The Union
International Union Against Tuberculosis and Lung Disease
Health solutions for the poor

MANAGEMENT OF TUBERCULOSIS

A Guide to Essential Practice

Seventh Edition 2019

Supplementary Materials

Table 1: Guiding principles of tuberculosis care and prevention and indicators[1]

Guiding principle of TB care and prevention	#	*Indicator*
I: Detect all presumptive TB patients	1	Presumptive TB patients identified per 100,000 population
	2	% of presumptive TB patients who were tested and who had positive sputum test result
II: Detect TB (all forms) / new TB patients confirmed by smear microscopy or Xpert MTB/RIF	3	All TB patients registered per 100,000 population
	4	New pulmonary bacteriologically confirmed TB patients registered per 100,000 population
	5	% of new pulmonary TB patients 5 years of age and above without smear microscopy or Xpert MTB/RIF result
III: Test all TB patients for HIV and if positive start CPT and ART	6	% of TB patients with recorded HIV test results
	7	% of TB patients with recorded HIV test result and who are HIV-positive
	8	% of HIV-positive TB patients on CPT
	9	% of HIV-positive TB patients on ART
IV: Provide all TB patients with daily treatment support and observation by a health worker, trained community volunteer or trained family member	10	% of all TB patients with DOT by health worker or trained community volunteer, including trained family member (proportion with any kind of DOT according to NTP)
V: Treat all TB patients successfully	11	% cured (only relevant in new pulmonary bacteriologically confirmed patients, from district upwards)
	12A	% treatment completed
	12B	% successfully treated (cured and treatment completed)
	13	% failed
	14	% lost to follow-up
	15	% died
	16A	% transferred out
	16B	% with treatment outcome 'not evaluated'
VI: Provide adequate stock of TB drugs	17	Levels of stock (months of consumption for each drug)
VII: Test sputum of all previously treated TB patients for rifampicin-resistance (with Xpert MTB/RIF)	18	% of previously treated TB patients with result of Xpert MTB/RIF test

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TB = tuberculosis; CPT = cotrimoxazole preventive treatment; ART = antiretroviral treatment; DOT = directly observed treatment.

Table 2: Expected indicator values and suggested explanations for indicators having differing values[2]

#	*Indicator*	*Expected value*	*Possible explanations for deviations (poor data quality is relevant for all indicators)*	
			Below expected	*Above expected*
1	Presumptive TB patients per 100,000 population	Compare with next level up*	• Limited access to facilities • Patients seek care elsewhere • Staff use (too) strict criteria for presumed TB • Estimated catchment population is too high	• Staff use (too) wide criteria for presumed TB • Patients from another catchment area seek care • Estimated catchment population is too low • Active case finding campaign
2	% of presumptive TB patients screened by smear microscopy or Xpert who had positive result	5-15%	• Staff use (too) wide criteria for presumed TB • Poor quality sputum specimens • Laboratory staff miss positive slides (false negative)	• Staff use (too) strict criteria for presumed TB • Presumptive TB patients present late • Laboratory staff read negative slides as positive (false positive)
3	TB patients (all forms) per 100,000 population	Compare with next level up*	• Same points as indicator #1 • TB patients who **die or are lost before starting treatment** are not registered • Patients with positive laboratory tests are not entered in TB register or clinically confirmed patients are not notified or started treatment • Truly low level of TB	• Diagnostic criteria are (too) open, for instance, based on chest x-ray (over-diagnosis) • TB patients from another catchment area seek care • Estimated catchment population is too low • Laboratory staff read negative slides as positive (false positive) • Truly high level of TB
4	New pulmonary bacterio-logically confirmed TB patients per 100,000 population	Compare with next level up*	• Same points as indicator #3	• Same points as indicator #3

* Not defined as % but values "obviously/clearly" higher or lower than the average so that it raises questions about what could be the explanation

5	% of new pulmonary patients 5 years and above without sputum test result	Less than 5%	• Not applicable: 'the less, the better'	• Staff do not collect diagnostic sputum specimens • Specimens do not reach laboratory because, for example, there is no transport system • Results do not reach referring centres • Results are not recorded in appropriate register • Patients live far away from diagnosing centre and cannot afford transport or other costs • Shortage of sputum specimen containers • Non-functioning laboratory (no staff, no reagents, no cartridges, etc)
6	% of TB patients with recorded HIV test results	100%	• Staff do not provide counselling and testing services for HIV • Staff do not repeat offer of HIV testing if patients are not ready to accept testing immediately • TB patients refuse to be tested • HIV test kits are out of stock • Delay in offering HIV test so that it remains not done when quarterly report is submitted	• Inaccurate recording and reporting (poor data quality)
7	% of TB patients with a HIV test result who have + result	Compare with the next level*	• If only few patients have recorded results, value may not be representative	• If not all patients are tested, TB patients with a higher risk could be selected for HIV testing
8	% of HIV-positive TB patients on CPT	100%	• Staff do not recommend CPT • TB patients have to collect cotrimoxazole supplies from another room (and join another queue) than TB room • Cotrimoxazole out of stock • CPT use is not recorded in register	• Inaccurate recording and reporting (poor data quality)

