SEA-TB-372
Distribution - General

Fighting MDR-TB in the SEA Region

Tenth Meeting of the Regional MDR-TB Advisory Committee (rGLC SEAR)

Jakarta, Indonesia
18-19 January 2018

World Health Organization
REGIONAL OFFICE FOR South-East Asia

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Acronyms

aDSM	active drug safety monitoring and management
Bdq	bedaquiline
CDC	Centers for Disease Control and Prevention, Atlanta
Cfz	clofazimine
Dlm	delamanid
DR-TB	drug-resistant tuberculosis
DST	drug susceptibility test
FQ	fluoroquinolone
EQA	external quality assessment
GF	the Global Fund
GDF	Global Drug Facility
GDI	Global Drug-Resistant Tuberculosis Initiative
KNCV	Royal Dutch Tuberculosis Association
Lzd	linezolid
MDR-TB	multidrug-resistant tuberculosis
MoH	Ministry of Health
MoU	memorandum of understanding
NSP	National Strategic Plan
NTP	National Tuberculosis Control Programme
NTRL	national tuberculosis reference laboratory (ies)
PMDT	programmatic management of drug-resistant tuberculosis
PPM	public-private mix
PSM	procurement and supply chain management
PV	pharmacovigilance
rGLC	Regional Green Light Committee
RR TB	rifampicin-resistant tuberculosis
R&R	recording & reporting
SEAR	South-East Asia Region
SLD	second-line drugs
SLI	second-line injectable
SNRL	supranational reference laboratory (ies)
STR	shorter treatment regimen (for RR/MDR-TB)
TB	tuberculosis
The Union	The International Union against Tuberculosis and Lung Disease

TWG	technical working group
UHC	universal health coverage
UN	United Nations
XDR-TB	extensively drug-resistant tuberculosis

Background

As per the 2017 Global TB report,[1] the burden of tuberculosis (TB) remains disproportionately high in the WHO South-East Asia (SEA) Region, home to 26% of the world's population. In 2016, an estimated 4.7 million people fell ill with TB in the SEA Region, representing 46% of the total TB incidence globally.

Although the Region experiences relatively low levels (2.8%; range: 2.4–3.1%) of multidrug-resistant (MDR) and rifampicin-resistant (RR) forms of TB among newly detected cases, and 13% (range: 10–15%) among previously treated cases, given the large number of TB cases in the Region, this translates into 117 000 estimated MDR/RR-TB cases among notified pulmonary TB cases each year. Thus in 2016, the Region accounted for more than 30% of the global estimated MDR/RR-TB cases among notified pulmonary TB cases worldwide. Six out of the 30 high TB (and MDR-TB) burden countries are in the SEA Region: Bangladesh, Democratic People's Republic of Korea, India, Indonesia, Myanmar and Thailand (Figure. 1).

Figure 1: Global estimated incidence of MDR/RR TB in 2016 for countries with at least 1000 incident cases

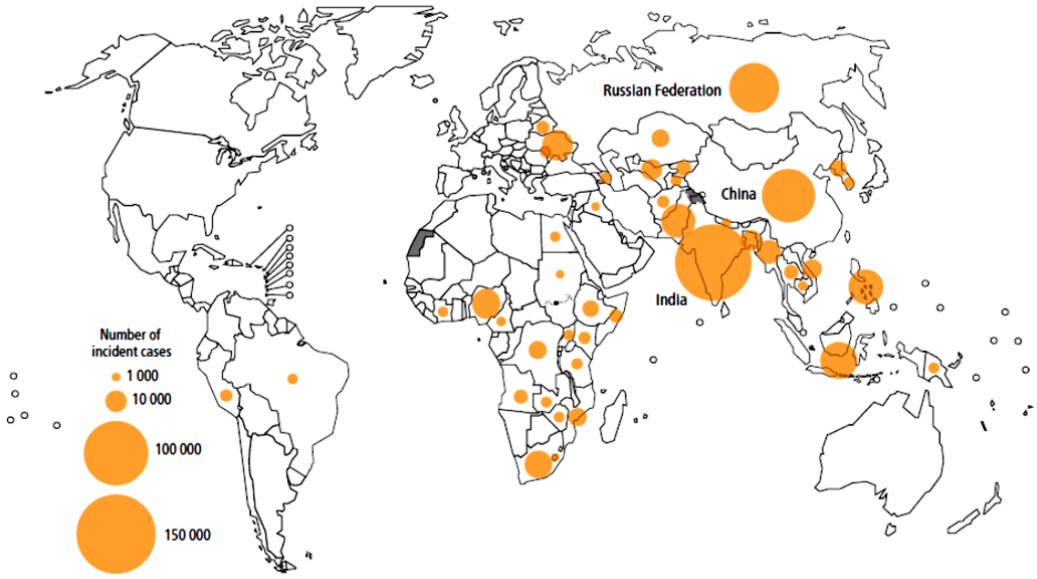


Image taken from WHO Global tuberculosis report 2017

The Region has a wide variation of RR/MDR-TB burden among the Member States varying from 1-2 case in Maldives to nearly 85,000 cases in India among the notified pulmonary TB cases. This makes it rather important to have country-specific strategy in each of the countries for addressing the challenge posed by drug-resistant Tb in the Region

[1] Global tuberculosis report 2017, World Health Organization, Geneva 2017.

In response to the need for scaling up the programmatic management of drug-resistant tuberculosis (PMDT) in the WHO South-East Asia Region, a Regional Advisory Committee on MDR-TB, also known as the regional Green Light Committee (rGLC), was established in 2012. The rGLC functions as Advisory Committee to the WHO Regional Office for South-East Asia, WHO Member States in the South-East Asia Region (SEAR) as well as donors and partners.

The rGLC has had nine meetings so far, the last one being in Kathmandu in October 2016. No physical meeting could be held in 2017. During these meetings, the Committee reviewed and endorsed the country mission reports on PMDT and extensively discussed issues related to the scale-up and implementation of PMDT in countries of the Region.

This report pertains to the proceedings of the tenth meeting of the rGLC held in Jakarta, Indonesia from 18 to 19 January 2018.

Inaugural session

The meeting was inaugurated by Chief Guest Dr. Asjikin Iman Hidayat Dahlan, Secretary of Director General of Disease Prevention and Control, Indonesia, along with Dr Navaratnasamy Paranietharan, WHO Representative to Country Office, Indonesia in presence of Dr Sarabjit Chadha, Deputy Regional Director, the Union and Chair, South-East Asia Region (SEAR) Advisory Committee on multi-drug resistant Tuberculosis (TB) and Dr Vineet Bhatia, Technical Officer-TB, WHO SEAR and secretariat, Regional Green Light Committee (rGLC).

The Chief Guest in his inaugural speech gave an overview of the TB control programme in Indonesia. He stated that Indonesia has a high burden of TB. Based on the WHO Global TB report 2017, the total number of tuberculosis cases notified in 2016 was 360 565 out of which, approximately 659 000 estimated cases were not diagnosed and/or notified in Indonesia. Indonesia has also managed to improve access to WHO approved rapid diagnostic for TB. The number of district with Xpert MTB/RIF tests available was 79 (15%) in 2013, and reached 329 districts (64%) in 2017 and now the programme aims to reach 514 districts (100%) by 2020. The ministry of health has declared TB as a notifiable disease in 2017 and TB is one of the 12 presidential indicators for district level development progress monitoring. The National Planning Bureau included TB in the National Health Development Agenda 2016 – 2025 and 2026 – 2035, ensuring increased domestic funding and multisectoral investments aiming for ending TB by 2035.

The WR welcomed the Chief Guest and participants to the workshop. He highlighted the disproportionate burden of TB in the Region. He emphasised the need for faster implementation of strategies, adoption of new tools and technologies and providing quality care to all those who need effective TB control. He encouraged participants to come up with a time bound plan to have concrete results on the ground and specific indicators against which the progress can be reported. The meeting should not just remain another meeting but a platform to discuss ideas that can bring real difference to MDR-TB situation in the Region.

The Chair of the rGLC reiterated the fact that the Region bears the highest burden of MDR-TB. He stated that the rGLC is a group of experts providing technical assistance for strengthening MDR-TB response in the Region. Several challenges exist in the Region, most of them because of the suboptimal health systems. The rGLC helps find solutions to these problems and designs future strategies. He then briefed participants on the objectives of the meeting.

rGLC secretariat proposed a vote of thanks to the Chief Guest, WR Indonesia and Chair of the rGLC.

