chapter for year ended 30 June 2017

Budget by NSP MTEF Chapter (Global Fund)	Opening Cash balance at 1 July 2016	Approved budget USD/year ended 30 June 2017	Total revised budget in USD for the year ended 30 June 2017	Actual expenditure in USD - year ended 30 June 2017	Variance budget in USD at 30 June 2017	Budget Performance in %
	(A)	(B)	C=(A+B)	(D)	E=(C-D)	F=(D) / (C)
22 Use of Goods & Services		3,416,218	3,416,218	2,508,270	907,948	73.42%
23 Acquisition of fixed assets		2,081,540	3,451,132	1,762,749	1,688,383	51.08%
28 Other Expenditures		2,523,250	3,217,324	3,210,677	6,647	99.79%
Cash Balance carried forward	2,063,666					
Grant total	**2,063,666**	**8,021,008**	**10,084,674**	**7,481,696**	**2,602,978**	**74.19%**

Table 35 : GF TB NSP budget and expenditure per budget category for year ended 30 June 2017

Budget by NSP GF cost category	Opening Cash balance at 1 July 2016	Approved budget USD/year ended 30 June 2017	Total revised budget in USD for the year ended 30 June 2017	Actual expenditure in USD - year ended 30 June 2017	Variance budget in USD at 30 June 2017	Budget Performance in %
	(A)	(B)	C=(A+B)	(D)	E=(C-D)	F=(D) / (C)
01. Human Resources		1,564,077	1,564,077	1,329,145	234,932	85%
02. Technical Assistance		89,920	89,920	85,726	4,194	95%
03. Training		208,214	222,280	222,281	-1	100%
04. Health Products and Health Equipment		1,608,988	2,417,473	1,228,521	1,188,952	51%
05. Medicines and Pharmaceutical Products		360,409	360,409	279,096	81,313	77%
06. Procurement and Supply Management Costs		63,118	74,129	74,129	0	100%
07. Infrastructure and Other Equipment		610,000	1,646,603	1,089,098	557,505	66%
08. Communication Materials		99,415	101,622	101,622	0	100%
09. Monitoring and Evaluation		303,775	415,765	416,229	-464	100%
10. Living Support to Clients/Target Population		2,267,036	2,267,036	1,835,851	431,185	81%
11. Planning and Administration		306,724	386,028	368,044	17,984	95%
12. Overheads		539,332	539,332	451,954	87,378	84%
Cash Balance carried forward	2,063,666				0	NA
Grant total	**2,063,666**	**8,021,008**	**10,084,674**	**7,481,696**	**2,602,978**	**74.19%**

The table above shows the TB NSP budget execution per cost category of the GF, budget execution for the FY 2016-2017, representing a total rate of **74.19%** expenditures over budget revised. The variance of USD 2,602,978 is subject of carry over to next Fiscal Year 2017-2018 for paying of the commitments from FY 2016-17.

Table 36 : GF TB NSP budget and expenditure per type of budget entity for year ended 30 June 2017

Budget Entity	Opening Cash balance at 1 July 2016	Approved budget USD/year ended 30 June 2017	Total revised budget in USD for the year ended 30 June 2017	Actual expenditure in USD - year ended 30 June 2017	Variance budget in USD at 30 June 2017	Budget Performance in %
	(A)	(B)	C=(A+B)	(D)	E=(C-D)	F=(D) / (C)
CHUB		66,356	76,866	76,866	0	100%
CHUK		164,000	160,473	160,473	0	100%
MOH		2,217,908	1,674,016	1,674,000	16	100%
NYC		84,735	84,597	81,893	2,704	97%
RBC		5,488,010	7,054,178	4,453,920	2,600,258	63%
RMH			1,034,544	1,034,544	0	100%
Cash Balance carried forward	2,063,666				0	
Grant total	**2,063,666**	**8,021,009**	**10,084,674**	**7,481,696**	**2,602,978**	**74.19%**

CHAPTER IV: STRATEGIC INTERVENTIONS FOR 2017-2018 FISCAL YEAR

TB screening and diagnosis

1. Maintain and strengthen/expand use, Monitoring and quality control of use of high sensitive TB screening and diagnostic tools/strategies.
2. Advocate for and strengthen involvement of all community stakeholders, in areas where TB cases are more prevalent, such as in Kigali, to bring TB services closer to communities in need.
3. Maintain routine activities related to TB detection by community health workers and health facilities.