9	% of HIV-positive TB patients on ART	100%	• Staff are not trained and mentored to initiate patients on ART • Staff do not record ART in register • Patients prefer to defer ART initiation • Centre is not accredited to initiate patients on ART	• Inaccurate recording and reporting (poor data quality)
10	% of all patients with DOT by health worker or trained community volunteer, including trained family member	100%	• Staff do not appreciate importance of daily observed treatment support • Staff are unable to negotiate the best DOT option with patients • Patients live too far to attend facility-based DOT and there are no community volunteers	• Poor data quality
11	% cured (only relevant in new pulmonary bacterio-logically confirmed patients)	87%	• High rate of "completed" patients who do not have required number of negative follow-up sputum microscopy results • High rate of unsuccessful outcomes (failure, loss to follow-up, death, not evaluated/transferred out) – see these indicators	• Not applicable: the higher, the better
12	% successfully treated (cured and treatment completed)	87%	• High rate of unsuccessful outcomes (failure, loss to follow-up, death, not evaluated/ transferred out) – see these indicators	• Not applicable: the higher, the better
13	% failed	Less than 1%	• Not detected because follow-up sputum microscopy is not done or is of poor quality (and has low sensitivity) • Strong TB programme with low level of drug resistance	• TB services providing 'floppy' DOT, leading to patients not taking their medicines – bordering on "loss to follow-up" • Patients with drug resistance, especially MDR-TB/XDR-TB

14	% lost to follow-up	Less than 5%	• TB patients who are lost **before starting treatment** are not registered • Staff do not adhere to the definition of loss to follow-up (falsification of data) • Poor quality of data	• Staff do not explain to patients and their family members the importance of taking TB medicines as prescribed and completing treatment • Staff and patient do not agree on the most convenient way to ensure DOT • Staff do not monitor TB patient attendances and do not bring treatment interrupters promptly back to treatment
15	% died	Less than 5%	• TB patients who die **before starting treatment** are not registered • Staff do not follow up treatment interrupters (who could have died) • Staff have not suggested to family members to report deaths of TB patients • Poor quality of data	• Patients come (too) late because they are unaware of TB symptoms or underestimate importance of symptoms, have previous experiences of unprofessional and/or impolite health staff, attend traditional healers first or do not have money for clinic fees, transport, etc • Staff do not have high degree of clinical suspicion of TB and do not screen patients (early) for TB • Staff delay investigating symptomatic patients • Staff do not ensure prompt start of TB treatment when diagnosis has been made • PLHIV with TB are not diagnosed early enough and not started early enough on CPT and ART • Patients are not taking medications regularly
16	% with treatment outcome not evaluated	0%	• Patients first registered when reporting treatment result, not registered when diagnosed. The indicator should be 0%	• Patients are transferred out and coordination with TB Coordinators in receiving BMU is weak and no information about outcome is returned • Notified cases do not have outcome: outcomes are not recorded in facility registers because DOT is weak and staff do not know treatment outcome

17	Levels of stock (months of consumption for each drug)	3-6 months stock (if quarterly distribution)	• Staff do not order drugs on time • Orders are inaccurate (too few medicines are ordered) • Less drugs are delivered (medical stores 'rationing' medicines) • Delays in receiving drugs • Expired drugs in stock • Drugs were lost • Drug were used for other purposes than TB	• Staff order too large stocks (compared with number of registered TB patients) • Receive more drugs than ordered • Fewer patients than expected are diagnosed and started on treatment
18	% of previously treated TB patients with result of Xpert MTB/RIF test	100%	• Staff do not collect / send sputum specimens to laboratory • There is no specimen transport system • Staff do not request testing because they are not familiar with indications for Xpert test • No access to Xpert test • Laboratory did not process sputum, for example, due to cartridge stockout • No test result was sent back to clinicians	• Not applicable: the higher, the better

[2] Reprinted with permission of the International Union Against Tuberculosis and Lung Disease. Copyright © The Union from Heldal E, Dlodlo RA, Mlilo N, Nyathi BB, Zishiri C, Ncube RT, Siziba N, Sandy C. Local staff making sense of their tuberculosis data: key to quality care and ending tuberculosis. Int J Tuberc Lung Dis 2019; 23(5): 612-618.

TB = tuberculosis; HIV = human immunodeficiency virus; CPT = cotrimoxazole preventive treatment; ART = antiretroviral treatment; DOT = directly observed treatment; PLHIV= person (people) living with HIV.