Objectives

- Review the progress In Member States based on recommendations of the Ninth MDR-TB Advisory Committee Meeting;
- Recommend strategies for ending MDR-TB in the Region;
- Share and discuss the modalities of rapid roll-out of WHO recommendation on the use of shorter regimen and second-line Drug Susceptibility Testing (SL-DST) in Member States;
- Review and validate the outputs of MDR-TB modelling exercise for accelerating efforts towards ending MDR-TB in the Region
- Discuss way forward and partner collaboration for scale-up of MDR-TB services in the Region.

Technical sessions

Day 1

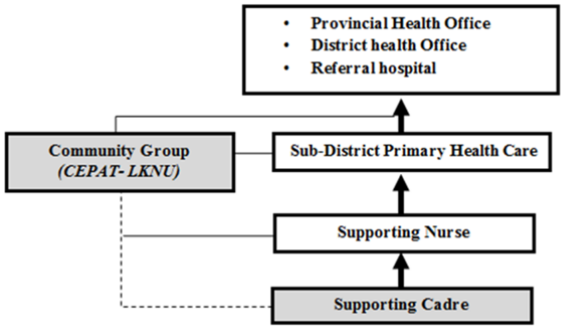
Session 1: Ending MDR-TB in the SEA Region with community engagement

Presentation: Community engagement – key to success of PMDT

Civil society organisations from Indonesia presented their work that helped improve MDR-TB related services through a community based approach. PETA made a video presentation of their activities and how outreach activities to patients are being undertaken.

Another civil society organisation CEPAT presented their programme structure and coordination with government health services (Figure 2)

Figure 2: CEPAT programme structure



This structure which starts with grassroots supporting cadre is well integrated to government provided services. The cadres trace DR-TB patient's address (delayed treatment, on treatment, and default) in their own coverage area based on data from Persahabatan Hospital. The cadres conduct an assessment of all DR-TB patient for their socio-economic condition and possible support they may need. The cadres also conduct identification of presumptive TB among close contacts through verbal screening of every DR-TB patients as index case. If the contact have any sign/symptom, the cadres bring the contact to primary health care for further diagnosis. The cadres also:

- Motivate and/educate patients
- Monitor the treatment progress, side effect, sputum check schedule, etc.
- Distribute material supports (nutrition/ transport compensation)

Presentation: CSO meeting with DG WHO in Moscow and way forward in SEA Region

In another presentation on the same subject, participants were updated on the outcome of CSO meeting with DG WHO in Moscow and the way forward in SEA Region based on the discussions. Providing these updates, Ms Blessi Kumar said that civil society has been at the forefront in promoting and providing prevention, diagnostics, treatment and patient support and care of

numerous health issues. Civil society and communities have an invaluable role in the achievement of the UN Sustainable Development Goals (SDGs), especially the End TB Strategy. She emphasised that there is a need to move from an exclusive biomedical approach to one that is people and community centred, human rights based and gender sensitive.

The civil society will work together with WHO, Stop TB Partnership and other key stakeholders to

- ensure that all of WHO's mandate on TB is informed by civil society and affected communities
- prioritise investment in community systems and civil society strengthening
- and promote transparency, accountability, equity and sustainability

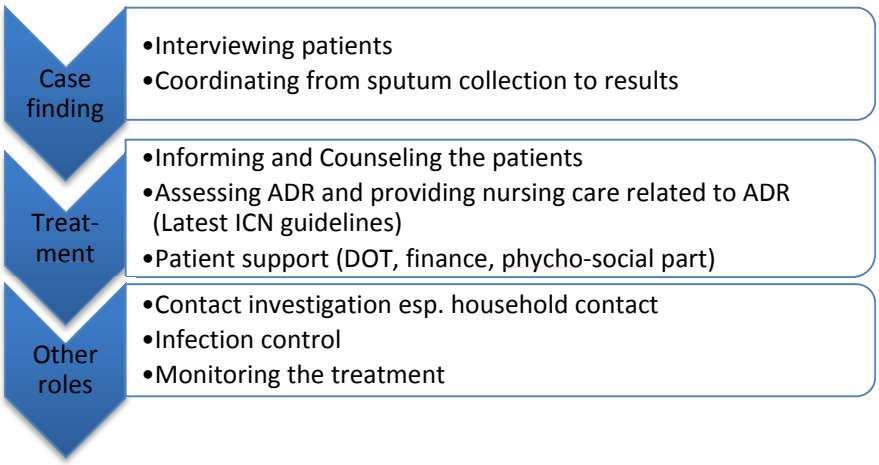
Some of the key asks of civil society from DG WHO were

1. The DG provides his vision of civil society engagement in TB programmes with all WHO offices globally
2. A letter from the DG to ensure:
    - WHO regional offices and country offices involve community representative in regional platforms, events such as NTP managers meeting, rGLC, Regional Advisory Groups etc.
    - WHO national and sub national involve community representatives in TB programme reviews, missions, meetings etc.
    - Ensure that all RO and CO create awareness and promote all WHO guidance and policies including WHO ethics guidance to implementing the End TB Strategy
    - Introduce various networks and coalitions working on TB such as Africa Coalition on TB (ACT), Activists Coalition on TB Asia Pacific, Global Coalition of TB Activists (GCTA), TB Europe Coalition etc.
3. WHO should demonstrate its commitment towards the meaningful engagement of CS and communities through adequate investment and resource mobilisation to build the capacity of CSOs

<u>Presentation:</u> Role of nurses in programmatic management of drug-resistant TB (PMDT) – updated guidelines from International Council of Nursing

Ms Sirinapha Jittimanee, representing the nurses' constituency at the rGLC presented the process of development and contents of the recent updated guidelines on role of nurses in PMDT. ICN collaborates with UCSF and the Heartland National TB Center and other nurse leaders in many countries to develop the nursing guide for managing ADR to the DR-TB treatment. The key role of nurses in PMDT as envisaged in the guidelines are summarised in figure 3:

Figure 3: Role of nurses in PMDT



It was informed that the guidelines cover more component of drug resistance TB than the earlier ICN version. Job description of the nurse practitioners, including provision of injections and treatment observation, is included. Daily adverse drug reaction (ADR) checklist has been developed so that nurses can record their assessment.

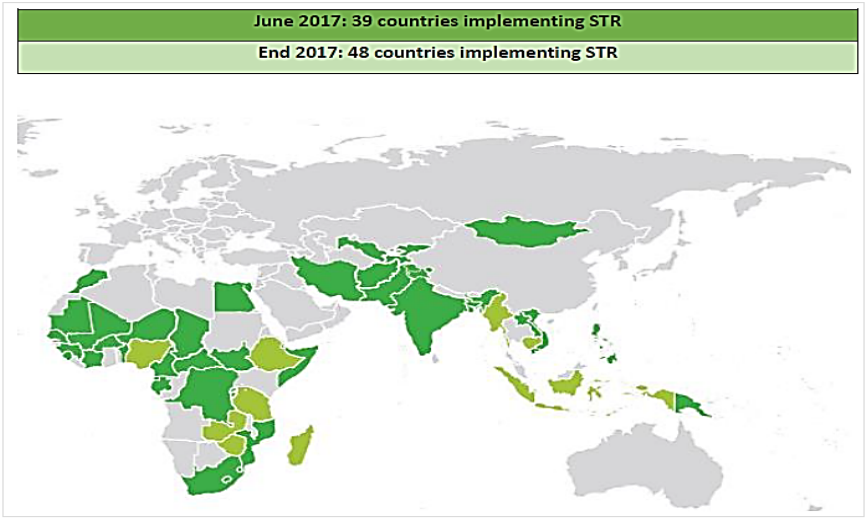
Session 2: Preparing for introduction of shorter MDR-TB regimen

Presentation: New drugs and regimens: the transition in practice

Dr Agnes Gebhard, KNCV, presented the global picture on new drugs and shorter regimen. Referring to STREAM 1 Preliminary results made public in Oct 2017. She said that the 9-month regimen performed well, similar to the control arm, despite stricter criteria and longer follow-up. Also quoting the Union Cohort Study report Dec 2017, it was informed that the study results support the use of the shorter regimen recently recommended by the WHO, even among HIV positive patients. In this study, 200/1006 (19.9%) MDR-TB patients included were HIV positive (with 88.8% on ART). Out of these, 728 (72.4%) got cured and another 93 reported treatment completed, making it a 81.6% treatment success rate.

