THE THIRTEENTH MEETING OF THE SOUTH-EAST ASIA REGIONAL MDR-TB ADVISORY COMMITTEE (SEA RGLC)

2-4 FEBRUARY 2021
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Acronyms

aDSM active TB drug safety monitoring and management
Am amikacin
Bdq bedaquiline
BEAT-TB Building Evidence for Advance Treatment against Tuberculosis
BPaL (regimen comprising of) bedaquiline, pretomanid and linezolid
C&DST culture and drug susceptibility testing
CDC Centers for Disease Control and Prevention, Atlanta, USA
Cfz clofazimine
Cs cycloserine
DAT Digital Adherence Technologies
Dlm delamanid
DNA deoxyribonucleic acid
dOT directly observed treatment
DR-TB drug-resistant tuberculosis
DST drug susceptibility test
DS-TB drug susceptible TB
E ethambutol
Eto ethionamide
FQ fluoroquinolones
EQA external quality assessment
GF the Global Fund
GDF Stop TB Partnership’s Global Drug Facility
GDI Global Drug-resistant Tuberculosis Initiative
GX GeneXpert
HC health centre
H<sub>HD</sub> isoniazid high dose
KNCV Royal Dutch Tuberculosis Association
Lfx levofloxacin
LPA line probe assay test
Lzd linezolid
MDR-TB multidrug-resistant tuberculosis
Mfx<sub>HD</sub> moxifloxacin high dose
MoH Ministry of Health
MoU Memorandum of Understanding
NAAT nucleic acid amplification test
NGS Next Generation Sequencing
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>NRL</td>
<td>National Reference Laboratories</td>
</tr>
<tr>
<td>NSP</td>
<td>National Strategic Plan</td>
</tr>
<tr>
<td>NTP</td>
<td>National Tuberculosis Control Programme</td>
</tr>
<tr>
<td>NTRL</td>
<td>national tuberculosis reference laboratory</td>
</tr>
<tr>
<td>OR</td>
<td>Operational Research</td>
</tr>
<tr>
<td>PCR</td>
<td>polymerase chain reaction</td>
</tr>
<tr>
<td>PMDT</td>
<td>programmatic management of drug-resistant tuberculosis</td>
</tr>
<tr>
<td>PPM</td>
<td>public private mix</td>
</tr>
<tr>
<td>PV</td>
<td>pharmacovigilance</td>
</tr>
<tr>
<td>rGLC</td>
<td>Regional Green Light Committee</td>
</tr>
<tr>
<td>RR-TB</td>
<td>rifampicin-resistant tuberculosis</td>
</tr>
<tr>
<td>R&amp;R</td>
<td>recording and reporting</td>
</tr>
<tr>
<td>SEAR</td>
<td>South-East Asia Region</td>
</tr>
<tr>
<td>SLD</td>
<td>second-line TB drugs</td>
</tr>
<tr>
<td>SLI</td>
<td>second-line TB injectable</td>
</tr>
<tr>
<td>SNPs</td>
<td>single nucleotide polymorphisms</td>
</tr>
<tr>
<td>SNRL</td>
<td>supranational reference laboratory</td>
</tr>
<tr>
<td>STR</td>
<td>shorter treatment regimen (for RR-/MDR-TB) (if prefixed by “m”, it means modified STR)</td>
</tr>
<tr>
<td>TA</td>
<td>technical assistance</td>
</tr>
<tr>
<td>TB</td>
<td>tuberculosis</td>
</tr>
<tr>
<td>TPT</td>
<td>TB preventive treatment</td>
</tr>
<tr>
<td>TWG</td>
<td>technical working group</td>
</tr>
<tr>
<td>UHC</td>
<td>universal health coverage</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>VOT</td>
<td>virtual/video observed therapy</td>
</tr>
<tr>
<td>WGS</td>
<td>whole-genome sequencing</td>
</tr>
<tr>
<td>XDR-TB</td>
<td>extensively drug-resistant tuberculosis</td>
</tr>
<tr>
<td>Z</td>
<td>pyrazinamide</td>
</tr>
</tbody>
</table>
Background
The WHO South-East Asia Region (SEAR) accounts for an estimated 171,000 rifampicin-resistant tuberculosis (RR-TB) and multidrug-resistant tuberculosis (MDR-TB) cases emerging each year (WHO Global TB Report 2020). There has been a steady improvement in screening and enrolment of drug-resistant TB (DR-TB) patients with 70,120 RR-/MDR-TB enrolled on treatment in 2019. However, a slight decline in extensively drug-resistant tuberculosis (XDR-TB) enrolment to 2,008 patients was seen in the same year. The treatment success rate for RR-/MDR-TB patients remained at 52%, similar to earlier cohorts, and the treatment success for XDR-TB patients was only 37%.

The SEA Regional Green Light Committee (rGLC) has been undertaking technical assistance, capacity building and programme review missions in Member States. This has been a major challenge in 2020 due to the COVID-19 pandemic related travel restrictions that have been imposed.

The rGLC annual meeting provides an opportunity to review the mission reports and discuss the findings collectively, in light of the global recommendations that will help identify key areas to be worked on in the coming year.

The thirteenth meeting of the SEA rGLC (also called the “MDR-TB advisory committee”) was held virtually from 2 to 4 February 2021. Participation was invited from 11 rGLC members, MDR-TB focal points from national programmes of six high-burden countries and Nepal, the Global Fund, Stop TB Partnership’s Global Drug Facility (GDF), Stop TB Partnership and the US Agency for International Development (USAID). Out of the 11 members and one standing invitee, ten participated in the meeting for all three days, while one member could attend only for two days. The list of participants is attached at the end of the report along with the agenda of the meeting (Annexures 1 and 2).
Opening Session

Being a virtual meeting with limited time, the opening session was kept short and largely informal. The meeting was inaugurated by Dr Sunil Bahl, Acting Director of the Communicable Diseases Department, WHO/SEARO. Dr Bahl welcomed the participants and provided a brief overview of the Regional challenges in relation to DR-TB, specifically in the wake of COVID-19 outbreak in 2020. He recognised that the rGLC is an important regional platform for technical and funding partners to come together, discuss challenges and find out synergies for addressing the DR-TB situation in the Region. Partners can pool resources towards supporting Member States to address this important challenge as part of our efforts towards ending TB, a WHO flagship area for the SEA Region.

Dr Fraser Wares, Chair of the rGLC, and Ms Paran Sarimita Winarni, Vice-Chair of the rGLC, inaugurated the meeting and listed the objectives of the meeting. The Chair also spoke about the ground rules for the meeting and handling of various sessions to keep them within the allocated time.
Technical Sessions
Day 1: Presentations from high-burden countries

In this first technical session of the meeting, National TB Control Programme (NTP) representatives from the six high TB burden countries i.e. Bangladesh, Democratic People’s Republic of Korea (DPRK), India, Indonesia, Myanmar and Thailand, were invited to make presentations. Additionally, NTP representatives from Nepal were also invited to make a presentation. The speakers talked about their respective progress in DR-TB case notification, current capacity of drug-susceptibility testing (DST) for first-line (FL) and second-line (SL) anti-TB drugs with their plans for expansion, treatment regimens being used, community and private sector engagement, and overall plans for future. Some of the country-wise slides from the respective presentations are placed below for quick reference.

Overall, it is seen that while all countries have increasing targets for enrolment of DR-TB patients, there has been a dip in 2020 due to the COVID-19 pandemic and resultant restrictions imposed in various countries. Different countries have so far had varying impacts from COVID-19 and different levels of restrictions. Therefore, although the impact has been different across countries, at worst a 30% decline in notifications was seen due to the COVID-19 pandemic.

Countries have started expansion of DST services, although the pace of expansion is variable. In several countries, the capacity is not being matched with the programmatic needs for implementation of the shorter all-oral MDR-TB regimen (STR).

All countries have adopted the updated 2020 WHO guidelines, but the uptake of the oral STR has been slow till date. Community and private sector engagement are also variable amongst the countries. Where available, it is not always introduced at all levels of the programme.

1. Bangladesh

**Figure 1: Trends in RR-/MDR-TB case notification**
Figure 2: FL- and SL-DST capacity and plans for expansion

<table>
<thead>
<tr>
<th>Technology</th>
<th>Number of units (annual DST capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
</tr>
<tr>
<td>GeneXpert</td>
<td></td>
</tr>
<tr>
<td></td>
<td>350</td>
</tr>
<tr>
<td>Culture/DST</td>
<td></td>
</tr>
<tr>
<td>Solid Liquid 3</td>
<td></td>
</tr>
<tr>
<td>(25 000/ 6 650) *</td>
<td></td>
</tr>
<tr>
<td>Liquid 6</td>
<td></td>
</tr>
<tr>
<td>(45 000/12 000) *</td>
<td></td>
</tr>
<tr>
<td>Solid Liquid 7</td>
<td></td>
</tr>
<tr>
<td>(50 000/13 000) *</td>
<td></td>
</tr>
<tr>
<td>LPA</td>
<td></td>
</tr>
<tr>
<td>Line probe assay (LPA) 3</td>
<td></td>
</tr>
<tr>
<td>LPA 3 (2 400)</td>
<td></td>
</tr>
<tr>
<td>LPA 6 (2 880)</td>
<td></td>
</tr>
<tr>
<td>LPA 7 (3 360)</td>
<td></td>
</tr>
</tbody>
</table>
*(Culture/ DST capacity)

