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INSTITUTE OF HIV/AIDS, DISEASE PREVENTION&CONTROL (IHDPC)
TB & OTHER RESPIRATORY COMMUNICABLE DISEASES DIVISION
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NATIONAL STRATEGIC PLAN FOR TUBERCULOSIS 2010-2013

ANNUAL REPORT

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ACRONYMS AND ABBREVIATIONS

ART	Antiretroviral Therapy
BCC	Behaviour Change Communication
CAAC	Cellule d'appui à l'approche contractuelle (PBF Unit/MOH)
CDC	Centre for Disease Control
CDT	Centre for Diagnosis and Treatment of Tuberculosis
CHD	Community health Desk (MOH)
CHUs	University teaching hospitals (CHUB and CHUK)
CHW	Community health worker
CNJR	National Youth Council for Rwanda
CPT	Cotrimoxazole Preventive treatment
CSO	Civil Society Organization
CT	Centre for Treatment of Tuberculosis
CXR	Chest X-ray
DFB	Damien Foundation Belgium
DH	District Hospital
DOT	Directly Observed Treatment
DOTS	Directly Observed Treatment Short Course Strategy
DST	Drug Susceptibility Testing
IHDPC	INSTITUTE OF HIV/AIDS, DISEASE PREVENTION&CONTROL
IPT	INH preventive treatment
KNCV	KNCV Tuberculosis Foundation
LED	Light Emitting Diode
MDG	Millennium Development Goal
MDR-TB	Multidrug Resistant Tuberculosis
M&E	Monitoring and Evaluation
MOH	Ministry of Health
NRL	National Reference Laboratory
NSA	National Strategy Application
NSP	National Strategic Plan
PAL	Practical Approach for Lung diseases
PBF	Performance-based Financing
PF	Performance framework (of the Global Fund consolidated project)
PTHW	National women's council
RBC	Rwanda Biomedical Center
RDQA	Routine Data Quality Audit
RH	Reference Hospital
RHCC	Rwanda Health Communication Center
RRP	People living with HIV/AIDS Network
SDA	Service Delivery Area
SPIU	Single Project Implementation Unit (MOH)
SSF	Single source of Funding
TB-HIV	TB and HIV coinfection
TB & ORD	Tuberculosis and Other Respiratory Communicable Diseases
TH	Traditional healer
TRAC PLUS	**C**enter for **T**reatment and **R**esearch on **A**IDS, **M**alaria, **T**uberculosis and **O**ther **E**pidemics
WHO	World Health Organization

SUMMARY OF THE REPORT

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I. INTRODUCTION

I.1. Context and components of the Rwanda 2009-2013 National TB Control Strategic Plan

The Rwanda National TB Control Strategic Plan 2009-2012 (TB NSP) was developed in line with the goals and objectives of the 2nd Health Sector Strategic Plan (HSSP II) that aims at improving the health status of the population, and thereby reduce poverty in line with the Poverty Reduction Strategy (EDPRS) 2008-2012. The Rwanda TB NSP focuses on the six objectives of the Stop-TB Strategy. Those are:

1. Pursue high quality DOTS expansion and enhancement;
2. Address TB/HIV, MDR-TB and other challenges;
3. Contribute to health system strengthening (HSS);
4. Engage all care providers;
5. Empower people with TB and communities;
6. Enable and promote research.

The plan includes 16 specific objectives also known as SDA (Service Delivery Area) and 86 main activities measured by 5 impact indicators and 46 performance/strategic indicators which are detailed in the monitoring plan. Different sectors and partners are engaged in TB NSP implementation, so that it is a comprehensive national TB control plan whose overall goal is to reach the Stop-TB and MDGs targets.

I.2. Supports to the Rwanda 2009-2012 National TB Control Strategic Plan

The TB NSP receives the financial support of several funding sources among which the Global Fund is the first donor. The Government of Rwanda provides staff from several departments, infrastructures, equipments, and contributes to the running costs as well as to provision of drugs and support to MDR-TB patients. USG agencies support technically and financially TB/HIV collaborative activities, laboratory development and TB infection control. WHO regularly monitors the program and provides punctual technical assistance.

The Global Fund against Tuberculosis, AIDS and malaria (GFTAM) approved the Rwanda National Strategic Application (NSA) to cover the gap identified in the TB NSP funding. The approved budget was thereafter consolidated with previous grants in order to manage a unique “Single Stream of Funding project” (SSF-TB). The principal Recipient is the Ministry of Health (MOH), and 12 sub-recipients are responsible for its implementation.

I.3. Implementers of the Rwanda 2009-2013 National TB Control Strategic Plan

The TB and Other Communicable Respiratory Diseases Division within Rwanda Biomedical Center/Institute of HIV/AIDS, Disease Prevention & Control (RBC/IHDPC) is responsible for technical guidance and coordination of the planning. The Single Project Implementation Unit (SPIU) of the Ministry of Health (MOH) is managing the funding and oversees the implementation of the whole project on behalf of the MOH. The National Reference Labortory (NRL) is responsible for the development and decentralization of the laboratory diagnosis activities. CHUs, District Hospitals and Health Centers are responsible for increasing TB case detection and offering successful treatment to identified TB patients. Success of these activities requirescapacity building of health providers, supportive supervisions and memntorships, monitoring and evaluation as well as provision of medicines/reagents and financial management. The Medical Production and Distribution Division, together with the Medical Procurement Division, both under

the RBC (former CAMERWA) are respectively in charge of production and distribution and procurement of TB reagents and medicines.

Community interventions are implemented by the National Youth Council, Profemme Twese Hamwe (a women's umbrella organization) and the Network of People Living with HIV. In addition four Non Governmental Organizations (NGOs) support the cooperatives of community health workers under the supervision of the Community Health Desk (CHD) of the MoH. Those are CARITAS Rwanda (Faith-based organization), CREDI NGO, STRIVE Foundation and ACCESS Project). The CHD and the Performance-Based Financing Desk (PBF, or CAAC) are responsible for the interventions that intend to improve the quality and increase the quantity of health care services, benefiting respectively the community health workers and the health facilities.

II. TB NSP IMPACT AND OUTCOME INDICATORS

II.1. Tuberculosis impact indicator

The National Tuberculosis Control Strategic Plan (TB NSP) 2009-2012 has one impact indicator, aimed at decreasing by 50% the TB prevalence by the year 2015 compared to 1990. During the 2012-2013 year, the survey of the TB prevalence survey was implemented. The implementation of the TB prevalence survey started end of March 2012, and ended in December 2012. Results of this survey are expected to be finalized by December 2013. However, by using the World Health Organization (WHO) estimates for Rwanda, the prevalence for all-forms TB decreased from 356 (173-603) per 100,000 population in 1990 to 114 (61-183) per 100,000 population in 2012[1], representing a decrease of 68%. From the same source, TB incidence rates decreased from 290 (259-323) per 100,000 population in 1990 to 86 (77-96) per 100,000 population in 2012[2], (representing a decrease of 70%); And TB mortality from 37 (15-70) per 100,000 population in 1990 to 10 (5-18) per 100,000 population in 2012[3] (representing a decrease of 73%).

II.2. Tuberculosis outcome indicators

Five outcome indicators have been defined in the TB NSP 2009-2012 monitoring and evaluation (M&E) plan, to summarize outcomes of essential activities carried out for TB detection and management. Those are TB case notification rate for new sputum smear positive (new SS+), TB case notification rate for all-forms TB, TB case detection rate for new SS+, TB treatment success rate for new SS+ and TB treatment success rate for Multi Drug Resistant TB (MDR-TB).

II.2.1. Tuberculosis case notification rates

From July 2012 to June 2013, 5 977 all-forms TB cases were registered. This represents a 6% decrease compared to previous year. 5 488 (92%) of all cases were new cases, 312 (5%) retreatment cases and 177 (3%) 'other' cases. 78% of all cases had pulmonary TB, and 59% of all cases were new SS+.

Table 1 : Tuberculosis Notification in Rwanda, by category, from July 2012 to June 2013.

N (%)	Sputum Smear-positive TB (SS+)				Sputum Smear-negative TB (SS-)	Sputum Smear-not done (SS0)	Extra Pulmonary (EP)	Other	Total
	New	Relapse	Failure	Return after default					
Number of TB cases	3 519	193	83	36	573	257	1 139	177	5 977
% of total TB cases	59%	3%	1%	1%	10%	4%	19%	3%	

The TB notification rate is a proxy of TB incidence rate. It is calculated by dividing the number of notified TB cases by the size of a specific population during a one year period. The national notification rates were respectively 57 and 33 per 100,000 population for all forms and for new smear-positive pulmonary TB. These results represent respectively 63% and 68% of the annual targets. For the 2011-2012 year, the above rates were respectively 59% and 33% per 100,000 population for all forms and for new smear-positive pulmonary TB.

By Provinces, all-forms TB notification rate was 153/100,000 for Kigali City, with all its 3 Districts reporting rates values beyond the national average (Nyarugenge reported 289/100,000). Other Provinces were

[1] World Health Organization, Global Tuberculosis Report 2013.
[2] World Health Organization, Global Tuberculosis Report 2013.
[3] World Health Organization, Global Tuberculosis Report 2013.

under the national average, however some of their Districts reported rates higher than the national average, these were Kayonza, Muhanga, Huye, Rubavu, Rusizi and Rwamagana. For details, see table on TB Notification rates, in the annexes.

From the WHO estimates, the TB detection rate, which is the proportion of registered TB cases among those expected for a specified time period, was estimated to be at 62% (56-69) for 2012[4] (the WHO target is to detect ≥70%).

Table 2 : TB detection outcome indicators in Rwanda, from July 2012 to June 2013.

TB NSP detection outcome indicators	Baseline	2010-2011		2011-2012		2012-2013	
		Target	Result	Target	Result	Target	Result
Case notification rate of new smear positive TB cases (per 100.000 pop)[5] ***(PF outcome indicator 1)***	44	45	39	47*	33¶	49‡	33†
Case notification rate of all TB cases (per 100.000 pop)	80	86	72	88*	59¶	90‡	57†
Case detection rate of new smear-positive TB cases	4,183/15,270 **28%**	4,428/15,270 **29%**	3,962/15,270 **26%**	**31%***	**64%**β¶†	**33%**‡	62%†

*: targets for December 2011, for new SS+. β: WHO estimates for 2011 calendar year ¶: results for July 2011- June 2012. †: for all-forms TB.

‡: targets for December 2012. †: results for July 2012- June 2013.

II.2.2. Tuberculosis treatment success rates

The main achievement in the fight against tuberculosis remained the sustained high treatment success rate for the new smear-positive patients (**89%** against 88% for the previous year), and which went over the 87% target, due mainly to decrease in transferred out rate and non-evaluated patients.

For multi-drug resistant Tuberculosis (MDR-TB), the treatment success rate was 88%.

[4] World Health Organization, Global Tuberculosis Report 2013.

[5] Population estimated at 10 537 222 habitants, as per the 2012 National Census Results.

Table 3 : TB treatment outcome indicators in Rwanda, from July 2012 to June 2013.

TB NSP treatment outcome indicators	Baseline	2010-2011		2011-2012		2012-2013	
		Target	Result	Target	Result	Target	Result
Treatment success rate of new smear-positive TB cases ***(PF outcome indicator 2)***	3584/4140 (86,6%) Cohort 2008	3630/ 4183 (86,8%) Cohort 2009	3,379 / 3,940 (**86%**) Cohort From July 2009 to June 2010	87%	3 501/3 962 (**88%**) Cohort From July 2010 to June 2011	4 118/4 733 (87%)	3 200/3 576 (**89%**) Cohort from July 2011 to June 2012
Treatment success rate among MDR-TB cases ***(PF outcome indicator 3)***	73/84 (87%) cohort 2007	66/75 (88%) cohort 2008	57/64 (89%) Cohort From July 2008 to June 2009 (confirmed and not confirmed cases)	88%	73/83 (88%) Cohort From July 2009 to June 2010 (confirmed and not confirmed cases)	142/161 (88%)	

These results are detailed in SDA 1.1.d and SDA 2.2.c.

III. TB NSP RESULTS INDICATORS BY OBJECTIVE AND SERVICE DELIVERY AREA (SDA)

III.1. Objective 1: Pursue high quality DOTS expansion and enhancement

III.1.1. SDA 1.1. Improving TB diagnosis and high quality DOTS

III.1.1.1. Fluorescence microscopy diagnosis (FM)

The TB NSP includes the progressive extension of fluorescence microscopy to 50 CDTs, mainly district hospitals. 25 LED microscopes arrived in country and were distributed to Health Facilities in June 2012. The procurement process of remaining 25 LED microscopes is in progress. So that, by end of June 2012 only 9 CDTs were routinely performing fluorescence microscopy among which 7 DHs, 1 reference Hospital and 2 health centers with high workload in Kigali area. They examined 15 160 TB suspects out of all TB suspects detected countrywide during year 2.