Quoting information available through the Triage task force of the Global Drug-resistant TB Initiative (GDI), 48 countries have started implementing shorter regimen by end 2017

Figure 4: Implementation status of shorter regimen



Gathered by GDI Triage TF from data sources: GDI DR-TB STAT TF, CTB, The UNION and rGLCs

http://www.stoptb.org/wg/mdrtb/taskforces.asp?tf=2

Some of the challenges being faced globally in expansion of new drugs and shorter regimen are

- **Delays in uptake of new drugs and regimen**:
  - Initial lack of firm WHO guidance
  - Concerns about drug wastage while transitioning from longer to shorter regimen
  - Lengthy country reviews of STR protocol and specifically concern of resistance to other first line drugs (H, E, Z)
  - Apprehensions about other adverse drug reaction (ADRs), e.g., QT prolongation

- **Limited human resource (HR) capacity:**
  - New tasks need HR addition and capacity building
  - Limited capacity of treatment observers
  - No experience in interpretation of DST results

- **Limited access to diagnostics and treatment**:
  - SL-LPA and SL DST: Only 1-2 centers during pilot and hence treatment limited to specific places
  - An efficient specimen collection and transport not yet established in several countries
  - Monitoring tests: ECG, audiometry, etc. not widely available or used for MDR-TB patients

- **Lacking information on:**
  - differences between phenotypic and genotypic DST
  - lack of information on the proportions of SL drug resistance among MDR patients

- **Treatment:**
  - Active role of treatment council for individualized regimen if not eligible for STR
  - Capacity for undertaking aDSM

- **Drugs:**
  - Quantification of drugs e.g. lack of information on percentage patients eligible per regimen, combined with expansion of PMDT

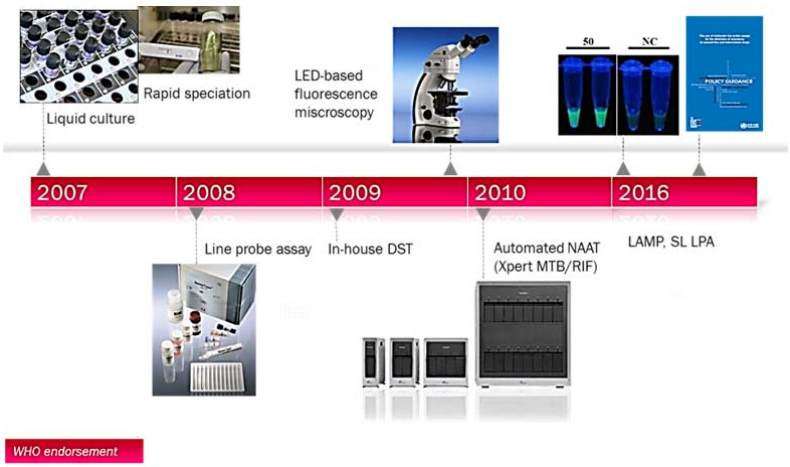
- **Ethical dilemmas**
  - How to explain to patients who just started the longer regimen

For the South-East Asia Region, it was proposed that rGLC to develop overview of capacity for triage approach in the Region in order to target advocacy and TA

Presentation: New diagnostic tools for PMDT

Dr C N Paramasivan, laboratory expert, presented updates on the diagnostic tools available and WHO policy recommendations. He stated that diagnostic algorithms should start with appropriate screening policies to identify persons at risk. New, rapid WHO-recommended tests should be prioritised in persons with risk factors for drug resistance and/or persons with HIV co-infection. He emphasised that for laboratory planning 'One size does not fit all' because recommended diagnostics are not mutually exclusive and should be combined based on country epidemiology, the existing laboratory network and available resources

Figure 5: Timeline of approval of new diagnostics for TB by WHO and policy guidelines



Implementation of any recommended diagnostic requires all core laboratory components to be in place. There is a need for drug-susceptibility testing (DST) to be accurate and reproducible for detection of MDR-TB and XDR TB. For first-line drugs other than isoniazid and rifampicin , DST is problematic and the clinical relevance of results are unclear.

Even with new, rapid diagnostics, conventional laboratory

capacity (microscopy, culture and DST) must be maintained for monitoring patient response to treatment and detecting resistance to drugs other than rifampicin. Scale-up of diagnostic capacity must be matched with access to appropriate treatment and care

Presentation: NITRD experience with use of shorter regimen and newer drugs

Dr Rohit Sarin, Director, National Institute of Tuberculosis and Respiratory Diseases (NITRD), Delhi, shared his institute's and country experience in implementing newer drugs and shorter regimen.

Bedaquiline (bdq) has been available under the conditional access programme. The first patient was enrolled on the drug in June'16. Currently, the drug access has been expanded to 21 DR-TB centers in 5 states and nearly 1000 patients initiated on bdq containing regimen across the country out of which 155 have been put on treatment at NITRD. A request for 3500 bdq courses under the USAID Bdq donation programme was placed in 2017.

A total of 155 patients have been placed on bdq treatment at NITRD till December 2017. Out of those initiated on treatment so far, sixteen pts have died on treatment – most deaths are in the initial months due to poor general condition.

As far as pharmacovigilance is concerned, mechanism to capture the ADRs with newer drugs exist in the country. Training has been provided to various categories of health cadre but gaps exists in reporting.

So far, total ADRs reported in bdq regimens -80

- Attributed to bdq -41
- QTc Prolongation -16
- 18 serious adverse events and 23 non serious adverse events were reported

Shorter Regimen: 62 patients have been started on shorter regimen till December 2017.

Table 1: Drug resistance pattern (N=62)

Drug Resistance pattern	No of patients
Rif mono-resistance (CBNAAT/LPA)	**16**
Rif and INH (LPA)	**44**
Rif and INH Sensitive (Clinical failure)	**2**

Deaths during Treatment

So far 2 Deaths have been reported among patients on shorter regimen

- One due to Dyselectrolytemia
- Another patient died at home where reason is not known

Challenges:

- Co-ordination Issues with laboratory for 2nd line liquid culture reports, and follow-up cultures
- Follow-up investigations once the patient is in field , it is difficult to retrieve patients for timely investigations
- Increased work load on the lab due to increased frequency of testing
- Adherence issue.
- Demand for frequent treatment modification.
- Difficult patient retrieval
- Bdq drug storage issue at DOT-Centre

Presentation: Adverse events monitoring and management at Persahabatan hospital

Dr Erlina Burhan, Persahabatan hospital, Jakarta made a presentation on bdq implementation and results of treatment.

Table 2: Bdq patients enrollment (Sept 2015 – Dec 2017)

Data	RSHS	RSDS	RSP	RSP Dr. Goenawan Cisarua	RSU Islam Jakarta	RSUP H. Adam Malik	RSUP Dr Kariadi	National
Number of Presumptive Pre/XDR Patient	45	27	179	76	3	112	3	445
Presumptive Pre/XDR Patient fit with Inclusive	7	27	41	6	3	6	2	90
Presumptive MDR Patient fit with Inclusive	27	41	10	0	29	0	2	109
Total refused Bedaquiline enrolment	1	13	33	3	3	0	0	53
total eligible patients	35	81	84	9	35	6	4	254
Number of patient on Treatment	34	68	51	6	32	6	4	201
Enrolment rates	97%	84%	61%	67%	91%	100%	100%	79%

*RSHS, RSDS, RSP, RSU, RSUP are various categories of hospitals. The full forms of these abbreviations are in Bahasa

Table 3: Treatment results (September 2015 – December 2017)

	Total patients	Percentage
Died	16	8.0 %
Cured	8	4.0 %
Treatment failure	6	3.0 %
Change of regimens (conventional)	7	3.5 %
loss to follow up	24	11.9 %
on treatment	140	69.7 %
Total patients enrolment bdq	**201**	**100%**

Main challenges being faced in implementation of bedaquiline containing regimen in Indonesia are