Figure 3: DR-TB regimens being used and plans for 2021

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Criteria for using the regimen</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2019</td>
</tr>
<tr>
<td>Oral shorter regimen</td>
<td>NA</td>
<td>0</td>
</tr>
<tr>
<td>Oral longer regimen</td>
<td>NA</td>
<td>0</td>
</tr>
<tr>
<td>Shorter regimen with injectable</td>
<td>NA</td>
<td>1 020</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(till September 2020)</td>
</tr>
<tr>
<td>Longer regimen with injectable</td>
<td>NA</td>
<td>223</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventive treatment among contacts</td>
<td>NA</td>
<td>0</td>
</tr>
</tbody>
</table>

NA – not available in the presentation

Status of engagement of communities/patient groups in DR-TB and the private sector:

- Once DR-TB is diagnosed, treatment is initiated from DR-TB treatment sites. Within 2-4 weeks, the patients are sent back to community for directly observed treatment (DOT). The DOT is done by a DR-TB DOT provider closer to patient’s home. NTP encourages referral of presumptive DR-TB patients and management of DR-TB from NTP assigned sites.
2. DPR Korea

Figure 4: Trends in RR-/MDR-TB case notification

<table>
<thead>
<tr>
<th>Year</th>
<th>Diagnosed</th>
<th>Enrolled</th>
<th>Target as per NSP</th>
<th>Estimated incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>1,515</td>
<td>1,732</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>1,782</td>
<td>1,487</td>
<td>2,500</td>
<td>5,200</td>
</tr>
<tr>
<td>2019</td>
<td>2,354</td>
<td>2,312</td>
<td>3,000</td>
<td>5,200</td>
</tr>
<tr>
<td>2020</td>
<td>1,902</td>
<td>640</td>
<td>4,500</td>
<td></td>
</tr>
<tr>
<td>2021 (plan)</td>
<td></td>
<td></td>
<td>6,100</td>
<td></td>
</tr>
</tbody>
</table>

Figure 5: FL- and SL-DST capacity and plans for expansion

<table>
<thead>
<tr>
<th>Technology</th>
<th>Number of units (annual DST capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
</tr>
<tr>
<td>Phenotypic culture (solid)</td>
<td>2</td>
</tr>
<tr>
<td>Phenotypic culture (liquid)</td>
<td>-</td>
</tr>
<tr>
<td>Phenotypic DST (solid) – first line</td>
<td>2</td>
</tr>
<tr>
<td>Phenotypic culture (solid) – second line</td>
<td>1</td>
</tr>
<tr>
<td>Phenotypic culture (liquid) – first line</td>
<td>2</td>
</tr>
<tr>
<td>Phenotypic culture (liquid) – second line</td>
<td>0</td>
</tr>
<tr>
<td>First Line LPA</td>
<td>1</td>
</tr>
<tr>
<td>Second Line LPA</td>
<td>1</td>
</tr>
<tr>
<td>GeneXpert</td>
<td>14</td>
</tr>
</tbody>
</table>
**Figure 6: DR-TB regimens being used and plans for 2021**

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Criteria for using the regimen</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral longer regimen</td>
<td>Recommended to RR-/MDR-TB patients</td>
<td>71, NA, NA</td>
</tr>
<tr>
<td>Shorter regimen with injectable</td>
<td>Recommended to RR-/MDR-TB patients who were not previously treated with second-line drugs and in whom resistance to FQs and second-line injectable agents was excluded or is considered highly unlikely</td>
<td>100, NA, 4 880*</td>
</tr>
<tr>
<td>Longer regimen with injectable</td>
<td>Unless constant provision of medicines used in the longer full oral regimen guaranteed, this regimen may be used for RR-/MDR-TB patients.</td>
<td>2 141, 640, 1 220*</td>
</tr>
</tbody>
</table>

* Source: NSP (2018-2021)

NA – not available in the presentation

3. **India**

**Figure 7: Trends in RR-/MDR-TB case notification**

*Validation of data under process*
Figure 8: FL and SL-DST capacity and plans for expansion

NAAT = nucleic acid amplification test

Figure 9: DR-TB regimens being used and plans for 2021

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Criteria for using the regimen</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral shorter regimen</td>
<td>MDR-/RR-TB + FQ sensitive and Non-DST based criteria</td>
<td>2019 2020 2021</td>
</tr>
<tr>
<td>Shorter regimen with injectable</td>
<td>40 397 29 857 24 000</td>
<td></td>
</tr>
<tr>
<td>Oral longer regimen</td>
<td>MDR-/RR-TB + FQ/SLI res. and Non-DST based criteria</td>
<td>8 338 15 106 23 700</td>
</tr>
<tr>
<td>Longer regimen with injectable</td>
<td>18 570 5 191 1 300</td>
<td></td>
</tr>
<tr>
<td>Preventive treatment among contacts</td>
<td>Contact of MDR-/RR-TB &amp; FQ resistant not detected in index case</td>
<td>NA NA 2 000-2 500</td>
</tr>
</tbody>
</table>

Community engagement in DR-TB

- Formation of National, State and District TB Forum (Voice of community)
- Training module for TB survivors/champions
- ~2000 TB Survivors sensitized virtually
- 200 TB Survivors completed 3 days training
- Plan to engage AB-HWCs Community Health Officers and staff in limb care of DR-TB patients.
4. Indonesia

Figure 10: Trends in RR-/MDR-TB case notification

Figure 11: FL- and SL-DST capacity and plans for expansion

<table>
<thead>
<tr>
<th>Technology</th>
<th>Number of units (annual DST capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
</tr>
<tr>
<td>GeneXpert</td>
<td>1 158 GX in 1 097 health centres (HC)</td>
</tr>
<tr>
<td></td>
<td>(2 779 200)</td>
</tr>
<tr>
<td>Culture lab</td>
<td>13</td>
</tr>
<tr>
<td>DST Lab</td>
<td>11</td>
</tr>
<tr>
<td>Second Line LPA</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>(24 000 – 28 000)</td>
</tr>
<tr>
<td>First Line LPA</td>
<td>-</td>
</tr>
</tbody>
</table>
### Figure 12: DR-TB regimens being used and plans for 2021

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Criteria for using the regimen</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2019</td>
</tr>
<tr>
<td>Oral shorter regimen</td>
<td>RR-/MDR-TB (introduced in August 2020)</td>
<td>0</td>
</tr>
<tr>
<td>Oral longer regimen</td>
<td>RR-/MDR-TB previously treated &gt;1 month, TB pre-XDR-TB, STR intolerant (introduced in October 2019)</td>
<td>1 393</td>
</tr>
<tr>
<td>Shorter regimen with injectable</td>
<td>RR-/MDR-TB</td>
<td>3 085</td>
</tr>
<tr>
<td>Longer regimen with injectable</td>
<td>RR-/MDR-TB previously treated &gt;1 month, TB pre-XDR-TB, STR intolerant</td>
<td>1 172</td>
</tr>
<tr>
<td>Preventive treatment among contacts</td>
<td>Household contacts (all ages) of DR-TB patients where TB/DR-TB is excluded</td>
<td>NA</td>
</tr>
</tbody>
</table>

*(as on 29 January 2021)*

### Status of engagement of communities/ patient groups in DR-TB

- Guideline of DR-TB support by the community team published on 2020, dissemination and training will be done in 2021
- New Principal Recipient (PR) of TB community for the Global Fund (GF) 2021 – 2023 grant period, covering 190 districts
- 16 TB Survivors group, capacity building is planned through the Community PR, including expansion of new organizations in other provinces
- Patient group representatives are in Country Coordination Mechanism and closely involved in National TB Strategic Plan (NSP) and GF proposal development

Regular meetings with all related community team are planned for DR-TB for coordinating and monitoring the implementation.
5. Myanmar

Figure 13: Trends in RR-/MDR-TB case notification

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimated among notified pulmonary TB patients*</th>
<th>Target as per NSP</th>
<th>Diagnosed</th>
<th>Enrolled</th>
<th>Number receiving SL DST</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>4 471</td>
<td>NA</td>
<td>2 701</td>
<td>1 537</td>
<td>24</td>
</tr>
<tr>
<td>2015</td>
<td>4 785</td>
<td>NA</td>
<td>2 793</td>
<td>2 217</td>
<td>40</td>
</tr>
<tr>
<td>2016</td>
<td>4 926</td>
<td>3 130</td>
<td>3 213</td>
<td>2 556</td>
<td>156</td>
</tr>
<tr>
<td>2017</td>
<td>4 939</td>
<td>3 303</td>
<td>3 197</td>
<td>2 691</td>
<td>188</td>
</tr>
<tr>
<td>2018</td>
<td>5 180</td>
<td>3 384</td>
<td>3 479</td>
<td>2 802</td>
<td>844</td>
</tr>
<tr>
<td>2019</td>
<td>5 497</td>
<td>3 510</td>
<td>3 205</td>
<td>2 891</td>
<td>1905</td>
</tr>
<tr>
<td>2020</td>
<td>5 735</td>
<td>3 580</td>
<td>2 366**</td>
<td>2 355**</td>
<td>2 148**</td>
</tr>
</tbody>
</table>

*Total MDR-TB among notified TB patients (epi assumption (NSP 2016-2020))

** Preliminary data as 27 January 2021.

Figure 14: FL- and SL-DST capacity and plans for expansion

<table>
<thead>
<tr>
<th>Technology</th>
<th>Number of units (annual DST capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2019</td>
</tr>
<tr>
<td>Second line LPA</td>
<td>1 905</td>
</tr>
<tr>
<td>First line LPA</td>
<td>773</td>
</tr>
<tr>
<td>Liquid culture</td>
<td>16 573</td>
</tr>
<tr>
<td>Solid culture</td>
<td>14 816</td>
</tr>
</tbody>
</table>
**Figure 15: DR-TB regimens being used and plans for 2021**

