World Health Organization
Myanmar

NATIONAL STRATEGIC PLAN 2021-2025

National TB Programme

March 2020
Ministry of Health and Sports
Nay Pyi Taw

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2021–2025

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Abbreviations

3MDG	Three Millennium Development Goals Fund
ACF	Active case-finding
AFB	Acid-fast bacillus
AHRN	Asian Harm Reduction Network
AIDS	Acquired immunodeficiency syndrome
AMW	Auxiliary midwife
ART	Antiretroviral therapy
ASEAN	Association of South-East Asian Nations
BHS	Basic health staff
BMU	Basic management unit
CBO	Community-based organization
CBTBC	Community-based tuberculosis care
CDC	Centers for Disease Control and Prevention
CHAI	Clinton Health Access Initiative
CHV	Community health volunteer
CHW	Community health worker
CME	Continuing medical education
CNR	Case notification rate
CPT	Co-trimoxazole preventive therapy
CSO	Civil society organization
CXR	Chest X-ray
DFID	Department for International Development (UK)
DHIS2	District Health Information System2
DHRH	Department of Human Resource for Health
DMO	District medical officer
DMR	Department of Medical Research
DMS	Department of Medical Services
DOPH	Department of Public Health
DOT	Directly observed treatment
DOTS	Directly observed treatment, short-course (The basic package for TB control consists of five elements: political commitment; case detection through quality-assured bacteriology; standardized treatment with supervision and patient support; effective drug supply system and management; and monitoring and evaluation with impact measurement.)

DQA	Data quality assessment
DST	Drug sensitivity testing
ECBHO	Ethnic and community-based health organizations
EPHS	Essential Package of Health Services
EPI	Expanded Programme on Immunization
EQA	External quality assurance
FDA	Department of Food and Drug Administration
FHI360	Family Health International
FIND	Foundation for Innovative New Diagnostics
FM	Fluorescence microscopy
GAVI	Global Alliance for Vaccines and Immunization
GF	Global Fund to Fight AIDS, Tuberculosis and Malaria
GLI	Global Laboratory Initiative
GP	General practitioner
HIV	Human immunodeficiency virus
HR	Human resources
HRD	Human resource development
HSS	Health systems strengthening
ICMV	Integrated community malaria volunteer
IDP	Internally displaced persons
IEC	Information, education and communication
IFRC	International Federation of Red Cross and Red Crescent Societies
IMNCI	Integrated Management of Neonatal and Childhood Illness
INGO	International nongovernmental organization
IOM	International Organization for Migration
IPC	Infection prevention and control
IPT	Isoniazid preventive therapy
ITHP	Inclusive township health planning
JATA	Japan Anti-tuberculosis Association
JICA	Japan International Cooperation Agency
JMM	Joint monitoring mission
LIMS	Laboratory Information Management System
LMIS	Logistics Management Information System
LPA	Line probe assay

LQMS	Laboratory quality management system
LTBI	Latent tuberculosis infection
MAF	Multisectoral accountability framework
MHSCC	Myanmar Health Sector Coordination Committee
MCH	Maternal and child health
MDG	Millennium Development Goal
MDR-TB	Multidrug-resistant tuberculosis
MHAA	Myanmar Health Assistant Association
MMA	Myanmar Medical Association
MMCWA	Myanmar Maternal and Child Welfare Association
MNCH	Maternal, Neonatal and Child Health
MOHA	Ministry of Home Affairs
MOHS	Ministry of Health and Sports
MRCS	Myanmar Red Cross Society
MSDP	Myanmar Sustainable Development Plan
MSF-OCA (H)	Médecins Sans Frontières – Operational Centre Amsterdam (Holland)
MSF-CH	Médecins Sans Frontières (Switzerland)
M.tb	Mycobacterium tuberculosis
MWAF	Myanmar Women's Affairs Federation
NAP	National AIDS Programme
NCD	Noncommunicable diseases
NDRS	National Drug Resistance Surveillance
NFM	New Funding Model
NIMU	National Health Plan Implementation Monitoring Unit
NGO	Nongovernmental organization
NHCP	National Hepatitis Control Programme
NHP	National Health Plan
NSP	National Strategic Plan
NTP	National Tuberculosis Programme
NTRL	National Tuberculosis Reference Laboratory
OOPE	Out-of-pocket expenditures
OPD	Outpatient department
PHC	Primary health care
PHS2	Public health supervisor grade 2