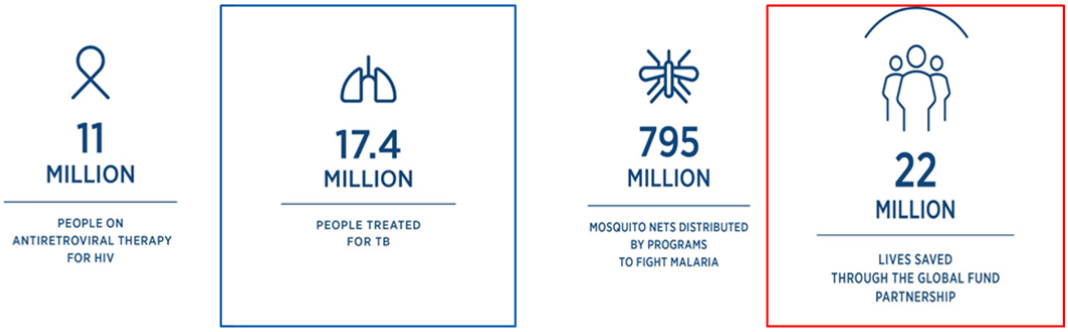
- Prolonged drugs registration procedures that need lot of paper work.
- No active Pharmacovigilance (PV) system in place. However some of the steps have already been included, that include
    - Integration of eTB manager and e-MESO software
    - Process of reporting if being changed from passive to active but needs time to adapt
    - Involvement of National Agency of Drug and Food Control (BPOM) is crucial for long term PV
- Initially there was low intake of new patients on treatment because of the need for patient to stay at the place of initiation of treatment. With expansion of treatment sites, this has largely been resolved
- There is a need for robust monitoring and information system that is not currently available
- Provision of more socio-economic supports and protection for all patients on second line treatment
- Availability of second line DST test is limited in the country

Session 3: Funding and commodity support for PMDT in the Region

Presentation: Global Fund perspective on PMDT expansion and rGLC support under the new MoU

Dr Mohammed Yassin, the Global Fund (GF), provided the GF perspective on expansion of PMDT services in the Region and the support available to Member Sates of SEAR. The GF has now a grant portfolio of US$ 4 billion per year for all three diseases – HIV, TB and Malaria. This has resulted in substantial savings of lives across the world.

Figure 6: Outcome of the GF investments



Dr Yassin, then informed the audience about funding requests for DR-TB across 2 cycles (upto 2017 and from 2018 onwards). For 52 countries being funded on DR-TB, there has been an 11 % increase in requests

Figure 7: MDR-TB funding request in two GF funding cycles

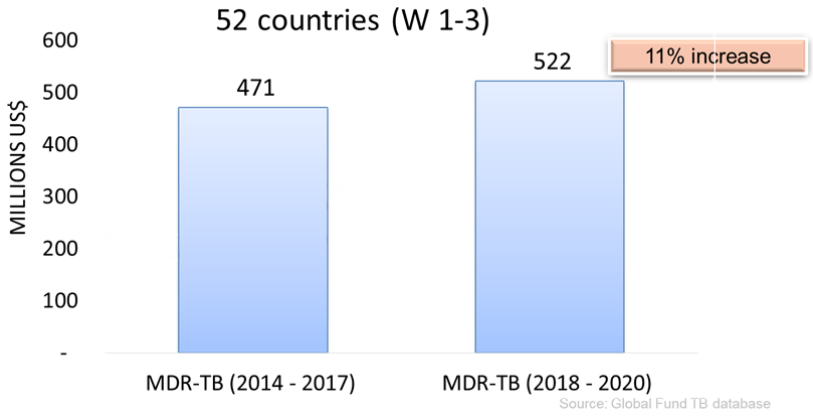
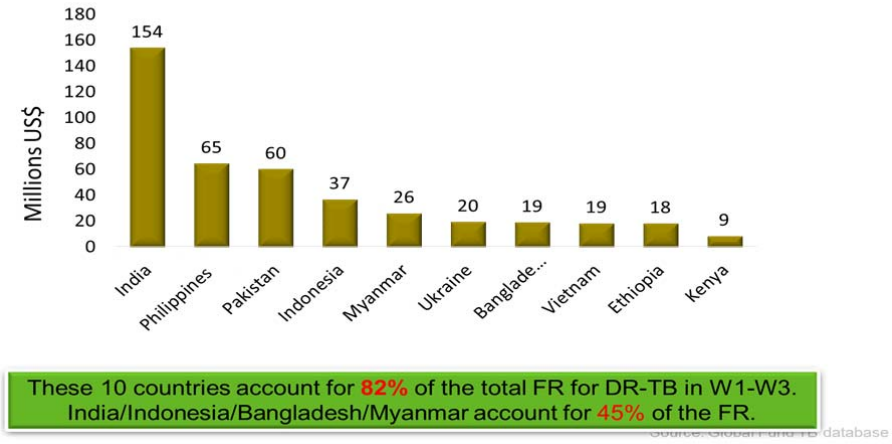
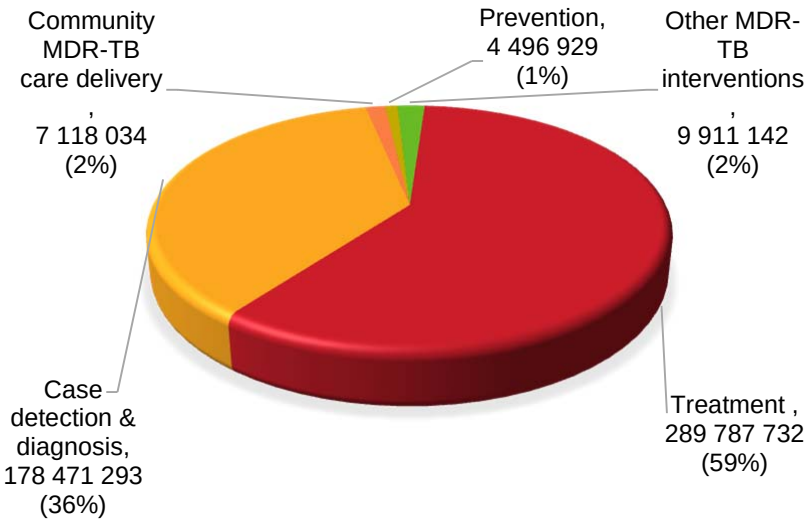


Figure 8: The top 10 countries with funding request for DR-TB



A major part of the funding request is for treatment of patients (59%) followed by case detection and diagnosis (36%). Community care and delivery occupies 2% of the proportion

Figure 9: Funding Request for DR-TB by intervention areas – 2018-2020



The meeting participants were also informed about some of the lessons learnt from the technical review panel's (TRP) assessment of Global Fund country proposals, specifically the DR-TB component. These include:

- Expansion of GeneXpert continuing quickly but optimization of use still needed
- Countries moving slowly on MDR-TB diagnosis - hence targets not reached.
- Most countries are moving to STR, a few holding back for lack of SLD–DST.
- TRP encourages prioritizing STR as capacity for SLD–DST is built for treatment optimization and better patient outcomes.

Key messages from the Global Fund for transition to STR and GF position

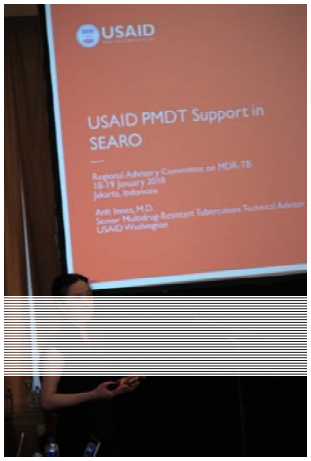
- GF encourages countries to transition to STR - multiple advantages to patients, NTPs and the health system.
- Savings/gain from transitioning to STR is more than the costs of old drugs which will be "wasted".
- Need to coordinate support to countries – GF, USAID, WHO, GDF during preparation of transition plans, implementation and monitoring.

Technical support available for PMDT

- In addition to funding TA through grants, support available through rGLCs as part of the MOU between GF and WHO
- The GF contribution to rGLC mechanism is part of cost-sharing and complementary to support available from USAID and other sources
- The GLC MOU has been revised several times based on lessons learned and roles/responsibilities of rGLCs evolved

Presentation: USAID support for PMDT in the SEA Region and potential for future collaboration

Dr Anh Innes, USAID Washington, presented the available support from USAID for MDR-TB related activities globally and for the Region. She informed that in December 2015, the U.S. Government released a 5-year *National Action Plan for Combating Multidrug-Resistant Tuberculosis* (*National Action Plan/ NAP)* . The U.S. NAP builds on the Government's domestic and global TB strategies, as well as the WHO's End TB Strategy. The goals of the NAP are:



1. Strengthen domestic capacity to combat MDR-TB
2. Improve international capacity and collaboration to combat MDR-TB
3. Accelerate basic and applied research and development to combat MDR-TB

Targets for 2020 under the NAP:

- Initiate appropriate treatment in 50% of patients with MDR-TB in 10 countries with the highest burdens of MDR-TB
- Reduce global TB incidence by 25% compared to 2015 levels
- Successfully treat >16 million TB patients in high-burden countries
- Achieve/maintain Rx success rates of 90% for DS-TB in high-burden countries

As part of a NAP milestone and to address the challenge of MDR treatment side effects, USAID developed an ancillary care package designed to define essential services needed to support patients during treatment.