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Criteria for using the regimen</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-8 (Am/Lfx/Cs/Eto/Z)/12-13 (Lfx/Cs/Eto/Z)</td>
<td>Main standard regimen (will be phased out in Q1 2021)</td>
<td>1980 1594 NA</td>
</tr>
<tr>
<td>4-6 (Am/MfxHD/Cfz/E/Z/Hid /Eto)/5 (MfxHD /Cfz/Etb/Z)</td>
<td>According to WHO criteria (will be phased out in Q1 2021)</td>
<td>559 381 NA</td>
</tr>
<tr>
<td>4-6 (Bdq(6)/Lfx/Cfz/E/Z/ Hid /Eto)/5 (Lfx/Cfz/E/Z)</td>
<td>According to WHO criteria</td>
<td>0 50 1752</td>
</tr>
<tr>
<td>6(Bdq/Lfx/Lzd/Cfz)/12 (Lzd/Lfx/Cfz)</td>
<td>patients with FQ sensitive or not at risk of FQ resistance, Extensive disease, bi-lateral lesions, residing in Yangon</td>
<td>0 94 1168</td>
</tr>
<tr>
<td>Individualized DR-TB regimen (pre-XDR-TB)</td>
<td>Resistant to either second-line TB injectable (SLI) or FQ</td>
<td>237 119 332</td>
</tr>
<tr>
<td>Individualized DR-TB regimen (XDR-TB)</td>
<td>Resistant to both SLI and FQ</td>
<td>23 11 66</td>
</tr>
<tr>
<td>Individualized regimen (other DR-TB)</td>
<td>DR-TB who need new and repurposed drugs (MDR-/RR-TB, H+ FQ resistant TB, etc)</td>
<td>92 106 NA</td>
</tr>
<tr>
<td>Preventive treatment among contacts</td>
<td></td>
<td>0 0 0</td>
</tr>
</tbody>
</table>

NA – not available in the presentation

**Status of engagement of communities/patient groups in DR-TB**

- Implementation and capacity building to partners working in community based MDR-TB care: Pyi Gyi Khin (PGK), Myanmar Medical Association, The Union, Myanmar Health Assistant Association (MHAA)
6. Nepal

Figure 16: Trends in RR-/MDR-TB case notification

Figure 17: FL- and SL-DST capacity and plans for expansion

<table>
<thead>
<tr>
<th>Technology</th>
<th>Number of units (annual DST capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
</tr>
<tr>
<td>Xpert MTB/Rif</td>
<td>104</td>
</tr>
<tr>
<td>LPA</td>
<td>2</td>
</tr>
<tr>
<td>Solid Culture</td>
<td>2</td>
</tr>
<tr>
<td>MGIT</td>
<td>1</td>
</tr>
</tbody>
</table>
### Figure 18: DR-TB regimens being used and plans for 2021

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Criteria for using the regimen</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2019</td>
</tr>
<tr>
<td>Oral shorter regimen</td>
<td>Not being used</td>
<td>NA</td>
</tr>
<tr>
<td>Oral longer regimen</td>
<td>As per WHO 2019 recommendations, NTP transitioned to all oral longer regimen regimen in 2019</td>
<td>NA</td>
</tr>
<tr>
<td>Shorter regimen with injectable</td>
<td>As per WHO STR initiation recommendation</td>
<td>203</td>
</tr>
<tr>
<td>Longer regimen with injectable</td>
<td>Not being used any more since middle of 2019</td>
<td>154</td>
</tr>
<tr>
<td>Preventive treatment among contacts</td>
<td>For children under 5, 3HR is being used</td>
<td>2 293</td>
</tr>
</tbody>
</table>

**Status of engagement of communities/ patient groups in DR-TB**

- Community affected by DR-TB was consulted during NSP development, but no direct engagement in annual planning for now
- Implementation and capacity building: DR-TB Community Based DOT is being piloted in 2 districts and capacity building of community is being done
7. Thailand

Figure 19: Trends in RR-/MDR-TB case notification

Figure 20: FL- and SL-DST capacity and plans for expansion

<table>
<thead>
<tr>
<th>Technology</th>
<th>Number of units (annual DST capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2020</td>
</tr>
<tr>
<td>Phenotypic</td>
<td>33</td>
</tr>
<tr>
<td>Xpert</td>
<td>111</td>
</tr>
<tr>
<td>LPA; First line</td>
<td>19</td>
</tr>
<tr>
<td>LPA; Second line</td>
<td>17</td>
</tr>
<tr>
<td>Real time polymerase chain reaction (PCR);</td>
<td>28</td>
</tr>
<tr>
<td>First line</td>
<td></td>
</tr>
<tr>
<td>Real time PCR; Second line</td>
<td>28</td>
</tr>
<tr>
<td>Second line DST group A</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure 21: DR-TB regimens being used and plans for 2021

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Criteria for using the regimen</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2019</td>
</tr>
<tr>
<td>Oral shorter regimen</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>Oral longer regimen</td>
<td>NA</td>
<td>-</td>
</tr>
<tr>
<td>Shorter regimen with injectable</td>
<td>NA</td>
<td>202</td>
</tr>
<tr>
<td>Longer regimen with injectable</td>
<td>NA</td>
<td>816</td>
</tr>
<tr>
<td>Preventive treatment among contacts</td>
<td>NA</td>
<td>-</td>
</tr>
</tbody>
</table>

NA – not available in the presentation

Bhutan, Sri Lanka and Timor-Leste NTP representatives were invited for verbal interventions. The countries gave an overview of the expansion of DR-TB services. Specific concerns raised by Timor-Leste included the need for more information on adherence support, specifically using digital technologies for TB patients.

Some comments from rGLC members and partners on country presentations:

- Some countries continue to use solid Culture & DST (C&DST). This should be used only as a back-up and countries should move to at least liquid C&DST and LPA, where feasible, for a shorter turn-around-time.
- Availability of SL-DST is still an issue in several countries of the Region. Target’s for FL- and SL-DST need to be ambitious enough to reach universal DST at the soonest possible in all countries.
- C-Xray and clinical condition of the patient should be correlated to decide on extensive disease as an exclusion criteria from the all oral-STR
- Injection containing regimen should be phased out as quickly as possible.
- Some of the countries continue to have a very high initial loss-to-follow-up among DR-TB patients. Plans to address the issue need to be developed and implemented.
- TB preventive therapy (TPT) among contacts of RR-/MDR-TB patients needs to be strengthened.
- Community engagement remains variable across the countries. Learning from the COVID-19 experience, this needs to be done on priority basis to ensure continuity of TB services in general.

There are countries in the Region where access to drugs and diagnostics is a challenge. These countries need special attention for reaching all DR-TB patients.
Questions and comments on Day 1 presentations

1. What support is required by the countries to help them transition from injectable containing regimens to all-oral regimens?
2. How can the countries tap rGLC resources to expand diagnostic capacity for SL-DST and DST to new drugs?
3. TPT among the contacts of RR-/MDR-TB cases is a relatively new area that may need support-technical and operational?
4. What can be done to reduce the loss to-follow-up after diagnosis or in other words, improve treatment initiation and adherence?
5. What are the steps that can be taken to strengthen community engagement in DR-TB?

Responses from countries

Bangladesh

- Bangladesh is using all oral regimens for eligible patients, except few patients with cardiac comorbidities.
- From October 2020, the all-oral STR is being used in 4 sites. The plan was that from January 2021, all MDR-centres would start using the all-oral regimen. But due to COVID-19, the required training has been postponed. Hence this transition will happen after the training activities have been completed.
- Need to get support for training of laboratory personnel.
- Logistics for DST already procured.
- TPT expansion is not yet planned as awaiting better evidence. Only expansion of TPT is for contacts of drug susceptible TB (DS-TB) cases.
- Community engagement: Modules developed by SEARO already translated in local language. Already budgeted. Patient referral, patient adherence-community has good role of community.

DPRK

- The country is interested to introduce the all-oral regimens (both LTR and STR) and updated guidelines include fully oral regimens.
- For DST, it is challenging because the suppliers are not interested to supply to DPRK, as well the fact that the LPA reagents are covered under the UN sanctions.
- TPT for contacts of RR-/MDR-TB cases is not planned currently.

India

- The country is transitioning to the all-oral longer regimen.
- Oral STR in two States only for now. This will be gradually expanded.
- Access to 1st line and 2nd line DST is being increased.
- Loss to follow-up: Strengthening supervision, using digital technology and, constitution of district and state TB forum for promoting adherence.
Indonesia

- Already introduced the all-oral regimen, but quality of services needs to be improved to ensure the quality of the treatment provided, and requires to be monitored continuously
- TA is required to implement H-resistant regimen. Country is preparing to develop the guidelines and algorithm, and build the capacity of the programme
- Has some experience for providing new drugs e.g. delamanid
- Support from rGLC is needed to build the laboratory capacity
- TPT (6 Lfx E) has been introduced on the advice of the TWG. TA needed to pilot and scale-up if successful.
- In regard to the loss to FUP, trying to engage community to decrease the loss.

Nepal: Regarding phenotypic DST, the problem Nepal has been facing is the accessibility to the newer pure drugs like bdq and dlm. As the powder for these newer drugs could not be procured and needs to be imported as a research reagent from the National Institute of Health in the USA, support would be appreciated to assist in obtaining said powder.
Day 2 (i): Technical updates

Session 1: Drug-resistant tuberculosis: Update on WHO expert consultations and upcoming treatment guidelines

This session included updates from WHO/HQ on changes in the definition of XDR-TB and other upcoming updates. The reasons for these updates are that as they were shown not to be effective drugs, the second-line injectable agents lost their priority ranking over the last decade and have replaced by other more effective oral agents for the treatment of RR-/MDR-TB. Further, resistance to fluoroquinolones is linked to lower level of favorable treatment outcomes and leads to the need to make the important choice between using a shorter or longer treatment regimen. Resistance to bedaquiline and linezolid is rare as yet but is already being reported. Both drugs are being used nowadays and will become more widely used in contemporary and future regimens.