TB management and outcomes

1. Reinforce monitoring and analysis of TB deaths audits and use of its findings for strategic planning.
2. Maintain and monitor availability of TB drugs at all levels and ensure continuous patients DOT.
3. Maintain TB/HIV collaborative activities.
4. Increase collaboration between central level and health facilities to ensure control of MDR-TB is done timely and to reduce contamination of samples.

TB prevention

1. Emphasis to be put on clarifying/mentoring in implementation and monitoring procedures of TB infection control and surveillance of TB among health facilities workers.
2. Improving implication and monitoring of NGOs/CSOs role in TB&ORD control.
3. Clarify the future of IPT among PLHIV.

TB program coordination and management

1. Capacity of central level and peripheral level will be maintained through technical working groups, trainings/mentorship, provision of equipment and commodities, etc.
2. Set up a strategy to make the electronic TB register (e-TB) more usable in generating some surveillance data/reports.
3. The integration of TB and other chronic respiratory diseases through practical approach to lung health (PAL) system will continue to work towards setting up a robust M&E system for data collection, continue to train health workers and provide necessary equipment to health facilities.

Leprosy control

1. Active cases finding in leprosy endemic areas.
2. Contacts investigations for both leprosy endemic and non-endemic ares.

CHAPTER V: ANNEX: SUMMARY ACHIEVEMENTS FROM JULY 2016 – JUNE 2017 BY TB NSP AND TB RBF INDICATORS

Annex 1 : TB detection outcome indicators in Rwanda, from July 2013 to June 2017.

TB NSP detection outcome indicators	2013-2014		2014-2015		2015-2016		2016-2017	
	Target	**Result**	**Target**	**Result**	**Target**	**Result**	**Target**	**Result**
Objective 1: Provide early TB detection in general population by intensifying case-finding in prioritized high-risk groups so that the proportion of TB cases all forms identified among HRG increases from 14% to at least 24% by mid-2018.								
Notification rate of all TB cases (all forms) ***(2013-2018 TB NSP indicator 1 and RBF indicator)***	55.4/100,000	56.4/100,000	5,895	5,828	5,784 (NSP target)	5,763	5,565 (NSP target)	5,760
	(5979)	(6085)	(53.3/100,000)	(52.5/100,000)	(6,085 for GF target)	(50/100,000)*	(6,085 for GF target)	
					(50.9/ 100,000)		(47.8/ 100,000)	(48.7/ 100,000)*
Notification rate of new pulmonary bacteriologically confirmed TB cases ***(2013-2018 TB NSP indicator 2)***	3,554	3,789	3,504	3,872	3,438	3,923	3,308	3,868
	(32.9/100,000)	(35.1/100,000)	(31.7/100,000)	(34.9/100,000)	(30.3/100,000)	(34/100,000)*	(28.4/100,000)	(32.7/100,000)*
Strategic intervention 1.1. Provide early, rapid and quality TB diagnosis by expanding LED MC to all CDT and ensuring that at least 96% of the laboratories have adequate performance in EQA								
Proportion of TB cases (all forms) referred by CHW during the evaluated year. ***(2013-2018 TB NSP indicator 3 and RBF indicator)***	19%	**19%**	**20%**	**19.20%**	20% (NSP target)	19.40%	21%	20.30%
		(1,161/6,085)		(1,117/5,828)	(20% for GF target)	(1,116/5,763)		(1,173/5,760)
Number and percentage of laboratories showing adequate performance in external quality assurance for smear microscopy among the total number of laboratories that undertake smear microscopy during the reporting period ***(2013-2018 TB NSP 0 indicator 1)***	91.40%		94%		96%	58%	96%	78%
Strategic intervention 1.2. Detect drug resistant TB by increasing to 90% the proportion of previously treated TB cases having a rapid test for detection of RR/MDR								