USAID has 22 priority countries that receive bilateral funding. Technical assistance support also includes other countries receiving Global Fund grants for TB. SEAR priority countries include Bangladesh, India, Indonesia and Myanmar.

TB and MDR-TB activities in the region funded through Washington and Mission-managed projects USAID's flagship TB project Challenge TB (CTB) currently being implemented in Bangladesh, India, Indonesia and Myanmar.

CTB supports PMDT implementation, tracking progress in PMDT scale-up to inform activities at the country and global levels.

Table 4: Country Snapshots: CTB support of PMDT

Bangladesh	• Supporting the programmatic implementation of the shorter treatment regimen (STR) for MDR-TB • Providing social support package to DR-TB patients in 19 selected districts and 4 City Corporations
India	• Embedded consultants in RNTCP PMDT Unit provide comprehensive support for diagnosis, treatment, pharmacovigilance and monitoring and evaluation • Engage private sector on patient-centered care through early diagnosis of DR-TB and linkage of patients to public sector across three states – Maharashtra, Odisha, and Uttar Pradesh
Indonesia	• Provided TA to scale-up and decentralize MDR-TB care, improve linkage to care and

	improve PMDT quality through benchmarking and interim cohort assessments. • NTP used self-assessment and quality improvement in all PMDT hospitals throughout Indonesia and introduced the PMDT benchmarks to 52 PMDT hospitals in 34 provinces
Myanmar	• Supporting case detection for MDR-TB in Yangon, which has 50% of MDR-TB cases in the country. • Xpert MTB/RIF optimization and specimen transportation pilot • Xpert MTB/RIF for all presumptive TB patients pilot • MDR-TB contact investigation (homes and communities) in 13 high burden townships of Yangon Region.

Bedaquiline Donation Programme - Innovative public-private partnership between USAID and Janssen Therapeutics

- 30,000 treatment courses of bdq have been donated
- Approximately 100 low- and middle-income countries eligible to participate.

USAID is also providing technical assistance to strengthen the quality of MDR-TB programs and pharmacovigilance systems.
As of December 2017, more than 60 countries have ordered Bedaquiline through the Donation Program.
Support is being provided to NTPs in all areas of PMDT including:

- Update current DR-TB treatment guidelines to reflect new regimen and drugs
- Development of clinical protocols, reporting tools
- Enhance capacity for Active TB drug safety monitoring and management (aDSM)
- Assist with the drug quantification and forecasting
- TB lab/diagnostic capacity for SLD DST, to screen out pre- and XDR-TB cases
- Provide training to all staff

MDR-TB Consultants

The project was started in January 2017, and is being managed through UNOPS/Stop TB Partnership Consultant roster. The rationale behind establishing this pool is:

- Limited capacity at country level for clinical and programmatic expertise to translate WHO guidelines into implementation
- Need for experienced consultants with strong clinical MDR TB management experience to work with countries' NTPs and guide or assist on implementing required elements for STR and ND introduction

In the SEA Region, MDR-TB advisors are present in Bangladesh and Myanmar. These MDR-TB advisors are embedded in the NTPs to provide technical expertise and guidance on initiation and expansion of PMDT (diagnosis, treatment, prevention) in context of Global Fund grant implementation.
In Bangladesh: Advisor assembled key stakeholders from the government, local NGOs and implementing partners to discuss training needs, patient criteria for the STR; and to define the division and district-wide implementation approach.

In Myanmar: Advisor works closely with the NTP to support ND and STR introduction/implementation; train on management of adverse events; strengthen DR-TB case detection (Yangon); PMDT site monitoring

Another country in the Region being supported through USAID funding is Nepal, where the following areas have received TA through this project:

- Transition from conventional MDR-TB regimen to ND and STR
- Implementation plan for aDSM drafted
- SOPs for diagnostic procedures, equipment and maintenance, staffing and HR development; HR development plans, costed transportation and logistics strategies, and supply management standards

Presentation: PSM achievements and challenges in the SEA Region - availability of SLDs including Paediatric formulations

Ms Zaza Munez, GDF provided an overview of achievements and challenges relating to procurement and supply management (PSM) of new drugs and shorter regimen

Role of GDF in the introduction of new tools: value-adding package of services

- Coordinates Procurement and Market-Shaping Action Team (TPMAT) work on Policy guidance to accelerate uptake of new medicines introduction:

  - GF guidance on medicines policy wastage for SLDs/STR and paediatric formulations;
  - WHO guidance on Importance of accelerated paediatric FDCs;
  - Provides accurate forecasts for production planning of all products and ensures medicines at lowest-possible and sustainable prices;
  - Strategic rotating stockpile – to accelerate orders and improve lead times;
- Provides flexible procurement fund - bridge for procurement costs when funds not readily available;
- Provides technical assistance to the national TB programs and partner organizations in regards to:
  - Develop different scenarios of implementation to assist in the countries' decision
  - Develop and implement transition plans including rational phase-in/phase-out plans and coordinate approval for accelerated uptake;
  - Capacitate country teams on PSM and establish functional systems for early warning and forecasting-quantification for all TB medicines;
  - Revise/adjust procurement/legal documents for state financed programs;

Global Fund Co-Financing and Transition has been and will continue to be a challenge. As countries take on more responsibility for funding their own programmes, including purchasing commodities, it is likely they will revert to their own procurement practices. These practices may prevent them from procuring in the international quality assured market. This could result in countries using non-quality assured products, losing access to GDF pricing, failed tenders due to small volumes or lack of

suppliers, using non-optimized formulations, etc. all of which could result in poor treatment outcomes for patients. GDF will commission a landscape analysis report (mapping) on funding transition and local procurement to better understand the status and challenges in priority countries; Report with recommendations on actions and eventual changes needed in procedures and policies for GDF, GF and partners; Convene regional stakeholders meetings to discuss funding and procurement options; risk management/action plans for priority countries. GDF has been working to assess lessons learned and best practices from countries that have already transitioned or currently have significant co-financing requirements for commodities. GDF will continue to monitor the implementation of these requirements and work closely with partners to identify and implement mitigation actions.

Table 5: Some key challenges and way forward in the introduction of new TB drugs and regimens

Key Issues	Ways to Address
Programs place orders by cohort resulting in several adjustments of orders (preponement/postponement)	***More frequent orders: biannually!*** *Programs will have multiple deliveries to have flexibility in orders.* *Minimize adjustments of orders by timely and accurate quantifications*
Limited information on **co-financing** and procurement transitioning	*Understand transition plans and its impact on procurement ensuring no supply gap* *Plan for procurement of QA products using domestic funding, including changes in tenders, national laws and regulations*
Lack/unreliable data quality for quantification and development of rational phase-in/phase-out planning	*Review/improve current process of recording and reporting* for medicines and also for cases *Use of standard tools for quantification and supply planning, e.g., QuanTB* *Regular review and update of transition plans*
Insufficient PSM support on diagnostics	*Capacity building and external specialized consultancy*
Insufficient information on the IPT for LTBI, Rifapentine use and DR-TB formulations for kids	*Regular data collection on case enrollment and expected cases* *Reviewed and updated supply plans*

<u>Presentation:</u> Global aDSM implementation survey results

Dr Kefas Samson, WHO HQ presented the findings of aDSM survey conducted globally. The data was collected from 44 from High burden countries and 34 from non-high burden countries.

AFR (35): Algérie, Angola, Botswana, Burkina Faso, Burundi, Cameroon, Cap-Vert, Congo, Ethiopia, Gabon, Ghana, Guinée, Guinée-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritanie, Moçambique, Namibia, Nigeria, République Centrafricaine, République Démocratique du Congo, Rwanda, Sierra Leone, South Africa, Swaziland, Tanzania, Tchad, TOGO, Uganda, Zambia, Zimbabwe.

AMR (18): Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Venezuela.

EMR(3): Afghanistan, Pakistan, Somalia.

EUR (5): Azerbaijan, Belarus, Kyrgyzstan, Moldova, Uzbekistan.

