rGLC COUNTRY SUPPORT MISSION REPORT

Country: Indonesia

Inclusive dates of mission: 20-30 January 2020

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Acknowledgments:

This Regional Green Light Committee (rGLC) Mission was part of the Joint External Monitoring Mission of National Tuberculosis Program, Indonesia, 20-30 January 2020. It is recommended to read the rGLC report together with the full report of Joint External Review of National Tuberculosis Program, Indonesia.

The author is grateful for the support provided by the National Tuberculosis Control Programme (NTP) and Ministry of Health for this visit. The mission team will like to thank all the PHOs, DHOs, Hospital staff, Puskesmas staff, civil society members, community (patient) support groups and other experts who contributed to the review mission.

The programme has agreed with open sharing of this report

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Abbreviations and acronyms

aDSM	active drug safety monitoring and management
BDQ	Bedaquiline
Cfz	Clofazimine
Cs	Cycloserine
CSO	Civil society organization
CXR	Chest radiograph
DLM	Delamanid
DOTS	Directly observed treatment short-course
DR-TB	Drug-resistant tuberculosis
DST	Drug susceptibility testing
E	Ethambutol
Eto	Ethionamide
ITR	Individualized treatment regimen
JEMM	Joint External Monitoring Mission
Lfx	Levofloxacin
LPA	Line probe assay
LFU	Loss-to-follw-up
Lzd	Linezolid
Mfx	Moxifloxacin
MICA	Monthly interim cohort analysis
MDR/RR-TB	multidrug-resistant/rifampicin-resistant TB
MoH	Ministry of Health
NTP	National Tuberculosis Programme
PMDT	Programmatic management of drug-resistant tuberculosis
rGLC	Regional Green Light Committee
SAE	Serious adverse event
STR	Short treatment regimen
TB	Tuberculosis
XDR	Extensively drug-resistant
Z	Pyrazinamide

I. Executive summary

1. Terms of references of the mission: to review

- *Implementation of drug-resistant tuberculosis (DR-TB) management*
- *DR-TB acceleration plan*
- *Country adaptation to the WHO rapid communication to DR-TB treatment change*
- *Monitoring of adverse events of drug resistant TB management (aDSM)*
- *Reasons for low number of DR TB enrolment*
- *Adherence and completion of DR treatment and monitoring and evaluation*

2. Key activities

This Regional Green Light Committee (rGLC) Mission was part of the Joint External Monitoring Mission (JEMM) of National Tuberculosis Programme, Indonesia, 20-30 January 2020. The rGLC consultant was the team lead of the team visiting South Sumatera. Agenda of the South Sumatera team and the JEMM overall is shown in appendix 1.

3. Overall implementation status of PMDT

A total of 878 Xpert sites and 233 multidrug/rifampicin-resistant tuberculosis (MDR/RR-TB) treatment centers have been established. About 2300 treatment sites have been involved in the treatment of MDR/RR-TB. According to Global TB report, the number of MDR/RR-TB and extensively drug-resistant TB (XDR-TB) cases detected was 9038 and 80, respectively, in 2018 and the number of MDR/RR-TB and XDR-TB cases enrolled on treatment was 4,194 (46%) and 59 (74%), respectively. Indonesia NTP began to use bedaquiline in August 2015, injectable-containing short MDR-TB regimen in August 2017, and delamanid in 4th quarter of 2017. Increased number of patients have been treated with injectable-containing short MDR-TB regimen and bedaquiline. The proportion of MDR/RR-TB patients with treatment success was about 50% in 2013-2016 cohort, decreased to 41% in 2017 cohort, due to a substantial proportion of lost to follow-up and death. The proportion of lost-to-follow-up remained substantial even in patients treated with a short MDR-TB regimen. Indonesia NTP also has planned to follow WHO's recommendation to apply all oral short MDR-TB regimen in 2020.

4. Key challenges identified in this mission

- Under-detection of MDR/RR-TB: the number of MDR/RR-TB case detected in 2018 accounted for about 40% of the estimated burden (24,000).
- Low proportion of MDR/RR-TB cases enrolled on treatment (46% in 2018 according to Global TB report 2019)
- Long interval between detection and treatment
- Lack of susceptibility testing of fluoroquinolone in a substantial proportion (>50%) of MDR/RR-TB enrolled on treatment
- Unsatisfactory outcome of MDR/RR-TB

5. Priority recommendations of the mission:

Recommendation	**Responsible persons/agency**	**Timeline**	**Support required to fulfill the recommendation**
1. Reducing the gap between detection and enrollment of MDR/RR-TB ➢ Engaging clinicians to elaborate on prompt initiation of MDR/RR-TB treatment ➢ Strengthening pre-treatment counseling, through training and supportive supervision, focusing on positive aspect of treatment in order to encourage treatment uptake ➢ Strengthening the linkage between Xpert sites and DOTS/DR-TB units at hospital and Puskesmas, including implementation of Xpert connectivity application, to ensure that health workers and patients are informed of Xpert results timely ➢ Conducting cohort review of Xpert *M tuberculosis* rifampicin resistance detected to monitor loss of patients at each step from diagnosis to treatment	NTP, Provincial health office	June 2020	WHO country office to provide technical support
2. Improve outcome of MDR/RR-TB ➢ Strengthening the capacity of treatment sites for early decentralization of treatment ➢ Strengthening education of health workers and incentivizing willingness of health care workers in taking care of MDR/RR-TB ➢ Establishing provincial consilium for mentoring clinical management of MDR/RR-TB at treatment sites and in the community, under the guidance and support of national consilium.	NTP, Provincial health office	June 2020	WHO country office to provide technical support

➢ Enhancing the capacity of health workers in clinical management of MDR-TB treatment by regular on site supervisory visit and off site consultation by provincial consilium			
3. Addressing social and financial barriers (including income loss) to access treatment service by mobilizing additional funding from provincial and city/district government	NTP, Provincial health office	June 2020	WHO country office to provide technical support
4. Engaging civil society organization and establishing patients support group for community-based patient centered care	NTP, Provincial health office	June 2020	WHO country office to provide technical support
5. Strengthening TB infection control and active drug safety monitoring and management (aDSM) at treatment centers, treatment sites and also in the community, through training, on site supportive visit, and on-line consultation	NTP, Provincial health office	June 2020	WHO country office to provide technical support

6. Status of Priority recommendations of previous mission:

Recommendation	**Responsible persons/agency**	**Timeline**	**Progress**
1. Reduce loss of patients – before or after start of treatment. • Expand MICA to all provinces with regular review and monitoring of loss to follow-up in each district and province. • Strengthen patient support mechanisms through government mechanisms and CSOs	NTP, Medical services department, partners and CSO	Continuous process till an acceptable level of treatment adherence are reached	Loss to follow-up before and during treatment remained substantial. In PMDT acceleration plan 2020, MICA guideline will be updated and disseminated in 34 provinces. At least 119 priority district to conduct the MICA monthly.

Recommendation	Responsible persons/agency	Timeline	Progress
2. Hold a high-level coordination meeting with directorate of medical services to ensure rapid engagement of all hospitals as well as ensuring pro-active adverse events monitoring and management (aDSM)	MoH and NTP		Several meetings have been held with DG of Medical Services for rapid engagement of all hospitals. On 2020, DG of med service will disseminate a letter to all hospital which has not yet started DR TB service in Minister of Health Decree 2017.
3. Multisectoral coordination through high level intervention for TB (national initiative for priority diseases) and establishing accountability.	MoH		Ongoing
4. Advocate for Presidential Decree on TB to accord high priority to the disease at sub-national level with sufficient allocation of resources	MoH		Presidential Decree on TB has been signed on 29 January 2020
5. Further dissemination of established screening guidelines – Any patient starting on TB treatment should have a rapid DST done, either at symptomatic stage itself or before start of treatment if diagnosis is based on microscopy	NTP and partners		12% of new and relapse TB cases notified in 2018 tested with rapid diagnostics at time of diagnosis. The current policy is to test non converted patients on 2nd month of DS TB treatment
6. Laboratory capacity in the country to be developed for sensitivity testing to new and repurposed drugs	NTP in coordination with laboratories	Q4 2019 – Q12020	On process with the recent SNRL
7. All oral regimen to be started as longer regimen of first choice by October 2019 with appropriate aDSM	NTP	Q3 2019	All oral regimen has started since October/November 2019. aDSM training has already done in 6 provinces under CTB.

II. Detailed report

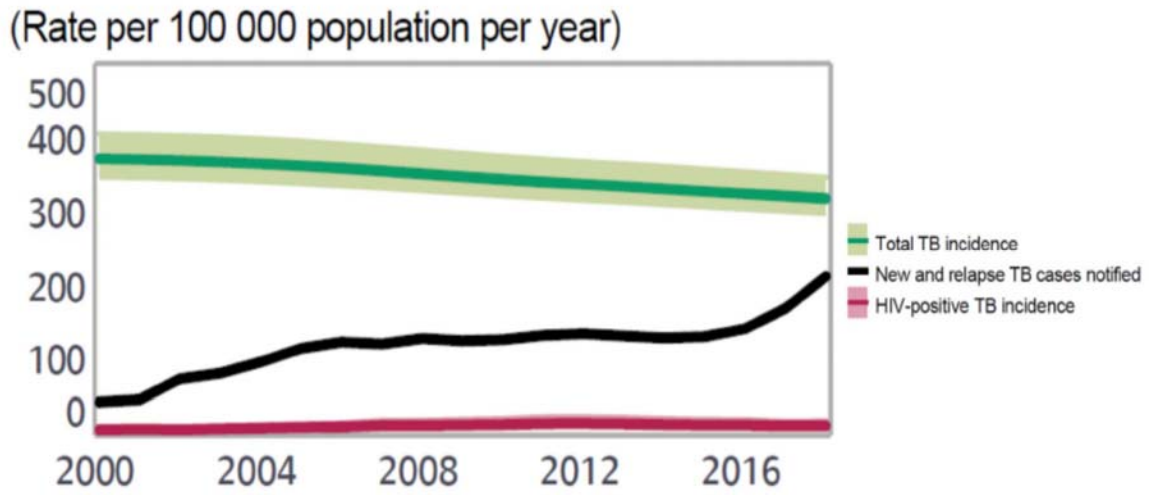
A. Introduction

The estimated incidence of tuberculosis (TB) was 316 per 100,000 population, with an estimated number of 845,000 (770,000 – 923,000) individuals developing active TB per year. The estimated HIV-positive TB incidence was 7.9 per 100,000 population, and the estimated MDR/RR-TB incidence was 8.8 (6.2–12) per 100,000 population. The total number of new and relapse TB cases notified in 2018 was 563,879, in whom 88% were pulmonary TB (50% were bacteriologically confirmed), and 52% were men (Global TB report 2019).