Table 3: Summary table for presumptive tuberculosis by quarter in 2018-2019 in a facility with analysis[3]

Period	*Number identified*	*Number with sputum sent to laboratory*	*Number with smear, Xpert or culture result*	*Number with positive smear, Xpert or culture result*	*Number with HIV test result*	*Number with HIV-positive result*
1.quarter 2018	20	14	12	2	18	8
2.quarter 2018	10	10	8	1	8	0
3.quarter 2018	28	26	26	0	22	16
4.quarter 2018	28	28	28	2	26	22
All 2018	**86**	78	**74**	**5**	**74**	**46**
1.quarter 2019	24	22	20	4	22	12
2.quarter 2019	28	28	26	6	26	10

[3] Modified from Making sense of TB data. Guide for collection, analysis and use of TB data for health workers in Zimbabwe, National Tuberculosis Control Programme, Ministry of Health and Child Care, Harare, Zimbabwe, 2015

In view of key principles in tuberculosis care and prevention, we should be able to answer the following questions using the data in the table above:

1. **Are we detecting the *expected number* of presumptive tuberculosis in our community?**

   - In the last quarter (2nd quarter 2019), 28 presumptive TB cases were identified, and 24 in the 1st quarter 2019, totalling 52 for the first two quarters. In the first two quarters of 2018, only 30 presumptive TB cases were identified. *Number of presumptive TB cases increased.*
   - To assess if the facility is identifying the expected number of presumptive cases compared to other clinics, we need to calculate presumptive case notification rate per 100,000 population (indicator #1, table 1). In our example, in 2018, the facility catchment population was 14,000, and the number of presumptive TB cases registered was 86. It follows that the rate was 86/14,000 x 100,000 = 614/100,000 population. Average for the BMU

(district) was more than 2 times higher: 1,700/100,000 population (see below) indicating that the number of presumptive TB cases identified in this facility was still low compared to other clinics in the BMU. In the first two quarters of 2019 there was some increase in presumption but the level remained very low.

- The indicator #1 is indicating a *challenge in TB case finding.*

2. Did all presumptive TB cases have their sputum samples *sent to laboratory?*

- In 2018, 91% (78/86 x 100) of cases had sputum samples sent to laboratory.
- In the 2nd quarter of 2019, all 28 (100%) had sputum samples sent, and 22 (92%) out of 24 in the 1st quarter, so almost all had sputum samples sent.

3. Did all presumptive TB cases with sputum samples sent *receive results?*

- In 2018, 95% received results, 74 out of 78, while in the 2nd quarter of 2019, 26/28 (93%) got results back, and 20 out of 22 (91%) in the 1st quarter.
- This shows that a high percentage (46/48 = 96%) received the investigation results.

4. How many of the presumptive TB cases tested had a *positive* result?

- Among 74 presumptive TB patients with sputum results in 2018, 5 (7%) had a positive sputum test result.
- In the 2nd quarter of 2019, 6 out of 26 presumptive TB patients had a positive sputum test result. In the 1st quarter of 2019, 4 out of 20 presumptive TB patients had a positive result. In the two quarters, 10 out of 46 (22%) had positive results.
- The indicator #2 (positivity rate) was very high (above expected) in 2019 making it a challenge.

5. Did all presumptive TB cases have a *known HIV status?*

- In 2018, 74 out of 86 (86%) had a known HIV test result.
- In the 2nd quarter of 2019, 26 out of 28 (93%) had a known HIV test result, 22 out of 24 (92%) in the 1st quarter, so almost all had a known HIV status.

In conclusion, in this facility, the presumptive TB cases identified are *well managed*, as almost all have sputum samples sent to laboratory, receive results and have an HIV test. However, the two indicators #1 and #2 show challenges in *too few* presumptive cases identified and *too high* percentage with positive results.

Table 4: Summary table of strengths, weaknesses and action points at facility[4]

Strengths	*Weaknesses*
• DR-TB tested (#18) • Almost all TB cases have an HIV test result and almost all HIV-positive patients are started on CPT and ART (#6, 8, 9) • For identified presumptive TB cases, almost all have sputum samples sent and results were received • DOT is practiced widely (#10) • Drug stocks are within expected levels (except RHZE) (#17)	• Low rate of presumptive TB cases (#1) • High positivity rate (#2) • Number of TB cases and new bacteriologically confirmed pulmonary cases are low (compared with BMU average) although the number has been increasing (#3, 4) • Treatment success rate is increasing but still below the expected (#11, 12)

Action points to address weaknesses that were identified

Action point	*Responsible person*	*Timeline*
Facility staff to ensure that TB screening is practiced in out-patient and HIV care rooms	Nurse in charge	Start immediately and ongoing
Community health workers to create awareness about TB in community, look actively for people with symptoms suggestive of TB and refer them to facility for further investigations; encourage household and other contacts to attend facility for screening	Nurse in charge and Environmental Health Technician	Start from 3rd quarter of 2019

[4] Includes analysis for all indicators in addition to those on presumptive tuberculosis presented in Table 3. Modified from Making sense of TB data. Guide for collection, analysis and use of TB data for health workers in Zimbabwe, National Tuberculosis Control Programme, Ministry of Health and Child Care, Harare, Zimbabwe, 2015

Table 5: Summary tables for presumptive tuberculosis by quarter in 2018-2019 in a BMU (district) and analysis (source of data: quarterly facility tuberculosis reports)[5]