SEAR (10): Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Sri Lanka, Thailand, Timor-Leste.

WPR (7): China, LAO, Mongolia, Philippines, PNG, Solomon Islands, Viet Nam.

Some of the specific findings from SEAR were

Figure 10: Ancillary test availability in SEA Region

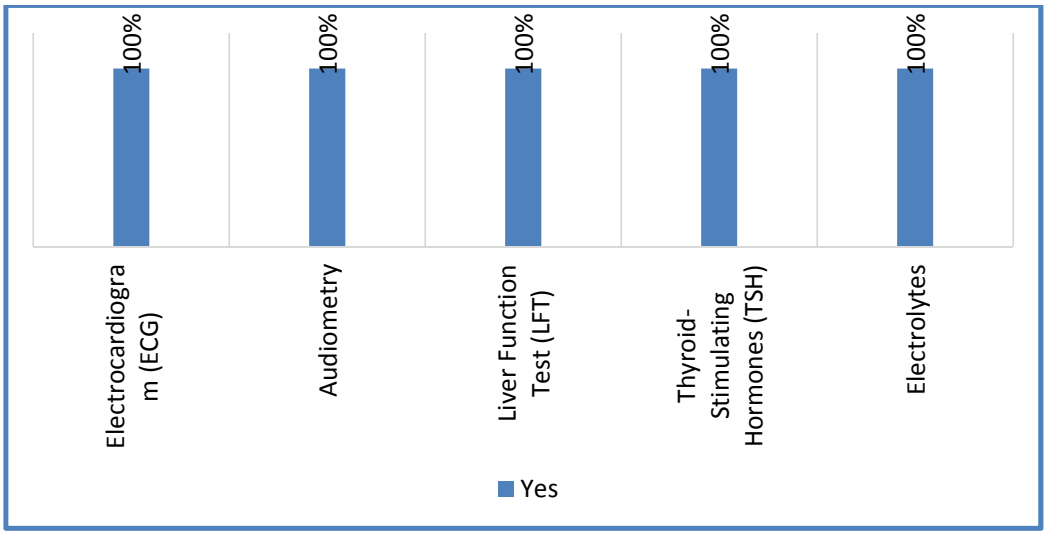
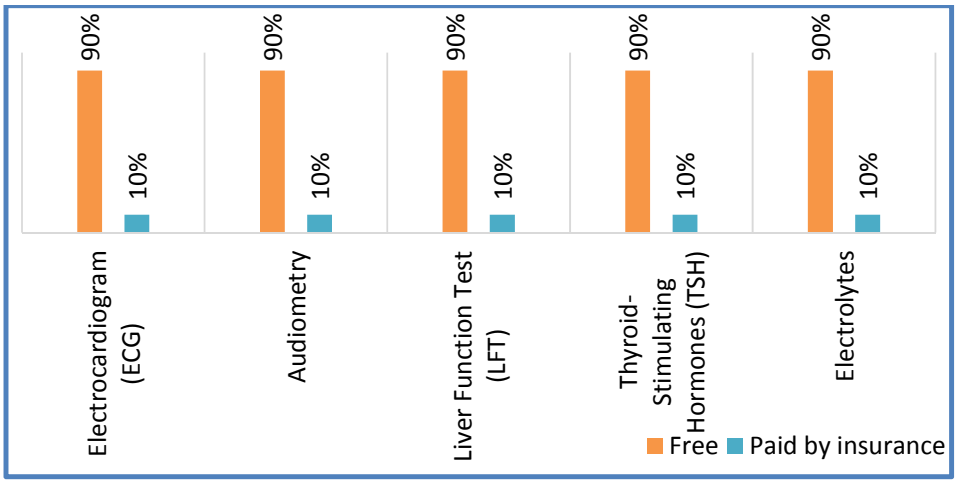


Figure 11: Payment for the tests to monitor adverse events in SEAR



Conclusions of the aDSM survey

- aDSM is a critical requirement for successful implementation of the most recent WHO recommendations on MDR-TB treatment with shorter regimen and new drugs;
- Regional and country variation in test availability and payment modalities for the tests;
- Globally, key aDSM tests are available in at least 86% of countries surveyed;
- Patients directly bear the cost of aDSM tests in about 10% of the countries surveyed;
- 100% of SEAR countries surveyed indicate that aDSM tests are available;
- 90% of SEAR countries surveyed provide aDSM tests free of charge to patients
- There is need to scale up efforts in ensuring uninterrupted access to aDSM tests globally,
- There is need to scale up advocacy to eliminate cost borne directly by patients to access aDSM tests.

Day 2

Session 4: Presentations by the high TB burden countries of the Region

1. Progress towards universal DST (FL and SL)–achievements, barriers and actions
2. Implementation status update, barriers and actions, future plans in SEARO countries, for
   a. Roll out of Shorter regimen , bdq and dlm
   b. aDSM mechanisms

Bangladesh: Presentation by Dr Nazis Arefin Saki

Progress towards Universal DST

Achievements

- Rapid expansion of Xpert sites
- Introduction of new algorithm for testing presumptive TB cases by Xpert
- Four culture laboratories are fully functional and two in pipeline
- SL-DST for all RR-TB cases
- Government facilities outside NTP setting are being explored
- Funding for LPA is secured under Government budget

Table 6: Plan of Expansion for Laboratory Services

	2017	2018	2019	2020
GeneXpert	51	163	213	453
LPA – first line	1	1+1	3+1	3+1
LPA – second line	1	1+1	3+1	3+1
Culture and DST– first line	4	5+1	5+1	5+1
Culture and DST– second line	1	2+1	2+1	2+1

Table 7: DR-TB treatment

	2017	2018	2019	2020
Shorter regimen	283+211 =494	1080	1296	1548
Longer regimen	424	68	84	84
Pre-XDR/ Co-morbidity	43	158	216	257
XDR	5	8	10	9

Table 8: New Drugs

	2017	**2018**	**2019**	**2020**
Bedaquiline	89	96	135	160
Delamanid	60	68	91	106
Bedaquiline and Delamanid	16	-	-	-
Total	165	164	226	266

Table 9: aDSM mechanism

Status	Jointly working with National PV centre under DGDA
Data collection tool	Available
National database established	Ongoing
Training material	Available
Staff trained	Partial
Funding for aDSM	No separate funding
Tests for adverse events free	Reimbursment

DPRK: Presentation by Dr Choe Kum Song

Progress towards universal DST

- FL-DST conducted to retreatment failures and relapse cases only
- No of FL-DST conducted increased 4 times in 2016 compared to in 2015(336 in 2015 to 1394 in 2016)

Table 10: Plan of expansion for laboratory services

	2018	**2019**	**2020**
GeneXpert	20600	20300	20900
LPA – first line	18600	17300	16900
LPA – second line	3000	2800	2700
Culture and DST – first line	1300	1500	1700
Other technologies (MODS)	1300	1500	1700

Table 11: MDR-TB treatment

	2017	2018	2019	2020
Shorter regimen	0	500	900	1080
Longer regimen	1732	2200	1100	1120

Table 12: New drugs

	2017	2018	2019	2020
Bedaquiline	25	50	50	50
Delamanid		50	50	50

aDSM mechanism

- Availability of data collection tool - R&R forms available for collecting ADRs
- National database established - Still in the pilot phase of using data collection tool
- Training material available - Training material developed
- Staff trained - Staff in one pilot sites trained on use of data collection tool

India: Presentation by Dr V S Salhotra

Implementing universal DST

Phase 1 – 19 states implementing UDST since Aug '17

Phase 2 – all remaining states directed to start UDST from Jan '18

With installation of additional 507 CBNAAT

4 states need to use FL-LPA till more machines are provided in future

Table 13: Plan of expansion for laboratory services

	2017	2018	2019	2020
Rapid molecular test	703	1335	1835	2335
LPA – first line	55	55	55	55
LPA – second line	55	55	55	55
Culture and DST – first line	80	95	110	125
Culture and DST – second line	40	55	70	85
Other technologies (WGS)	-	6	6	6

Table 14: MDR-TB treatment

	2017	2018	2019	2020
Shorter regimen	72	36500	56600	66200
Longer regimen	39928	22900	14500	16600
Total	40000	59400	71078	82800

Table 15: New drugs

	2017	2018	2019	2020
Bedaquiline	**982**	**4620**	**5390**	**6000**
Delamanid	**-**	**400**	**1150**	**1800**

aDSM mechanism

- aDSM strengthened at bdq implementing sites and a pre-requisite for bdq and shorter regimen expansion.
- aDSM implemented for DR-TB through Nikshay-CEM for all cases
- Data shared from Nikshay to Vigiflow (PvPI) via electronic bridge
- Availability of data collection tool - CEM treatment initiation and review forms filled on paper and updated in Nikshay from DR-TBC
- National database established - through Nikshay
- Training material available - Yes, integrated with PMDT trainings
- Staff trained - integrated with the ongoing PMDT trainings
- Funding for aDSM - via annual programme plans and budgets.
- Tests for adverse events free - via health system or outsourced.