Under-reporting and under diagnosis of TB have been a very challenging issue in Indonesia. Indonesia national tuberculosis programme (NTP) has conducted mopping-up activities to address under-reporting, resulting in substantial increase in case detection rate (treatment coverage rate) (Figure 1). However, reporting of TB after mopping-up activities remained incomplete, especially in the private sector; a substantial number of TB cases were not detected during mopping-up activities.

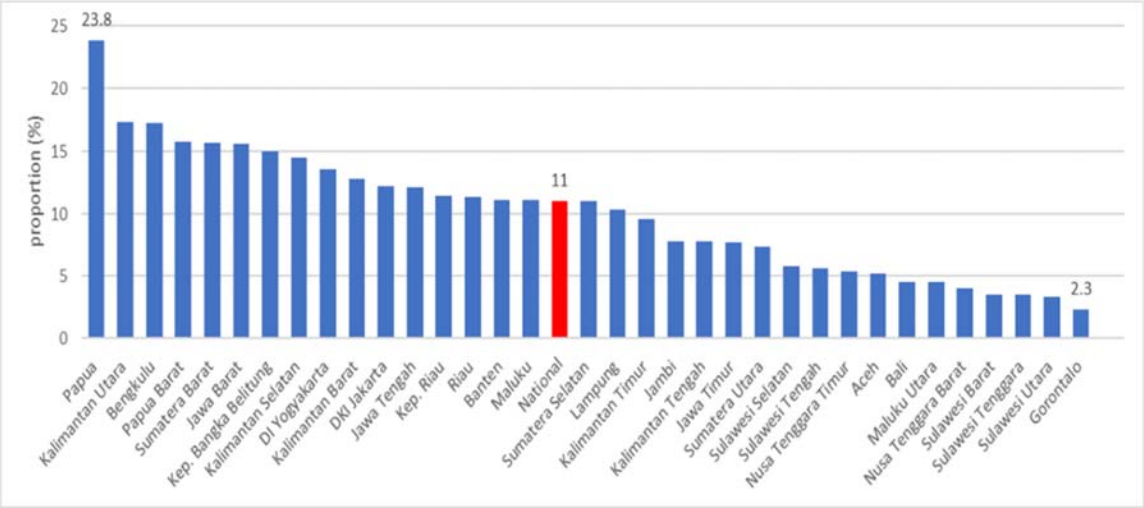
The estimated TB treatment coverage (notified/estimated incidence) in 2018 was 67% (61-73%). There remained a substantial proportion of estimated TB cases not detected, in part because of 1) under-utilization of Xpert due to ineffective transportation mechanism, 2) insufficient number of Xpert sites, 3) under-use of chest radiograph (CXR) in the identification of presumptive TB cases for sputum examinations, 4) insufficient systematic screening and active TB cases finding in the community, workplace, and health care facilities, 5) relatively low number of presumptive TB cases examined in several health care facilities and 6) a long path of TB patients to diagnosis, resulting in financial hardship related to TB.

Figure 1. Estimated TB incidence and TB notification, 2000-2018, Indonesia



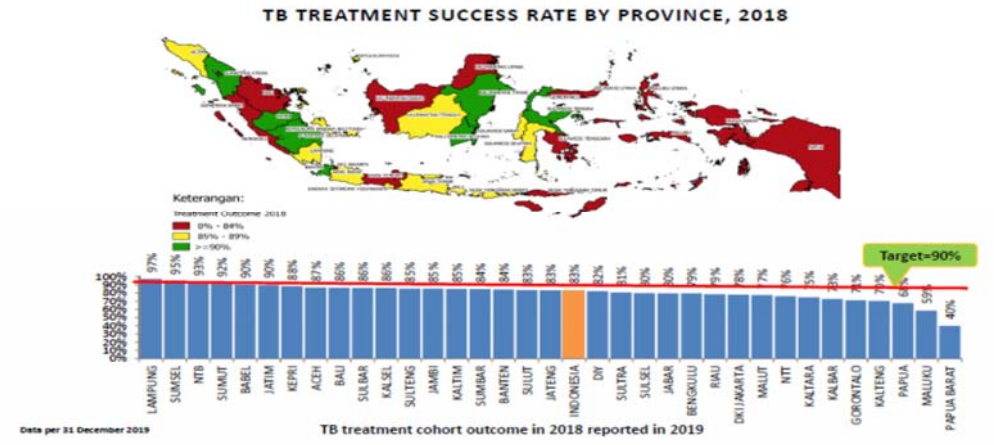
Indonesia NTP recommended a scoring system to help diagnose childhood TB. (appendix 3) The number of childhood TB (aged 0-14 years old) notified was 61,059 in 2018, accounted for about 11% of all new and relapse cases notified. The proportion of childhood TB among all TB cases notified was in line with the internationally expected proportion. However, Indonesia suffered from both over-diagnosis of childhood TB in some settings and under-detection of childhood TB in others. The proportion of childhood TB among all notified TB cases was 23.8% in Papua and 2.3% in Gorontalo (Figure 2).

Figure 2. proportion of childhood TB (0-14 years old) among new and relapse TB in 2018, Indonesia



About 37% of notified TB cases had HIV testing in 2018, in whom 5% (10,174) were HIV-positive. Among those TB patients who were living with HIV, 40% (4,082) were on anti-retroviral therapy. The average proportion of new and relapse cases registered in 2017 with treatment success was 85%, and that of 2018 was 83%, ranging from 40% in Papua Barat to 97% in Lampung (Figure 3).

Figure 3. Proportion of treatment success among new and relapse TB cases notified in 2018



The estimated proportion of rifampicin resistant TB was 2.4% (1.8% - 3.3%) among new TB cases, and 13% (9% - 13%) among previously treated TB cases.

B. Expansion of PMDT

Indonesia has 17,000 islands, 10,158 Puskesmas, 7,417 microscopy centers. A total of 878 Xpert sites and 233 MDR/RR-TB treatment centers have been established. Initiation of treatment of MDR/RR-TB take place at treatment centers. About 2300 treatment sites have been involved in the treatment of MDR/RR-TB.

C. Case finding of MDR/RR-TB

Indonesia NTP targeted individuals with a high risk of drug-resistant TB for Xpert test, including 1) previously treated TB cases who have treatment failure, 2) previously treated TB cases who have delayed sputum conversion, 3) TB patients treated at non-DOTS facilities, 4) new TB patients who have treatment failure, 5) new TB cases who have delayed sputum conversion, 6) relapse, 7) treatment after loss-to-follow-up, 8) close contact of DR-TB cases, 9) PLHIV without poor condition; and recently also 10) presumptive TB cases.

The number of Xpert test was 124,160 in 2017, in which 47,790 (38%) were high risk groups of DR-TB and 76,370 (62%) were presumptive TB without a high risk of DR-TB. Of the 47,790 tests among high risk groups, 17,379 (14%) had *M tuberculosis* detected, in which 4,001 (23%) were resistant to rifampicin. Of the 76,370 tests among individuals without specific risk of DR-TB, 17,824 (23%) had *M tuberculosis* detected, in which 1,115 (6%) were resistant to rifampicin.

The number of Xpert test increased to 395,733 in 2018, in which 74,152 (19%) were high risk groups of DR-TB and 321,581 (81%) were presumptive TB without a high risk of DR-TB. Of the 74,152 tests among high risk groups, 23,273 (31%) had *M tuberculosis* detected, in which 5,294 (23%) were resistant to rifampicin. Of the 321,581 tests among individuals without specific risk of DR-TB, 70,503 (22%) had *M tuberculosis* detected, in which 3,631 (5%) were resistant to rifampicin.

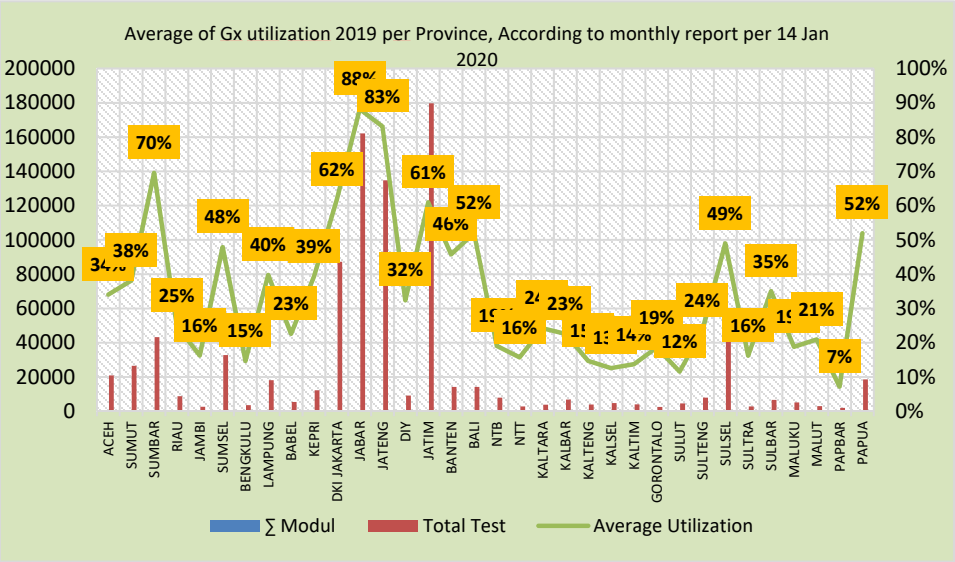
Challenges

The estimated annual number of MDR/RR-TB patients is 24,000 (17,000 – 32,000) in 2018. According to Global TB report, the number of MDR/RR-TB and extensively drug-resistant TB (XDR-TB) detected was 9038 and 80, respectively, in 2018 .The number of MDR/RR-TB cases detected account for about 40% of the estimated burden. The proportion of bacteriologically confirmed new pulmonary TB cases tested for rifampicin resistance in 2018 with 33%.