The updated definitions are as below:

**Pre-XDR-TB**
- TB caused by *Mycobacterium tuberculosis* strains that fulfil the definition of MDR-/RR-TB and which are also resistant to any fluoroquinolone (*FQs include Lfx and Mfx as they are the FQs currently recommended by WHO for inclusion in longer regimens*).

**XDR-TB**
- TB caused by *Mycobacterium tuberculosis* strains that fulfil the definition of MDR-/RR-TB and which are also resistant to any fluoroquinolone and at least one additional Group A drug (*The Group A drugs are: Lfx, Mfx, Bdq,Lzd. Therefore XDR-TB is MDR-/RR-TB that is resistant to a fluoroquinolone and at least one of bedaquiline or linezolid (or both). The Group A drugs mentioned here are appropriate at the moment, however the definition will apply to any drugs added to Group A in the future)*.

**Revised treatment outcome definitions:** A global consultation meeting was held from 17-19 November 2020 to discuss updates to the treatment outcome definitions. The general principles adopted for these updates include:
- applicability to both DS-TB and DR-TB, and to different length of treatment regimens
- de-emphasizing the traditional division between intensive and continuation phases
- taking into consideration the use of appropriate diagnostics for treatment monitoring
- having clear parameters for defining treatment failure, by a decision to change or stop treatment or by reliable evidence for non-response
- practical for clinical and programmatic monitoring, and feasible for NTPs
### Figure 22: Updated treatment outcome definitions

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Details</th>
</tr>
</thead>
</table>
| Treatment failed         | A patient whose treatment regimen needed to be terminated or permanently changed\(^1\) to a new regimen option or treatment strategy.  
\(^2\) *Reasons for the change include:*  
*no clinical and/or no bacteriological response*;  
*Adverse drug reactions (ADRs)*;  
*Evidence of additional drug resistance to medicines in the regimen.* |
| Cured                    | A pulmonary TB patient with bacteriologically confirmed TB at the beginning of treatment who completed treatment as recommended by the national policy with evidence of bacteriological response\(^2\) and no evidence of failure.  
\(^2\) *Bacteriological response – bacteriological conversion with no reversion.* |
| Treatment completed      | A patient who completed treatment as recommended by the national policy whose outcome does not meet the definition for cure or treatment failure.                                                      |
| Died                     | A patient who died *before starting* or during the course of treatment.                                                                                                                                  |
| Lost to follow-up        | A patient who *did not start treatment* or whose treatment was interrupted for 2 consecutive months or more.                                                                                             |
| Not evaluated            | A patient for whom no treatment outcome was assigned.                                                                                                                                                   |
| Treatment success        | The sum of cured and treatment completed                                                                                                                                                                |

**An optional definition of Sustained Treatment Success (for use in operational research only)**

| Sustained treatment success | An individual assessed at 6 months (DS-TB and DR-TB) and 12 months (DR-TB) after successful TB treatment who is alive and TB free.                                                                 |

### Update on the use of Nucleic Acid Amplification Tests to detect TB and DR-TB: These updates are based on Guideline Development Group meeting held from 7-18 December 2020. The general scope of the GDG meeting was:

i. to discuss the findings of the systematic reviews conducted; and

ii. to make recommendations on three classes of technologies.
Figure 23: Recently endorsed rapid technologies

<table>
<thead>
<tr>
<th>Technology Class</th>
<th>Products included in evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Moderate complexity automated NAATs for detection of TB and resistance to R and H</td>
<td>Abbott RealTime MTB and Abbott RealTime MTB RIF/INH (Abbott) FluoroType MTBDR and FluoroType MTB (Hain Lifescience) BD MAX™ MDR-TB (Becton Dickinson) cobas MTB and cobas MTB-RIF/INH (Roche)</td>
</tr>
<tr>
<td>2. Low complexity automated NAATs for detection of resistance to H and second-line anti-TB agents</td>
<td>Xpert MTB/XDR (Cepheid)</td>
</tr>
<tr>
<td>3. High complexity hybridization based NAATs for detection of resistance to Z</td>
<td>Genoscholar PZA-TB II (Nipro)</td>
</tr>
</tbody>
</table>

**Other upcoming treatment guidelines updates:** WHO will convene a GDG to review the results of Study 31/AS349, a phase 3, open-label randomized controlled clinical trial for the treatment of DS-TB. The aim of the review is to examine the efficacy and safety of two four-month treatment regimens with high-dose rifapentine with or without moxifloxacin for the treatment of pulmonary DS-TB, compared to the currently recommended six-month regimen (2RHZE/4RH). Key finding of the Study 31 has been that a four-month regimen with high-dose rifapentine, isoniazid, pyrazinamide and moxifloxacin, was shown to be non-inferior in terms of efficacy to the currently recommended six-month regimen (2RHZE/4RH). In addition, this four-month regimen was safe and well-tolerated by patients.

**Session 2: Promoting Treatment Adherence for TB/MDR-TB and Using Digital Adherence Technologies (DAT)**

In most countries, lower treatment outcomes amongst DR-TB patients are largely because of poor treatment adherence to recommended treatment regimens leading to increased lost to follow up, failure of treatment and death. NTPs are moving towards using upfront newer and much stronger, safer WHO recommended treatment regimens, that also demand strengthened treatment adherence strategies. It is crucial that the challenges of inadequate adherence to treatment should be addressed urgently to reduce loss to follow-up, TB-related morbidity and mortality, and to achieve End TB Targets.

WHO in their 2020 DR-TB guidelines recommended Virtual/Video observed therapy (VOT) and Digital Technologies (DAT) for NTPs as methods of observed treatment. Given the restrictions imposed due to COVID-19 pandemic, the situation necessitates using DAT for patient care and treatment support for the following key activities:

- Promoting treatment adherence strategies
- Patient-centred care
- Patient education/ DOT provider education/ family involvement
- Early side effect detection and management / implementation of active TB drug safety monitoring and management (aDSM)
• Preference of oral shorter treatment regimen where eligible
• Psycho-social support and effective enablers support
• Stronger community-based care
• Strengthened DOT and Digital Adherence Technologies, VOT – COVID-19 pandemic has necessitated using such approaches
• Systems for retrieval of Lost to Follow-up patients for treatment

Figure 24: Evidence for efficacy of VOT

<table>
<thead>
<tr>
<th>Study &amp; Findings</th>
<th>Study &amp; Findings</th>
<th>Study &amp; Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The findings of multicenter, randomized controlled superiority trial in 22 clinics in England demonstrated that 77% on VOT achieved the primary outcome compared with 63% on DOT.</td>
<td>- A single-arm trial among tuberculosis (TB) patients in San Diego, California, USA, (n = 43) and Tijuana, Mexico (n = 9) to represent high- and low-resource settings</td>
<td>- Multiple other studies found that home video observation is a patient-centered, resource efficient way of delivering direct observation for TB, VOT is cost-effective when compared with a drive-around service/DOT and did not reduce identification of adverse events</td>
</tr>
<tr>
<td>- Study suggests that VOT was a more effective and cheaper approach to observation of tuberculosis treatment than DOT.</td>
<td>- The adherence was similar in San Diego (93%) and Tijuana (96%). Compared to time on in-person DOT, 92% preferred VDOT, 81% thought VDOT was more confidential, 89% never/rarely had problems recording videos, and 100% would recommend VDOT to others. Seven (13%) participants were returned to in-person DOT and six (12%) additional participants had their phones lost, broken or stolen</td>
<td></td>
</tr>
</tbody>
</table>

Implementation approach for digital adherence technologies

For countries without any prior DAT experience, a phased implementation starts by determining the necessary infrastructure (e.g. data hosting) and customizing of the technology and platform to match with the country needs. Recommended steps are:

• Phase 0: Customization, configuration and testing of infrastructure, DATs, and platform.
• Phase 1: Small rollout (>2000 patients/1-2 regions/districts) to contextualize interventions, customize country specific workflows, develop local DAT protocols, etc.
• Phase 2: Scaled implementation in multiple districts, >2000+ patients
• Phase 3: Province or country-wide scale, consider migrating from cloud hosting to in-country hosting, using servers, etc.

NOTE: Even using simplified approaches with mobile handsets through WhatsApp/Viber or adopting mobile applications are also good options for V-DOT with sound M&E.
Session 3: Whole Genome Sequencing: current use and future potential

Whole genome sequencing (WGS) approaches use deoxyribonucleic acid (DNA) sequencing platforms to reconstruct the complete DNA sequence of an organism’s genome. The small (~4.4Mb), single-chromosome genome of *M.tb complex* strains is well suited to WGS approaches. Rapid, reliable and increasingly affordable WGS technologies can now guide all components of TB control: diagnosis, treatment, surveillance and source investigation (Figure 25). Individual strains of human and animal *M.tb complex* lineages can be identified by WGS and drug resistance profiles can be predicted, especially well for first-line drugs, allowing prompt, appropriate initiation of treatment and the monitoring of the acquisition of drug resistance. TB outbreaks can be identified with high resolution including across borders and disease control measures can be implemented. The analysis of the emergence, spread, genetic makeup and evolution of specific outbreak strains (for example, highly resistant or highly virulent clones) can allow the implementation of targeted measures.