Table 4 : Numbers and percentages of TB suspects examined through Fluorescence microscopy in Rwanda, from July 2011 to June 2012.

CDT	Jul-Sep 2011	Oct-Dec 2011	Jan-Mar 2012	Apr-Jun 2012	Total
Ruhengeri DH	671	983	613	818	3 085
Kabgayi DH	307	348	556	484	1 695
Kabutare DH	130	301	195	232	858
Nyagatare DH	600	1 413	628	760	3 401
Gisenyi DH	598	781	801	501	2 681
Nyamata DH	98	100	112	90	400
CHUK	227	186	209	220	842
Biryogo HC	471	292	193	173	1 129
Kicukiro HC	183	246	396	244	1 069
Total examined with FM	3 285	4 650	3 703	3 522	15 160
Total Nb of TB suspects	38 576	41 429	43 529	44 542	168 076
% examined with FM	9%	11%	9%	8%	9%

During the 2011-2012 FY, 9% of all TB suspect examined with FM which is lower than the target but is explained by the limited FM capacity due to the delayed procurement procedures.

III.1.1.2. Quality assurance of microscopy

The laboratory network in 2011-2012 included 194 health facilities carrying out TB microscopy diagnosis (CDT). According to NRL quality assurance policy, all CDT must have quarterly quality control through the re-reading of a sample of smears. Quality control is organized at 2 levels: firstly district hospitals (DH) perform quality control CDT-HCs of their catchment areas. At the second level, the National Referral Laboratory (NRL) performs quality control for all hospitals and CDT using fluorescence microscopy. NRL is also the second controller for all discordant smears detected countrywide.

Table 5 : TB Microscopy quality control carried out in Rwanda, from July 2011 to June 2012.

Type of CDT	Nb CDT controlled	Nb and type of slides controlled				Errors detected					Nb CDT with major errors†
		Total	Pos	Rares	Neg	HFP	LFP	HFN	LFN	QE	
DH	36/36 (100%)	2755	311	59	2385	4	1	4	4	0	8
CDT-HC	136/149 (91%)	8 715	617	60	8038	2	0	2	2	3	4
FM	9/9 (100%)	662	85	12	565	0	3	4	0	0	4
Total	181/194 (93%)	12 132	1 013	131	10 988	6	4	10	6	3	16

HFP: high false positive. LFP: low false positive. HFN: high false negative. LFN: low false negative.
QE: quantification error. †: cumulatively during the whole year. FM: Fluorescence (CDTs with-).

During the Y2 of the SSF-TB project, 93% of all CDT had regular quality control, meaning that the 89% target was achieved. In total 12 132 smears were checked.

III.1.1.3. Detection of new smear-positive TB cases

The number of TB suspects increased by 5% as compared to Y2, as a result of continuation of active strategies, among others the inclusion of TB indicators in the PBF of health facilities and community health workers strong involvement. However, the positivity rate remained at 2% of all TB suspects examined.

51.6% of all TB suspects were brought by CHWs. The later contributed up to 31.1% of all SS+ TB cases.

Table 6 : TB detection and contribution of each level in Rwanda, from July 2012 to June 2013.

	CDT	CT	CHWs	THs	Total
Nbr of TB Suspects	42,982	40,743	91,286	1,761	176,741
Nbr of AFB+ suspects	1,728	867	1,182	21	3,798
Positivity rate	4.0%	2.1%	1.3%	1.2%	2.1%
Contribution of each level (CDT, CT, CHWs and THs) in TB suspicion	24.3%	23.1%	51.6%	1.0%	
Contribution of each level (CDT, CT, CHWs and THs) in TB positivity	45.5%	22.8%	31.1%	0.6%	

Table 7 : TB detection indicators in Rwanda, from July 2012 to June 2013.

NSP result indicators related to TB diagnosis	Baseline	2010-2011		2011-2012		2012-2013	
		Target	Result	Target	Result	Target	Result
Percentage of TB suspects benefiting from a smear examination through fluorescent microscopy.	6%	20%	10%	30% (January to Dec 2011)	9%		
Number and percentage of laboratories performing regular quality assurance (at least 3 times per year) for microscopy (ZN and Fluorescence). (***PF indicator 1)***	150/191 (79%)	159 / 194 (82%) (January to Dec 2010)	152 /194 (78%)	161/194 (83%) (January to Dec 2011)	181/194 (93%)		
Percentage of laboratories showing adequate performance (no major error) among those that received EQA for smear microscopy	92%	93%	93%	94% (January to Dec 2011)	98%		
Number of new sputum smear-positive cases detected among all TB suspects examined with microscopy. (***PF indicator 2)***	4 183/68 172	4 428 NS+ out of 88 051 TB suspects	3 962 /134 536	4 885 out of 132 319 TB suspects (4%)	3 910 out of 168 076 TB suspects (2%)	5,120 out of 148,092 TB suspects (3.5%)	3,798 out of 176,741 TB suspects (2%)

The number of new smear-positive cases detected reached 74.1%:3,798/5,120 of the target, while the number of TB suspects largely exceeded the target (119.3%: 176,741/148,092).

III.1.1.4. Treatment outcomes for Tuberculosis cases

We analysed results of treatment of the cohort of TB patients registered from 01 July 2011 to 30 June 2012.

A total of 3 576 new smear-positive cases were evaluated, out of which 3 023 were treated successfully (cured or treatment completed). This represents **89.3%** as treatment success rate (TSR) for new SS+, against a target of 87%. It represents also a progress of 1.1% as compared to the Y2 results, due to decrease in transferred out and lost to follow up. The cure rate of 84.5% marked an increase of 1.5% as well compared to Y2, and reached the target of 81%. These TSR exceeded 90% in 15 Districts. Regarding the cure rate, 84.4% of the evaluated cohort cured. Almost all Districts achieved the 81% NSP target, except four Districts (Musanze, Gicumbi, Rutsiro and Gasabo).

For new sputum smear (SS) negative (SS-), SS not done (SS0) and extra-pulmonary TB (EPTB) forms together, the treatment success rate was **75.5% (1.5% increased from the 74% of the Y2).** For these forms, rates of deaths and transferred out remained elevated. This highlights the need of evaluating reasons behind and providing more efforts in order to overcome the problem.

Table 8 : TB Treatment outcomes. New SS+ and new SS-/0/EP TB cases enrolled in Rwanda from July 2011 to June 2012.

TB treatment Outcome	New SS+			New SS-/0/EP		
	Number	%	TSR	Number	%	TSR
Nb registered	3 576			2 144		
Cured	3 019	84.4%	**89.3%**	NA	NA	**75.5%**
Complete treatment	176	4.9%		1 619	75.5%	
Failure	116	3.2%		6	0.3%	
Death	158	4.4%		356	16.6%	
Lost to follow up	60	1.7%		57	2.7%	
Transferred	43	1.2%		78	3.6%	
Not evaluated	4	0.1%		25	1.2%	

TSR: Treatment success rate. SS: sputum smear. SS+: SS positive. SS-: SS negative. SS0: SS not done. EPTB: extra-pulmonary TB.

Table 9 : TB Treatment outcomes. New smear-positive TB cases enrolled in Rwanda from July 2011 to June 2012.

NSP result indicator on Cure rate	Baseline Cohort 2008	2010-2011		2011-2012		2012-2013	
		Target Cohort 2009	Result Cohort July 09-June 10	Target Cohort 2010	Result Cohort July10-June 11	Target Cohort 2011	Result Cohort July11-June 12
5.Number and % of New SS+TB cases who were cured.	3 266/ 4 140 (78.9%)	3 325 / 4 183 (79.5%)	3 032 / 3 940 (**77%**)	3 542 / 4 428 (80%)	3 278 / 3 962 (**83%**)	3 834 / 4 428 (81%)	3 019 / 3 576 (**84.4%**)

Table 10 : TB Treatment outcomes. Retreatment TB cases enrolled in Rwanda from July 2010 to June 2011.

TB treatment Outcome	Relapses		Failures		Return after default		All Retreatment cases	
	N	%	N	%	N	%	N	%
Nb registered	252		107		27		386	
Cured	186	73,8%	85	79,4%	15	55,6%	286	74,1%
Complete treatment	17	6,7%	7	6,5%	3	11,1%	27	7,0%
Failure	14	5,6%	7	6,5%	3	11,1%	24	6,2%
Deaths	26	10,3%	5	4,7%	1	3,7%	32	8,3%
Lost to follow up	7	2,8%	2	1,9%	5	18,5%	14	3,6%
Transferred	1	0,4%	1	0,9%	0	0,0%	2	0,5%
No evaluated	1		0	0,0%	0	0,0%	1	0,3%
Treatment success rate		**80,6%**		**86,0%**		**66,7%**		**81,1%**

For TB retreatment cases, the treatment success rate was **81.1%** (from 77% in 2011-2012 FY), following increase in cure rate and decrease in treatment completed and deaths rate.

III.1.2. SDA 1.2. Patients' support

Nutritional support is provided to MDR-TB patients. They receive monthly food basket and transportation fees to take daily DOT at the health facility for the whole duration of the second-line treatment.

Table 11 : Number of MDR-TB patients beneficiating from nutritional support in Rwanda, during July 2011 to June 2012.

NSP result indicator on patient support	Baseline	2010-2011		2011-2012		Comments
		Target	Result	Target	Result	
6.Number & % of MDR-TB cases on Cat IV benefiting from nutritional support	77 (2009)	161 (100%)	145	206 (100%)	138 (67%)	82 New MDR TB patients started treatment in Y1

The total number of MDR-TB patients on treatment, either hospitalized or as outpatients, was 138 at the end of June 2012.

III.1.3. SDA 1.3. First line drug management

No CDTs reported interruption to treatments as a consequence of stock out of drugs.

Table 12 : Number of CDTs experiencing stock out in first line TB medicines in Rwanda, during July 2011 to June 2012.

NSP result indicator on first line drug management	Baseline	Y1 Targets	Y1 Results	Y2 Target	Y2 Result
7. Number & % of CDT which reported a stock out in first line drugs during the reporting period out of all CDT. (***PF indicator 4)***	NA	10 / 194 (5%) max	0 CDT had drug stock out	10 / 194 (5%) max	0 CDT had drug stock out

III.1.4. SDA 1.4.1. Monitoring & evaluation system, impact measurement

III.1.4.1. Workshop (Atelier) with Directors Hospital, Doctors Medical Doctors Focal point of TB, In charge of PBF at district Hospital, In Charge of community health at district and M&E Officers at District level.

Two and one sessions held respectively in Huye and Muhanga Districts in August 2013, with Directors Hospital, Medical Doctors Focal point of TB, In charge of PBF at district Hospital, In Charge of community health at district and M&E Officers at district level. In total 252 participants attended. During those workshops, we discussed the below points:

1. Review of recommendations of TB & ORD Division Staff Retreat held in March 2012 and those of the 2011 LFA OSDV;
2. Review of the 2011-2012 SSF-TB annual and the TB NSP and TB NSA mid-term reviews reports, to identify current strengths, weaknesses and challenges in its implementation, and ways to solve them;
3. Discussion on the system of data verification for the clinical and community PBF;

II.1.4.2. Introduction of a new Tuberculosis reporting into the R-HMIS

With the purpose of integrating TB & ORD reporting into the MoH reporting system (R-HMIS), we developed a new TB quarterly reporting tool. The tool incorporates information to collect data on the new performance frame work (PF) for Y4-6 and, to report to other information requested by partners like MOH and others. Specific information added concerns indicators on TB detection among high risk groups and use of GeneXpert, as well as stratification of notification data by sex and age group. The tool has been included the Rwanda Health Management Information System (R-HMIS), and is available at http://hmis.moh.gov.rw/hmis. Then after, nine sessions of trainings of 2 days each one held to initiate 515 data managers of ALL health facilities (HFs) of Rwanda to the new TB R-HMIS system. Since January 2013, the reporting of quarterly TB data is based on that new tool.

II.1.4.3. MESST Process

This was the implementation of the monitoring and evaluation systems strengthening tool. It happened in Musanze District during 2-7th June 2013. During the exercice, the TB M&E system assessment tools was completed, covering the following program areas: M&E plan, capacities of the management unit, and data reporting systems in health facility DOTS, community DOTS and TB/HIV integration. Identified needs were then costed. These needs will be incorporated in the 2013-2018 TB NSP M&E Plan for implementation.

III.1.4.4. Implementation of the National Tuberculosis Prevalence Survey

The implementation (data collection) of the national TB prevalence survey (TPS) started during the 2011-12 FY (end March 2012). The data collection ended with December 2012. Field operations were conducted in all 73 clusters.

As part of monitoring of the implementation of the TPS, the TB & ORD Division received many missions, to monitor how the survey was being implemented. Those included:

- Missions from the Senior Epidemiologist and Senior data manager from KNCV TB Dutch foundation;
- Mission for mid-term evaluation by a WHO team;
- Mission for quality control of the laboratory component by a Senior TB laboratory Advisor from CDC Atlanta; and
- Mission for end-term evaluation, by TPS Team Lead from the WHO Global Task Force on TB Impact Measurement, and his team.