Table 5.1: Number of presumptive tuberculosis in a BMU by quarter 2018-2019

Period	*Number facility reports received*	*Number identified presumptive TB cases*	*Number with sputum sent to laboratory*	*Number with smear, Xpert or culture result*	*Number with positive smear, Xpert or culture result*	*Number with HIV test result*	*Number with HIV-positive result*
1.quarter 2018	15	266	226	200	22	210	143
2.quarter 2018	15	235	226	210	16	200	116
3.quarter 2018	15	373	347	328	19	332	194
4.quarter 2018	15	261	243	219	25	227	145
All 2018	**60**	**1,135**	**1,042**	**957**	**82**	**969**	**598**
1.quarter 2019	15	199	187	172	13	175	93
2.quarter 2019	13	162	150	129	5	141	89

[5] Modified from Making sense of TB data. Guide for collection, analysis and use of TB data for health workers in Zimbabwe, National Tuberculosis Control Programme, Ministry of Health and Child Care, Harare, Zimbabwe, 2015

The absolute numbers in Table 5.1 are shown as percentages in Table 5.2 to facilitate analysis.

Table 5.2: Presumptive tuberculosis in a BMU by quarter in 2018-2019 and percentage with sputum sent, result received, with sputum positive result, HIV test result and positive HIV result

Period	*Number of presumptive TB cases*	*% presumptive TB cases with sputum sent to laboratory*	*% presumtive TB cases with sputum sent and who have result of microscopy, Xpert or culture*	*% presumtive TB cases with result with positive microscopy, Xpert or culture result*	*% presumptive TB cases with HIV test result*	*% presumptive TB cases with positive HIV result*
1.quarter 2018	266	85%	88%	11%	79%	68%
2.quarter 2018	235	96%	93%	8%	85%	58%
3.quarter 2018	373	93%	95%	6%	89%	58%
4.quarter 2018	261	93%	90%	11%	87%	64%
All 2018	**1,135**	**92%**	**92%**	**9%**	**85%**	**62%**
1.quarter 2019	199	94%	92%	8%	88%	53%
2.quarter 2019	162	93%	86%	4%	87%	63%

Key questions to be answered from the above tables are:

1. **Are the BMU and its health facilities identifying the *expected number* of presumptive tuberculosis cases?**

   - In the 2nd quarter of 2019, 162 cases were identified which is lower than in the previous quarter (199) and lower than in 2018 (average per quarter 1,135/4 = 284).
   - In 2018, the rate of presumptive tuberculosis in this BMU was 1,769/100,000 population (calculated as follows: 1,135 presumptive cases divided by 64,164 population and multiplied with 100,000). The average for the province was 1,662/100,000 population.

- The rate for the BMU was higher than the provincial average (**indicator #1**) but there has been a decline in the 1st and 2nd quarter of 2019, making the finding a challenge.

2. Did all identified presumptive TB cases have sputum samples *sent to laboratory?*

- In the 1st and 2nd quarter of 2019, a high percentage (94 and 93%) had samples sent with a similar high percentage (92%) in 2018.

3. Did all presumptive TB cases with sputum samples sent *receive results?*

- In the 1st and 2nd quarter of 2019, a high percentage (92% and 86%) of presumptive TB cases received their results. This was a bit lower than in 2018 when almost everybody (92%) received the results.

4. Was sputum *positivity rate* (percentage of presumptive TB cases with positive test result) as expected (indicator #2)?

- The positivity rate was 4% in the 2nd quarter of 2019 which was lower than in the 1st quarter of 2019 (8%) or in 2018 (9%). Numbers are small and it is important to assess percentages with caution. However, this indicator is suggestive of a challenge.

5. Did all presumptive TB cases have a *known HIV status?*

- In the 1st and 2nd quarter of 2019, 88% and 87% of presumptive TB cases had a known HIV status. A high percentage of patients knew their status also in 2018 (85%).

The next step is to look at the *data by facility* to see if any has numbers that differ from the expected indicator values. Since numbers per facility per quarter are low, we only tabulate the data for *the last full year* (2018).

Table 6: Summary tables for presumptive tuberculosis by facility in a BMU in 2018 and analysis[6]

Table 6.1: Presumptive tuberculosis by facility in 2018: number identified, sputum sent, result received, positivity rate, HIV testing and HIV test result

Facility	*Number identified*	*Number with sputum sent to laboratory*	*Number with smear, Xpert or culture result*	*Number with positive smear, Xpert or culture result*	*Number with HIV test result*	*Number with HIV-positive result*
A	48	47	42	0	38	17
B	73	63	59	3	50	32
C	84	65	59	3	68	44
D	47	46	43	1	48	34
E	59	53	53	5	56	25
F	52	48	48	6	49	36
G	44	44	43	5	43	33
H	52	47	37	5	33	21
I	83	82	81	9	80	42
J	77	68	64	4	67	38
K	83	81	71	4	77	63
L	76	68	66	3	65	44
M	115	112	102	7	109	61
N	59	56	55	2	53	29
Hospital	183	162	134	25	133	79
Total	1,135	1,042	957	82	969	598

[6] Modified from Making sense of TB data. Guide for collection, analysis and use of TB data for health workers in Zimbabwe, National Tuberculosis Control Programme, Ministry of Health and Child Care, Harare, Zimbabwe, 2015

To facilitate data analysis, the absolute numbers shown in Table 6.1 have been calculated and shown as rates and percentages in Table 6.2 below.