Figure 25: Current implementation of Whole genome sequencing of Mycobacterium *tuberculosis*. *Nat Rev Microbiol* 17, 533–545 (2019)

The current standard workflow for WGS analysis of *M.tb complex* strains (Figure 26) involves culturing sputum specimens on solid (Löwenstein–Jensen) or liquid (Mycobacteria Growth Indicator Tube) media, extracting DNA from cells, library preparation and sequencing using short read technologies (for example, Illumina platforms). The complete *M.tb complex* WGS analysis pipeline involves several key steps, such as input data validation and quality control followed by mapping to a reference
genome (often *M. tuberculosis* strain H37Rv) and detection of genomic variants such as Single nucleotide polymorphisms, and insertion or deletions (indels) and applying various criteria, such as read depth, base quality and strand bias, to filter out false positive variants. Finally, based on the variants detected, several tasks can be performed, including (but not limited to) prediction of drug resistance and susceptibility profiles, strain typing and identification of transmission clusters.

Figure 26: Standard workflow for whole genome sequencing of *Mycobacterium tuberculosis* complex isolates. *Nat Rev Microbiol* 17, 533–545 (2019)

As mentioned above, in the current WGS approach, linked phenotypic–genotypic data derived from a variety of strains across the diversity of the *M. tb* complex are passed through statistical approaches such as likelihood ratios to identify genetic variants that are likely related to drug resistance. The suggested future approach would complement this procedure with additional information from targeted mutagenesis, machine learning, multiomics and so on to detect drug resistance-causing SNPs that are too rare to be detected with a statistical approach only.

In conclusion, WGS has great potential as a method for rapidly diagnosing DR-TB in diverse clinical reference laboratory settings worldwide. This approach overcomes many of the significant challenges associated with conventional phenotypic testing as well as the limitations of other less comprehensive molecular tests by providing rapid, detailed sequence information for multiple gene regions or whole genomes of interest.

Despite the advantages of WGS over other molecular methods for DR-TB identification and characterization, the uptake of these technologies has been hindered, especially in low- and middle-income countries, by cost limitations, the need for specialized and well-trained staff, a lack of readily-
available data analysis and data storage solutions, and the lack of ‘plug-and-play’ solutions capable of obtaining sequencing information directly from primary clinical samples.
Day 2 (ii): Partner presentations

Session 4: Stop TB partnership: “Support to Countries for better DR-TB Care”

The presentation highlighted 2018 UNGA Political Declaration on for 2022:

- Successfully treat 40 million TB patients including 3.5 million children with TB.
- Successfully treat 1.5 million RR-/MDR-TB patients, out of which more than a third are estimated to be in the SEA Region. This includes 115 000 children with RR-/MDR-TB
- Provide TB Preventive therapy to more than 30 million eligible population.

This would need US$ 13 billion on average per year for implementation, out of which US$ 2 billion per year is needed for research.

Figure 27: Global achievements until 2019

Source: WHO Global TB Report, 2020

Preliminary projected impact of COVID-19 on TB programmes in priority countries:

- Estimated % change in TB notification by region in 24 GF-supported countries, 2020 vs 2019
- Estimated % change in DR-TB Notification in 23 highest TB burden GF eligible countries (Figure 27)
An Emergency Recovery Plan is **urgently** required to mitigate the potential adverse consequences of COVID-19 outbreak on TB epidemic. Some of the principles to be followed are:

- Focus on countries hardest hit but be vigilant about monitoring countries at highest risk
- Focus on interventions to massively increase TB screening and testing
- Focus on interventions that will support COVID-19 efforts and build platforms for future pandemics

**Focus Countries (as per STP presentations):**

- 20-24% decline: India, Myanmar, Pakistan, Tajikistan and Ukraine
- 25-41% decline: Bangladesh, Indonesia, Philippines, and South Africa
**TB REACH: Wave 9**

For the first time, TB REACH will be using its platform to solicit proposals for DR-TB. The grant in the current wave round is funded by USAID, with additional support from Global Affairs Canada. Wave 9 was launched on 27 January 2021 with a two-stage application process – Stage 1 proposals are due on 5 March 2021, and final funding decisions are expected by the end of July 2021.

**Session 5: Global Drug Facility (GDF): The only one-stop shop with all TB products**

GDF has all the quality-assured and WHO-recommended products needed to prevent, diagnose and treat all forms of TB. The UN General Assembly declaration encourages all nations to use Stop TB GDF for procurement. GDF provides TA and capacity strengthening in TB pharmaceuticals’ procurement and supply management including supply planning to priority countries (non-priority countries are subject to individual discussion and funding availability). GDF has also launched Child-friendly DR-TB medicines, including coming soon Delamanid 25mg child friendly dispersible tablets, to ensure appropriate dose in children.

The presentation also brought up the issue that TB products procurement is getting more complicated as the treatment and diagnostics landscapes are rapidly changing, and many more trial results and new products are expected. Respectively, accurate quantification and supply planning with optimized procurement frequency and reasonable buffer stocks becomes critical for continued access to TB commodities and reducing the risk of wastages and stockouts. The Impact of COVID-19 lockdown in the supply and logistics of TB products were being addressed by several interventions by GDF in coordination with the countries, and notably using evaluation of in-country stocks and regularly updating supply plans based on country’s shared Quan TB files.

**Session 6: Global Fund presentation on support in the SEA Region**

**Global Fund support for COVID-19 responses and mitigation of its impact on the three diseases**

The recommendation from the Global Fund for grant recipient countries is to increase or at least maintain the commitments made by governments of domestic funding for TB for the period 2020-2022. Where possible, mobilize additional resources and/or reprogram current. Countries are encouraged to maintain the ambitious performance targets agreed in the national strategic plans and the funding requests to the Global Fund (2021-2023). Catch-up plans should aim to make up for the loss in 2020 while achieving the 2021 targets to get back on-track to meet the UNHLM target by 2022. The national programmes are encouraged to identify opportunities for the TB programmes to benefit from the COVID-19 response, including heightened attention to public health measures such as infection prevention and control, contact tracing, strengthened laboratory networks, and surveillance systems. TB programmes need to adapt to the COVID-19 situation to decentralize care through community & home-based care models, adopt innovations and digital tools for TB diagnosis, treatment support and prevention.

A new GLC memorandum of understanding (MoU) with WHO has been signed up to December 2023. Some of the key principles/components of the MoU that are maintained from previous MOU are:

- Demand-based TA (NTP, Global Fund country teams)
• Quality assurance of the support/report
• Capacity building (country, regional)
• Coordination with partners (USAID, GDF and others)
• Performance-based payment
• Central pooled payment mechanism
• Follow up of recommendations

New components:
• Flexible support including remote support
• Supporting mitigation of COVID on DR-TB
• Aligned with GF grant period

Focus of rGLC support in 2021:
• Depends on country need/demand
• Align with priorities in the NSP and grants
• Prioritize supporting development and implementation of catch-up/adaptation plans
• To compensate for the loss in notification in 2020 (COVID-19 and lockdown)
• Support countries to achieve their 2021 targets
• Support uptake and scale up of new tools and new oral regimens (diagnostic, all-oral regimens, aDSM, patient care and support, digitalization, Operational Research [OR])

**Session 7: USAID perspective and available DR-TB support in the SEA Region during COVID**

U.S. funding for bilateral TB efforts through USAID is US$ 314 million. Additionally, the U.S. is the largest donor to the Global Fund. U.S. TB activities reach more than 50 countries (SEARO: Bangladesh, India, Indonesia, Myanmar), and focus on preventing, detecting, and treating TB, including DR-TB, as well as research and development. Global TB Accelerator announced by Administrator Green at the UNGA in September 2018. A priority under the programme is to meet the UN target of treating 40 million people by 2022. The Accelerator will focus on locally generated solutions that tailor the Agency’s TB response to patients and communities to address the diagnosis, treatment and prevention needs, addressing stigma and discrimination. Some of the recommendations from USAID include:

**Prioritizing essential elements of tb services during Covid-19**

• ENSURE screening and testing for TB
• A focus on COVID = low index of suspicion for TB. Promote screening/testing of any symptomatic for both COVID and TB (bi-directional testing)
• Switching MDR-TB treatment to all oral treatment regimen is very important, particularly when social distancing is implemented. MDR-TB CANNOT be temporarily ignored
• It is essential to monitor both TB and MDR-TB programs for any adverse outcomes attributable to COVID-19. NTPs should consider gathering and evaluating data more frequently from subnational sites in order to detect case detection, adherence, or treatment outcome issues more quickly
• ENSURE commodities supplies. Drug quantification and forecasting, and ongoing communications with GDF or other relevant procurement agents to prevent shortages are critical
• ENSURE that TB patients have sufficient medications, via longer duration prescriptions and instruction on where to seek care and meds if access to health facilities is restricted or difficult

On the road to Recovery: DR-TB

• Share and discuss international and country-specific data demonstrating the impact of COVID-19 on TB; review data, look at impact of COVID-19, and determine fundamental causes; systematically review performance and make adjustment

• Fully integrate DR-TB services into country TB services at all level (decentralization)

• Speed up uptake of shorter oral treatment regimens (will make it easier to enrol and treat DR-TB patients and will improve treatment outcomes)

• Fully implement DR-TB Care Package for 100% of DR-TB patients

• Scale up DR-TB case finding and treatment for children (e.g. use of GeneXpert stool testing)

• Strengthen aDSM

• Research: TB (DR-TB)/COVID, BPaL, operational research (e.g. mSTR)
Discussions – Day 2

Question and comments on Day 2 technical presentation:

1. What are the timelines for “Rapid Communications” on NAATs and for the new treatment outcomes?
   - Rapid communication on NAATs is to be released by the end of this week. For the treatment outcome definitions, WHO will first be publishing a report of the meeting. It is ready and should not take longer than 1 or 2 weeks.

2. A common concern expressed was that many countries do not have DST for Group A drugs (Bdq, Lzd, FQ). As a result, XDR-TB by the new definition may be hard to detect.
   - This is something that the rGLC needs to advocate on with other partners (GDI, WHO, GLI).