A total of 49,305 adults were registered in the households in the selected clusters during the study. Just over half, 27,150 (55%) were females and the remaining (45%) were males. The large majority of those registered in the census 45,065 (91%) were eligible to be enrolled into the survey. The study had a high participation rate at 96 % (43,336 of the 45,065 eligible). Among screened, 4,709 (10.9%) were screened positive with any duration of cough and/or any abnormal Chest X-ray finding in lungs. Those screening positive were requested to provide spot and morning sputum specimens, 4,622 (97.7%) submitted specimen(s) and got at least one smear and culture result and HIV status was identified in 4,295 (92.9%). Due especially to some errors in merging the NRL data for some clusters, the individual level analysis could not be conducted yet. As a start, cluster level analysis was done indicating preliminary results for prevalence of 97/100,000 (67-128) for bacteriological confirmed cases and 66/100,000 (41-90) for smear positive cases. This analysis should be supplemented with individual level analysis to obtain a final robust prevalence estimate.

This iimplementation experience was shared by international scientific community members during the Union Conference for Africa Region held in Kigali 20-22 June 2013.

III.1.4.5. Routine monitoring and evaluation activities

Quarterly evaluation meetings were conducted in all districts (30/30), at the end of every quarter. During these meetings, the district TB coordinators, the M&E officers from the district hospitals, and the TB nurses from the CDT and CT interchange data, compile the quarterly reports and analyse their results against the targets.

III.1.4.6. Supervisions

During the period of July 2012 to June 2013, 87% (104 out of 120 planned) of all planned Districts were supervised. In general, activities are normally performed in all health facilities visited, all documents (Registers, lab forms, treatment cards etc.) to record on all kind of information were available in every health facility visited. These supervisions however highlighted the need of improving documentation and on time update of TB tools in TB tools (lab requests, lab registers, treatment cards, etc.). The need of strengthening supervisions of CHWs by health facilities has also been reported. It was also noted a reduction in the supervisions made by hospitals towards health centres. This could have a negative impact on the quality of service provided by health centres. Another weak point is the delay in transmission of the sputum examination results from CDTs to CTs and delay to request medicines of some districts pharmacies and leads to shortage of some products.

Table 13 : Number of CDTs with timely reports and adequate performance of data in Rwanda, and Supervisions carried out TB coordinators in Rwanda, during July 2012 to June 2013.

NSP result indicators on M&E	Baseline	2010-2011		2011-2012		2012-2013	
		Target	Result	Target	Result	Target	Result
8. Number & % of CDT submitting timely their reports in line with national guidelines	NA	155/194 (80%)	194/194 (100%)	165/194 (85%)	194/194 (100%)	197/197 (100%)	197/197 (**100%**)
9. CDT showing adequate performance on routine data quality audit (RDQA)	NA	43/50 (85%)	25/33 (76%)	44/50 (88%)	43/50 (86%)	45/50 (90%)	44/50 (**88%**)
13. Number and percentage of quarterly supervision visits from TB coordinators to districts with documented feedback (numerator) of all planned visits (denominator). (***PF indicator 5)***	107/120 (90%)	108/120 (90%)	118/120 (98%)	114/120 (95%)	96/120 (80%)	114/120 (95%)	104/120 (**87%**)

Table 14 : Supervisions carried out during July 2012 – June 2013

Quarter	# Districts supervised	%
July - September 2012	26/30	86%
October – December 2012	21/30	70%
January – March 2013	30/30	100%
April – June 2013	27/30	90%
	104/120	**87%**

SDA 1.4.2. Program management and planning

III.1.4.2.1. Development of the extend TB NSP for July 2013-June 2016

During the July – September quarter, the TB & ORD as the leading institution in TB control activities, conducted, in collaboration with partners, the planning of TB control activities for the period of July 2013 to June 2016. For the mentioned period, the following documents were developed: the extend TB NSP for July 2013-June 2016 and the extend TB NSP monitoring and evaluation plan for July 2013-June 2016. In addition to that, an SSF-TB proposal for the same period was developed and submitted to GFTAM-Genève; this included its performance framework as well.

III.1.4.2.2. Revision of the "TB Technical Manual"

The TB technical manual is developed based to the WHO guidelines on TB control. Every two years, the manual is revised and updated to take into account available new WHO recommendations on TB control.

For this Purpose, in October 2012 and in January 2013, the TB & ORD Division organized workshops to update and finalize a new TB technical Manuel, and related M&E tools. Participants were coming from different public institutions (Teaching and district hospitals) and partners (WHO, CDC, ICAP). The French version of the manual is available, waiting for validation and translation in English. Revised tools were distributed in countrywide from 14-22 February 2013.

III.1.4.2.3. Development of the COP13 Proposal

During the quarter of Jan–Mar 2013, the TB & ORD as the leading Institution in TB control activities, participated in the development of the COP13, supported by the PEPFAR, specifically regarding TB and HIV collaborative activities.

In collaboration with the NUR-SPH, KNCV, USAID, under the PMDT-CoE, a training of 20 representatives of TB control programs of 8 East African countries held in Kigali on TB infection control in health facilities.

III.1.4.2.4. 2013 TB & ORD Division staff and partners retreat

During the quarter of April to June 2013, the TB & ORD organized a retreat of its staff and partners involved in TB control activities.

The purpose of the retreat was to:

1. Refresh on the current status of TB control activities in Rwanda:
    a. Progress on TB Performance Framework to date;
    b. Current status on implementation of the 2012 TB program evaluations (OSDV RSQA, GLC, GDF and DF recommendations)
    c. Key findings of other recent TB program evaluations (KAP study, TB risk assessment among health care workers, TB prevalence survey);
2. Develop the 2013-2014 FY TB & ORD action plan;
3. Discuss and refine the TB quarterly reporting tool;
4. Discuss the road map for the 2013-2018 TB NSP development, and for other key priority activities for 2013-2014;
5. AOB

Main Accomplishments, Future Plans and recommendations of the retreat were:

1. The 2013-2014 FY TB & ORD action plan was developed: This was the main outcome of the retreat. Participants developed actions plans related to different SDAs (services delivery areas) of TB NSP, in different working groups. This is an integrated action plan, incorporating Global Fund budget, PEPFAR budget, GOR budget and Damian Foundation budget. Then SDA actions plans are compiled in one document for the whole TB & ORD Division. In addition to budgeted activities, other TB activities time consuming but not specifically budgeted by the above 4 TB & ORD Division classic funders, were incorporated as well. This action plan details main activity, sub-activities, timeline, responsible person for implementation or follow up, allocated amount of money, funder and the measurement indicator. For the smooth implementation of this action plan, PBF indicators were developed. It is only based on these indicators; staffs of TB & ORD Division will be evaluated for their quarterly evaluation, by the Head of TB & ORD Division. The compiled action plan will be reviewed for refinement in early July 2013.
2. The 2013-2016 TB Performance Framework (a set of 19 key TB indicators) is revised to make it concordant with recently gained information, including the 2012 Rwanda national census and the 2012 TB surveillance data base. Indicators reviewed are those in relation with TB notification (number notified and TB notification rates), reviewed at a slight decrease for the general population, but at the same time we increased the number of high risk people to be screened for TB;
3. Four key priorities of TB activities were defined for the upcoming FY:

a. They are:

i. The development of the 2013-2018 TB National Strategic Plan;

ii. The development and the implementation of an electronic TB recording and reporting system (e-TB);

iii. The development and implementation of a Childhood TB policy;

iv. The development and implementation of a policy on TB screening and diagnosis among high risk people;

III.1.4.4. SDA 1.4.3. Human resources development

III.1.4.4.1. Trainings

For the purpose of reinforcing the decentralization of health system and transferring of capacity from central level to peripheral level, the TB & ORD Division has adopted a new approach of "trainers of TB" at District Hospital (DHs) level. For that, trainers from DHs (MDs focal point of TB and TB supervisors) were trained (TOT) on TB, including practical practice. Then after, sessions of trainings on TB, TB/HIV and Leprosy are conducted by those DHs trainers, under supervision of central level.

These trainings sessions were conducted with technical support from the TB District Coordinators and TB & ORD staff specialist of each area of activities. Trainees were trained on topics like TB and MDR-TB screening, TB and MDR-TB diagnosis, TB and MDR-TB treatment, TB and HIV collaborative activities, TB infection control, TB drugs management, PAL and monitoring and evaluation of TB control activities.

Table 15 : Number of medical personnel trained on TB in Rwanda during July 2012 to June 2013

Categories of staff trained	Jul12-Sep12	Oct 12-dec 12	Janv131-Mar13	Apr13-June13	Total
TOT on DOT	0	0	86	0	86
Nurses on DOT	131	165	656	580	1,532
Nurses of Prisons on DOT	32	0	0		32
TB IC	0	224	186	322	732
PAL	0	39	0	49	88
PPD practice and reading	0	37	0		37
Private clinics' health providers on DOT	0	0	0	0	-
Medical doctors of Hospitals on DOT	0	0	0	0	-
Medical doctors TOT on Radiology	10	0	0	0	10
Medical doctors on Radiology	33	0	0	0	33
Medical doctors of Fac Med on DOT	29	0	0	0	29
Health Institutes	9	0	0	0	9
TB Drugs Management	0	29	25	70	124
GXP policy	0	181	0	0	181
TB focal points & M&E staff from DH	0	218	515	198	931
RBC Clinical Mentors	0	0	0	28	28
TOTAL (Indicator 15)	**244**	**893**	**1,468**	**1,247**	**3,852**
MDR-TB training (Indicator 16)	**0**	**90**	**0**	**52**	**142**

Table 16 : Number of medical personnel trained on TB in Rwanda during July 2012 to June 2013

NSP indicator on HR training	Baseline	2010-2011		2011-2012		2012-2013	
		Target	Result	Target	Result	Target	Result
15. Number of medical personnel trained (and retrained) in DOTS. (***PF indicator 6)***	473	426 x 2	1 599	853	2 038	739	3,852
16. Number of health workers trained on management and care of MDR-TB patients	92	100	94	100	113	100	142

III.2. Objective 2: TB-HIV, TB contacts, prisoners, refugees, vulnerable groups, special situations

III.2.1. SDA 2.1. Improving TB-HIV integration and management

As during previous years, this component remained one of the most successful, with **98.4%** of all TB patients registered from July 2012 to June 2013 being tested for HIV (**PF indicator 7**), same as the previous year. The prevalence of HIV was **24.5%** and **97.6**% of all co-infected cases received Cotrimoxazole preventive treatment (CPT).

Table 17 : Detection of HIV among all TB patients registered in Rwanda from July 2012 to June 2013.

All-forms TB cases Registered	TB cases tested for HIV N (%)	HIV+ TB cases N (%)	HIV+ TB cases on CPT N (%)
5,977	5,880 (**98.4%**)	1,440 (**24.5%‡**)	1,405 (**97.6%†**)

‡: Of all-forms TB cases HIV tested. **†**: Of all-forms TB cases HIV positive.

In addition, HIV test is not only provided to TB cases, but also routinely provided for TB suspects. **98.7%** of those with unknown HIV status were tested and **4.8%** were HIV infected.

Table 18 : Detection of HIV among all TB suspects registered in Rwanda from July 2011 to June 2012.

Total Nb of TB suspects	PLHIV	Unknown HIV status		
		Nb	Nb Tested	HIV+
176 741	13 855	162 886	160 528	7 635
	7.8%		98.7%	4.8%

Most CDTs follow the "one-Stop TB-HIV" model, i.e. the TB nurse gives counseling and takes the blood sample for HIV test for all TB patients. When the result is positive, the TB nurse is also responsible for providing more counseling, registering the patient at the HIV clinic, drawing blood for CD4 count, initiating CPT and ART according to the norms of the program.

The proportion of TB/HIV patients on antiretroviral therapy (ART) by the end of TB treatment was **81.2%** (1410/1737) for the cohort of patients (all forms) registered from July 2011 to June 2012 (**PF indicator 8**). This increased from 70% for the TB cases cohort of July 2010 to June 2011.

Table 19 : TB/HIV indicators in Rwanda from July 2012 to June 2013.