Sputum transportation has been established in 195 high burden districts in 15 provinces. However, operation of the sputum transportation remained weak. The capacity of Xpert tests of established Xpert sites has not yet been completely utilized. The average utilization rate of

estimated Xpert capacity ranged from 7% in Papbar to 88% in Jabar (Figure 4) Furthermore, the majority of private sectors have not yet been linked with Xpert sites.

Figure 4. Average utilization of Xpert capacity in 2019 by Province, Indonesia.



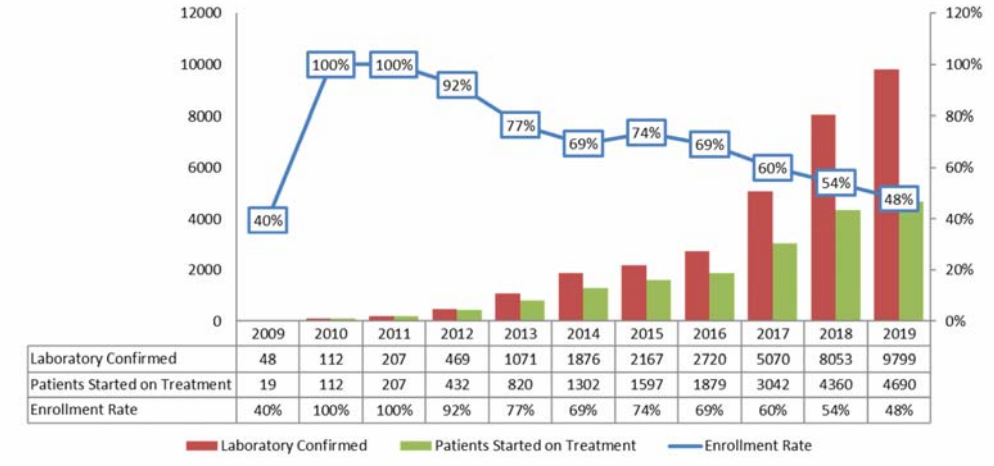
Recommendations

- To expand the use of Xpert as the front line test for all presumptive TB cases, especially at health facilities with Xpert;
- To establish sputum transportation mechanism at all districts.
- In districts with sputum transportation mechanism in place, constraints of sputum transportation need to be identified systematically and addressed.

D. Enrollment of RR-TB on treatment

Figure 5 shows that the number of patients with rifampicin resistant TB detected in the laboratory was 2,720 in 2016, 5,070 in 2017, 8,053 in 2018, and 9,799 in 2019. The number of MDR/RR-TB cases enrolled on treatment was 1879 (69%) in 2016, 3042 (60%) in 2017, 4360 (54%) in 2018, and 4690 (48%) in 2019. The data of Figure 5 presented during the mission were slightly different from data reported in Global TB Report 2019 due to different methods of data collection. However, it clearly highlighted the challenges of enrollment of MDR/RR-TB cases on treatment.

Figure 5. Detection and enrollment of MDR/RR-TB cases, 2009-2019, Indonesia

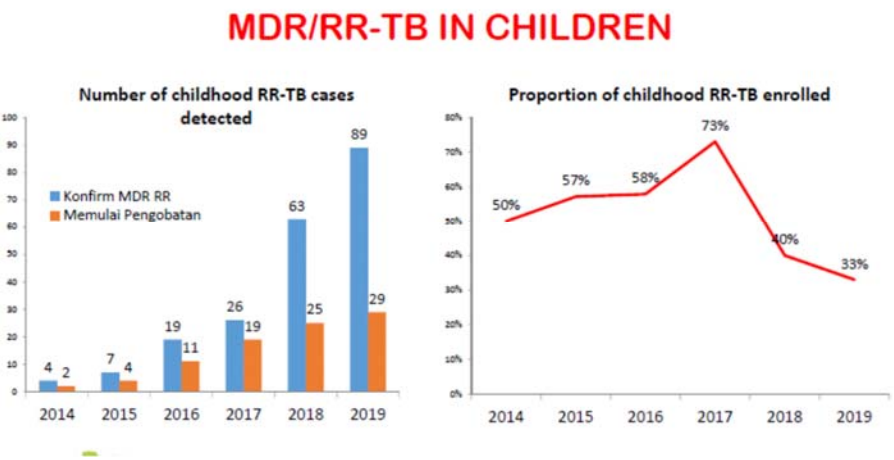


	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Laboratory Confirmed	48	112	207	469	1071	1876	2167	2720	5070	8053	9799
Patients Started on Treatment	19	112	207	432	820	1302	1597	1879	3042	4360	4690
Enrollment Rate	40%	100%	100%	92%	77%	69%	74%	69%	60%	54%	48%

Laboratory Confirmed Patients Started on Treatment Enrollment Rate

NTP has investigated RR-TB cases who were not enrolled on treatment and found that some patients died before treatment (16%), some refused treatment (16%), some patients did not accept the diagnosis of MDR/RR-TB (8%), and some patients had socio-economic issues (no family support, distances, work, 5%); some patients were not traced by Puskesmas (29%) and some had invalid address (12%). The number of childhood MDR/RR-TB detected was 26 in 2017, increased to 89 in 2019. The proportion of childhood MDR/RR-TB enrolled on treatment was 73% in 2017, decreased to 33% in 2019 (Figure 6).

Figure 6. Detection of childhood MDR/RR-TB and enrollment on treatment



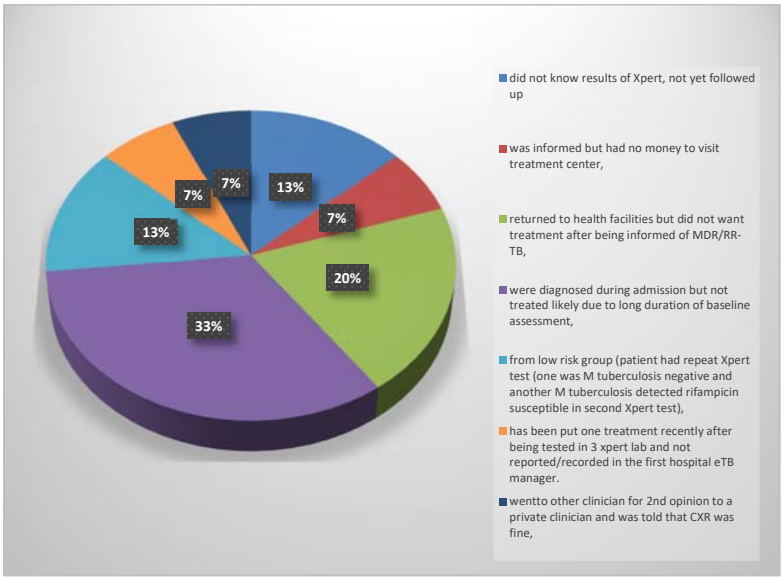
Challenges

In two hospitals in South Sumatra, 30 consecutive RR-TB patients were reviewed and 15 were not treated:

- 2 (13%) did not know results of Xpert, not yet followed up by the HC/DHO staff
- 1 (7%) was informed but had no money to visit treatment center,

- 2 (13%) patient had repeat Xpert test (one was *M tuberculosis* negative and another *M tuberculosis* detected rifampicin susceptible in second Xpert test),
- 1 (7%) went to a private clinician for 2nd opinion and was told that CXR was fine,
- 3 (20%) returned to health facilities but did not want treatment after being informed of MDR/RR-TB,
- 5 (33%) were diagnosed during admission but not treated likely due to long duration of baseline assessment, and
- 1 (7%) has been put on treatment recently after being tested in 3 xpert lab and not reported/recorded in the first hospital's eTB manager (Figure 7).

Figure 7. Reason of non-enrollment of 15 patients with rifampicin resistance detected by Xpert test in RSMH and Puskesmas Dempo, 2019



There might have double counting of RR-TB cases due to repeat Xpert tests. However, according to a previous assessment by Challenge TB, double counting was likely small, only about 6%.

A long duration of pretreatment baseline assessment (>2 weeks) before Initiation of treatment caused delayed enrollment or non-enrollment in a considerable proportion of MDR/RR-TB patients even among those who were diagnosed during admission. This likely was modifiable by prompt initiation of treatment without waiting for results of pre-treatment examinations.

Some patients refused treatment after having a conversation with health workers about the diagnosis of MDR/RR-TB, which likely indicated that pre-treatment counselling was either not available or inadequate, failing to encourage patients to be enrolled on treatment.

There have been barriers (especially financial and transportation) for MDR/RR-TB patients to access care. Patients who knew results of Xpert may not be able to travel to treatment centers

for enrollment. Furthermore, patients without insurance may not be able to afford pre-treatment baseline assessment.

A considerable proportion of patients with RR-TB detected by Xpert may not have been informed of testing results, indicating that the linkage between Xpert sites, health facilities and patients required strengthening.

Furthermore, information of standardized DR TB diagnosis and treatment should be disseminated to private clinicians for supporting the patients to start DR TB treatment.