3. How can countries order pure drugs for DST available from GDF?
   - All pure drug substances, except Dlm and Bdq, are available in the GDF catalogue
   - Bedaquiline: Free through the NIH AIDS Reagent Program: [https://www.aidsreagent.org](https://www.aidsreagent.org) During registration on the NIH website, countries should select “non-Fedex Account” as courier and write "JNJ" as the account number, in order to get free delivery
   - Delamanid: Free through the ATCC BEI Program: [https://www.beiresources.org/About/BEIResources.aspx](https://www.beiresources.org/About/BEIResources.aspx)

4. As per revised WHO XDR-TB definition, ‘Building Evidence for Advance Treatment against Tuberculosis’ (BEAT-TB) study and BPaL OR will be largely applicable to Pre-XDR-TB instead of XDR-TB. How would the revised XDR-TB definition impact some of the ongoing trials like BEAT-TB study?
   - Revised XDR-TB definitions will have the same implications on BEAT as it would be for BPaL given Bdq and Lzd are common to both. However, it would still be useful for the new pre-XDR definition that would now be the larger proportion of cases as the proportion of XDR-TB is expected to drop given that resistance to Bdq and Lzd are quite low compared to FQ and SLI.
   - For BPaL, pre-XDR-TB and those who are intolerant or not responding to RR-/MDR-TB treatment regimens, will remain eligible. Obviously with the new XDR-TB definition, the XDR-TB cases will not be eligible for BPaL but will need an individualized treatment regimen to be designed.
5. Question on tools for digital treatment adherence: not much experience is available in some countries. How will this be supported? Community-based treatment adherence: How can the experience from some of the countries be replicated in other low-resource setting? Some countries are planning to procure Smart Medication Container Kits from the GDF catalogue. Can they get technical assistance for the same?

- Some countries are incorporating funding requests for adherence tools in their GF proposals.
- rGLC members and secretariat: Capacity building of communities, as undertaken in some of the countries of the SEA Region, can be replicated based on the expressed needs by the respective NTP. Similarly, support can also be provided for digital adherence technologies.
- There are examples from TB REACH projects on use of the video observed method. These have also been used to identify the adverse events during treatment.
- There are modeling works (including by ASCENT) on cost and cost effectiveness of different digital adherence tools/approaches including VOT, smart boxes etc. We need to think about phased implementation while generating more evidence.

6. Would it be fair to summarise that although genome sequencing is probably the future direction, currently due to the challenges that you listed (especially the limited understanding of what the actual mutations identified mean regarding treatment and outcomes), WGS/Next Generation Sequencing (NGS) is for research by high level laboratories (i.e. Supra-National Reference Laboratories [SNRL] and National Reference Laboratories [NRL])? How good are the genotype/phenotype mappings currently, for the various types of drug resistance?

- Regarding the current challenges especially in low resource countries, it is correct that currently the use of NGS technologies is limited to the NRLs and SNRLs, and is mainly used for research purposes. The first line drug resistance to H, R, E, Z was correctly predicted with 97.1%, 97.5%, 94.6%, and 91.3% sensitivity. So WGS can predict profiles of susceptibility to first-line anti-TB drugs with a degree of accuracy sufficient for clinical use.
Day 3 (i): Regional progress updates

Overall, there has been a progress in screening activities for drug resistance. Among the previously treated patients, 82% were screened for drug resistance exceeding the global average of 80%. Among new patients, 65% were screened for drug-resistance in the Region, again above the global average of 59% in 2019. It needs to be noted here that because of cleaning of data for previous year, the proportions screened for resistance shown in this graph have been adjusted to the new figures and, therefore, cannot be compared with an earlier report.

**Figure 30: Trends in screening of new and retreatment TB patients for rifampicin-resistance**

A steady progress is noted in the diagnosis and enrolment of RR-/MDR-TB patients, as also mentioned above. In the SEA Region, close to 87,000 out of the estimated 171,000 MDR-/RR-TB cases emerging each year, were confirmed by available diagnostic tools. Among those who were diagnosed, more than 70,000 were started on treatment in 2019 (Figure 30). The difference of 19% between diagnosed and enrolled patients is concerning, though this figure has declined a little from ~25% in the previous year.
The overall treatment success rate in the Region for 2017 cohort among the RR-/MDR-TB patients was 52%, similar to outcomes of the previous cohort and below the global average.
of 58% (Figure 31). Among XDR-TB patients, the reported treatment success rate was just 37%.

In individual countries, the treatment success rate varied from 45% in Indonesia and 49% in India, to more than 90% in Bhutan. In addition, Bangladesh, DPR Korea, Myanmar and Nepal, reported treatment success rates of at least 70%. However, the very high treatment success rate in Bhutan may be attributed to the relatively small cohort size. For other countries witnessing lower cure rates, the reason is mainly a high loss to follow-up, often before treatment initiation.

**rGLC activities in 2020**

Three rGLC specific meetings – one formal face-to-face in Delhi on 12-13 February 2020 and two remote virtual meetings for follow-up on recommendations of the annual meeting and for discussions regarding remote rGLC support for the Region.

Four meetings with participation of rGLC members were also organised to discuss technical updates.

- 15 country activities were held in the Region.
  - One **physical review** mission to Indonesia along with the Joint Monitoring Mission held in the country in January 2020.
  - Three **remote review** missions were organized for Bhutan, DPR Korea and Sri Lanka.
  - One **Training of Trainers** on updated guidelines for Nepal
  - The remaining support activities were around guidelines dissemination, capacity building and TA support.

- The secretariat **collaborated with POP-TB** in Indonesia to organize a capacity building workshop for survivors and community workers in diagnosis and management of RR-/MDR-TB patients, specifically during the COVID-19 outbreak.
**Figure 33: Progress against the agreed action points in 2020 rGLC meeting**

<table>
<thead>
<tr>
<th>Action points for the committee</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate technical assistance to the Member States for introduction of all oral STR and LTRs under programmatic conditions or the conducting of OR for all oral modified STRs, including BPaL at the earliest;</td>
<td>Being done</td>
</tr>
<tr>
<td>Support countries in strengthening their aDSM systems via the organizing of a regional workshop and specific aDSM related in-country missions based on requests by Member States;</td>
<td>Done for Myanmar</td>
</tr>
<tr>
<td>Facilitate drug registrations in coordination with relevant partners;</td>
<td>Not done</td>
</tr>
<tr>
<td>Develop a checklist of required actions to facilitate the roll-out of the all oral DR-TB regimens to be used by the SEARO countries; and</td>
<td>TDR protocol shared but no Region-specific checklist</td>
</tr>
<tr>
<td>Support adoption of generic OR protocol and coordinate with TDR/WHO’s Global TB Programme (GTB) and partners for capacity building opportunities in the Region on OR for all oral modified STRs.</td>
<td>Same as above</td>
</tr>
<tr>
<td>Finalize the community engagement assessment checklist for use during rGLC monitoring missions;</td>
<td>Draft developed. Not finalised yet</td>
</tr>
<tr>
<td>Support community activities/engagement via in-country workshops as requested by Member States;</td>
<td>Done in Indonesia</td>
</tr>
<tr>
<td>Encourage National TB Programmes to request capacity building for community, and advocate for the importance of the involvement of community activities/engagement in the NTP’s DR-TB related-activities;</td>
<td>Partly done</td>
</tr>
<tr>
<td>Organise a Regional workshop for community/civil society engagement followed by country-specific workshop.</td>
<td>Not done</td>
</tr>
<tr>
<td>Facilitate the harmonization of activities (e.g. awareness raising, placement in treatment pathways, data collection, etc.) between NTPs, technical agencies/partners, donors, WHO and TDR related to the introduction of all oral treatment regimens and appropriate OR for DR-TB patients.</td>
<td>Operationalisation needs to be discussed</td>
</tr>
<tr>
<td>Work with Global Laboratory Initiative on standardized consolidated diagnostic algorithms to allow for triage of DR-TB patients to the most appropriate treatment regimen.</td>
<td>Not done</td>
</tr>
<tr>
<td>Whilst acknowledging the support available through the Global Fund and WHO MoU, other sources need to be explored to secure additional resources (HR, funding, etc.) to support rGLC activities.</td>
<td>Not done</td>
</tr>
</tbody>
</table>
### Action points for secretariat

<table>
<thead>
<tr>
<th>Action</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liaise with TDR, GTB and partners and subject to availability of necessary resources to facilitate organization of Regional workshops on new regimen as well as on aDSM.</td>
<td>Remote support provided</td>
</tr>
<tr>
<td>Work with the Member States and rGLC to identify common barriers across countries in implementing updated WHO guidelines. This would help prioritization of support to the Member States.</td>
<td>Remote reviews conducted</td>
</tr>
<tr>
<td>Collate activities relevant to PMDT/DR-TB planned by key partners in SEAR member countries and share with the rGLC.</td>
<td>Partly done</td>
</tr>
<tr>
<td>Collate “requirements and expectations of the rGLC of the GDI” from rGLC members for sharing with the GDI Core Group.</td>
<td>Not done</td>
</tr>
<tr>
<td>Work with partners to develop an investment case for new drugs and regimen that lends evidence to cost effectiveness of the newly recommended regimens, despite cost of regimen being higher than previous recommendations.</td>
<td>Started last year but not completed</td>
</tr>
<tr>
<td>Share data collection tools of the TDR’s generic OR protocol for mSTR with rGLC members for discussion on how the rGLC can support harmonized/standardized data collection from OR on mSTR in the SEAR countries.</td>
<td>Done</td>
</tr>
<tr>
<td>Incorporate community checklist, in the standard rGLC reporting template while conducting a PMDT mission.</td>
<td>Not done pending finalisation of checklist</td>
</tr>
<tr>
<td>In future face to face meetings, ensure presentations from Member States, on multi-stakeholder and civil society engagement and strengthening.</td>
<td>Included in template this year</td>
</tr>
<tr>
<td>Organise theme-specific discussions with individual countries, to have focused discussions in next face to face meeting.</td>
<td>Will be done in face-to-face meeting</td>
</tr>
</tbody>
</table>