NSP indicators on TB-HIV	Baseline	2010-2011		2011-2012		2012-2013	
		Target	Result	Target	Result	Target	Result
17. Number & % of TB patients (all forms) tested for HIV of all TB patients (all forms) registered (***PF indicator 7)***	7448/7664 (97%)	8148/ 8400 (97%)	7044/7230 (97.3%)	8555/8820 (97%)	6201/6352 (98%)	8983/9261 (97%)	5977/5880 (98.4%)
18. Number & % of TB/HIV patients receiving Cotrimoxazole during TB treatment of all TB/HIV patients	2329/2529 (92%)	2604/ 2770 (94%)	2048/2100 (98%)	2763/2909 (95%)	1695/1742 (97%)	2902/2909 (95%)	1405/1440 (97.6%)
19. Number & % of TB/HIV patients receiving ART by the end of TB treatment out of all TB/HIV patients. (***PF indicator 8)***	1534/ 2560 (60%) Cohort 2008	1644/ 2529 (65%) Cohort 2009	1482 / 2221 (68%) Cohort July 09-June 2010	1884/2770 (68%)	1480/2119 (70%) Cohort July 10-June 2011	2036/2909 (70%)	1410/1737 (81.2%) Cohort July 11-June 2012
20. Number & % of TB suspects tested for HIV among all suspects with unknown HIV status	63%	65%	96%	75%	99%	80%	98.7%
21. Number (%) of CDT with a functional "one-stop TB-HIV" service out of all CDT.	75%	80%	176/194 (90%)	85%	176/194 (90%)	95%	189/197 96%

III.2.2. SDA 2.2. MDR-TB detection and management

III.2.1.1. MDR-TB diagnosis

From July 2012 to June 2013, 87.5% (1,466 culture over eligible 1,676) of patients eligible to sputum culture had their culture done.

Table 20 : Coverage in sputum culture, for people at high risk of MDR-TB, Jul 2012 - Jun 2013

Type of case	Jul-Sep 2012			Oct-Dec 2012			Jan-Mar 2013			Apr-Jun 2013			Jul 2012-Jun 2013		
	Registere	Nb with culture		Registered	Nb with culture		Registered	Nb with culture		Registered	Nb with culture		Registered	Nb with culture	
		N	%		N	%		N	%		N	%		N	%
New SS+ at M2	147	145	98.6	177	164	92.7	137	129	94.2	910	762	83.7	1371	1200	87.5
Failure	14	14	100.0	25	21	84.0	19	11	57.9	23	21	91.3	81	67	82.7
Relapse	47	41	87.2	44	40	90.9	44	41	93.2	49	39	79.6	184	161	87.5
Defaulters	9	8	88.8	9	8	88.9	12	12	100.0	10	10	100.0	40	38	95.0
Total	217	208	95.8	255	233	91.4	212	193	91.0	992	832	83.9	1676	1466	87.5

III.2.1.2. Enrollment on second line treatment

From July 2012 to June 2013, 47 patients were enrolled for second line treatment, all confirmed patients. 28 patients initiated treatment at Kabutare MDR-TB Unit, 1 at Kibagabaga MDR-TB Unit and 18 at Kibungo MDR-TB Unit.

Table 21 : Enrollment on MDR-TB treatment in Rwanda during July 2012 to June 2013

	Nb of MDR-TB patients enrolled				Site of treatment initiation			
	Confirmed	Empiric	Total		Kabutare	Kibaga-baga	Kibungo	Other site
Q1(Jul-Sept 2012)	11	0	11		10	1	0	0
Q2(Oct-dec 2012)	14	0	14		2	0	12	0
Q3(Jan- Mar 2013	10	0	8		10	0	0	0
Q2 (Apr-Jue 13-	12	0	12		6	0	6	0
Total	**47**	**0**	**47**		**28**	**1**	**18**	**0**

III.2.1.3. MDR-TB treatment follow-up and outcomes

The proportion of patients who had negative smear and culture by the end of the sixth month of treatment is indicative of the efficacy of the treatment and of the program performance. This preliminary evaluation is done quarterly for the cohort of patients enrolled in the last 9 to 12 months, due to the long delay for receiving culture results (at least 8 weeks). It was established in the Performance Framework to report this indicator by the end of year 1 only for the patients enrolled in the first quarter 2010.

Table 22 : Culture conversion at the 6th month of treatment, for confirmed MDR-TB patients enrolled in Rwanda from July 2012 to September 2012.

Treatment start	Month of evaluation	Nb confirmed MDR-TB	Deaths before 6 months	Lost to follow up before 6 months	Nb MDRTB patient evaluated at 6 months	Negative smear and culture	≥ 1 positive smear and/or culture	smear and/or culture not done	Contaminated culture
Q_3 2012	6 months	11	0	0	11	9	0	2	0
%						81.8%	0%	18.2%	0%

Out of the 11 confirmed patients enrolled, 9 had both negative culture and smear, which is 81.8% (9/11) and exceeded the target.

Table 23 : Treatment outcomes for MDR-TB patients enrolled in Rwanda from July 2010 to June 2011 (confirmed and not confirmed).

	Nb registered	Nb started on treatment	Cured	Complete treatment	Failure	Dead	Lost to follow up	Still on treatment	Treament success rate
Q1 (Jul10-Sep10	21	20	13	4	0	3	0	0	85.0%
Q2 (Oct10-Dec10	23	23	13	8	1	1	0	0	91.3%
Q3 (Jan11-Mar11)	11	11	8	2	0	1	0	0	90.9%
Q4 (Apr11-Jun11	14	14	10	3	0	1	0	0	92.9%
FY Jul10-Jun11	69	68	44	17	1	6	0	0	89.7%

68 MDR-TB patients started second-line TB treatment from July 2010 to June 2011. 61 (89.7%) completed the treatment successfully, 6 (8.8%) died and 1 (1.5%) failed. One patient had already died before confirmatory diagnosis and so before initiation of treatment, therefore could not be evaluated for treatment outcome. The treatment success rate was 88% which exceeded the 80% target and highlights the efficacy of the treatment regimen and good adherence of patients treated at decentralised level.

Table 24 : MDR-TB related indicators Rwanda during July 2011 to June 2012.

NSP indicators related to MDR-TB	**Baseline**	**2010-2011**		**2011-2012**		**2012-2013**	
		Targets	**Results**	**Targets**	**Results**	**Targets**	**Results**
22. Number of DST done (1st line DST)	247	430	771	610	999‡	830	
23. Number (%) of MDRTB (bacteriologic ally confirmed) detected of WHO estimate* (denominator) per year '*Global report 2007	79/1818 (4.3%)	161/1818 (8.9%)	71/1818 (3.9%)	206/1818 (11.3%)	82/1818 (5%)	206/1818 (11.3%)	47/1818 (2.6%)
24. Number of MDR-TB patients enrolled for 2nd line treatment. (**PF indicator 9)**	77	161	73	101	88	101	47
25. Smear conversion rate of confirmed MDR-TB cases at 6 months (Nb and % with negative smear and culture at month 6). (**PF indicator 10)**	7/10 (70%) Cohort Q1 2009	20/26 (75%) Cohort Q1 2010	14/18 (78%) Cohort Q1 2010	80%	27/31 (87%)	80%	9/11 (81.8%)

‡: this includes DST tests and Hain tests.

III.2.3. SDA 2.3.1 High-risk groups

III.2.2.1. TB and Prisons

Prisons constitute a challenge because the risk of transmission is potentially high and the proportion of HIV infected inmates is also higher than in the general population. The clinical screening is routinely done for the majority of new prisoners upon entry. It includes the screening of TB based on symptoms and sputum examination for those who have TB signs (TB suspects). All smear-positive cases must have a culture and DST in order to quickly identify any possible MDR-TB case.

Table 25. Notification of Tuberculosis in prisons in Rwanda during July 2012-June 2013

Quarter	New SS+	Relapses	Failures	RAD	SS-	SS_0	EP	Others	Total
Q1	27	3	0	0	9	0	3	1	42
Q2	21	3	1	0	5	3	3	1	37
Q3	41	3	0	0	3	2	6	5	60
Q4	35	1	0	0	3	0	5	0	44
TOTAL	124	10	1	0	20	5	17	7	183
	68%	5%	1%	0%	11%	3%	9%	4%	

Table 26: Treatment outcomes for New SS+ patients registered in prisons in Rwanda from July 2011 to June 2012.

	Nb registered	Cured	Complete treatment	Failure	Dead	Lost to follow up	Transfer	Success rate by cat
NTPM+	114	99	4	5	5	0	1	90%
TPM-,TPM0, EP	36	2	31	0	2	1	0	92%
Retrait	30	8	17	0	4	1	0	83%
Other	12	2	8	2	0	0	0	83%
Total	192	111	60	7	11	2	1	89%
	114	99	4	5	5	0	1	90%

The treatment success rate for new smear-positive patients treated in prisons was **90%**.

Table 27 : Indicators related to Tuberculosis in prisons in Rwanda during July 2012 to June 2013.

NSP indicators related to TB in prisons	Baseline	2010-2011		2011-2012		2012-2013	
		Targets	Results	Targets	Results	Targets	Results
26. Number of new SS+ TB cases detected in prisons. (***PF indicator 11)***	144	150	136	158	112	165	124
27. Treatment success rate of new SS+ TB cases registered in prisons	86%	>85%	93% (Cohort registered Jul 2009-Jun 2010)	>85%	93% (Cohort registered Jul 2010-Jun 2011)	>85%	90% (Cohort registered Jul 2011-Jun 2012)

II.2.3.2. Implementation of the GeneXpert program

From December 2012, the GeneXpert (GXP) MTB/RIF assay has been implemented and incorporated into the routine national diagnostic algorithm. Current algorithm recommends the use of Genexpert on specimen (sputum) of HIV+ TB suspects and severely ill TB suspects (regarding their SS status), TB suspects among prisoners and MDR-TB suspects.

Currently, the GeneXpert techniques is implemented in 6 sites (CDTs), which are CHUK, Rwinkwavu District Hospital, Kabgayi District Hospital, Rwanda Military Hospital, Muhima District Hospital and Biryogo Health Center. To each GXP site, are attached a number of "GXP satellite sites". These are either CDTs or CTs which transfer sputum samples of their eligibles patients to the 6 GXP sites. In total, we have 55 satellites sites.

Table 28. Implementation of geneXpert technology for TB and MDR-TB diagnosis, during July 2012-June 2013

GXP site	# satellite sites	# samples examined with GXP	Results				
			MTB not Detected	Invalid	error	MTB Detected	RIF. RES
Rwinkwavu	4	33	28	0	0	5	0
Muhima	5	22	11	2	1	8	1
Biryogo	5	112	91	0	6	15	2
Kabgayi	8	212	190	0	0	22	2
RMH	11	62	44	0	3	15	0
CHUK	22	265	192	6	14	53	3
	55	706	556	8	24	118	8

In the six sites performing GeneXpert test, for the period of December 2012 to June 2013, we examined 706 samples. 118 (16.7%) cases of MTB were detected and 8 (1.1%) cases of Rifampicin resistance. The remaining 556 (77.8%) cases were MTB not detected, 8 (1.1%) were errors and 24 (3.4%) were invalid.

Regarding the workload, 37.5% of all samples were examined by CHUK, 30.0% by Kabgayi DH, 15.9% by Biryogo HC, 8.8% by Rwanda Military Hospital and 4.7% by Rwinkwavu DH.

For the last quarter of the FY, being an HIV infected TB suspect with SS- is the most used criteria for GXP, representing 42.5%. Other criteria were used as follow: TB suspects among prisoners with 33.8% and severely affected cases with 23.8%.

When considering positivity of samples to GXP for MTb within each GXP site, 36.4% of all samples examined at Muhima were MTb positive. These proportions were respectively 24.2% for RMH and 20.0% for CHUK.

II.2.3.3. Investigation of TB among Contacts of smear-positive TB patients and Isoniazide preventive therapy among fewer than 5 years children

Contacts of smear positive TB patients are at high risk for developing TB disease, in particular children and HIV infected contacts. From July 2012 – June 2013, 20,616 contacts were examined, which represents a contacts:index case (SS+) ratio of 6:1 (20,616:3,745). Among investigated contacts, 191 cases were confirmed with TB, representing a notification rate of 926/100 000 among contacts. Among contacts aged fewer than five years without TB disease, 1,774 were enrolled on Isoniazide Preventive therapy (INH).

II.2.3.4. Sensitization on Tuberculosis in refugees camps

During the quarter of July 2012 to September 2013, sensitizations were conducted in 4 refugee's camps, on recognition of TB symptoms. Then people were encouraged to report if they have those symptoms. Those with symptoms were appropriately examined according to national guidelines. Results are summarized in the table below.

Table 29 : Results of sensitization in four refugee's camps, July-September 2012.

Refugee camp	Total number of refugees	Number of CHWs trained	Number of new SS+	Number of transferred out	Number of other forms	Number of defaulters	Total number of cases
KIZIBA	19,500	43	0	3	4	0	7
GIHEMBE	19,366	49	5	4	2	0	11
NYABIHEKE	14,663	92	2	0	3	0	5
KIGEME	14,500	26	6	6	9	2	23
TOTAL	**68,029**	**210**	**13**	**13**	**18**	**2**	**46**

III.2.4. SDA 2.3.2 Infection control (IC)

Infection control component aims at reducing the transmission of TB within the health facilities through 3 categories of measures, by priority order: administrative measures, environmental measures and respiratory protection. The NSP includes all these interventions. The TB program defined a minimum package of administrative measures which are summarized below.

Table 30. Basic package of infection control measures for health facilities in Rwanda.