Indonesia: Presentation by Nurjannah

Progress towards universal DST (1)

- 14 laboratories accredited for FL DST
- 512 xpert MTB Rif ® distributed to 491 HC/GX lab in 326 districts
- 9 laboratories accredited for SL DST
- 3 SL LPA lab staff trained that will establish additional capacity in 2018 and plans to train 4 more lab staff

Table 16: Plan of expansion for laboratory services

	2017	2018	2019	2020
GeneXpert	512	1043	1043	1043
LPA – 1st line	3			
LPA – 2nd line	3	7	7	7
Culture	25	40	46	46
C and DST 1st line	14	15	17	17
C and DST – 2nd line	9	*(SDP)**	*(SDP)**	*(SDP)**

Table 17: DR-TB treatment

Target of DR-TB Treatment	%	2017		2018	2019	2020
		Jan-Jun	Jul - Dec			
Target No. of patient		5,899 (40%)		10,657 (60%)	14,046 (70%)	16,212 (80%)
Shorter Regimen (Start – 09/ 2017)	80		2,360	8,526	11,237	12,970
Individual/ Conventional Regimen/ New Drugs (bdq, dlm, cfz, lzd)	20	3,539		2,131	2,809	3,242

Table 18: New drugs

	2017	2018	2019	2020
Bedaquiline (12%)	**425**	**1024**	**1349**	**1557**
Delamanid (5%)	**177**	**427**	**562**	**649**

aDSM

- aDSM has been introduced during the national workshop of STR.

- Starting in Sept 2017, in principle aDSM is in place for all MDR TB patients on treatment. However, on the job training is still needed to ensure effective monitoring and management of AEs during treatment.

Plan for aDSM:

- In collaboration with the Indonesian BPOM (NADFC) (in national and provincial level), to conduct training and monitoring for implementation of aDSM in all PMDT sites.

Myanmar: Presentation by Dr. Si Thu Aung

Progress towards universal DST

- FL-DST: Xpert criteria (all smear positive, all retreatment, TB/HIV, contacts of MDR-TB, TBDM, smear non converters, all registered cases in Yangon Region, EP specimens (CSF, gastric aspirate and lymph node aspirate)
- There are 73 Xpert machines
- SL-DST (by both phenotypic and genotypic)
    - DR-TB follow up patients whose month 3 culture results are positive
    - all rifampicin resistant patients who give consent to treat by STR
- New BSL-3 labs in Yangon and Mawlamyaing

Table 19: Plan for laboratory expansion

	2017	2018	2019	2020
GeneXpert	72	85	85	85
LPA – first line	2 (Ygn, Mdy)	3 (Ygn, Mdy, TG)	4(Ygn, Mdy, TG, Mawlamyaing)	4 (Ygn, Mdy, TG, Mawlamyaing)
LPA – second line	2	2	3	4
Culture and DST – first line	2	3	3	4
Culture and DST – second line	2	2	3	4
Other technologies (WGS)	1 (Yangon)	1 (Yangon)	1 (Yangon)	1 (Yangon)

Table 20: Plan for shorter regimen

	2017	2018	2019	2020
Shorter regimen	200	500	700	1000
Longer regimen	3100	2900	2700	2500

Table 21: New Drugs

	2017	2018	2019	2020
Bedaquiline	10	50	50	50
Delamanid	10	10	10	10

Thailand: Presentation by Dr Thidaporn Jirawattanapisal

TB laboratory network

- 1191 Light microscopy
- 84 LED microscopy
- 65 Culture Facility
- 23 FL DST, 3 SL DST (phenotypic)
- 100 Xpert MTB/RIF (next year 10 more planned). Out of 110
  - 103 machines are 4 modules
  - 7 machines are 16 modules
- 18 FL LPA, 3 SL LPA (SL LPA next year 15)

Shorter regimen for MDR-TB – Started with 7 hospitals and will be expanding soon to 21 sites in total

First 7 hospitals

1. Chest Institute, Department of Medical Services
2. Bamrasnaradura Institute, Department of Disease Control

3. Pranangkloa hospital, Nonthaburi province
4. Khonkan regional Hospital, Khonkan province,
5. Maharachnakhonratchasrima rehional hospital, Nakhonratchasrima province
6. Chonburi regional hospital, Chonburi province
7. Makarak district hospital, Kanchanaburi province

Expanded sites

Bangkok:

8. Tagsin Hospital

North: 4 hospitals

A. Chiang Mai province

9. Sanpatong district hospital
10. Nakhonping district hospital
11. Tuberculosis Center, Regional office of Disease Control,

B. Lampang province

12. Lampang Hosapital

South: 4 hospitals:

13. Nakhon Sithammarat hospital
14. Maharat Nakhon Srithammarat
15. Tasara district hospital
16. Toonsong district hospital
17. Sichon district hospital

Lower North: 2 hospitals:

Patchboon province

18. Petchaboon provincial hospital
19. Nongpai district hospital

North-East: 1 hospital:

20. Srisaket Hospital

13 cases were initiated on STR during 20 October to 1 December 2017

aDSM – Training held

1. In November 2017 for XDR-TB
2. In December 2017 for Shorter-MDR-TB

<u>Summary of barriers to expansion (based on country presentations)</u>

Common barriers to universal DST

- Limited lab capacity to diagnose pre-XDR and XDR cases by conventional SL DST or 2nd Line LPA
- Insufficient human resource capacity to undertake these tests, specifically second line DST
- Sputum transportation capacity making access to laboratory services difficult
- Issues with follow-up cultures of patients on treatment
- Delayed procurement and supply of cartridges and SLD through GDF and domestic sources
- Sub-optimal use of available GeneXpert machine

Common barriers to uptake of new drugs and shorter regimen

- Human resource capacity, specifically at peripheral level to administer drugs and manage patients on shorter regimen and new drugs
- Uncertain availability of drugs especially clofazimine for implementing Shorter Regimen
- Some countries face logistics challenges in quantification of drug needs for the transition phase
- Registration of new medicines is waived in most countries, specifically bdq under donation programme. However for long term suitability of supplies, all necessary approvals and registration process for all new/ repurposed drugs should be pursues
- Excessive caution among clinicians regarding expected side-effects of drugs and regimen

Common barriers to implementing aDSM

- aDSM policy has been developed in most countries but its implementation remains weak. It is because of lack of trainings, resource availability
- ECG and audiometry are not always available and even when available, these are not being routinely used to monitor patients
- Integration of software for programme management with those needed for aDSM

Session 5: DR-TB modelling – impact of interventions on incidence and potential gains

Presentation: Roadmap to ending MDR-TB in the WHO South-East Asia Region – modelling evidence

Achieving universal DST is being strongly advocated as a means to reach the End TB goals. However, this entails huge investments and therefore, questions are raised on the potential gains of undertaking this resource investment.

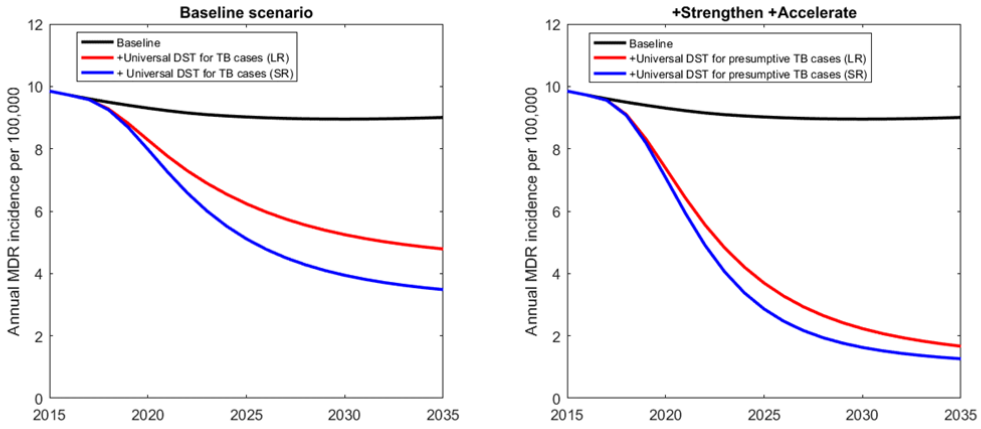
WHO SEARO in partnership with international experts is undertaking modelling exercises to provide evidence for potential gains of achieving universal DST.