### Anticipated impact of COVID-19 outbreak on MDR-TB situation in SEA Region

- Expected 10-30% decline in 2020 case notifications due to COVID related restrictions.
- The treatment success rates may also decline due to decreased access to treatment services during the lockdown periods.
- More than 17% among those with unfavourable outcomes in the year, was due to “loss to follow-up”.
- Slower update of all oral-shorter regimen, also due to lack of rapid SL-DST capacity.
- aDSM is not fully functional in several countries.
- Variable patient support systems.
Day 3 (ii): rGLC planning for 2021

This session was aimed at discussing priority areas in the Region for strengthening DR-TB services, potential activities for the rGLC for the year and make recommendations to the Member States. The members discussed challenges and achievements based on country presentation on Day 1. Some of the ongoing discussions and potential asks from countries for TA based on the respective country presentation were also discussed. These included:

- Ongoing discussions at the time of rGLC meeting were
  - PMDT guidelines update in Sri Lanka; and
  - Development of training modules for Timor-Leste
- Programme reviews were requested by 4 countries (out of 6 which presented). This included Bangladesh, Indonesia, Myanmar and Nepal. There could also be additional countries seeking reviews from those who did not make a presentation.
- Strengthen aDSM capacity – DPR Korea, Indonesia and Nepal
- TA on OR for BPaL was requested by Nepal and Indonesia
- Capacity building on genome sequencing was requested by India.
- Implementing TPT among RR-/MDR-TB contacts was requested by Indonesia

Other areas that were discussed by rGLC members included:

- Post COVID-19 catch-up plans tapping into opportunities such as the GF support and ongoing (at the time of meeting) TB REACH Wave 9 grants.
- Strategic information and prioritization of approaches
- Advocacy
- Adoption of new definitions and technologies
- Potential rGLC support in organising capacity building on DST for new drugs in the Region has been a pending activity since 2020, deferred due to COVID-19 outbreak.
- Enhanced community support is one of the key areas considered by the rGLC specifically for delivery of people-centred, rights-based approach with adequate social support structure.
- Assessment of impact of moving to on-line training and capacity building, including acceptability to participants, effectiveness, utility, etc.

Based on the discussions the members came up with priorities for the committee and recommendations

Overall priorities for 2021

- Reach out to missing TB and RR-/MDR-TB patients due to COVID-19 outbreak in 2020 and early 2021 (‘Catch up activities’).
- Roll-out of 2020 updated guidelines for DR-TB management and care including, adoption of updated definitions and, operational research for BPaL regimen and/or modified shorter regimen.
- Strengthening and scaling-up aDSM systems in all Member States.
• Supporting roll-out of moderate and high complexity Nucleic Acid Amplification Tests for SLD-DST.

• Capacity building for DST to second-line drugs, specifically new and repurposed drugs.

• Promote community capacity building for meaningful engagement of communities and multisectoral engagement to provide comprehensive support for RR-/MDR-TB patients – during and after treatment.
Recommendations and action points

Recommendations to the SEAR Member States

• Plan early for catching up on shortfall in DR-TB case notifications in 2020. This would include:
  o Enhanced case finding of TB in general and specifically contact-investigations;
  o Improving DST capacity and outreach;
  o Prioritising interventions in local context including provision of TPT to contacts as per country policy; and
  o Assessing funding needs.

• Adopt and roll out of shorter and longer all-oral regimen for DR-TB patients. This would require, among others:
  o Sufficient capacity for SL DST to triage patients;
  o Improve access to SL-DST using molecular tests;
  o Strengthen treatment adherence with support of digital technologies;
  o Updated guidelines incorporating the shorter regimen and conditions under which this can be administered; and
  o Fully functional aDSM systems for treatment monitoring and management of AEs.

• Adopt new definitions for pre-XDR-TB and XDR-TB in alignment with WHO recommendations and prepare for adoption of updated treatment outcome definitions for TB (combining DS-TB and DR-TB patients).

• Enhance community engagement, including TB champions and community-based groups in planning, monitoring and implementing of TB and DR-TB activities and promote a rights-based, people-centred approach and address mental health issues among patients.

• Address high pre-treatment and during treatment loss to follow up by developing appropriate strategies

• Strengthen multi-sectoral engagement for TB and DR-TB to find missing patients and offer a comprehensive package of services to all patients.

• Dialogue with TB champions on how they can bring value to the programme management, monitoring and patients care, and what steps would be needed for capacity building
Action points for the rGLC committee

- Engage with countries and provide need-based support for resource mobilisation through the GF, TB REACH, USAID and other funding opportunities for catch-up plans.

- Support prioritisation of activities to catch-up on missing DR-TB patients, through generation of strategic information to support the process.

- Advocacy with Member States for roll-out of newer, shorter all-oral regimen and strengthening outreach of services.

- Technical guidance to countries on OR for BPaL and mSTR.

- Capacity building on DST to new drugs and introduction of new technologies, specifically the moderate and high complexity NAATs for SLD-DST.

- Strengthening and supporting the scale-up of aDSM in countries through virtual and, when possible, on-ground technical support.

- Technical support to promote multisectoral engagement, including private sector, for improved planning, management and outreach of services.

- Support countries in enhanced community engagement through capacity building of Civil Society Organisations, Community Based Organisations and patient organisations; finalisation of the community engagement checklist to be used during the rGLC review.
Action points for the rGLC secretariat

- Organise capacity building activities using virtual platforms\(^1\) (until physical missions are possible) for:
  - Dissemination of updated WHO guidelines and definitions;
  - Strengthening of aDSM;
  - OR on BPaL regimen and mSTR;
  - Other relevant DR-TB areas based on country specific needs; and
  - Help in identifying new funding opportunities.

- Organise programme review missions for the countries, as per the country demand.

- Facilitate support to Member States for adoption of new tools and technologies, specifically those related to diagnostics for DR-TB.

- Organise virtual meetings of rGLC members specifically, and with other partners, as needed, for follow-up on action points, as well as discussions on technical updates as and when needed.

- Coordination with GDF, GF, USAID and other partners for ongoing support to DR-TB activities in the Region.

- With support of rGLC members, assess the effectiveness of the virtual capacity building activities undertaken by the rGLC in 2020.

- Incorporate community checklist, in the standard rGLC reporting template while conducting a PMDT mission.

---

\(^1\) Including an exploration of how the ECHO platform could be used for planned rGLC activities.
## Annex 1: Agenda of the meeting

<table>
<thead>
<tr>
<th>Day 1: Tuesday, 2 February 2021</th>
<th>14.30 – 14.40</th>
<th>Opening session</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14.40 – 16.30</td>
<td>Welcome Remarks</td>
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<tr>
<td></td>
<td>Dr Sunil Bahl, Ag Director, Communicable Diseases department, SEARO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fraser Wares, Chair and Paran Sarimita Winarni, Vice-Chair of rGLC</td>
<td></td>
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<tr>
<td></td>
<td><strong>1. PMDT status and expectations from rGLC (10 mins each)</strong></td>
<td></td>
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<tr>
<td></td>
<td>Member States presentation (based on ppt template shared)</td>
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<tr>
<td></td>
<td>• Expansion of diagnostic and treatment services <em>incl. the impact of COVID-19 outbreak in 2020</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Status of adoption of updated WHO guidelines</td>
<td></td>
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<td></td>
<td>• Engagement of stakeholders in PMDT expansion</td>
<td></td>
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<tr>
<td></td>
<td>• Plans for 2021</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NTP Managers or their representatives – Bangladesh, DPR Korea, India, Indonesia, Myanmar, Nepal and Thailand followed by discussion</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 2: Wednesday, 3 February 2021</th>
<th>14.30 – 15.15</th>
<th>2. Policy updates (10 mins each)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Digital technologies in promoting treatment adherence for MDR-TB.</td>
<td>Muhammad Asif</td>
</tr>
<tr>
<td></td>
<td>Whole Genome sequencing – current use and future potential.</td>
<td>Arash Ghodousi</td>
</tr>
<tr>
<td></td>
<td>Discussions</td>
<td></td>
</tr>
<tr>
<td>15.15 – 16.15</td>
<td>Partner support for MDR-TB expansion and implementing policy updates in SEA Region.</td>
<td>Sreenivas Nair, STP</td>
</tr>
<tr>
<td></td>
<td>Availability of new and repurposed drugs, and 2020 drug orders in SEAR for oral regimen.</td>
<td>Alessio Mola, GDF</td>
</tr>
<tr>
<td></td>
<td>GF funding support for rGLC in 2021, and for the countries in the Region to catch-up with MDR-TB in post-COVID period.</td>
<td>Mohammed Yassin, Global Fund</td>
</tr>
<tr>
<td></td>
<td>USAID support in the SEA Region for catch-up during post COVID period in 2021.</td>
<td>Viktoriya Livchits, USAID</td>
</tr>
<tr>
<td></td>
<td>Discussions</td>
<td></td>
</tr>
</tbody>
</table>

|----------------------------------|---------------|-------------------|
### Annual progress report, ongoing activities and country requests for support.