1. To have an infection control plan and an IC focal point (or team)
2. To have trained or retrained the health facility staff on IC during the last 12 months
3. To perform "triage" of people with cough in the waiting areas (consultations, ARV clinic) and wards
4. To carry regular IEC sessions on TB and cough hygiene in the waiting areas
5. The TB infectious patients who need to be admitted are put in a separate room.
6. Windows and doors are kept opened in the TB and ARV clinics as well as in OPDs and wards

By June 2013, 180 out of 194 CDTs (90.8%) applied all six measures**.**

Table 31 : Indicators related to Tuberculosis infection control in Rwanda during July 2012 to June 2013.

NSP indicator related to infection control	Baseline	2010-2011		2011-2012		2012-2013	
		Target	Result	Target	Result	Target	Result
28.Number and percentage of CDTs meeting minimum infection control requirements (numerator) of all CDTs (denominator). (**PF indicator 12)**	NA	116/194 60%	125/194 64%	155/194 (80%)	170/194 (87.6%)	191/197 (92%)	180/197 (90.8%)

III.3. Objective 3: Contribute to HSS, HR, Financing, PAL, Laboratory, IC etc

III.3.1. SDA 3.1. Performance based financing (PBF)

The PBF TB indicators are evaluated at both level- DH and HC level. For the HCs and the private clinics evaluation the hospitals mandate a team with the TB focal point among it, to evaluate all the HCs within the hospital catchment area.

The DHs and RHs have been evaluated quarterly by central level PBF team.

The Global Fund indicator number 13 i.e. "the number and percentage of health facilities that received PBF for reaching the targets for at least 50% of their indicators" shows the overall performance on TB indicators. The performance on this indicator in the last quarter of the third year of the SSF- TB project was 98,2% of the target.

PF indicator 13 related to PBF and NSP indicator related to TB suspicion in the general population	**Baseline**	**Baseline March 11**	**2010-2011**		**2011-2012**		**2012-2013**	
			Target	**Result**	**Target**	**Result**	**Target**	**Result**
30. Number & % of health facilities that received PBF for reaching targets for at least 50% of their indicators (***PF indicator 13)***	Not available	86%	86%	Not yet available	432/480 (90%)	491/498 (98.6%)	442/480 (92%)	507/516 (98.2%)[6]
33. Percentage of TB suspects detected among the general population	0.7%	Not applicable	0.9%	134 536 TB suspects / 10117029 pop (1.3%)	1.2%	168 076/ suspects / 10718379 pop (1.6%)	1.4%	176,741 TB suspects / 10,515,973 pop (1.7%)

By the end of Year 2, the TB suspicion among the general population achieved the target (1.7% against 1.4%). As during the previous year, this could be more related to CHWs involvement and the PBF for both health facilities and CHWs. For next years, activities in specific high risk group will be more encouraged.

[6] CAAC 2012-2013 Annual Report

III.3.2. SDA 3.2. Practical Approach to Lung Health

The Practical Approach to Lung Health (PAL strategy) has the following two main objectives:

- To improve the quality of respiratory care management; and
- To improve the efficiency of respiratory care service delivery within health systems and optimize the cost-effectiveness of health service delivery.

A progressive roll out of PAL activities is planned with the objective of covering 100% of district hospitals and 38% of CDT (health centers doing TB microscopy diagnosis) by the end of June 2013.

III.3.2.1. Field visits

As main activities were related to elaboration of guidelines and trainings of health providers during the second term 2012, main activities focused on field visits in health facilities holding trained personel for initiation of practical of knowledge acquired during the trainings and initiation of PAL activities in those health facilities. 22 health facilities have been visited by PAL focal Point : those HF are located in four districts which are Kamonyi, Ruhango, Gisagara and Nyanza. Those visits have as objectives:

- To realize the state of progress of implementation of PAL activities (respect of guidelines of PAL especially diagnosis and prescription of drugs accordingly)
- To discuss with HF managers on the importance of PAL approach including restitution of knowledge gained from the trainings
- To discuss with trained health providers the challenges encountered in implementation of PAL activities
- To install the system of reporting and collecting data on respiratory diseases according to PAL approach

The main strengths are the following generally:

- Register of patients with chronic respiratory diseases has been set up since June 2012 up as it has been agreed on during the training, for heath facilities without theses register, we recommended its initiation
- A big number of patients already registered in the chronic respiratory diseases register since the end of training (June 2012), we recommended continuing the registration of these patients.
- The guidelines related to antibiotics prescription and diagnosis are being progressively implemented in a big number of health facilities with trained personnel
- PAL modules at health facility available

Weakness/Challenges identified:

- Other health providers working at outpatient department need to be trained
- There are a big number of patients with asthma registered since the end of training; hence there is a need in medication related, appropriate medication will be available soon as there is an ongoing command on medication

III.3.2.2. Elaboration of Supervision tool

Besides field visits in health facilities, a supervision tool has been elaborated in close collaboration with TB District Coordinator

III.3.2.3. Finalization of PAL guidelines elaboration

For PAL guidelines related activities, a final review and correction by a consultant has been done and a final review by PAL working group is planned to occur starting January the 3rd for lasting three days.

III.3.2.4. Finalization of PAL guidelines elaboration

For PAL guidelines, a final review by PAL working group members has been conducted at Huye in January 2013. It was a three day workshop, and at the end, two PAL guidelines (one for health centers and the other one for district hospitals) reviewed by a consultant have been reviewed by all participants and corrections and suggestions have been presented and have been further taken into consideration before submitting the final guidelines which are now available.

III.3.2.5. Elaboration of PAL reporting tools

During the first quarter 2013, self assessment tool for health facilities implementing PAL activities has been elaborated and health facilities applying PAL activities began to fill these forms for better monitoring.

III.3.2.6. Implementation of PAL activities in Health Facilities

41/43 (95.3%) CDTs-Hospitals have begun implementation of PAL activities, against a target of 43/43 (100%) of the target (**PF indicators 14)**. For CDTs-HCs, 59/151 (39%) have began implementation of PAL activities against a target of 58/151 (38%) (**PF indicators 15)**.

Table 32 : Implementation of PAL activities in Rwanda during July 2012 to June 2013

PF Indicator	Target for P12	Achievement for P12
14. Number and Percentage of Hospitals conducting PAL activities.	43/43 (100%)	41/43 (95.3%)
15. Number and Percentage of CDT conducting PAL activities (health centers CDT).	58/151 (38%)	59/151 (39%)

III.4. Objective 4: Engage all care providers from the public and private sectors

III.4.1. Traditional healers

Engaging traditional healers is a activity that became possible with SSF-TB funding. It started during the last quarter of 2010. Health facilities were encouraged to prepare a list of traditional healers and to train them with the support of the TB coordinators.

Table 33 : Sensitization of traditional healers, on Tuberculosis, by the health facilities in Rwanda during July 2012-June 2013.

District	Hospital	# of THs trained
GAKENKE	NEMBA	300
MUHANGA	KABGAYI	360
GASABO	KIBAGABAGA	156
NYARUGENGE	MUHIMA	129
RUSIZI	MIBIRIZI	437
NYAMASHEKE	BUSHENGE	361
MUSANZE	RUHENGERI	262
NYABIHU	SHYIRA	277
RUTSIRO	MURUNDA	560
KIREHE	KIREHE	971
MUHANGA	KABGAYI	455
KAMONYI	REMERA RUKOMA	704
TOTAL		**4,972**

12 districts trained a total of 4, 972 traditional healers. Trainings put emphasis on TB signs and symptoms which require the reference to the health centres.

III.4.2. Private Clinics

The 3 private clinics working as CDTs (performing TB microscopy) detected 37 new smear-positive TB cases, which is lower than the expected 76 new SS+ cases, but this is following the national TB notification trend.

Table 34 : Detection of TB in the private clinics working as CDTs in Kigali-Rwanda, during July 2012-June 2013.

Clinic	NSS+	Relapses	Failures	RP	Sm-	Sm0	EP	Other	TOTAL
Carrefour	5	0	0	1	3	0	4	0	13
Lamedicale	23	0	0	1	18	0	16	0	58
Plateau	9	0	0	0	1	0	1	0	11
TOTAL	37	0	0	2	22	0	21	0	82

Table 35 : Indicators related to PPM in Tuberculosis in Rwanda, during July 2012-June 2013.

NSP indicators related to PPM	Baseline	2010-2011		2011-2012		2012-2013	
		Target	Results	Target	Results	Target	Results
34. Number of traditional healers trained on TB signs and symptoms. (***PF indicator 16)***	NA	4000	6,485 (162%)	4 000	5 328 (133%)	4 000	4 972 (124%)
35. Number & % of new SS+ TB patients detected in private clinics (numerator) of all new SS+ registered for treatment country-wide	51/4 183 (1.2%)	58 /4 428 (1.3%)	45/3962 (1.1%)	66/4 733 (1,4%)	50/3 576 (1,4%)	76/5 039 (1,5%)	37/3 519 (1,1%)

III.5. Objective 5: Empowering people with TB and communities

III.5.1. SDA 5.1. Advocacy, communication, and social mobilization (ACSM)

II.5.1.1. Broadcasting of radio program on TB

IEC/BCC messages were aired on local private and public and international radio stations, with the following topics being discussed:

- The following topics were discussed on Radio Rwanda station: General concepts on TB (cause, transmission, symptoms, screening and diagnosis); prevention of TB, how to fight against 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 members, nutrition, adherence to treatment and bacteriological follow up), national TB prevalence survey and the community DOT, the role of CHWs in TB control, TB control activities in different health facilities, Testimonies of TB patients on TB treatment of Murambi Health Center (what symptoms they presented, how they get treated, etc), collaboration between Health Centers and Community Health Workers, in follow up of TB cases (process of transferring a TB cases from health center to CHWs and different follow up activities once under CHWs responsibility) and the 19th Union Conference, Africa Region held in Kigali in June 2013(the purpose of the conference, benefit of the conference for Rwanda).
- BBC Radio in its Baza Muganga program, discussed about TB transmission and prevention, Lymph node TB and on multi drug resistant tuberculosis;
- The Kigali Today Radio discussed generalities on Tuberculosis;

II.5.1.2. The 2013 World TB day

For the 21st time, Rwanda joined the international community, to celebrate the World TB day. Ceremonies held on March 22nd, 2013 in Rusizi District (Gihundwe District Hospital). The main theme was “life without TB”, with a national sub-theme of “eliminate TB by early diagnosis and treatment”. The day was prepared by the District of Rusizi. Were present: administrative and health authorities, civil society, religious authorities, communities and medias. In the framework of preparations of the day, radio programs were aired on following radio stations: including all 5 communities’ radio (Rusizi, Musanze, Rubavu, Huye and Nyagatare), Rwanda national radio station and on 5 private radio stations (Radio 10, Isango Star, Contact FM, Flash FM and City Radio). Each station broadcast 1 program of 1 hour except Rusizi community radio, which aired 3 emissions. In total 13 emissions were broadcasted on general concepts of TB (causes, modes of transmission, symptoms and prevention) and on the 2013 TB world day.

Picture 1 : Representatives of MoH (Dr Kayumba PC, Left), of RBC/TB & ORD Division (Dr Gasana M, Centre) and of WHO (Dr Mugabekazi J, Right), adressesing their speeches to the community during the 2013 TB World Day in Rusizi District.

II.5.1.3. Current knowledge, attitudes and practices of Rwanda population regarding TB

All the IEC activities conducted in communities or in health facilities, as well s those conducted at central level (radio or TV programs or papers published in journals), are intended to improve the level of knowledge of Rwanda population on TB, to allow them taking correct measures and attitudes regarding TB health care seeking, treatment and prevention. In 2009, composite information including only questions on symptoms and transmission on TB revealed that **45%** had correct knowledge on those two information. In December 2012, this level, taking into account TB symptoms, transmission and curability, is estimated to be at **56%**. Comments on this result are provided in the chapter 6 on evaluations and research.

Table 36 : Knowledge, attitude and practices on TB, in Rwanda, 2012

PF Indicator	Target for P_{11}	Achievement for P_{11}
17. Proportion of population with correct knowledge about TB (transmission, symptoms, and curability).	70%	56%

III.5.2. SDA 5.2. Community-based DOTS

By end of June 2013, the community DOTS strategy was covering all districts of Rwanda. The mandate of CHWs in TB control activities is to sensitize communities on TB, identify potential presumptive TB cases and follow up (giving TB treatment) of some TB patients identified by health facilities.

III.5.2.1. Training of community health workers (CHWs)

Eight districts conducted a refreshment course for their CHW. In total, 17 962 CHWs were trained on community-based DOTS, TB signs and MDR-TB issues.

Table 37 : Number of CHWs trained on TB, by district in Rwanda, during July 2012 to June 2013.