The exercise is being undertaken with following objectives:

1. To establish timelines for countries to reach universal DST (coverage levels in a step-wise manner) which would mean also calculating the cost of delays in reaching those targets.
2. To compare costs and benefits of universal DST for TB cases v/s universal DST for all symptomatics. While latter is the ultimate goal, we may also be able to arrive at ideal costs of the DST test that would make it more beneficial by using such comparison
3. To compare any additional benefits of using shorter regimen on MDR-TB incidence (in addition to the known programmatic and cost benefits)
4. To provide an estimation of overall benefits of ending MDR-TB over the desired time-frame

The graphs below show potential reduction in MDR-TB incidence and mortality if universal DST is achieved

Figure 12: Modelling exercise on potential impact of universal DST on MDR-TB incidence (work in progress)



Baseline – current pace of activities extrapolated to future
Universal DST for TB cases means all TB cases starting on treatment undergo a drug-susceptibility test for first line drugs
Universal DST for symptomatics means all patients with symptoms suggestive of TB undergo a drug-susceptibility test for first line drug at the time of diagnosing TB

It is anticipated that by reaching the targets of universal DST for all TB cases, will lead to more than 50% reduction in incidence by 2035 if longer regimen is used and a 65% reduction if shorter regimen is used.

However ifs Universal DST for symptomatics is achieved, then a 83% reduction in MDR-TB incidence is possible by 2035 using longer regimen and a 87% reduction if shorter regimen is used

Similarly a 94% reduction in mortality due to MDR-TB is possible by using shorter regimen over and above what can be achieved with current efforts if all symptomatics undergo upfront DST.

(Disclaimer: The modelling exercise is work in progress and the potential results are illustrative examples only. For longer regimen, the current average of treatment success being achieved is considered while for shorter regimen, the available information from ongoing studies has been used)

Assumptions for modelling

- New and retreatment cases are not separated in the current model.
- Second line treatment is available only in NTP and engaged sector.
- Age specific disease burden is not considered in the model.
- Population growth considered as per UN prediction.

- Second-line treatment outcomes under programmatic conditions drawn from WHO reports.
- Epidemiological impact of early cure is achieved using shorter regimen.

Table 22: Potential reduction in incidence without background intervention and DST for all TB cases

In absence of background intervention	Reduction in incidence rate relative to 2015	
	2025	2035
Universal DST for TB cases (LR)	37%	51%
Universal DST for TB cases (SR)	48%	65%

*LR – longer regimen for MDR-TB; SR – Shorter regimen for MDR-TB

Table 23: Potential reduction in mortality with background intervention and DST for all TB cases

Strengthen + Accelerate at the background	Reduction in incidence rate relative to 2015	
	2025	2035
Universal DST for presumptive TB cases (LR)	62%	83%
Universal DST for presumptive TB cases (SR)	71%	87%

Table 24: Potential reduction in incidence without background intervention and DST for all TB symptomatics

In absence of background intervention	Reduction of MDR-TB mortality numbers w.r.t 2015	
	2025	2035
Universal DST for TB cases (LR)	36%	44%
Universal DST for TB cases (SR)	54%	62%

Table 25: Potential reduction in mortality with background intervention and DST for all TB symptomatics

Strengthen + Accelerate at the background	**Reduction of MDR-TB mortality numbers w.r.t 2015**	
	2025	**2035**
Universal DST for presumptive TB cases (LR)	73%	89%
Universal DST for presumptive TB cases (SR)	86%	94%

Conclusions based on modelling

- All countries need to move towards Universal DST for all TB cases at the earliest possible to have a substantial impact on the DR-TB incidence and mortality
- Use of shorter regimen leads to a greater decline in incidence and mortality vis-à-vis longer regimen
- Universal DST for presumptive TB cases along with use of shorter regimen will lead to achievement of MDR-TB goals in alignment with End TB strategy leading to

Potential gains of universal DST and simultaneous use of shorter regimen for MDR-TB

- > 2 million cases averted between now and 2035
- > 1 million deaths due to MDR-TB averted between now and 2035

Conclusion and recommendations

Recommendations for Member States

- Quick roll-out of first-line, and second-line LPA and DST for universal access. This should be part of the laboratory expansion plans and National Strategic Plans with a clear laid out time line and resource availability
- Organize consultative meetings along with all relevant stakeholders for discussing roll-out of shorter regimen as per defined timelines. The regimen should be made available to all eligible patients at the soonest possible
- Access to bedaquiline and delamanid needs to be improved in all countries for all eligible patients. Country-wise plans need to be prepared and monitored
- Along with introduction of shorter regimen and new drugs, countries to ensure that aDSM mechanisms are in place

Action points for rGLC members

- Create 'how-to' document/practical tips for providing care to DR-TB patients, specifically for nurses. Ms Sirinapha to take the lead in development of this document with support from interested partner organization/s
- To enhance visibility of the rGLC mechanism; editorial/commentary to be considered for publication; Dr Patrick Moonan to take the lead along with the chair of rGLC
- Further discussions are needed on role of rGLC in promoting support and rehabilitation for patients undergoing second-line treatment for drug-resistant TB. Ms Blessina Kumar will lead the discussions

Action points for rGLC secretariat

- Create database of key partners actively supporting PMDT activities in the Region and update periodically to include any upcoming meetings/trainings/workshops within the Region
- Continue video conferences and conference calls art frequency of about once in two months
- Increase pool of consultants with different technical areas to address the emerging needs of PMDT, e.g. aDSM, Infection Control. Secretariat to explore with USAID regarding tapping their pool of consultants for Regional needs
- Secretariat to initiate discussions with rGLC members on Centre of Excellence (CoE) for PMDT pertaining to the expectation from a CoE in terms of activities, expected basic/available capacity and infrastructure, possible support and certification process
- Update PMDT monitoring format to adopt some of the key monitoring indicators being used in EURO

- Subject to availability of funds, the Secretariat to coordinate conducting of following workshops
    - aDSM implementation
    - Laboratory capacity building for molecular diagnostics
    - Community engagement for strengthening TB response and a people centred approach

Agenda

1. Opening session and objectives of the meeting
2. Technical sessions
    a. Ending MDR-TB in the SEA Region
        i. Community engagement – key to success of PMDT
        ii. CSO meeting with DG WHO in Moscow and way forward in SEA Region
        iii. Role of nurses in PMDT – latest ICN guidelines
    b. Preparing for introduction of shorter MDR-TB regimen
        i. New drugs and regimens: the transition in practice
        ii. New diagnostic tools for PMDT
        iii. NITRD experience with use of shorter regimen and newer drugs
        iv. Adverse events monitoring and management at Persahabatan hospital
    c. Funding and commodity support for PMDT in the Region
        i. Global Fund perspective on PMDT expansion and rGLC support under the new MoU
        ii. USAID support for PMDT in the SEA Region and potential for future collaboration
        iii. PSM achievements and challenges in the SEA Region - availability of SLDs including Pediatric formulations
        iv. Global aDSM implementation survey results
    d. High TB burden countries presentations on
        i. Progress towards universal DST (FL and SL)–achievements, barriers and actions
        ii. Implementation status update, barriers and actions, future plans in SEARO countries, for
        iii. Roll out of Shorter regimen , bdq and dlm
        iv. aDSM mechanisms
    e. rGLC specific agenda
        i. rGLC activities in 2017 and SEA Regional response framework
        ii. Plan for 2018 – activities to strengthen lab capacity and capacity building for new PMDT guidelines
        iii. Enhanced engagement of rGLC members and improving partners' collaboration in the Region
        iv. Manuscript on rGLC
    f. DR-TB modelling – impact of interventions on incidence and potential gains
    g. Other areas discussed were
        i. Plan for 2018 – activities to strengthen lab capacity and capacity building for new PMDT guidelines
        ii. Enhanced engagement of rGLC members and improving partners' collaboration in the Region
        iii. Manuscript on rGLC
3. Conclusions, Recommendations and closing

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