TB NSP detection outcome indicators	2013-2014		2014-2015		2015-2016		2016-2017	
	Target	Result	Target	Result	Target	Result	Target	Result
Proportion of new bacteriologically confirmed TB cases tested for TB drugs susceptibility (***2013-2018 TB NSP process indicator 5***)	NA	NA	60%		65%	59% (2,300/ 3,923)	70%	70% (2,524/3,616) (Only New smear positive considered in the calculation)
Proportion of previously treated TB cases with result of a test for detection of resistance to rifampicin or rifampicin and isoniazid (***2013-2018 TB NSP process indicator 6, RBF indicator***)	NA	NA	87%		88% (NSP target) / (88% for GF target)	70% (315/448)	89% (NSP target) / 89% (GF target)	83.1% (467/562)
Strategic intervention 1.3. Enhance TB case finding in selected and prioritized high risk groups.								
Proportion of TB cases notified among high-risk groups (Number and Percentage) ***(2013-2018 TB NSP indicator 7, RBF indicator)***	895/5,979 / (15%)	321/6,085 / (5%)	18% / 1,047/5, 895	15% / 851/5,828	21% (NSP target) / (21% GF target)	43.9% (2,534/5,7 63)	22% (NSP target) / (22% GF target)	41.1% (2,370/ 5,760)
Objective 2: Increase treatment success rate from 88% to 90% for bacteriologically confirmed TB cases and to maintain it at 87% for MDR-TB								
Strategic intervention 2.2: Improve treatment success rate for all forms of TB, specifically to 90% for bacteriologically confirmed TB cases								
Treatment success rate for bacteriologically confirmed new and relapse TB cases ***(2013-2018 TB NSP outcome indicator 8 and RBF indicator)***	NA	NA	87%	90%	88% (NSP target) / (89% for GF target)	90%	89% (NSP target) / (89% for GF target)	88%
Treatment success rate for clinically diagnosed TB cases (SS-, EPTB and others) ***(2013-2018 TB NSP outcome indicator 9 and RBF indicator)***	NA	NA	76%	74%	77% (NSP target) / (77% for GF	79%	78% (NSP target) / 78% (GF target)	79%

TB NSP detection outcome indicators	2013-2014		2014-2015		2015-2016		2016-2017	
	Target	**Result**	**Target**	**Result**	**Target**	**Result**	**Target**	**Result**
					target)			
Cure rate bacteriologically confirmed new and relapse TB cases ***(2013-2018 TB NSP outcome indicator 10)***	NA	NA	82%	85%	82%	83%	83%	80%
Number & % of TB patients (all forms) tested for HIV of all TB patients (all forms) registered ***(2013-2018 TB NSP indicator 11)***	99% for 2013-2018 TB NSP	5,999/6,085 (98.6%)	99%	5793/5830 **(99%)**	99%	5,719/5,763 (99.2%)	99%	5,711/5,760 (99.1%)
Number & % of TB presumptive tested for HIV among all suspects with unknown HIV status ***(2013-2018 TB NSP indicator 12)***	94% for 2013-2018 TB NSP	187,408/187,692 (99.8%)	95%	196474/198773 (99%)	96%	166,819/167,941 (99%)	97%	154,501/155,778 (99.2%)
Number & % of TB/HIV patients receiving ART by the end of TB treatment out of all TB/HIV patients. ***(2013-2018 TB NSP indicator 13). RBF indicator***	87% for 2013-2018 TB NSP and RBF	1,299/1,439 (90.3%)	88%	1339/1475 (91%)	89% (NSP target) (90% for GF target)	1,360/1,449 (94%)	90% (NSP target) 90% (GF target)	1,343/1,417 (95%)
Strategic intervention 2.4. Increase to 95% the treatment success rate for TB patients managed in the community								
Treatment success rate for TB patients (all forms) receiving DOT through community health workers (CHW) ***(2013-2018 TB NSP outcome indicator 14)***	2,225/2,368 (94%)	2,678/2,853 (94%)	94%	(2728/2885) 95%	94%	95%	95%	93%
Strategic intervention 2.5. Ensure treatment of MDR-TB with patient support Strategic intervention 2.5. Ensure treatment of MDR-TB with patient support								