District	District Hospital	Nb of CHWs in catchment area	Nb of CHWs trained
RUBAVU	Gisenyi	2,114	2,114
NYARUGENGE	Muhima (Cor Unum)	96	83
GASABO	Kibagabaag	217	217
GAKENKE	Ruli	804	781
	NEMBA	1,664	1,641
GISAGARA	Kibirizi	1,252	1,250
NYABIHU	Shyira	1,906	1,906
BURERA	BUTARO	1,969	1,967
MUSANZE	RUHENGERI	1,296	1,263
GICUMBI	BYUMBA	1,299	1,299
RUTSIRO	MURUNDA	1,457	1,342
NGOMA	KIBUNGO	1,969	1,967
RUHANGO	RUHANGO	1,140	1,140
	GITWE	992	992
TOTAL		18,175	17,962

III.5.2.2. TB Detection and treatment follow up by CHWs

From July 2012 to June 2013, community health workers (CHW) identified 51.6% of all Presumptive TB cases (TB suspects) and 31.1% of all smear-positive TB cases.

Out of the 6 174 TB cases notified from July 2011 to June 2012, 3 088 (50%) were entrusted to CHWs for administration and observation of the TB treatment. This strategy is highly appreciated by the patients because they receive DOT close to their home. The TB treatment success rate among TB patients followed up through the community-DOT (by CHWs) was excellent and, reached 93.4%. This result is slightly lower than the target which was established based in previous years success rate and is really challenging.

Table 38 : TB detection by CHWs during July 2012-June 2013 and TB Treatment success rate among TB patients managed by CHWs in Rwanda for TB patients enrolled from July 2011 to June 2012.

TB DETECTION BY CHWs IN JULY 2012-JUNE 2013			
	Total number	TB Suspects and Cases sent by CHWs	
		N	%
Presumptive TB cases	176,741	91,286	51.6%
Presumptive TB cases with positive smear	3798	1,182	31.1%
Positivity rate	2.1%	1.3%	

TB TREATMENT SUCCESS FOR PATIENTS FOLLOWED UP BY CHWs (Cohort of Jul 2011-June 2012)		
	All TB cases	Cases followed by CHWs
Nb registered	6,174	3,088
Nb successfully treated	5,130	2,885
Success rate	83.1%	93.4%

III.5.2.3. Community PBF

As during the outgoing FY, the MOH Community Health Desk continued to pay two indicators that have been identified to encourage CHWs in fight against tuberculosis. The first one is related to the identification of people with cough and their referral to the health facilities for clinical examination and sputum microscopy. The second indicator is related to the follow-up of TB patients and administration of DOT. PBF money is benefiting to CHW cooperatives.

76.5% of all cooperatives registered countrywide reached 80% of their targets and received PBF incentives (indicator 45).

III.5.2.4. Civil Society Organizations

Since several years, the TB program engaged 3 civil society organizations working with people and communities at higher risk of developing TB. they are the PLHIV associations' network, the National Youth Council and the Profemmes Twese Hamwe (women association).

Table 39 : Indicators related to Communities and Civil Society Organizations involvement in TB control, in Rwanda during July 2012-June 2013.

NSP indicators related to community DOTS	Baseline	2010-2011		2011-2012		2012-2013	
		Target	Results	Target	Results	Target	Results
37. Community DOTS coverage	24/30 (80%)	30/30 (100%)	30/30 (100%)	30/30 100%	30/30 100%	30/30 100%	30/30 100%
38. Number & % of SS+ TB cases referred by CHW of all SS+ detected countrywide. (**PF indicator 18)**	275/4445 (6%)	466/4663 (10%)	843/5007 (17%)	398/2654 15%	984/3910 25%	548/2738 20%	1182/3798 31%
39. Number & % of patients receiving DOT by CHW	2627/7644 (34%)	2940 /8400 (35%)	3307/7230 (45.7%)	3528/8820 (40%)	3352/6352 (53%)	3704/9261 (40%)	3088/6174 (52%)
40. Number & % of TB patients (all forms) successfully treated among all TB patients managed by CHW. (**PF indicator 19)**	1566/ 1630 (96%)	2522/ 2627 (96%)	2123/2251 (94.3%)	1693/1764 (96%)	2573/2782 (92%)	1778/1852 (96%)	2885/30882 (93%)
41. Number of CHW trained/ refreshed on TB and MDR-TB issues. (**PF indicator 20)**	5467	10000	10885	10000	6229	10000	17962
42. Number and % of supervisions conducted to districts with peer educators	88 (100%)	88 (100%)	14/88 (16%)	88	84/88 (95%)	88	85/88 97%
43. Number and % of schools sensitized on TB in collaboration with health facilities	689 (100%)	689 (100%)	391 (56.7%)	689	630 (91%)	689	394
44. Number of women in charge of social affairs at sectors and cells who were sensitized on TB	416 sectors (100%)	416 (100%)	217 (52%)	416	287	416 sectors	41
						2250 cells	229
45. Number and % cooperatives that received PBF for at least 80% of their indicators	416 Sectors (100%)	Baseline established by March 2011 & targets set	220/421 52%	442	338 (76.5%)		

III.6. Objective 6: Enable and promote research: New diagnostics, drugs, vaccines, Re-tooling, Operational Research

With the support of different partners, the TB & ORD Division launched and implemented many evaluations activities. These were either TB & ORD Division based-evaluations, either evaluations conducted by post-graduate students on Tuberculosis or TB programs implementation and impact evaluations; All with the aim of more informing the TB & ORD Division for the more improvement of TB control activities, and sharing Rwanda experiences and best practices with national, regional and international community. Some of them used TB surveillance data; others collected actively data during surveys/studies. In addition, the TB & ORD Division participated in TB/HIV related conferences, either as organizer or as presenter.

III.6.1. TB & ORD Division based survey/studies/evaluations/publications

III.6.1.1. Trends of TB notification rates in Rwanda and scale up of antiretroviral therapy (ARTs) program and High Treatment Success Rates in Rwanda's National MDR-TB Program, 2005-2011

These three projects used data from Rwanda TB surveillance system. Preliminary results of these evaluations were compiled in an abstracts, presented by the HoD of TB & ORD during the 43rd world conference of the International Union against Tuberculosis and Lung Disease, held in Malaysia, Kuala-Lumpur, form 14-17 November 2012. They were published in the volume 16, number 12, supplement 1 of December 2012 of the International Journal of Tuberculosis and Lung Disease as well. Their main conclusions were that:

1. Scale up of ART program in Rwanda had a potential impact on decline of TB Notification rates, especially for SS-, EPTB forms and HIV+; And highlighted the need to sustain the early HIV testing for an early start of ART, and;
2. High MDR-TB treatment success rates can be achieved in national programs in sub-Saharan Africa, including in settings with large burdens of HIV. National ownership of the tuberculosis response, a robust drug supply, system readiness to harness advances in diagnostic technology, and comprehensive adherence support interventions are crucial.

The project entitled "Trends of TB notification rates in Rwanda and scale up of antiretroviral therapy (ARTs) program" was also presented during the XIX International AIDS Conference to hold in Washington D.C., USA from 22-27 July 2012 [Date of poster display: Tuesday, 24 July 2012. Location: Poster Exhibition Area].

III.6.1.2. The survey on Tuberculosis Knowledge Attitude and Practices (TB KAP)

This was done in collaboration between the TB and ORD Division/IHDPC/RBC and the National University of Rwanda School of Public Health. It has been finalized and the final report issued. Overall the TB knowledge in the general population has improved from 45% in 2009 to 56% by December 2012. The progress could even be considered more, as in 2010 the Rwanda TB & ORD Division revised considerably its TB control policy. Cough is reported to be the well known main symptom of TB disease; however other symptoms of TB are not sufficiently known. In addition, some important risk factors of TB disease, like people with weakened immunity, crowding, tobacco use, etc are not well known. Not sharing straws is the most known measure to prevent TB bacilli transmission; other preventive measures are known by 30% of the community. 69% of respondents declared to be informed on TB through radio messages, 48% through health facilities, 38% through community health workers and 6% by TV and news papers. 65% of Rwandans have positive attitudes toward TB disease like not sharing the bed room with TB patient while 35% do not perceive any need to take protection measures against TB disease. There is therefore need to

widen messages on other TB symptoms, on TB risk factors and on TB infection control measures in general population; through updating TB message content and diversifying community mobilization channels. Results of this survey were shared during the 19th Conference of the Union Africa Region in Kigali in June 2013.

II.6.2. Co-authorship of TB & ORD Division staff in peer reviewed publications

III.6.2.1. Moving the goalposts for tuberculosis targets in Africa

This article was published in The **Lancet. 2013 Mar 16;381(9870):905-6**, by Binagwaho A, **Gasana M**, Nyemazi JP, Nutt CT and Wagner CM, in response to an Editorial published by The Lancet 2012; 380: 1359, and entitled "Tuberculosis—from ancient plague to modern-day nemesis", recommending the initiation of a Global Commission on Tuberculosis elimination. The TB & ORD Division, in collaboration with the Rwanda Ministry of Health, replied. Our main concern is that WHO incidence and mortality figures for several African countries in its Global Tuberculosis Reports of 2011 and 2012 differ by more than an order of magnitude. In our reply, we advocated for the inclusion of more clear and consistent methods for generating and communicating estimates of country progress on its list of priorities.

III.6.2.2. Adherence to tuberculosis treatment, sputum smear conversion and mortality: a retrospective cohort study in 48 Rwandan clinics

This article published in the **PLoS One. 2013 Sep 16;8(9):e73501**, by Kayigamba FR, Bakker MI, Mugisha V, De Naeyer L, **Gasana M**, Cobelens F, van der Loeff MS; examined risk factors associated with sputum smear conversion at month 2 of TB treatment, and how it affect the successful outcome of the TB treatment success. No-conversion at month 2 was find to be linked with baseline sputum smear grade (odds ratio [OR] = 2.7, 95% Confidence interval [CI] 1.1-6.6 comparing smear 3+ against 1+) and HIV infection (OR 3.0, 95%CI 1.3-6.7). Besides other known determinants, poor adherence had an independent, strong effect on mortality (OR 3.4, 95%CI 1.4-7.8).

III.6.2.3. Combatting Substandard and Falsified Medicines: A View from Rwanda

In the **PLoS Med. 2013;10(7):e1001476**., Binagwaho A, Bate R, **Gasana M**, Karema C, Mucyo Y, Mwesigye JP, Biziyaremye F, Nutt CT, Wagner CM, Jensen P and Attaran A discussed ; discussed following key points: Substandard and falsified medicines are major global health challenges that cause unnecessary morbidity and mortality around the world and threaten to undermine recent progress against infectious diseases by facilitating the emergence of drug resistance. In a recent study, Rwanda had the lowest prevalence of poor quality tuberculosis drugs among African countries in the sample. This positive finding may be associated with Rwanda's efforts to ban the sale of monotherapies, ensure that private sellers of important medicines are qualified, and prioritize the prevention of falsified medicines entering the country. Drawing on our experiences in Rwanda scaling up pharmacovigilance for malaria and tuberculosis, we call for a global treaty and leadership by the World Health Organization to address manufacturing and trade in substandard and falsified medicines.

III.6.2.4. PEPFAR support for the scaling up of collaborative TB/HIV activities

In this review, by Howard AA, **Gasana M**, Getahun H, Harries A, Lawn SD, Miller B, Nelson L, Sitienei J, Coggin WL; and published in the **J Acquir Immune Defic Syndr. 2012 Aug 15;60 Suppl 3:S136-44**. Authors discuss how the support of The US President's Emergency Plan for AIDS Relief (PEPFAR) to a comprehensive package of TB/HIV activities, based on World Health Organization's 12-point policy for collaborative TB/HIV activities, made significant gains in HIV testing and counseling of TB patients and linkages to HIV care and treatment, intensified TB case finding, and TB infection control. PEPFAR's support of TB/HIV integration has also included significant investment in health systems, including improved laboratory services and educating and enlarging the workforce. Authors concluded that, the scale-up of

antiretroviral therapy along with support of programs to increase HIV counseling and testing and improve linkage and retention in HIV care may have considerable impact on TB morbidity and mortality. Authors highlighted also that for future programming Rwanda should accelerate implementation of isoniazid preventive therapy, increasing access and ensuring appropriate use of new TB diagnostics, supporting early initiation of antiretroviral therapy for HIV-infected TB patients, and strengthening systems to monitor and evaluate program implementation.

III.6.2.5. Sputum completion and conversion rates after intensive phase of tuberculosis treatment: an assessment of the Rwandan control program

In this study, published in **BMC Res Notes. 2012 Jul 16;5:357**, Kayigamba FR, Bakker MI, Mugisha V, **Gasana M**, Schim van der Loeff MF, evaluated associated health facility characteristics and completion of sputum smear examinations at the end of the intensive phase of TB treatment and sputum conversion rate. In this January and June 2006 cohort of new and retreatment smear-positive pulmonary TB (PTB+) cases, 80.0% had a smear examination at month 2 done, with 82% having smear-negative. A high number of new PTB cases at a health facility was the only significant predictor of a low completion rate, while the only independent factor associated with low sputum conversion rates was rural (vs. urban) location of the health facility.