Indonesia NTP has planned to establish 360 PMDT treatment centers by the end of 2020, and eventually at least one treatment center at each district (514). Currently, the number of PMDT treatment centers with the capacity in initiation of treatment of MDR/RR-TB remained relatively small; management of MDR/RR-TB remained too centralized to ensure access to PMDT care. In Indonesia, there has been regulation on who are qualified to manage MDR/RR-TB, restricting initiation of treatment to clinicians specialized in internal medicine and chest medicine, making it harder to increase the number of treatment centers.

Some patients had repeat Xpert test because the results of Xpert showed *M tuberculosis* detected very low; this practice may not be consistent with national guidelines of Indonesia.

Finally, it was noted during field visit that the interval between detection of RR-TB and enrollment on treatment could be quite long (>2 months) in some patients.

Recommendations

To reduce the gap between detection and enrollment of MDR/RR-TB,

1. Clinicians need to be engaged to elaborate on prompt initiation of MDR/RR-TB treatment upon diagnosis, and quickly perform baseline assessment including blood test, ECG, and audiometry in a timely manner, to avoid multiple visits of patients before treatment initiation.
2. Pre-treatment counseling should be strengthened through training and supportive supervision, focusing on positive aspect of treatment in order to encourage treatment uptake. Pre-treatment counseling does not need to discuss too much details of potential adverse reactions, which can be addressed after treatment initiation.
3. Social and financial barriers (including income loss) of patients to access treatment service should be removed by mobilizing additional funding from provincial and city/district government.
4. The linkage between Xpert sites and DOTS/DR-TB units at hospital and Puskesmas needs to be strengthened, such as by the use of Xpert connectivity application, to ensure that health workers are quickly informed of results of Xpert test. It is critical to have proper recording of patients' phone and address upon Xpert test to ensure that all patients will be informed of results in a timely manner

5. Additional PMDT treatment centers (upto 360 by 2020 according to plan) need to be quickly established to bring service of treatment initiation closer to patients.
6. Support of Director General of Medical Service and professional associations to remove rigid restriction on qualification of clinicians in the treatment of MDR-TB need to be obtained, so that increased number of facilities will be able to initiate MDR-TB treatment.
7. Training on interpretation of Xpert results needs to be strengthened; Xpert *M tuberculosis* detected very low may not need confirmation, unless it is among low risk group of RR-TB. Whether false rifampicin resistance occurs in Xpert *M tuberculosis* detected very low could be investigated by operational research.
8. It will be critical to conduct cohort review of Xpert *M tuberculosis* rifampicin resistance detected to monitor loss of patients at each step from diagnosis to treatment: a) how many patients do not receive prompt initiation of treatment at first pre-treatment visit, b) how many patients refuse treatment after counseling, c) how many patients have difficulty in accessing treatment center for pretreatment assessment and treatment initiation, d) how many patients do not believe the diagnosis or understand the implication of RR-TB detected, e) how many patients visit other health facility without treatment, and f) how many patients do not receive results of Xpert.
9. Additional number of case managers for the management of MDR/RR-TB at treatment centers needs to be enrolled.
10. "Advocacy, communication, and social mobilization (information education communication)" materials for strengthening patient education and increasing patients' motivation for treatment need to be developed.
11. All root causes analysis included in the acceleration plan for PMDT 2020 need to be addressed.

E. Second line drug susceptibility testing (DST)

Indonesia NTP has 3 national reference laboratories, 7 line probe assay (LPA) laboratories, 12 certified drug susceptibility testing laboratories, and 21 culture laboratories. MDR/RR-TB patients have sputum sent to laboratories for second line DST by LPA (Appendix).

In 2019, a total of 2,048 second-line LPA was performed, in which 1,698 (83%) were *M tuberculosis* positive. Of the 1698 LPA tests with *M tuberculosis* detected, 124 (8%) were resistant to fluoroquinolone and 62 (4%) were resistant to second line injectables (including 13 that were resistant to both fluoroquinolone and second line injectables).

Challenges

Despite that a national algorithm was in place, a substantial proportion (>50%) of MDR/RR-TB enrolled on treatment did not have results of susceptibility testing of fluoroquinolone. In patients with results of susceptibility testing of fluoroquinolone, the turnaround time was relatively long.

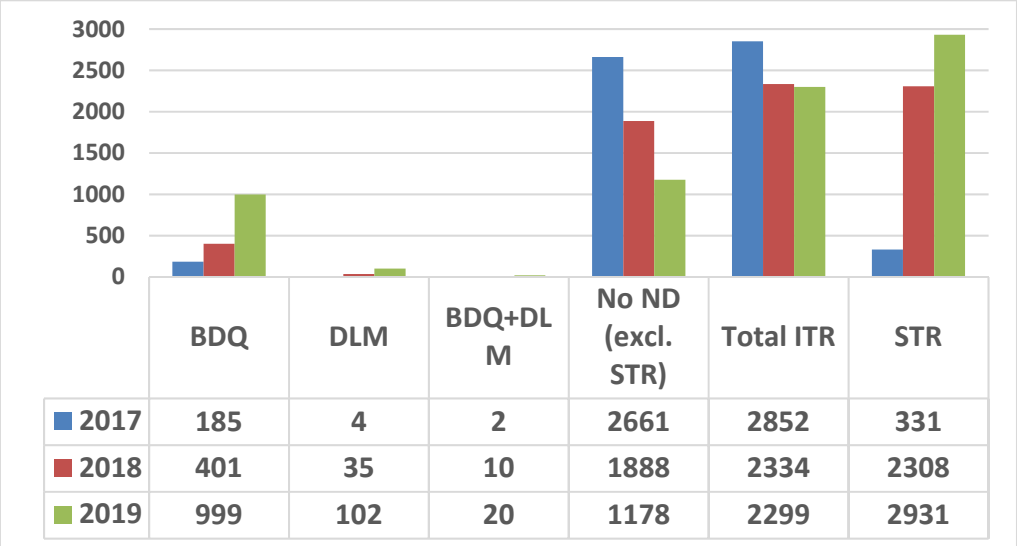
Recommendations

To ensure susceptibility testing of fluoroquinolone and other drugs in MDR/RR-TB patients enrolled on treatment, sputum transportation system linking PMDT treatment centers and laboratories with the capacity of second-line LPA needs to be strengthened. Health workers at PMDT treatment centers must ensure that sputum samples have been sent for testing and to actively look for results of testing for modification of regimens as needed. Culture and conventional DST should also be performed because LPA frequently fails to give results in sputum samples that are smear negative.

F. MDR/RR-TB treatment regimens

Indonesia NTP begun to use bedaquiline in August 2015, to apply injectable-containing short MDR-TB regimen in August 2017, and to conduct a workshop on the use of delamanid in 4th quarter of 2017. Increased number of patients have been treated with injectable-containing short regimen for MDR/RR-TB and bedaquiline. (Figure 8) WHO-recommended all oral longer regimens have been applied since 4th quarter 2019 (Figure 9). Several treatment options have been made available for the management of MDR/RR-TB (Table 1). Indonesia NTP also has planned to follow WHO's recommendation to apply all oral short MDR-TB regimen in 2020.

Figure 8. Bedaquiline, delamanid, and regimens used in the treatment of MDR/RR-TB, 2017-2019, Indonesia.



	BDQ	DLM	BDQ+DLM	No ND (excl. STR)	Total ITR	STR
2017	185	4	2	2661	2852	331
2018	401	35	10	1888	2334	2308
2019	999	102	20	1178	2299	2931

Note: BDQ, bedaquiline; DLM, delamanid; ND, new drugs; ITR, individualized treatment regimen; STR, short treatment regimen.

Figure 9. Progress in the introduction of new drugs and regimens for PMDT, Indonesia

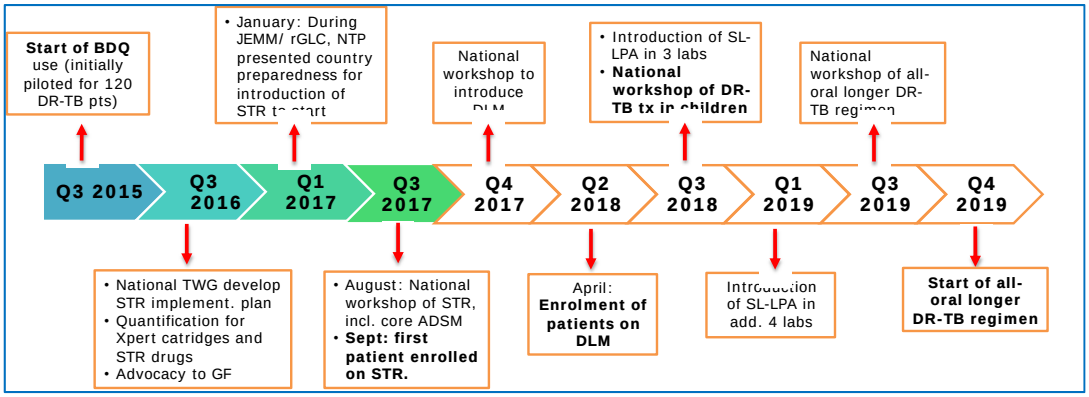


Table 1. Options of treatment regimens, Indonesia.