Table 6.2: Presumptive tuberculosis by facility in 2018: number identified, rate for 100,000 population, percentage sputum sent, result received, positivity rate, HIV testing and HIV test result

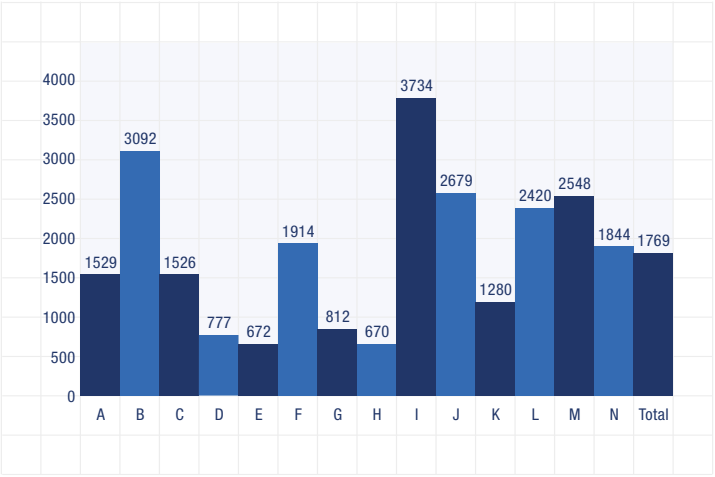
Facility	*Catchment population in 2018*	*RATE: Presumptive TB case microscopy screening/100,000 population*	*% presumptive TB cases with sputum sent to laboratory*	*% presumptive TB cases with sputum sent that have result of microscopy, Xpert or culture*	*HIV*	
					% of presumptive TB cases with HIV test result	*% of presumptive TB cases with HIV result who have a positive HIV result*
A	3,140	1,529	96%	96%	81%	68%
B	2,361	3,092	86%	94%	68%	64%
C	5,505	1,526	100%	91%	100%	64%
D	6,049	777	100%	100%	100%	50%
E	8,774	672	83%	100%	100%	50%
F	2,717	1,914	94%	100%	100%	76%
G	5,420	812	100%	100%	100%	86%
H	7,765	670	91%	67%	57%	85%
I	2,223	3,734	100%	100%	91%	55%
J	2,874	2,679	86%	100%	76%	63%
K	6,483	1,280	90%	100%	100%	70%
L	3,140	2,420	96%	100%	96%	68%
M	4,513	2,548	96%	75%	96%	54%
N	3,200	1,844	93%	100%	100%	36%
Hospital			87%	65%	67%	65%
Total	64,164	1,769	92%	92%	85%	62%

Key questions to be answered are:

Are we detecting the *expected number* of presumptive TB cases in our community?

- Table 6.1 shows that all facilities registered presumptive TB cases. Their number ranged from 44 (Clinic G) to 115 (Clinic M). Excluding the hospital (because as a referral centre, its catchment population is that of entire BMU), average number of presumptive TB cases per facility (apart from the BMU hospital) was (1,135-183)/14 = 68 in 2018 (one year) or 68/4 = 17 per quarter.
- Presumptive TB case identification rate ranged between facilities from 670/100,000 (in Clinic H) (or 1 per 149 persons) to 3,734/100,000 (in Clinic I) which is 1 per 27 persons. Presumptive TB case identification rates per 100,000 population are also presented in Figure 1 below. Four clinics had much lower rates than the average (D, E, G, H) and two clinics much higher rates (I and B).
- Clinic I with an exceptionally high presumptive TB case identification rate was a mine clinic and its catchment population included persons from all around the country.
- Clinic H with one of the lowest rates in the BMU is situated close to a major city where many people with presumed TB prefer to seek services.
- The number of presumptive TB case in the hospital has declined dramatically but this could be a positive trend, if more cases were registered in the clinics and sputum collected there, instead of patients going directly to the hospital. But this did not seem to be the case, since the overall number of presumptive TB cases with laboratory result in the BMU declined. This occurred in spite of a functional active sputum specimen transport system.
- Percentage of presumptive TB cases who had sputum samples sent to laboratory was below 90% in Clinics E, B, J and hospital.
- Percentage of patients who had received test results was below 90% in the hospital and facilities H and M.
- All facilities except one (A) found at least one presumptive case with a positive sputum test result. The average number (excluding hospital) was (82-25)/14 = 4, that is, four bacteriologically confirmed TB cases per year per clinic or one per quarter.
- Percentage of patients with a known HIV status below 90% were found in the hospital and facilities H, B, J and A.