III.6.3. Support to Students theses on Tuberculosis

The TB & ORD Division provided technical and financial support to four post-graduate students projects on Tuberculosis. Those were:

III.6.3.1. Isoniazid prophylaxis for children under five in contact with smear positive tuberculosis patients in Kigali City

Objectives : Guidelines in Rwanda recommend six months of Isoniazid Preventive Therapy (IPT) to prevent the development of active tuberculosis in children exposed to smear positive tuberculosis (TB) adults. The aim of the present study was to assess the implementation of IPT administration for children with household exposure to a smear positive adult TB case. **Methods :** This study is a combination of a record review of routinely collected tuberculosis program data in Kigali city health facilities from July to September 2011 and a cross sectional survey. Data was obtained from registers, patients' records, cell phone interviews with adult pulmonary tuberculosis (PTB) index cases and from face-to-face key informant interviews with health care providers in charge of tuberculosis. These different approaches identified under 5 years old children who are household contacts of adult PTB cases in order to determine the proportion of those who received INH preventive therapy (IPT). Analysis was done in SPSS16 using appropriate statistical tests and considering $p<0.05$ as significant. Results were analyzed by means of SPSS16 statistical packages. Chi square 2 tests and logistic regression were performed. **Results :** A total of 172 adult PTB patient records were reviewed. From 485 identified household contacts, 54 (11% of all contacts) under five years old children should have received IPT based on national guidelines; A total of 48 (83%) children were initiated on IPT ,25% were documented to have completed 6 months of IPT. The adult TB patient's awareness on tuberculosis was between 94%and 96% except for awareness on IPT initiation for the under five children which was 44%. Awareness of the HCWs was varying between 95% and 100% and a low awareness level regarding side effects of IPT at 57%. Few barriers of IPT were elicited including parents' refusal, forgetting to propose IPT to the child's caretaker and the fact that the index patient was lost to follow-up. **Conclusions**: Although awareness of health provider and parents on IPT is satisfactory, IPT delivery to children remains an operational challenge. Strategies to overcome these challenges need to be developed and implemented. **Key Words:** Tuberculosis; contact; children, chemoprophylaxis.

III.6.3.2.One Stop TB-HIV Services evaluation in Kicukiro and Rulindo Districts: Comparison of the cohorts of 2001-2005 and 2006-2010

Problem statement: In Rwanda, the TB specific fatality rate is 7.5% and it stays the first opportunistic infection among PLWHA because the number of TB cases has doubled along the 10 last years and almost 35% are HIV positives. **Research objective**: To evaluate One stop TB-HIV services in Rwanda, a strategy implemented to manage the TB-HIV co-infection, by comparing the TB treatment outcomes before and after the implementation. **Methods:** This study was descriptive retrospective (program evaluation) and used two approaches. The quantitative methods used ecological data with aggregated data on TB treatment outcomes from 2001 to 2010. Descriptive statistics were computed and $\chi 2$ as the test of significance was computed for the TB treatment outcomes comparison. The qualitative method assessed the quality of services, challenges and address recommendations to improve the One stop TB-HIV services. **Results:** 12 health facilities were included in the study, 6 in Kicukiro district as an urban area and 6 in Rulindo district as a rural area. All the sites were functional according to the settled criteria. The TB treatment outcomes after the intervention were not statistically different from before intervention in both areas, even though qualitative data have revealed many positive outcomes, especially waiting time reduction and appointments that were more respected after intervention (adherence). **Conclusion**: The program implementation has improved the quality of service offered even though the treatment outcomes didn't show any statistical difference. Therefore, study participants suggested many issues to improve the TB treatment outcomes like strengthening the health care system, especially staff retention policy; hire special staff for the service and data management issues; continuous training on ART and TB for a sufficient number of staff; strengthening CHWs involvement in TB activities, especially in urban areas; nutritional support not only for MDR-TB patients but also for all TB-HIV patients and involvement of many private health facilities in TB activities.

III.6.3.3. Evaluation of knowledge and risk behavior towards TB among patients diagnosed with TB in Rwanda

A cross- sectional quantitative study carried out in Kigali within a one year period (July 2011 to June 2012). It evaluated knowledge, attitude and practices towards TB infection among TB diagnosed patients. Sample of 411 TB patients was randomly and proportionately drawn for the study. The validated and translated questionnaires comprised participants' socio-demographic characteristics, 11 items Knowledge questions, 13 item attitudes questions and 10 practices questions. Trained community health workers at health center, interviewed participants face to face during their routine daily treatment at the health Centre. Data from the field were sorted out, arranged and analysis with SPSS based on analysis plan.

Study result showed that 59.9% participants had good TB knowledge, while 40.1% participants had poor TB knowledge. The poor knowledge was most predominant on knowledge of who can be infected with TB infection, especially homelessness, People living with HIV/AIDS and people who has been to prison (8.3%, 23.4% and 6.3%) respectively. Also there were poor responses on some of the symptoms regards coughing up blood and shortness of breath (37.2% and 25.1). Diagnosis of TB led to increase anxiety / tension & participants also had worries on prolonged treatment, fear of spread, stigma, threatened self-esteem and quality of life. There were some stigmatization attitude and resentful behavior of the community members towards most of the participants, most people rejects him/her (53.8%) and most people are friendly but they generally try to avoid him / her (44.5%).

Practices of covering mouth and nose when coughing and sneezing, personal hygiene, immunization of family members were poor among study participants. The determinants of knowledge and practices were education, profession, residence. The knowledge effect on practices were significant with OR = 7.466, CI 4.766, 11.695. There's need to Strengthens TB awareness and have new interventions that contributes to stigma reduction.

III.6.4. Evaluations of TB & ORD Division Programs/Activities (Program evaluations)

III.6.4.1. Financing of TB diagnostics and treatment in Rwanda

This is a project that was conducted I different countries (Vietnam, Bangladesh and Uganda). Its aim was to assess financing of TB diagnostic and treatment tools, and financing barriers to maintain existing TB tools and introduce additional TB tools in Rwanda; And to identify options to overcome financing barriers and ensure effective and efficient use of TB tools. The TB and ORD Division was interested to participate in this project. We received a non-research determination by the Rwanda ethics committee. The evaluation has been conducted in collaboration with an MSH team of consultants, and preliminary report shared (is still under finalization). The evaluation concluded that installing and implementing each genexpert 4 modules costs 48,070 USD, and that determining and ensuring adequate financing for TB diagnostics and treatment interventions will be a recurring challenge for developing countries. These results will be presented in a workshop during the 2012 IUATLD conference in Kuala-Lumpur.

III.6.4.2. The 2012 Annual Evaluation by the Global Drug Facility

From the 2nd to the 06th July 2012, Dr Dr Ann Meeussen of the Global Drug Facility (GDF) conducted a monitoring mission in the purpose of: Monitoring of GDF direct procurement of adult and paediatric anti-TB drugs, review of current stock status in view of the deliveries made between January and March 2012, and the reported stock-out of paediatric drugs at central level, quantification of next drug supply needs, communication and discussion on the implementation of the new pediatric guideline. The following main recommendations have been issued to TB & ORD Division: Examine the reasons for the increasing category II patients (Q4 2012); Update National TB Management Guidelines (Q1 2013); Use monthly consumption data and patient numbers as a tool to cross-check expected drug consumption and use it to cross-check system drug requisitions form the district pharmacies (Continuously).

III.6.4.1. The 2012 Annual Evaluation by GFTAM (The On-site Data Verification/Rapid Service Quality Assessment: OSDV/RSQA)

OSDV-RSQA: In September 2012, an LFA team conducted an on site data verification and a rapid service quality assessment in three districts (Muhima, Nyagatare and Nyarugenge). This covered 01st January 2012 to 30 June 2012. Generally data verification was good without many variances. The quality evaluation reported the need of improving documentation (well filling of tools), and to reorient our supervisions to quality checking and to install a system that could help in avoiding double counting (like an electronic R&R).

II.6.4. Implementation of the 19th Conference of the UNION Africa Region

Rwanda was nominated to host this conference, by the 18th Conference of the Union that held in Abuja-Nigeria i^{n} March 2011. The 19th Conference of the Union, Africa Region, held in Kigali Serena Hotel; from 20th-22nd June 2013. Around **450** Participants attended, including Regular delegates (Countries, the Union, NGOs, health facilities, etc), Students and academic delegates, Media, Exhibitors. Sponsors were Government of Rwanda, the US CDC, GFTAM, WHO and ACCESS Project.

The conference was opened on Wednesday June 19th, 2013; by the Rwanda Minister of Health, in the presence of an International TB Expert: Professor Paul Farmer, the President of the Union, World: Professor Jane Carter, and a Special Guest: the Togo Minister of Health.

The main theme of the conference was “Tuberculosis and other respiratory diseases: successes and challenges”. The topic was selected because achieved targets by certain countries have to be shared, to speed up Tuberculosis control across the World. The following sub-themes were specifically discussed:

- TB surveillance:

    - Global burden of Tuberculosis: Results from surveillance systems and surveys and programs implications;
    - Treating successfully all forms of Tuberculosis;
- TB laboratory:
    - New technologies of Tuberculosis Diagnosis: Challenges and Solutions related to their implementation in Developing Countries;
    - Laboratory networking to faster the diagnosis of Tuberculosis;
- Childhood Tuberculosis: Challenges in control and perspectives;
- Identify, Diagnose and manage people at high risk of Tuberculosis ;
- Tuberculosis infection control programs in health facilities, congregate settings and in communities;
- Financing health system strengthening in developing countries: Rwanda experience;
- Socio-behavioural and economic support to better control and prevent Tuberculosis and Other Lung Diseases;
- Community involvement in Tuberculosis control;
- Asthma; Other chronic respiratory diseases; And Tobacco control.

Discussions were conducted through different types of sessions, which were:

- 5 Plenary sessions:
    - Global TB burden and TB surveillance systems;
    - Childhood TB;
    - Financing Health Systems;
    - TB infection prevention and control;
    - Asthma, Other CRDs (chronic respiratory diseases) and Tobacco.
- 54 Oral abstracts presentations
- 28 Posters presentations
- 5 Workshops:
    - Shortened MDR-TB treatment regimens;
    - Ethics in Research;
    - MDR TB program management;
    - TB prevalence surveys;
    - Introduction to Projects management.
- The Union Africa General Assembly

Main recommendations of the conference are:

- Global burden of TB from surveillance systems, surveys and programs implications

- Background: even if TB prevalence surveys are an important contribution despite being costly and logistically demanding, the ultimate method of assessment is routine surveillance
- Recommendation: Countries should improve quality of their routine surveillance data, keep them simple to keep them reliable, improve their analyze for decisions making;

- Treating successfully all forms of Tuberculosis
  - Background: TB treatment success rate targets are achieved for SS+, not for other TB forms; because of high level of deaths, following late diagnosis;
  - Recommendation: Maintain a high index of early suspicion and diagnosis of other forms of TB.
- New Tuberculosis Diagnosis Technologies in Developing Countries
  - There is need to understand more the performance of these tests in African countries context:
    - Including lab sites assessment, sample transportation systems, QA systems, cost-effectiveness, impact on TB notification and management, etc
- Childhood Tuberculosis: challenges in control and perspectives
  - Ensure children are included in the three pillars of public health:
    - Include children in TB policies;
    - Include children in scientific and operational research;
    - Implementation of Appropriate Clinical Practices
  - Meet funding needs for childhood TB.
- Identify, Diagnose and manage people at high risk of Tuberculosis
  - Background: There is a consistent decrease of TB notification in general population; However notification rates remain high in some specific groups of population;
  - Recommendation: Set active TB screening and detection interventions among high risk people and Evaluate efficacy of these activities.
- Financing health system strengthening in developing countries
  - Background: Lack of coordination, synergy and ownership at different steps of health project cycle, and risk of budgets duplication and overlapping; With issue of Sustainability;
  - Recommendation: Countries are encouraged to set their own “one stop centre” OR “Single Project Implementation Units” for coordinated, fast and efficient Implementation of Health programs.
- Community, CSOs, other partners, HR, etc
  - Students in medical schools should not only be trained on TB as a disease but also as a public health challenge ;
  - Modules on TB should be Incorporated into standard Life Orientation syllabus for all schools.
- TB Infection Prevention and Control

- Prioritization and Reinforce TB IPC interventions by national TB programs in health facility settings, congregate settings and in the community;

- Asthma, other CRDs and Tobacco
  - Current well-organized TB programs should be a strength to implement the integrated management of lung diseases (PAL);
  - Need of innovative and Creative interventions for effective Tobacco Awareness and control.