No.	Criteria	Treatment regimen
1.	RR/MDR TB eligible for STR (with injectable)	• 4-6 Km-Mfx-Cfz-Eto-H^{HD}-Z-E/5 Mfx-Cfz-Z-E
2.	RR/MDR TB not eligible for STR; Pre-XDR second-line injectable resistance	• 6 Bdq-Lfx-Lzd-Cfz-Cs / 12 - 14 Lfx-Lzd-Cfz-Cs • 6 Bdq-Lfx-Cfz-Cs-E / 14 Lfx-Cfz-Cs-E • 6 Bdq-Lfx-Lzd-Cfz-E / 14 Lfx-Lzd-Cfz-E • 6 Bdq-Mfx-Lzd-Cfz-E / 14 Mfx-Lzd-Cfz-E
3.	Pre-XDR FQ resistance; XDR TB	• 6 Bdq-Lzd-Cfz-Cs-E / 14 Lzd-Cfz-Cs-E • 6 Bdq-Lzd-Cfz-Cs-Eto / 14 Lzd-Cfz-Cs-Eto
4.	Patients intolerance to BDQ or experiences severe AEs; Patients < 18 year-old; Patients with HIV	• 6 Dlm-Lfx-Lzd-Clz-Cs / 14 Lfx-Lzd-Clz-Cs • 6 Dlm-Lzd-Clz-Cs-E / 14 Lzd-Clz-Cs-E • 20 Lfx-Lzd-Cfz-Cs-Eto • 20 Mfx-Lzd-Cfz-Cs-E • 20 Mfx-Lzd-Cfz-Cs-Z • 6 Lfx-Lzd-Cfz-Cs-Amk / 14 Lfx-Lzd-Cfz-Cs • 6 Lfx-Lzd-Cfz-Cs-S / 14 Lfx-Lzd-Cfz-Cs • 6 Lfx-Lzd-Clz-Eto-PAS / 14 Lfx-Lzd-Clz-Eto

Challenges

Preliminary data show that a substantial proportion of MDR/RR-TB had additional resistance to fluoroquinolone. Fluoroquinolone resistance would be missed in patients without second line DST results.

It is critical to note that WHO has emphasized that “access to rapid drug susceptibility testing, especially for ruling out fluoroquinolone resistance, is required before starting the shorter, all-oral, bedaquiline-containing MDR-TB regimen”. The use of bedaquiline in MDR/RR-TB with

additional resistance to fluoroquinolones that are not detected due to lack of DST results run the risk of acquired resistance to Bedaquiline.

Furthermore, regimens may not make an impact on treatment outcome if challenges in service delivery have not been properly addressed.

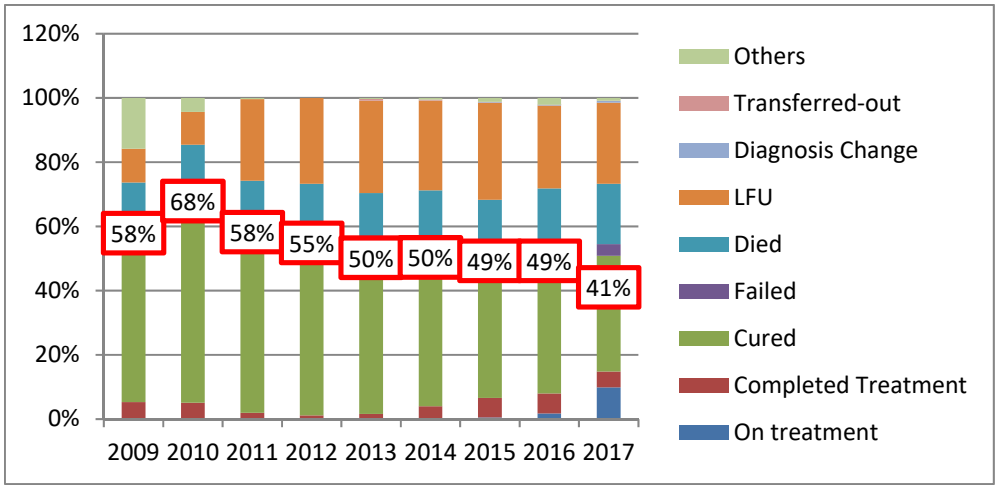
Recommendations

Indonesia NTP may consider using amikacin to replace kanamycin in STR. Whenever bedaquiline is used, it might be better to apply a regimen that could cover fluoroquinolone-resistant MDR-TB before obtaining the results of DST of fluoroquinolone, because the use of WHO recommended bedaquiline-containing all oral regimen in patients with undetected fluoroquinolone resistance may run the risk of acquired bedaquiline resistance.

G. Treatment outcome of MDR/RR-TB

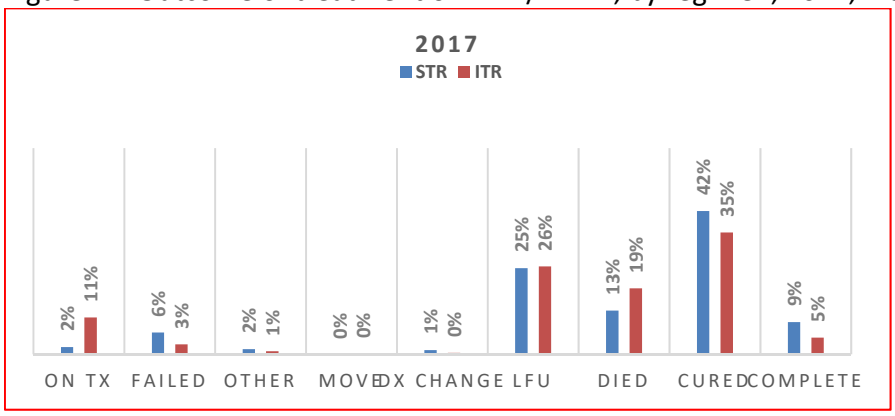
The proportion of MDR/RR-TB patients with treatment success was about 50% in 2013-2016 cohort, decreased to 41% in 2017 cohort, in a great part due to a substantial proportion of loss to follow-up and death (Figure 10).

Figure 10. Outcome of MDR/RR-TB patients enrolled, 2009-2017



The proportion of loss-to-follow-up remained substantial (25%) even in patients treated with short MDR-TB regimen (Figure 11). Assessment of timing of loss-to-follow-up of 2018 cohort revealed that of those who were lost to follow-up, 61% were lost within 3 months and 88% were lost within 6 months in patients treated with short MDR-TB regimen.

Figure 11. Outcome of treatment of MDR/RR-TB, by regimen, 2017, Indonesia



* STR, short treatment regimen; ITR, individualized treatment regimen; LFU, loss-to-follw-up.

Challenges

Treatment outcome of MDR/RR-TB has been unsatisfactory:

1. A high proportion of patients were lost to follow-up, in a great part because patients have to travel to treatment centers or treatment sites on a daily basis which create remarkable barriers for adherence to treatment.
2. Decentralization of treatment to community would bring treatment services closer to patients, but community-based supportive model of care of MDR/RR-TB has not yet been established.
3. Human resource for the management of MDR/RR-TB was insufficient; some PMDT treatment centers were over-burden, contributing to unsatisfactory performance of PMDT.
4. Although MDR/RR-TB patients have been provided with USD$ 55 per month as enablers, social and financial support provided to MDR/RR-TB patient remained insufficient for them to overcome challenges in accessing treatment service.

Recommendations

To improve outcome of MDR/RR-TB

1. The capacity of treatment sites need to be strengthened for early decentralization of treatment.
2. Training and education of health workers need to be strengthened and willingness of health care workers in taking care of MDR/RR-TB may be incentivized.
3. NTP may consider to establish provincial consilium for mentoring clinical management of MDR/RR-TB at treatment sites and in the community, under the guidance and support of national consilium.
4. The capacity of health workers in clinical management of MDR-TB needs to be enhanced by regular on site supervisory visit and off site consultation, which could be done by provincial consilium; NTP may consider developing a catchment area for each treatment center and assign supervisory role of treatment center (rather than providing treatment service alone).

5. CHO/PHO need to be engaged in PMDT supervision and their PMDT capacity needs to be strengthened.
6. Financial barriers of MDR/RR-TB patients in going to treatment sites before decentralization of treatment to community level need to be drastically removed.
7. Civil society organizations need to be engaged and patients support groups established for community-based patient centered care.

H. Active drug safety monitoring and management (aDSM)

The Pharmacovigilance programme in Indonesia is managed by the National Agency for Drug and Food Control. The core package of aDSM has been introduced since August 2017 to detect, manage and report suspected or confirmed drug toxicities in all MDR/RR-TB patients enrolled on treatment. DR-TB nurses in treatment centers actively monitor adverse events through the use of the aDSM form. Puskesmas has to send aDSM forms to treatment centers on a monthly basis. Fatal serious adverse events (SAEs) should be reported within 24 hours to Pharmacovigilance centers and NTP, and non-fatal SAE be reported as soon as possible (within 15 days). In 2019, 8 nervous, 14 cardiac, 2 infectious, 2 renal, 9 psychiatric, 21 ear and labyrinth, and 8 other SAEs have been reported. On May 2019, the Head of National Agency for Drug and Food Control release a decree of National Committee of Drug Resistant TB Pharmacovigilance team, consisted of the National Agency for Drug and Food Control officials and staffs, NTP, DG of medical services, DR TB clinical expert team, universities, and representatives of PV in some hospitals. The tasks of the Committee include

a. Do assessment of adverse event report of DR TB drugs
b. Do analysis of the assessment's reports
c. Provide data and analysis report to National Agency for Drug and Food Control officials and NTP
d. Provide recommendation based on the assessment and analysis result
e. Provide regular report to National Agency for Drug and Food Control officials and NTP

The team has already developed a workplan, which include regular meeting and capacity building of provincial team to conduct *signal detection and causality assessment.* NTP has already conducted trainings of early identification of adverse reaction in 2019.

Challenges

Management of adverse reaction was inadequate, contributing to early treatment interruption. Training of health workers in the management of adverse reactions was insufficient and technical support on clinical management was rarely provided to PMDT treatment sites.

Recommendations

Management of adverse reactions at treatment centers, treatment sites and also in the community need to be greatly strengthened through training, on site supportive visit, and on-line consultation. Access to blood test, ECG and audiometry must be ensured.