Figure 1: Presumptive tuberculosis rate per 100, 000 population by facility in a BMU in 2018 (when BMU and provincial averages were 1,769 and 1,662 per 100,000 population, respectively)[7]



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Again the above analysis is summarised in Table 7 that also indicates action points.

Table 7: Strengths, weaknesses and action points at a BMU[8]

Strengths	*Weaknesses*
• High percentage of presumptive TB cases identified with sputum samples sent and results received • High coverage of HIV testing in presumptive TB cases • Almost all new pulmonary cases over 5 years had bacteriological sputum test result (data not shown) • Low loss to follow-up rate in TB patients (data not shown)	• Two facilities did not submit quarterly report for the 2nd quarter of 2019 • Facility reports are incomplete on presumptive TB when compared with quarterly district summary reports (data not shown) • Low rate of presumptive TB cases • Low and falling positivity rate among presumptive cases • Low TB case finding and new PTB/ bacteriologically confirmed cases (data not shown) • DOT coverage not reported in patients from hospital (but high in total, data not shown) • Not all TB cases had treatment outcome • Not all previously treated patients had Xpert MTB/RIF test done.

Action points to address weaknesses that were identified

Action point	*Responsible person*	*Timeline*
1. Increase HCWs' clinical suspicion of TB and reinforce use of TB screening tool 2. Compare number of presumptive TB patients with number of patients in OPD register: adult patients in total, how many had diagnosis "long term cough"/respiratory symptoms. Compare also with TB laboratory register; how many presumptive TB cases were not investigated? 3. Investigate whether data from all presumptive TB registers kept in different hospital departments were compiled into the quarterly facility reports 4. Discrepancies in TB case numbers between quarterly reports and laboratory register and in cases with treatment outcome between case finding report and outcome reports should be investigated to establish the most correct data	BMU TB Coordinator TB focal nurses	From 1st quarter of 2019

[8] Includes analysis for all indicators in addition to those on presumptive tuberculosis presented in Table 6. Modified from Making sense of TB data. Guide for collection, analysis and use of TB data for health workers in Zimbabwe, National Tuberculosis Control Programme, Ministry of Health and Child Care, Harare, Zimbabwe, 2015

Table 8: Checklist for NTP data-driven supportive supervision visits *from BMU/ district to health facility*

(Source: National TB Programme, Zimbabwe)

Name of Province: _____

Name of BMU: _____

Name of Health Facility: _____

Population: _____ Date of visit: ____ / ____ / ____

Step 1: On arrival

Meet the person in charge at the health facility, explain the purpose of the visit, ask for permission to visit different sections and agree to have a feedback meeting at the end of the visit, ideally with key facility staff.

Review the recommendations made during the previous visit on ____ / ____ / ____ (date).

Fill in the table below at the beginning of the visit and revise at the end of your visit when new action points are discussed with the facility staff.

Recommendation	Implementation status	Reasons for not implementing

Step 2: Meet with facility TB focal person: tabulate and analyse data

- The team should look for a quiet place to work on data with the TB focal person.
- Discuss how quarterly TB reports and data are collected, analysed, used and filed.
- Update all data in the summary tables and also *validate* data by comparing the data of the *last quarter* in the tables with the data recorded in the relevant registers and the data in the quarterly reports that the facility has submitted. Comment on concordance.

Analysis of data

- Analyse TB data in the summary tables.
- Revise – tentatively – the *strengths* and *weaknesses* that the validated and updated TB data analysis and assessment of indicators suggest. Keep in mind 'where you are coming from', in other words, findings of previous supervision visits and action thereafter.
- Keep these strengths and weaknesses in mind during the visit and focus your attention on weaknesses / challenges so that you understand what may be causing them, confirm findings and make other observations that can be discussed in the feedback meeting.
- Keep focus on supportive supervision that *makes a difference* and *improves* both TB patient management and TB care and prevention services in the facility.

Step 3: Interview relevant facility staff on TB services

- Review the map of the catchment area (take a photo for your records) and population.
- Describe access to health services and transport routes for patients.
- Describe specimen / result transport system.
- Find out about user fees for consultation, waivers?
- Follow (walk through) the flow of presumptive TB patients from the point they enter the facility until they start treatment. Do it 'step-by-step' and observe infection control measures and possibility of patients getting lost.
  - · How are TB case finding, treatment initiation and treatment support organised?
  - · Are sputum cups available in different sections of the facility (out-patient, antenatal services, maternity ward etc)?
  - · Who is responsible for instructing patients to produce sputum specimens? Assess adequacy of explanation.
  - · How many diagnostic specimens are collected? When?
  - · Which diagnostic test(s) is / are used?
  - · Where do patients produce sputum specimens?

- How is DOT arranged? Any health worker-supported DOT? Are community DOT supporters trained?
- Are there co-located services for HIV-positive TB patients?
- Other observations

Discuss infection control with focal nurse

- Is there a written infection control plan that includes TB infection control: Yes / No
- Is there a trained infection control focal person: Yes / No
- Are health workers screened for TB: Yes / No; if yes, how often and how is screening done?
- Are health workers practicing triage: Yes / No; if yes, for which patients?
- Are waiting areas and consultation rooms well ventilated?
- Is tissue paper available for coughing patients: Yes / No
- Are N95 respirators available: Yes / No
- Other observations

Discuss staff situation and training in TB

- List staff who are involved in providing TB and TB-HIV services.
- Discuss whether they have been trained in TB care and prevention.
- Are there any obvious human resource challenges compared to workload?