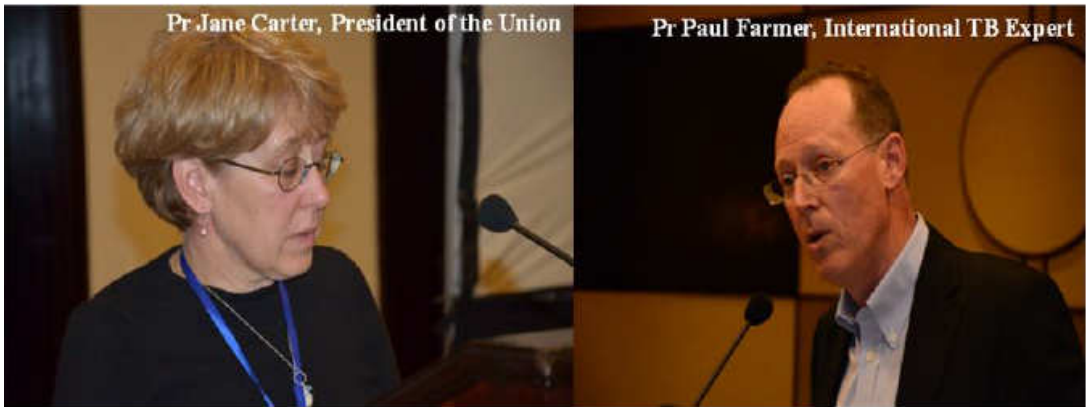
The conference was closed on Saturday 22nd June 2013.

- Conference Recommendations read by Dr Claude Bernard Uwizeye;
- Remarks by the In coming President of the Union Africa Region: Dr Muyabala Muna;
- Official Closing by the Principal DDG of RBC/Rwanda Ministry of Health: Mr Andrew Makaka.

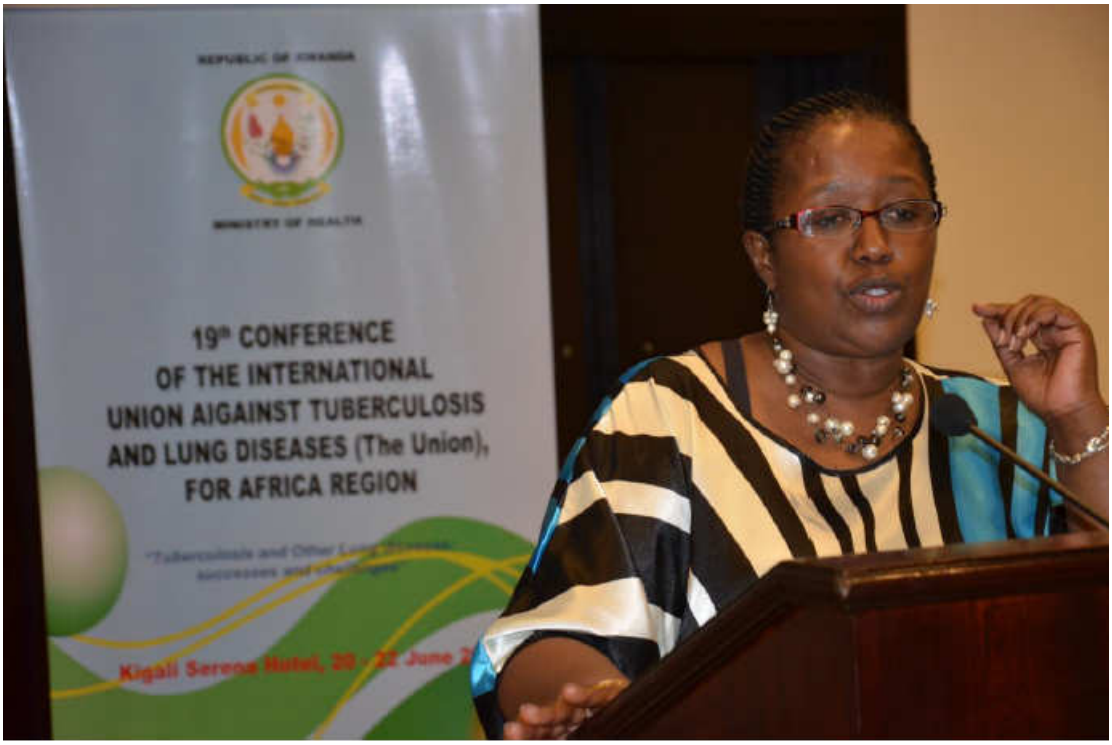
Dr Muyabala Muna, from Swaziland was elected as the new President of the Union, Africa Region. The 20th Conference of the Union, Africa Region to hold in Swaziland in 2015.

Picture 2 : Hon Dr Agnes BINAGWAHO, the Rwanda Minister of Health (Center), Prof Jane Carter, the President of The Union Worldwide (Left) and Prof Kondi Charles AGBA, Minister of Health of Republic of Togo, Guest of Honor of the Rwanda Minister of Health (Right).

Picture 3 : The Principal Deputy Director General of the Rwanda Biomedical Center addressing his welcoming speech during the opening ceremony of the 19th Conference of the Union, Africa Region.



Picture 4 : International TB experts addressing their remarks during the opening ceremony of the 19th Conference of the Union, Africa Region.



Picture 5 : Honorable Dr Agnes BINAGWAHO, The Rwanda Minister of Health addressing her speech during the opening ceremony of the 19th Conference of the Union, Africa Region.

Picture 6 : Mr Andrew MAKAKA, The Principal Deputy Director General of the Rwanda Biomedical Center (Center), Dr Michel GASANA, the Outgoing President of The Union , Africa Region and Prof Jane Carter, the President of The Union Worldwide (Left), Dr Siphiwe NGWENGA, Secretary of The Union, Africa Region, Dr Munachitambwe MUYABALA, the Incoming President of The Union, Africa Region, and Dr Claude Bernard UWIZEYE, Secretary of the Sceintific Committee of the Conference (Right).

Picture 7 : Group photo during the closing ceremony of the 19th Conference of the Union, Africa Region.

V. CONCLUSION

V.1. Summary of key achievements during the 2011-2012 fiscal year

V.2. Summary of key challenges during the 2011-2012 fiscal year and orientations for the 2012-2013 year

Table 40 : Key challenges to be addressed during the 2012-2013 FY.

V. ANNEXES

Annex 1 : All-forms TB Notification rates by Provinces and by District, in Rwanda, during July 2012-June 2013.

District	All-forms cases	National %	District Population	TNR per 100,000
Musanze	216	3.6%	368,563	58.61
BURERA	64	1.1%	336,455	19.02
GICUMBI	101	1.7%	397,871	25.39
RULINDO	106	1.8%	288,452	36.75
GAKENKE	85	1.4%	338,586	25.10
MUHANGA	217	3.6%	318,965	68.03
KAMONYI	130	2.2%	342,792	37.92
RUHANGO	110	1.8%	322,021	34.16
NYANZA	178	3.0%	323,388	55.04
HUYE	301	5.0%	328,605	91.60
GISAGARA	190	3.2%	322,803	58.86
NYARUGURU	38	0.6%	293,424	12.95
NYAMAGABE	144	2.4%	342,112	42.09
NYAGATARE	211	3.5%	466,944	45.19
GATSIBO	243	4.1%	433,997	55.99
KAYONZA	227	3.8%	346,751	65.46
RWAMAGANA	188	3.1%	310,238	60.60
NGOMA	149	2.5%	338,562	44.01
BUGESERA	138	2.3%	363,339	37.98
KIREHE	114	1.9%	340,983	33.43
RUBAVU	264	4.4%	404,278	65.30
NYABIHU	75	1.3%	295,580	25.37
RUTSIRO	103	1.7%	323,251	31.86
NGORORERO	104	1.7%	334,413	31.10
KARONGI	171	2.9%	331,571	51.57
NYAMASHEKE	138	2.3%	383,138	36.02
RUSIZI	236	3.9%	404,712	58.31
GASABO	507	8.5%	530,907	95.50
KICUKIRO	407	6.8%	319,661	127.32
NYARUGENGE	822	13.8%	284,860	288.56
Country	**5,977**		**10,537,222**	**56.72**
	Average	3.3%	Average	57.30
	Median	2.7%	Median	44.60
	Maximum	13.8%	Maximum	288.56
	Minimum	0.6%	Minimum	12.95
	1st Quintile		1st Quintile	
	3rd Quintile		3rd Quintile	

TNR: TB notification rate

Province	Province Population	All-forms cases	TNR per 100,000
North	1,729,927	572	33.1
South	2,594,110	1,308	50.4
East	2,600,814	1,270	48.8
West	2,476,943	1,091	44.0
Kigali	1,135,428	1,736	152.9
Country	**10,537,222**	**5,977**	**56.7**

Annex 2 : Rates of different TB treatment outcomes by Provinces and by District, in Rwanda, for the new SS+ cohort registered during July 2012-June 2013.

DISTRICTS	# of cases registered	# cured		# treatment completed		# failures		# deaths		# lost to follow up		# transferred out		# not evaluated	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%
MUSANZE	102	82	80.4%	6	5.9%	5	4.9%	3	2.9%	5	4.9%	1	1.0%	0	0.0%
BURERA	35	31	88.6%	3	8.6%	0	0.0%	1	2.9%	0	0.0%	0	0.0%	0	0.0%
GICUMBI	75	60	80.0%	4	5.3%	3	4.0%	4	5.3%	1	1.3%	1	1.3%	2	2.7%
RULINDO	61	46	75.4%	6	9.8%	5	8.2%	2	3.3%	0	0.0%	1	1.6%	1	1.6%
GAKENKE	41	37	90.2%	0	0.0%	3	7.3%	1	2.4%	0	0.0%	0	0.0%	0	0.0%
MUHANGA	155	130	83.9%	8	5.2%	3	1.9%	14	9.0%	0	0.0%	0	0.0%	0	0.0%
KAMONYI	99	89	89.9%	1	1.0%	4	4.0%	5	5.1%	0	0.0%	0	0.0%	0	0.0%
RUHANGO	89	83	93.3%	0	0.0%	1	1.1%	5	5.6%	0	0.0%	0	0.0%	0	0.0%
NYANZA	106	92	86.8%	1	0.9%	7	6.6%	6	5.7%	0	0.0%	0	0.0%	0	0.0%
HUYE	186	153	82.3%	9	4.8%	6	3.2%	7	3.8%	0	0.0%	9	4.8%	0	0.0%
GISAGARA	102	87	85.3%	8	7.8%	2	2.0%	4	3.9%	0	0.0%	1	1.0%	0	0.0%
NYARUGURU	43	36	83.7%	2	4.7%	2	4.7%	2	4.7%	1	2.3%	0	0.0%	0	0.0%
NYAMAGABE	54	48	88.9%	1	1.9%	1	1.9%	2	3.7%	0	0.0%	2	3.7%	0	0.0%
NYAGATARE	141	118	83.7%	3	2.1%	8	5.7%	3	2.1%	6	4.3%	3	2.1%	0	0.0%
GATSIBO	143	124	86.7%	7	4.9%	2	1.4%	6	4.2%	4	2.8%	0	0.0%	0	0.0%
KAYONZA	127	107	84.3%	11	8.7%	2	1.6%	4	3.1%	1	0.8%	2	1.6%	0	0.0%
RWAMAGANA	97	82	84.5%	6	6.2%	1	1.0%	4	4.1%	3	3.1%	0	0.0%	1	1.0%
NGOMA	122	108	88.5%	9	7.4%	1	0.8%	4	3.3%	0	0.0%	0	0.0%	0	0.0%
BUGESERA	101	88	87.1%	4	4.0%	2	2.0%	4	4.0%	3	3.0%	0	0.0%	0	0.0%
KIREHE	90	76	84.4%	8	8.9%	5	5.6%	1	1.1%	0	0.0%	0	0.0%	0	0.0%
RUBAVU	139	117	84.2%	9	6.5%	4	2.9%	6	4.3%	2	1.4%	1	0.7%	0	0.0%
NYABIHU	62	50	80.6%	5	8.1%	2	3.2%	1	1.6%	3	4.8%	0	0.0%	0	0.0%
RUTSIRO	42	32	76.2%	5	11.9%	3	7.1%	2	4.8%	0	0.0%	0	0.0%	0	0.0%
NGORORERO	36	31	86.1%	3	8.3%	1	2.8%	1	2.8%	0	0.0%	0	0.0%	0	0.0%
KARONGI	102	89	87.3%	4	3.9%	3	2.9%	2	2.0%	3	2.9%	1	1.0%	0	0.0%
NYAMASHEKE	86	75	87.2%	2	2.3%	5	5.8%	3	3.5%	0	0.0%	1	1.2%	0	0.0%
RUSIZI	124	108	87.1%	3	2.4%	4	3.2%	4	3.2%	3	2.4%	2	1.6%	0	0.0%
GASABO	336	253	75.3%	33	9.8%	7	2.1%	24	7.1%	11	3.3%	11	3.3%	0	0.0%
KICUKIRO	251	213	84.9%	5	2.0%	14	5.6%	11	4.4%	3	1.2%	5	2.0%	0	0.0%
NYARUGENGE	429	374	87.2%	10	2.3%	10	2.3%	22	5.1%	11	2.6%	2	0.5%	0	0.0%
Country	**3576**	**3019**	**84.4%**	**176**	**4.9%**	**116**	**3.2%**	**158**	**4.4%**	**60**	**1.7%**	**43**	**1.2%**	**4**	**0.1%**