I. Reporting ad recording

The TB surveillance system in Indonesia is an online, case-based information system. The case-based system was introduced first for DR-TB (eTB-manager) in 2009, which captures data on GeneXpert test results, and also can record and report serious adverse event. Thereafter, a case based system for drug-sensitive TB (SITT) was developed, which needs to be populated by each health facility. Despite the use of an online reporting system, the Inventory Study in 2016-2017 showed an under-reporting of 41%; from the estimated 842,000 incident cases, 82% was thought to already access health facilities, but only 53% was notified to the NTP. A new TB information system (SITB) which will replace the current information system for Drug sensitive TB (SITT) and that for DR TB (eTB Manager) has been piloted since August 2019; NTP has planned to implement the new system in 2020 throughout the country.

Appendix 1 Agenda of the South Sumatera team and the JEMM overall

TB Program Review Agenda, South Sumatera, 21-27 January 2019

South Sumatra JEMM team member:
Dr. Chen-Yuan Chiang, Dr. Pandu Riono, Nurjannah, Dina Frasasti, Siti Nurfiqa, Mikyal Faralina Mulyono, Marsal, Idrus, Dr. Yohhei Hamada, Dr. Rina Handayani, Dr Isnada Sp.A, Dr. Fiqri , Andini Ayu, Tiar Salman, Iswara Mespa, Dr. Fadila

Date / Time	Activities	Location
Tuesday, 21 January 2019		
13.30	Team leaves hotel to airport Soekarno-Hatta, Cengkareng	
17.20-18.30	Flight to Palembang (GA 114 on 17.20 – 18.30)	
	Arrival of JEMM Team in Palembang: Team 1 stays in Palembang -The Alts Hotel Team 2 goes to Muara Enim	
Wednesday, 22 January 2019		
07.30	Car stand at the hotel	
08.30 – 10.30	**Team 1 (Palembang)** Briefing with Province Health Office of South Sumatera and DHO Kota Palembang	PHO South Sumatera
	Team 2 (Muara Enim) Briefing with District Health Office Muara Enim	DHO Office
10.30 – 12.00	**Team 1 :** Briefing with Province Health Office of South Sumatera and DHO Kota Palembang	Palembang
	Team 2: Visit Rabain Hospital Address: Jalan Sultan Mahmud Badaruddin II No. 48	Muara Enim
12.00-13.00	Lunch break	
13.00-16.00	**Team 1 :** Visit M Hoesin Hospital	Palembang
	Team 2: Rabain Hospital	Muara Enim
Thursday, 23 January 2019		
07.30-08.00	Car stand by at the hotel	
08.00 – 12.00	**Team 1:** Puskesmas Dempo	Palembang
	Team 2: Puskesmas Ujan Mas	Muara enim
12.00 – 13.00	Lunch	
13.00 – 16.00	**Team 1:** Visit BBLK Palembang (Laboratory)	Palembang
	Team 2: Labkesda Muara Enim (Laboratory)	Muara Enim
Friday, 24 January 2019		
07.30 – 08.00	Car stand by at the hotel	
08.00 – 10.00	**Team 1:** Visit to Charitas Hospital (Private hospital)	Palembang
	Team 2: Visit Muara Enim Prison	Muara Enim
10.00-11.15	**Team 1:** Still in Charitas Hospital	Palembang
	Team 2: Private Clinic Amalia Muara Enim	Muara Enim
11.30-13.30	Friday Prayer and Lunch Break	
14.00-16.00	**Team 1:** Private Clinic Sayang Bunda Plaju	Palembang

	Team 2: Debriefing at DHO Muara Enim	Muara Enim
Saturday, 25 January 2019		
09.00-11.00	**Team 1:** Visit Prison Pak Jo	Palembang
	Team 2: Discussion with community Aisyiyah office	Muara Enim
11.00	**Team 1:** Discussion with community Aisyiyah Office	Aisyiyah
	Team 2: Travel back to Palembang (The Alts Hotel)	
Sunday, 26 January 2019		
	Preparing debriefing	
Monday, 27 January 2019		
08.00-11.00	Debriefing in PHO	PHO/Governor Office
13.00	Depart back to Jakarta GA 115 Palembang – Jakarta on 17.10 – 18.20	

Joint Program Review National TB Program Indonesia, 20 -31 January 2020

DATE/TIME	ACTIVITY	VENUE/Remarks	PIC	DOCUMENTS
Sunday, 19 January 2020				
	Arrival of team members	Ayana Mid plaza,		
Monday, 20 January 2020 ***"Internal Meeting with NTP"***				
08.30 – 0.00	Briefing with WR and WHO		**PIC: Bu Inong**	
	Coffee break			
10.00 – 0.30	Opening and briefing			
10.30 – 1.00	Presentation on Epi Review			
11.00 – 12.30	Presentation on progress of TB program from the 2017 JEMM per thematic area 1. Health system issues (TB Financing, social protection, UHC, regulation) 2. Human Resources 3. PPM 4. Political commitment 5. Childhood TB 6. Civil society and community engagement	Deputy TB Drug Susceptible	**All focal point person need to be available for panel discussion**	PPT presentasi untuk tiap area tematik dalam Bahasa inggris
12.30 – 3.30	Lunch			
13.30 – 4.00	UNDSS briefing	UNDSS	PIC : Regina	
14.00 – 15.30	7. Early diagnosis and universal DST 8. Diagnosis, Laboratory Management 9. Treatment 10. TB HIV 11. PMDT	Deputy of Drug resistant TB		

	12. Research 13. Procurement and drug supply management 14. Monitoring and evaluation, Health information system			
15.30 – 16.00	Coffee break			
16.00 – 18.00	Field visit preparation meeting	Team leader		
Tuesday, 21 January 2020 ***Briefing and Kick off meeting for TB program review***				
08.30 – 09.00	Registration	Venue TBC Meeting room for 250 participants (TB :120, HIV : 120)	**PIC :** Sesuai arahan bu direktur **NTP :** **kasie TB RO** **NAP:** **kasie HIV** **MC : Adi (Promkes)..**	• Key note speech (bu Lani dan bu Inong/Rina) • Bahan WR : WHO
09.00 – 10.00	Welcome and Introduction: • JEMM (TB and HIV) activity preparation report and agenda by Director of DTDC • Welcome and Opening Remarks on National TB and HIV Strategic Plan-key approaches and targets by DG of Prevention and Disease Control • Welcome and Opening Remarks by WHO Representative for Indonesia* • Introductions of team reviewers** • Group Photo***	*WR memperkenalkann team leader (Paul Nunn utk TB; Jamie Uhrig utk HIV) **Team leader akan memperkenalkan tim external reviewer ***MC** mengundang peserta untuk foto bersama		
10.00 – 10.30	Tea/ Coffee break			
10.30 – 12.00	Progress report NTP and NAP: • NTP Situation, GF Grant Performance and TB Progress in Indonesia - NTP Manager		**PIC:** **Pak Imran**	Paparan pak Imran (mas Tyo dan mas Bowo)
	• NAP Situation, GF Grant Performance and HIV Progress in Indonesia - NAP Manager • Discussion.		**PIC:** **Pak Ongky**	Paparan pak Ongky (pak Sugeng/Aan/bu Pandam)
12.00 – 13.00	*Lunch break*			
13.00 – 13.30	Preparation for field visit		**PIC:** **Regina**	Persiapan tools & guidance field

	Field visit team depart to province			visit → WHO
13.30 – 17.00	Desk review team Visit to BPOM	Desk review and West Java team	**PIC : mas Dwi & bu Mirna**	
Wednesday, 22 Jan to Thursday 23 Jan 2020				
04.00 – 12.00	Briefing /visit to Provincial health office Briefing /visit to District health office			
Wednesday, 22 Jan to Thursday 23 Jan 2020 Desk Review				
	Desk review for 5 provinces visited during JEMM 2017 (DKI Jakarta, Sumbar, Sultera, Kalsel, Jateng) + Papua		District	• Separate schedule is prepared
Friday, 24 January 2020 **Discussion on Health Financing and Strategic Health Purchasing**				
08.30 – 09.00	Opening remarks	**Director of DTDC**	**PIC:** **Nurul**	
09.00 – 09.30	TB financial situation overview	**NTP**		
09.30 – 10.00	Coffee break			
10.00 – 11.30	Panel discussion - TB in Indonesia mid term development plan - TB budgeting process from National to district level	**Bappenas** **MoH**	**Moderator :**	NTP, BPJS, P2JK, UI (Prof. Hasbullah), UGM (Prof. Laksono), World Bank,
11.30 – 13.30	Lunch break			
13.30 – 15.00	Panel Strategic health purchasing for TB - TB in Universal health coverage scheme - Strategic health purchasing progress in Indonesia	**BPJS** **SHP/World bank**	**Moderator :**	
15.00 – 16.00	Discussion and Clarifying questions from Reviewer team			
16.00 – 16.30	Closing remark			
Monday, 27 January 2020				
08.30 – 15.00	Debriefing with Provincial health office Return to Jakarta			
17.00 – 18.00	Briefing meeting (all field visit lead with Paul Nunn)			
Tuesday, 28 January 2020				
09.00 –	Opening and foreword from		***PIC :Bu Inong,***	

09.30	team leader		***bu Sagala, Wawan***	
	Presentation of findings and conclusion from field visit (West Java & South Sumatera)			
10.00 – 10.30	Coffee break			
10.30 – 12.30	Presentation of findings and conclusion from East Kalimantan and NTT			
12.30 – 13.30	Presentation from desk review result		**PIC: Nurul**	
13.30 – 15.00	Group works on thematic area to conclude finding and prepare recommendations: 1. High level commitment, MAF TB, community engagement and empowerment 2. Funding, human resources and social protection 3. Diagnostic tools/services and drug management 4. Supervision, monitoring, and evaluation 5. TB/HIV, childhood TB and programmatic management of LTBI 6. DR TB and infection control 7. Private sector engagement, innovation and research	***Prepare 2 break out room for 7 group each 10 participants***	**PIC:**	
15.00 – 30	Coffee break			
15.30 – 17.30	*Continue group works on 7 thematic area*			
	Side meeting: TB HIV collaboration			Special invitation
Wednesday 29 January 2020 (Parallel with TB High Level Event with President of Indonesia in Cimahi)				
08.30 – 10.00	*Continue group works on 7 thematic area*		**PIC:**	
10.00 – 30	*Coffee break*			
10.30-12.30	*Continue group works on 7 thematic area*			
12.30– 13.30	Lunch			
13.30-15.30	*Continue group works on 7 thematic area*			
	Side meeting 1. DR TB Progress and Plan	Special invitation ***Those who are not**	**2. PIC : Luki, Yussie, Ella**	