Partners in TB

- Find out whether there are partners that support TB services, who they are and what they do.

National TB Control Programme Guidelines

Item	Available		Comments
	Yes, verified	No	
National TB Guidelines			
DR-TB Guidelines			
Community TB Care Guidelines			

Programmatic activities

Activity	Yes	No	Comments
Do you conduct TB data analysis meetings? Who is involved? Give examples how you use TB data for decision making			
Do you receive supportive supervision from the BMU? When was the last visit? Did you discuss and agree on action points?			

Step 4: Visit out-patient and opportunistic infections (OI) / ART section

- Assess workload: number of consultations per day (according to T5 form and monthly summary of OPD patients).
- Check out-patient register (T12): number and % of patients with chronic cough during last full month, select 5 names randomly and check whether you can find these patients in the *presumptive TB register*.
- Review registration of presumptive TB cases: how many registers are maintained, where are they placed, are they up-to-date?
- Are HIV-positive patients screened for TB?
- Other observations

Step 5: Visit facility pharmacy / drug store room

- Is the store room orderly, locked? Who is the responsible person?
- Fill in the summary table with observed stock levels of TB drugs (first- and second-line) and consumables with expiry date.
- Are stock cards updated and in line with physical counts of current stocks?
- Were there stockouts of
  - · First- and second-line TB drugs during the last quarter?
  - · First-line ARVs?
  - · Co-trimoxazole?
- Calculate monthly needs using the table in the guide, in order to calculate the months of stocks.

Step 6: Convene a feedback meeting with *facility* team at the end of the visit

- Provide *balanced* feedback and present the summary table below with strengths or weaknesses that are based on the validated TB data.
- Discuss performance as reflected by the indicator values and include any additional issues from observations that were made during the visit.
- Ask the facility team whether they agree and what *their* main challenges are.
- Discuss the way forward with the facility team and *agree on the action points* that you then record into the table below.
- Provide the feedback table in *two copies*: the 1st copy remains in the facility and the 2nd copy is kept and filed for preparation of the next visit.

Strengths	**Weaknesses**	
Action points to address weaknesses / challenges that were identified		
Action point	Responsible person	Timeline

Table 9: Checklist for NTP data-driven supportive supervision visits *from province to BMU / district*

(Source: National TB Programme, Zimbabwe)

Please note:

Supervision visit to BMU / district level will only include BMU / district level functions (such as, laboratory services, reporting for TB surveillance) and not patient management services provided at the district hospital (such as, TB, OI/ART clinics and OPD).

Supportive supervision that covers patient management can be done using the checklist for facility level.

Name of Province: _____

Name of BMU: _____

Population: _____ Date of visit: ____ / ____ / ____

Step 1: On arrival

Meet the person in charge at the BMU, explain the purpose of the visit, ask for permission to visit different sections and agree to have a feedback meeting at the end of the visit, ideally with key BMU staff.

Review the recommendations made during the previous visit on ____ / ____ / ____ (date).

Fill in the table below at the beginning of the visit and revise at the end of your visits when new action points are discussed with the BMU / district staff.

Recommendation	Implementation status	Reasons for not implementing

Step 2: Meet with BMU TB Coordinator: tabulate and analyse data

- Find a quiet place to interview BMU TB Coordinator and work on routine TB data with him/her.
- Find out how TB diagnostic and treatment are organised in the BMU:
  - Assess BMU TB programme performance using the indicators on TB case finding, notifications and treatment outcomes (see below: analysis of data).
  - Assess TB-HIV related data and discuss them with HIV care / ART focal nurse.
- Clarify the number of diagnosing centres in the BMU.

Tuberculosis Diagnosing Centres

Name of diagnosing centres in BMU	Type of TB diagnostic service				
	Light microscopy	LED microscopy	Xpert MTB/RIF	Functional X-ray	Other

- Ascertain the number of TB registers
  - · Are they as many as diagnosing centres?
  - · Or is there a "master" paper-based BMU / district register that includes all patients in the BMU / district?
- Is there an electronic BMU TB register?
- Any other electronic systems in place?
- Discuss how quarterly TB reports and data are collected, analysed, used and filed?
- Update all data in the summary tables and also *validate* data by comparing the data of the *last quarter* in the tables with the data recorded in the relevant registers and the data in the quarterly reports that the BMU TB Coordinator/ BMU health team has submitted. Comment on concordance.