- **rGLC Secretariat**

### 5. rGLC planning for 2021

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Participant(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.00</td>
<td>Concept notes on remote support for the Member States.</td>
<td>rGLC members</td>
</tr>
<tr>
<td>5.20</td>
<td>Work and funding outlook.</td>
<td>Plenary</td>
</tr>
<tr>
<td>5.40</td>
<td>Any other rGLC related business.</td>
<td>Plenary</td>
</tr>
<tr>
<td>5.50</td>
<td>Chair and Vice chair of the rGLC – election/reappointment.</td>
<td>rGLC members</td>
</tr>
</tbody>
</table>

### 16.20 – 16.30 Closing remarks

- **Mukta Sharma, Regional Adviser, TB/HIV/Hepatitis/STI**
Annex 2: List of Participants

rGLC Members

1. Dr Aung Kya Jai Maung
   Country Director
   Damien Foundation
   Dhaka, Bangladesh

2. Dr Nimalan Arinaminpathy
   Reader (Associate Professor)
   Imperial College
   London, UK

3. Dr Padmapriyadarsini Chandrasekaran
   Director
   National Institute for Research in Tuberculosis
   Chennai, India

4. Dr Christine Sandra Ho
   TB Advisor
   Centers for Disease Control and Prevention
   New Delhi, India

5. Dr Asif Muhammad
   Technical Advisor
   National TB Control Program
   Myanmar

6. Dr Wipa Reechaipichitkul
   Professor
   Khon Kaen University
   Thailand

7. Dr Sanjay Sarin
   Head
   FIND India

8. Dr Kwonjune Justin Seung
   Instructor in Medicine
   Harvard Medical School
   Boston, MA, USA

9. Prof Ye Tun
   Professor/Head
   Thingankyun General Hospital
   Myanmar

10. Dr Douglas Fraser Wares
    Senior Consultant
    KNCV Tuberculosis Foundation,
    United Kingdom

11. Ms Paran Sarimita Winarni
    Monitoring and Evaluation staff
    SSR POP TB
    Jakarta, Republic of Indonesia

Standing invitee to the rGLC

12. Dr Arash Ghodousi
    Emerging Bacterial Pathogens Unit
    WHO collaborating Centre and TB Supranational Reference Laboratory
    IRCCS San Raffaele Scientific Institute
    20132 Milano, Italy

Government Nominations

Bangladesh

13. Dr Pronab Kumar Modak
    Deputy Program Manager (Training)
    National Tuberculosis Control Program (NTP)
    Mycobacterial Disease Control (MBDC)
    DGHS
    Dhaka Bangladesh.

India

14. Dr K S Sachdeva
    Deputy Director General
    National TB Elimination Programme
    Ministry of Health and Family Welfare
    Nirman Bhavan
    New Delhi
    India

15. Dr Ravinder Kumar
    TB Specialist
    National TB Elimination Programme
    Ministry of Health and Family Welfare
    Nirman Bhavan
    New Delhi
    India

16. Dr Ritu Gupta
Additional Deputy Director General TB cum Consultant (SAG)  
Central TB Division, Ministry of Health and Family Welfare, Government of India  
Nirman Bhawan New Delhi  
India

17. Dr Sandeep Chauhan  
WHO NTEP National Consultants – DR-TB  
National TB Elimination Programme  
Ministry of Health and Family Welfare  
Nirman Bhavan  
New Delhi  
India

18. Dr Hardik Solanki  
WHO NTEP National Consultants – DR-TB  
National TB Elimination Programme  
Ministry of Health and Family Welfare  
Nirman Bhavan  
New Delhi  
India

19. Dr Lakshmi Rajgopalan  
National TB Elimination Programme  
Ministry of Health and Family Welfare  
Nirman Bhavan  
New Delhi  
India

20. Dr Endang Lukitosari  
Deputy NTP Manager for Drug Resistant TB  
Directorate of Communicable Disease Prevention and Control  
Ministry of Health Republic of Indonesia  
Jakarta  
Indonesia

21. Dr Si Thu Aung  
Director of Disease Control, Myanmar  
Department of Public Health  
Ministry of Health and Sports  
Myanmar

22. Dr Cho Cho San  
National TB Programme Manager/ Deputy Director  
Department of Public Health  
Ministry of Health and Sports  
Myanmar

Nepal

23. Ms Thuma Pun  
Nursing Officer  
National Tuberculosis Centre  
Ministry of Health and Population  
Government of Nepal  
Kathmandu  
Nepal

Thailand

24. Dr Phalin Kamolwat  
Director, Division of Tuberculosis  
Department of Disease Control  
Thailand  
Ministry of Public Health, Thailand

25. Dr Thidaporn Jirawattanapisal,  
Chief of Office of International Collaborations Division of Tuberculosis  
Department of Disease Control  
Ministry of Public Health, Thailand

Partner Agencies

26. Dr Shamim Mannan  
TB Lead  
Clinton Health Access Initiative  
40, Okhla Industrial Estate Phase 3 Rd Okhla Phase III  
New Delhi, Delhi 110020

27. Dr Sreenivas Nair  
Technical Advisor  
Stop TB Partnership  
Geneva, Switzerland

Myanmar

28. Dr Alessio Mola
Country Supply Officer for South-East Asia
Stop TB Partnership
Geneva, Switzerland

29. Dr Waqas Rabbani
Regional Technical Advisor
Global Drug Facility Team
Stop TB Partnership
Geneva, Switzerland

30. Dr Mohammed Yassin
Senior TB Advisor
The Global Fund
Chemin Blandonnet 8
1214 Vernier-Geneva, Switzerland

31. Ms Viktoria Livchits
USAID Contractor & TB Research Advisor
Tuberculosis Division
Bureau for Global Health, USA

Country Offices

32. Dr Nazis Arefin Saki
National Professional Officer (TB)
WHO Country Office
Bangladesh

33. Dr Sonam Wangdi
NPO (Communicable Disease Control)
WHO Country Office
Bhutan

34. Dr Md. Kamar Rezwan
Technical Officer
WHO Country Office
DPR Korea

35. Dr Ranjani Ramachandran,
National Professional Officer (Labs)
WHO Country Office
India

36. Dr Malik Parmar
National Professional Officer
WHO Country Office
India

37. Dr Kiran Kumar Rade
NPO (TB Epidemiologist)
WHO Country Office
India

38. Dr Shalala Rafayil Ahmadova
Medical Officer
WHO Country Office
Indonesia

39. Dr Setiawan Jati Laksono
National Professional Officer (Tuberculosis)
WHO Country Office
Indonesia

40. Dr Maria Regina Christian
National Professional Officer
WHO Country Office
Indonesia

41. Ms Mikyal Faralina
National Consultant
WHO Country Office
Indonesia

42. Ms Yoana Anandita
National Consultant
WHO Country Office
Indonesia

43. Mr Jonathan Marbun
National Consultant
WHO Country Office
Indonesia

44. Dr Sushil Dev Pant
Medical Officer
WHO Country Office
Maldives

45. Dr Faiha Ibrahim
National Professional Officer – EHA
WHO Country Office
Maldives

46. Dr Aye Thida
National Professional Officer (TB)
WHO Country Office
Myanmar

47. Dr Kyaw Ko Ko Win
National Professional Officer-TB),
WHO Country Office
Myanmar

48. Dr Aung Thu
49. Dr Tin Mi Mi Khaing  
   (Senior National Technical Officer-TB),  
   WHO Country Office  
   Myanmar

50. Dr Khine Thet Su  
   National Professional Officer (TB)  
   WHO Country Office  
   Myanmar

51. Dr Ye Win Thein  
   National Technical Officer  
   WHO Country Office  
   Myanmar

52. Dr Ashish Shrestha  
   National Professional Officer - TB  
   WHO Country Office  
   Nepal

53. Dr Navaratnasingam Janakan  
   NPO (Communicable Disease Control)  
   WHO Country Office  
   Sri Lanka

54. Dr Mizaya Cadar  
   NPO (Neglected Tropical Diseases/Anti-Microbial Resistance)  
   WHO Country Office  
   Sri Lanka

55. Dr Preshila Samaraweera  
   National Professional Officer  
   WHO Country Office  
   Sri Lanka

56. Dr Gopinath Deyer  
   Medical Officer (Malaria and Border Health)  
   WHO Country Office  
   Thailand

57. Ms Kallayanee Laempoo  
   Programme Associate  
   Thailand

58. Dr Debashish Kundu  
   Medical Officer (Tub)  
   WHO Country Office  
   Timor-Leste

59. Dr Mia Domingas  
   Programme Assistant TB  
   WHO Country Office  
   Timor-Leste

Observers

60. Ms Rada Dukpa  
   Programme Assistant  
   Bhutan

61. Mr Phurpa Tenzin  
   NTP  
   Bhutan

62. Ms Tiara Verdinawati  
   PMDT Technical Officer  
   Ministry of Health Republic of Indonesia  
   Jakarta  
   Indonesia

63. Dr Yusie Permata  
   USAID STAR Project  
   PMDT Advisor  
   Jakarta, Indonesia

64. Ms Dina Frasasti  
   PMDT Technical Officer  
   Ministry of Health Republic of Indonesia  
   Jakarta  
   Indonesia

65. Dr Padmanav Ghimire  
   Nepal

66. Dr Basundara Sharma  
   Nepal

67. Dr Dushani  
   Consultant microbiologist  
   National reference laboratory  
   Sri Lanka

68. Sr Costa Lopes  
   NTP Manager  
   Timor-Leste

WHO/HQ

69. Dr Medea Gegia
WHO/SEARO

70. Dr Mukta Sharma
   Regional Advisor (THS)

71. Dr Partha Pratim Mandal
   Medical Officer – TB
   TUB/CDS

72. Dr Vineet Bhatia
   Medical Officer – MDR-TB
   TUB/CDS

73. Ms Shweta Verma
   Team Assistant
   TUB/CDS