TB NSP detection outcome indicators	2013-2014		2014-2015		2015-2016		2016-2017	
	Target	Result	Target	Result	Target	Result	Target	Result
Proportion of confirmed RR/MDR-TB cases enrolled on second-line treatment (number and percentage) ***2013-2018 TB NSP process indicator 15***	100	74	100%	69	100%	100%	100%	96% (among 80 registered, 2 died and 1 LTFU before treatment initiation)
Treatment success rate, confirmed RR/MDR-TB (***2013-2018 TB NSP outcome indicator 16, RBF indicator***)	87%	94%	87%	88%	87%	85%	87%	95%
Interim results: culture conversion at six months (***2013-2018 TB NSP process indicator 17***)	90%	79%	91%	89%	91%	77.90%	91%	73%
Objective 3: Improve TB prevention (TB infection control in HF, behavior change and prevention by medication) so that the percentage of population with adequate knowledge on TB increase from 56% to 75% by 2018.								
Percentage of population with adequate knowledge* on TB symptoms, transmission and prevention (***2013-2018 TB NSP process indicator 18***)	NA	NA	NA	NA	NA	NA	NA	NA
Objective 4: Improve managerial capacities of the TB program; enhance the monitoring, evaluation system and operational research by implementing and make functional* an electronic TB register in all CDTs.								
Strategic intervention 4.3: Enhance the monitoring and evaluation system								
Timeliness of routine reporting (***2013-2018 TB NSP process indicator 19***)	90%		90%		90%	81.20% (1,828/2,252)	95%	83.20% (1,874/2,252)

*Rwanda population estimated at 11,828,373, as per the National Institute of Statistics of Rwanda: http://www.statistics.gov.rw/statistical-publications/subject/population-size-and-population-characteristics. Accessed in August 2017.

$: Based on the" TB/HIV and TB among people at high risk of TB and Community DOTS, Screening – July 2016 to Jun 2017" dataset of the HMIS, used by both CDTs and CTs.

Annex 2 : level of achievement of TB RBF indicators in Rwanda, from July 2016 to June 2017, compared to targets.

Impact indicator	NSF Target (Jul 2016 - Jun 2017)		WHO Global TB Report 2016	
	Value	Year	Value	Year
	82	2016	NA	
TB I-2: TB incidence rate (per 100,000 population)	70	2016	56	2016
TB I-3: TB mortality rate (per 100,000 population)	6.9	2016	3.8	2016

D. Modules and outcome/coverage indicators							
Module 1	**TB care and prevention**						
Coverage/Output indicator	**NSF Target (Jul 2016 - Jun 2017)**			**Program results (Jul 2016 - Jun 2017)**			**Level of achievement**
	N# / **D#**	**%**	**Source**	**N#** / **D#**	**%**	**Source**	
DOTS-1a: Number of notified cases of all forms of TB - bacteriologically confirmed plus clinically diagnosed, new and relapses	6,085 /		Grant agreement	5760 /		TB & ORD Div Reports	94.7%
DOTS-other: Percentage of bacteriologically-confirmed TB cases, all forms (new and relapse) that are successfully treated (cured plus treatment completed)	/	89.0%	Grant agreement	3773 / 4281	88.1%	TB & ORD Div Reports	98.9%
DOTS-other: Percentage of clinically diagnosed TB cases (new and relapse) that are successfully treated (-treatment completed)	/	78.0%	Grant agreement	1098 / 1394	78.7%	TB & ORD Div Reports	100.9%
DOTS-6: Proportion of TB cases (all forms) notified among key affected populations/high risk groups	/	22.0%	Grant agreement	2370 / 5760	41.1%	TB & ORD Div Reports	186.8%
DOTS-7c: Percentage of notified TB cases, all forms, contributed by community referrals	/	21%	Grant agreement	1173 / 5760	20.3%	TB & ORD Div Reports	96.7%
Module 2	**MDR-TB**						
MDR TB-1: Percentage of		89.0%	Grant	467	83.1%	TB &	93.4%

previously treated TB patients receiving DST (bacteriologically positive cases only)			agreement	562		ORD Div Reports	
MDR TB-other: Percentage of bacteriologically-confirmed RR and/or MDR-TB cases successfully treated (cured plus completed treatment)		≥90%	Grant agreement	91 96	94.7%	TB & ORD Div Reports	105.2%
Module 3	**TB/HIV**						
TB/HIV-2: Percentage of HIV-positive registered TB patients given anti-retroviral therapy during TB treatment		90.0%	Grant agreement	1,343 1,417	94.7%	TB & ORD Div Reports	105.2%

*Rwanda population estimated at 11,828,373,, as per the National Institute of Statistics of Rwanda: http://www.statistics.gov.rw/statistical-publications/subject/population-size-and-population-characteristics.. Accessed in August 2017.