Analysis of data

- Analyse the TB data in the summary tables.
  - · First, analyse the data *for the BMU as a whole*.
  - · Second, analyse the data *by facility*.
- If the BMU has *more than one* diagnosing centre, routine data are first analysed for entire district, followed by analysis by diagnosing centre and last, analysis by facility.
- Sum up – tentatively – the *strengths* and *weaknesses* that the TB data analysis and assessment of indicators suggest. Keep in mind 'where you are coming from', in other words, findings of previous supervision visits and action thereafter.
- Keep these strengths and weaknesses in mind during the visit and focus your attention on weaknesses / challenges so that you understand what may be causing them, confirm findings and make other observations that can be discussed in the feedback meeting.
- Keep focus on supportive supervision that *makes a difference* and *improves* both TB patient management and TB care and prevention services in the BMU / district.

Step 3: Interview relevant BMU staff on TB services

- Review the map of the catchment area (take a photo for your records) and population.
- Describe access to health services and transport routes for patients.
- Describe specimen / result transport system.
- Find out about user fees for consultation, waivers?
- Other observations

Discuss infection control with focal nurse

- Is there a written infection control plan that includes TB infection control: Yes / No
- What are the minimum standards to be followed?
- Is there a trained infection control focal person: Yes / No
- Are staff trained in infection control: Yes / No
- Is personal respiratory protection equipment available: Yes / No
- Are health workers screened for TB: Yes / No; if yes, how often and how is screening done?
- Other observations

Assess staff situation and training in TB, DR-TB and TB-HIV by interviewing BMU staff

Fill in the table below.

Health staff trained in TB care and prevention

Designation	Authorised establishment	Number in post	TB case management, TB-HIV, M&E	TB infection control	MDR –TB, PMDT	Community TB care and ACSM	Laboratory external quality assurance	Microscopy	Other
Doctors									
Nurses									
Laboratory staff									
Microscopists									
Environmental Health staff									
Radiographers/ X-ray operators									
Pharmacy staff									

Others, specify: _____

Are there other training gaps that would need to be addressed?

_____

_____

_____

Partners in TB, DR-TB and TB-HIV

Name of partner	Type or activity supported	Coverage (entire BMU, ward, village)	Budget (USD) and funding period (eg. from 2017-2019)

National TB Control Programme Guidelines

Item	Available		Comments
	Yes, verified	No	
National TB Guidelines			
DR-TB Guidelines			
Community TB Care Guidelines			
Other, specify			

Programmatic activities

Activity	Yes	No	Comments
Do you conduct TB data validation/ analysis meetings? Who are involved? How often?			
Do you conduct BMU TB performance review meetings?			
Do you utilise routine TB data for planning and decision making? Give examples how you do it.			
Does a TB-HIV-DR-TB coordinating committee exist? Is there a record of the last TB-HIV-DR-TB committee minutes?			
Do you conduct supportive supervision visits to health facilities? How often? When was the last visit? Do you have a file for supervision / feedback reports?			
Do you receive supportive supervision from the province? When was the last visit? Did you receive a written supervision report / feedback?			

Records of meetings, supportive supervision visits and plans

Item	Available	Are they filed?	Comments
	(Yes / No)	(Yes / No)	
Minutes of data analysis / validation meetings			
Review meeting reports			
Minutes of TB-HIV-DR-TB collaboration meetings			
Support and supervision reports *Province to BMUs / districts* *BMU / district to health facilities*			
TB quarterly and annual plans			

Step 4: Visit BMU laboratory

Visit to the BMU laboratory (or a laboratory at another diagnosing centre) is part of the supportive supervision visit to a BMU hospital. It should be done with a representative from laboratory services.

- Find out about the following:
  - · TB tests available in this (and other diagnosing centre) laboratory?
  - · Xpert MTB/RIF available, since when?
  - · Smear microscopy register, Xpert register – available, updated?
  - · How are laboratory request forms kept? How are they filled in – address/ phone number, category of patient?
  - · What are the routines to ensure that laboratory data are entered in facility and BMU TB registers?
  - · EQA reports available? Results?
  - · Supervision / feedback reports for visits to diagnosing centre laboratories

· Availability and stocks of
  - Sputum cups
  - ZN / Auramine reagents
  - Xpert MTB/RIF cartridges
  - Availability of laboratory forms and registers

· If possible, check a positive smear microscopy slide

Step 5: Visit BMU / district medical stores

Invite the BMU pharmacist to join you and find out the following:

- Are TB medicines and other consumables provided through a 'pull' or 'push' system?
- Who is quantifying the needs and making the drug request?
- What are the strengths and weaknesses of the current system?
- How could it be improved?

Step 6: Convene a feedback meeting with the BMU team at the end of visit

- Provide *balanced* feedback and present the summary table below with strengths or weaknesses that are based on the validated TB data.
- Discuss performance as reflected by the indicator values and include any additional issues from observations that were made during the visit.
- Ask the facility team whether they agree and what *their* main challenges are.
- Discuss the way forward with the facility team and *agree on the action points* that you then record into the table below.
- Provide the feedback table in *two copies:* the 1st copy remains in the facility and the 2nd copy is kept and filed for preparation of the next visit.

Strengths	**Weaknesses**	
Action points to address weaknesses / challenges that were identified		
Action point	Responsible person	Timeline