	2. Latent TB infection expansion plan	**invited to the side meeting will continue to discuss in group**	**3. PIC : pak Galuh,Roro dan Regina**	
15.30 –16	Coffee break			
***Thursday, 30 January 2020* PIC**			**PIC: bu Rina & Wawan**	
	Stakeholder workshop Moderator : Prof Sudijanto Kamso		**PIC:**	
08.00 – 8.30	Registration			
08.30 – 09.00	Remark from director of communicable disease			
09.00 – 10.30	Panel discussion finding and recommendations 1			
10.30 – 1.00	Coffee break			
11.00 – 13.00	Panel discussion finding and recommendations 2			
13.00 – 14	Lunch			
14.00 – 15.00	Presentation on NSP 2020-2024 finalize recommendation		**PIC:** **Nurul**	
	Debriefing with Minister of Health DG- Pak Anung			
15.00 – 15.30	Report of program review activity by Pak Anung		**PIC:** **Mba Luki**	
15.30 – 16.00	Presenting recommendation: - TB Program Review /JEMM (Paul Nunn) - HIV program review (Jamie uhrig)		**PIC:**	**presentation TB and HIV Program Review/ JEMM**
16.00 – 16.30	Response from Minister of health to the recommendations		**PIC:Bu Inong dan Bu Lani**	
16.30 – 17.00	Closing remark and souvenir		**PIC:** **Pak Imran**	
Friday, 31 January 2020				
09.30 - onwards	Program review core team: report writing	Venue: TBC	**PIC :** **Bu Luki**	• **Draft report JEMM 2020**
Saturday, 1 February 2020				
	Departure Mission members.			

Appendix 2 Person met in the field (South Sumatra team)

Name	Institute	Name	Institute
Nurjanah	Subdit RS Dit P2P Kemenkes	Siti Rofiqah Nuriyah	CCM - POP TB
Fawzr	Dinkes Kota	Tri Hari Irfan	Dinkes Prov SS
Muyono	Dinkes Prov SS	Ranti Yuliana Putri	Dinkes Prov SS

Yudhi Setiawan	Dinkes Plg	Tri Hartati	IO PPM - Yayasan KNCV Palembang
Marsal Husnan	Dinkes Prov SS	Donna Pertiwi	Dinkes Kota Palembang
Muhamad Idrus	Dinkes Kota Palembang	M. Rizky	Dinkes Prov SS
Dina Frasasti	Subdit TB	M. Firanata	Dinkes Prov Sumsel
Dahniar	RSMH	Natalie Duyen	RSMH
Vanlianal	RSMH	Sri I.	RSMH
Endang Wahyuni	RSMH	Nurlela	RSMH PK
Eny Rahmawati	RSMH	dr. Devi Azri Wahyuni Spm, K.mars	RSMH
RA linda A	RSMH	Indah Nurmala Dewi Skp MHSM	RSMH
Marsal Husnan	Dinkes Prov SS	R Sudarp Spm K- P	RSMH
R Harun	RSMH	Muhamad Idrus	Dinkes Kota Pbg
Jony Anwar	RSMH	Ryanti Ismail	RSMH
Zubaedah	RSMH	Misran Ana	RSMH
Dr. M. Syahrul	Dirut RSMH	Nurjanah	Subdit RS Dit P2P Kemenkes
dr. Mliri Iryani	Kapus PKM Dempo	Nelliyana	BBLK Palembang
dr. Fitrianti	Dokter	Obrin Porulian	BBLK Palembang
dr. Marlia R	Dokter	Junaidi	BBLK Palembang
dr. Selly Aprida	Puskesmas Dempo	Citra Wulandari	BBLK Palembang
Siti Rofiqah Nuriyah	CCM - POP TB	Marsal Husnan	Dinkes Prov Sumsel
Dina Frasasti	Subdit TB	Joko Misanto	BBLK Palembang
Sri Aswati	RS Charitas	Sr. M. Fausta Fch	RS Charitas
Marwiyah	RS Charitas	dr. Benny Loho	RS Charitas
Setia Lestari	RS Charitas	dr. Elina Waiman Sp A	RS Charitas
Lenny	RS Charitas	dr. Harsono Santoso	RS Charitas
Siti Miloh Inrawati	RS Charitas	dr. Cicilia Partini	RS Charitas
Halimah D	RS Charitas	Sugiyono	RS Charitas
Sr. Albertin Fch	RS Charitas	Rahmat Fajri	Dinkes Kota Palembang
Dina Frasasti	Subdit TB	Ranti Yuliana Putri	Dinkes Prov Sumsel
dr. Chairatun Nisa	Klinik Sayang Bunda	Resty Akmalia	Klinik Sayang Bunda
Dra. Rohantana Siregar	Klinik Sayang Bunda	Septy Dwi Damayanti	Klinik Sayang Bunda
Drs. James Purba	Klinik Sayang Bunda	Indah Kesuma Dewi	Klinik Sayang Bunda
Tri Atika, Am. Kep	Klinik Sayang Bunda	Winda Ayu Safitri	Klinik Sayang Bunda
Mia Mustika	Klinik Sayang Bunda	Hj. Halimatussakdiah	PKM Plaju
Ribut Sugiarti	PS TB Care Aisyiyah	Intan Permatasari	PKM Plaju
R Nurhasanah	PS TB Care Aisyiyah	Irma Suryani	Mantan Pasien TB
Lisdaniar	PS TB Care Aisyiyah	Romayansyah	SSR TB Aisyiyah Palembang
Dwi Agus Santi	PS TB Care Aisyiyah	Yudi Ariza	SR TB Aisyiyah SUMSEL
Sayayu	PS TB Care Aisyiyah	Lufita Harianto	SR TB Aisyiyah SUMSEL
Suhairoh	TB Care Aisyiyah	Ika Febriyanti	SR TB Aisyiyah SUMSEL
Dr. Mahmud S	Rutan Klas I Palembang	Karina Dianita, S. Kep	Rutan Klas I Palembang

dr. Haikal Mubarak	Rutan Klas I Palembang	Fridon H. M Pasaribu S.Kep	Rutan Klas I Palembang
Yoshar Julizar, SH., M.Kom	Rutan Klas I Palembang	Dimas Aditya A	Rutan Klas I Palembang
Farida, S. Kep. Ns	Rutan Klas I Palembang	Dwi Kornia, S.kep. Ns	Rutan Klas I Palembang

Appendix 3 **Field visit South Sumatra**

Findings

South Sumatra has 17 Kota and Kabupaten (4 cities and 13 districts), and a population of 8.4 million. The number of DOTS facilities was 341, in which 239 provided smear microscopy services.

The estimated annual number of incident TB cases is 33,733. TB notification rate increased from around 110 per 100,000 population in 2014 to 268 per 100,000 population in 2018. TB case detection rate was 40% in 2017, increased to 67% in 2019 mainly due to mopping up activities. In 2019, the number of TB cases notified was 12,128, and the number of TB patients found during mopping up activities was 10,357, totaling 22,485. Treatment successful rate of TB maintained above 90% in 2016-2018.

The proportion of childhood TB among all reported TB cases was 10% in 2018, ranging from 2% in Prabumlih to 37% in OKU. The proportion of TB patients with HIV testing was 1% in 2016, increased to 23% in 2018. The proportion of HIV positive TB patients who were on antiretroviral therapy was 10% in 2016, increased to 55% in 2018.

South Sumatra began to establish Xpert site in 2014, and has established 30 Xpert sites by the end of 2019. The monthly number of Xpert test increased from 872 in Jan 2018 to 3280 in Dec 2019. The average Xpert utilization rate was around 50% in 2019, ranging from 7% in RS Talang Ubi to 176% in M Hoesin hospital. The number of PMDT treatment centers established was 14, located in 11 districts; 6 districts did not have a PMDT treatment center.

The number of RR-TB cases increased but enrollment on treatment remained low: 46% (51/110) in 2017, 36% (102/281) in 2018, and 41% (161/391) in 2019. Of the 51 RR-TB patients enrolled in 2017, 21 (41%) were successfully treated, 10 (20%) lost to follow-up, 16 (31%) died and 2 failed. Of the 102 RR-TB patients enrolled in 2018, 49 (48%) were successfully treated, 23 (23%) lost to follow-up, 20 (20%) died, 3 failed and 6 were still on treatment.

In BBLK in 2019, second line LPA was done in 205 specimens, 14 did not have M tuberculosis detected, 5 invalid and 185 have M tuberculosis detected, in which 168 were susceptible, 15 (8%) FQr and 3 (1.6%) SLIr, (one XDR).

In 2019, the uptake of IPT was very low at 7.3 % among child contacts< 5 years despite relatively large number of contacts assessed by cadres. It was also low at 4.4% in PLHIV. Only 20% (4405/22137) of people with new or relapse TB know their HIV status. Only 54% (35/65) of HIV-positive people with TB were put on ART.

No stock out of drugs was noted. Entry symptom screening has been conducted in prison.

Challenges

1. Insufficient budget to address the challenges in TB prevention and care
2. Substantial number of estimated TB cases are not detected
    - Under-utilization of Xpert due to ineffective transportation mechanism; insufficient number of Xpert sites.
    - Chest radiograph (CXR) has not yet been used in the identification of presumptive TB cases.
    - Lack of systematic screening and active TB cases finding in the community, workplace, and health care facilities.
    - Low number of presumptive TB cases examined in several health care facilities.
    - Patients had a long path to diagnosis and faced financial hardship related to TB
3. High proportion of clinically diagnosed TB cases
    - CXR has been inadequately used in the diagnosis of pulmonary TB without sputum examinations.
4. Management of comorbidities was weak
    - Lack of intensified TB case finding among the elderly, diabetic patients, smokers, patients with mental problem and other high risk groups.
    - TB patients were not routinely screened for diabetes and provided with assistance on smoking cessation
5. Diagnosis of childhood TB was weak
    - over-diagnosis of childhood TB in some districts and under diagnosis in others.
    - Inadequate capacity of Puskesmas to diagnose childhood TB and difficult to obtain sputum.
6. Reporting of TB was incomplete, especially in the private sector; a substantial number of TB cases not detected during mopping up activities.
7. Under-detection of MDR/RR-TB and poor outcome of treatment
    - Limited number of facilities with the capacity in initiation of treatment of MDR/RR-TB.
    - Community-based supportive model of care of MDR/RR-TB has not yet been established.
    - High proportion of RR-TB detected were not enrolled on treatment
    - Low number of RR-TB patients with second line LPA test.
    - Insufficient human resource and inadequate training.
    - Inadequate management of adverse reaction.
    - Insufficient social and financial support provided to MDR/RR-TB patient.

8. A substantial proportion of health workers working on TB have not been trained.
9. CXR has not been used in the detection of presumptive TB in prison.
10. Priority not given to TB prevention. HCW and patients are not well informed of the importance of preventive treatment.
11. Cough triage is not systematically implemented at Puskesmas and heath care workers are not systematically screened for TB. Number of HCW with TB is not monitored.
12. Monitoring and supervision are relatively weak, unable to detect and address several programmatic challenges.
13. PPM remained insufficient to ensure adequate diagnosis of and reporting of TB Not all private clinics are engaged. Outcomes of treatment was largely unknown.
14. Lack of encoding at health facilities due to inadequate capacity and lack of commitment from HCW. Paper-based recording system results in duplication of work.
15. Stock of TB drugs is monitored separately for those from the program and those procured by pharmacy directorate.
16. Not all TB patients are insured leading to significant economic burden.
17. Multisectorial approach is limited, missing opportunity to obtain support from sectors other than health.
18. No operational research at provincial level.

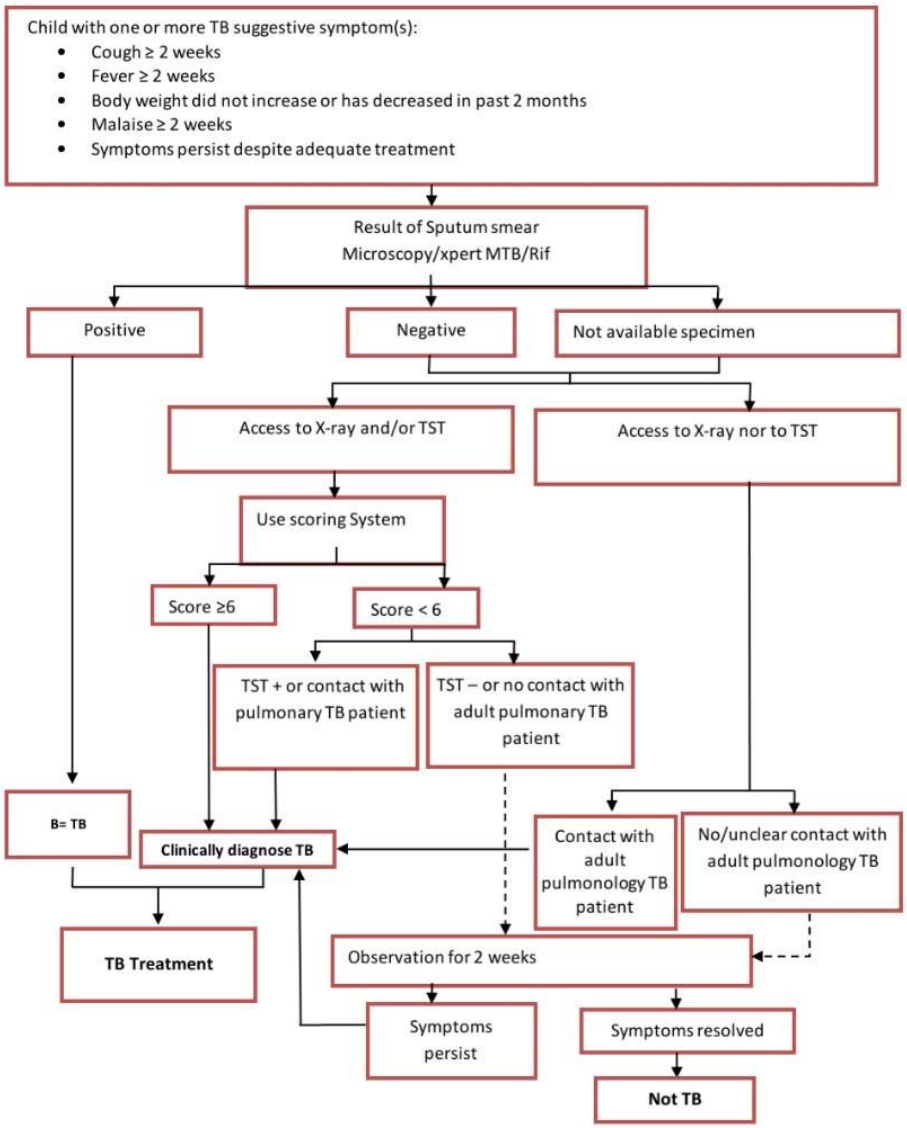
Recommendations

- Provincial government may allocate additional funding for TB prevention and care
- Strengthen transportation mechanism to increase utilization of current Xpert sites, and to further expand the number of Xpert sites.
- PHO needs to work with NTP to develop a plan in introducing CXR in the detection of presumptive TB cases; ensure access to X ray at Puskesmas.
- To conduct active TB cases finding in the community and systematic screening in health care facilities, especially among the elderly, those with diabetes, those who smoke, and people with high risk of TB, such as miners, patients on immune-suppressive therapy.
- Engage professional society to ensure optimal use of CXR in the diagnosis of pulmonary TB. Presumptive TB detected by CXR needs bacteriological examinations.
- Engage professional society in strengthening the diagnosis of childhood TB. The national algorithm for the diagnosis of childhood TB may need revision, possibly including use of other specimen types (e.g. stool and nasopharyngeal aspirate) .
- Continue to strengthen mandatory reporting of TB, through linkage with health insurance (no reporting no reimbursement). A monitoring mechanism needs to be conducted periodically to monitor progress in completeness of reporting.
- Work with NTP to urgently establish additional PMDT treatment centers who are able to initiate treatment of MDR/RR-TB.
- Ensure RR-TB cases detected are enroll on treatment:
  - Strengthening the linkage between Xpert lab and DOTS/DR-TB units at hospital and puskesmas
  - Conduct cohort review for smear positive, Xpert positive, and RR-TB to ensure enrollment on treatment.

  - Patients should be informed of results in a timely manner and be supported to visit treatment center for assessment and treatment.
  - Pre-treatment counseling should be strengthened.
  - Enhance the capacity of facilities in clinical management of MDR-TB treatment, especially adverse reactions.
  - Engage CSO and establish patients support group to establish community-based patient centered care
- Ensure sputum transportation of MDR/RR-TB patients to BBLK for second line LPA
- Advocate for more funding to conduct training for new employees and those already employed (e.g. refresher training). Explore other training modes (e.g. online).
- Introduce CXR for entry screening and regular systematic screening in prisons including inmates and prison staff in coordination with PHO, laboratory, and ministry of justice.
- Introduce CXR for contact examinations and other high risk groups to find more TB.
- Set provincial and district targets for preventive treatment and monitor achievements as a key indicator during performance review. Expand preventive therapy to contacts ≥5 years and other risk groups. Introduce short regimen. Strengthening counselling on TB preventive treatment for contact and PLHIV. Leverage on existing home visit activities by cadres and disseminate information on preventive treatment.
- Set infection control plan at all levels and designate a person in charge of monitoring its implementation. Monitor number of HCW diagnosed with TB to assess performance of infection control practice.
- Advocate for more budgets for monitoring and supervision activities and increase capacity of staff to conduct quality supervision.
- Engage private sector, including clinics and pharmacies in referral, diagnosis, treatment and mandatory reporting through promotion of national standard of TB care.
- PHO and DHO should ensure that data entry is done at health facilities. NTP should explore implementation of full electronic recording and reporting system in locations where feasible.
- Pharmacy units should manage MDR-TB drugs and Xpert cartridge.
- Strengthen coordination with other programs (e.g. NCD) under the Ministry of Health as well as other ministries (e.g. Justice and Labor) to intensify case finding activity, improve quality of care and provide social and financial support to patients. Set mutually agreed targets and ensure accountability by all programs and ministries concerned.

Appendix4 Algorithm and scoring system for the diagnosis of childhood TB

Algorithm for the detection of tuberculosis in children in Indonesia



Parameter	Number of points				Score
	0	1	2	3	
TB contact	unclear		TB diagnosed in family, smear-negative or unknown smear status	contact with smear-positive TB patient	
TST	negative			Positive (≥10mm or ≥5mm and impaired immune response	
Body weight/nutritional status		weight/height <90% or weight/age <80%	Clinical undernutrition or weight/height <70% or weight/age <60%		
Unexplained fever		≥ 2 weeks			
Chronic cough		≥ 3 weeks			
Peripheral lymph node enlargement		≥ 1 cm, 1 KGB, no pain			
Swelling of bones, hips, knee joints or phalanx		Present			
Chest X-ray	Normal/no clear abnormalities	Suggestive of tuberculosis			
				Total score	

Score chart used for the diagnosis of tuberculosis in children in Indonesia, in absence of a bacteriological test result

Appendix 5 Treatment algorithm of MDR/RR-TB