PLHIV	People living with HIV/AIDS
PMDT	Programmatic management of drug-resistant tuberculosis
PPM	Public–private or public–public mix
PSI	Population Services International
PWID	People who inject drugs
RHC	Rural health centre
RIT	Research Institute of Tuberculosis (Japan)
RMNCH	Reproductive, maternal, newborn and child health
RPHD	Regional public health department
RR	Rifampicin-resistant
SDs	Strategic directions
SDG	Sustainable Development Goal
SE	Specialized centre
SHG	Self-help group
SNRL	Supra National Reference Laboratory
SOP	Standard operating procedure
SORT IT	Structured Operational Research and Training Initiative
STD	Sexually transmitted disease
STI	Sexually transmitted infection
STR	Shorter Treatment Regimen
TB	Tuberculosis
TMO	Township medical officer
TOR	Terms of reference
ToT	Training of trainers
TPT	Tuberculosis preventive therapy
TB TSG	Technical and Strategic Group (Tuberculosis)
TSR	Treatment success rate
UHC	Universal Health Coverage
UNAIDS	Joint United Nations Programme on HIV/AIDS
Union	International Union against Tuberculosis and Lung Disease
UNOPS	United Nations Office for Project Services
USAID	United States Agency for International Development
VHW	Voluntary health worker
WFP	World Food Programme

WGS	Whole genome sequencing
Xpert® MTB/RIF	Rapid TB and MDR-TB diagnostic test based on nucleic acid amplification

Executive summary

Myanmar has long been active in the global fight against tuberculosis (TB). Having achieved the 2015 TB-related Millennium Development Goals, the country has made further progress in its pursuit to eliminate TB. Myanmar joined the global movement to achieve the Sustainable Development Goals, and not only did it adopt WHO's End TB Strategy to meet the TB-related goal, but is well on its way to achieving a key milestone of the Strategy for 2020, that is, achieving a 20% reduction in the incidence of TB from the 2015 baseline. Myanmar was also a signatory to major global and regional commitments made in the Moscow Ministerial Declaration, the South-East Asia Regional Call for Action in 2017, as well as at the United Nations high-level meeting in 2018 for a sustained, holistic and multisectoral response to end TB.

The development of the National TB Strategic Plan (NSP) 2021–2025 began in 2019, alongside the preparation of the joint monitoring mission (JMM) that was intended to comprehensively evaluate Myanmar's National TB Programme (NTP) and make recommendations to strengthen the national TB response further. The critical lessons drawn from the implementation of the NSP 2016–2020; information mined from the results of the 2017–2018 national TB prevalence survey; examination of TB-related interventions in Myanmar's National Health Plan (NHP); and above all, findings and recommendations of the national and international experts of the 2019 JMM have all provided a solid foundation for the formulation of this NSP.

A re-estimation of the TB burden in Myanmar, based on a comparison of the findings of the 2009 and 2017–18 national TB prevalence surveys, demonstrated an annual decline of nearly 5% in the incidence of TB. Myanmar is now among the few countries set to meet the 2020 milestone mentioned earlier. The overall notification rate of TB cases has been on the decline, as has the notification of TB among children. The treatment success rate (TSR) among new and relapsed TB cases was as high as 87% for the 2017 cohort. Notably, the TSR those among multidrug-resistant (rifampicin-resistant)-TB patients was also high, at 79%. From 2016, TB/HIV collaborative activities were expanded to all townships. Under the previous NSP, many new and diverse initiatives envisaged under the End TB Strategy to bolster TB care and prevention through an integrated, community-oriented and coordinated multisectoral response were started and scaled up.

The findings of the fourth National TB Prevalence Survey, undertaken in 2017–2018, have clear implications for the design and implementation of this NSP. The distribution of TB in the country is uneven, with the burden being higher in urban areas, especially the Yangon region, and a much greater prevalence among high-risk groups, such as the elderly and tobacco smokers. This calls for a differentiated overall approach. It demands large-scale implementation of active case-finding strategies, especially among high-risk groups and in high-prevalence areas, through stronger decentralization and greater integration of TB services into primary health care. Recognizing this, the JMM made several recommendations based on direct observations from the ground. These recommendations highlighted the need to: set up a high-level mechanism for a coordinated multisectoral response to end TB; actively engage with the broader health sector; address the human resource challenge faced by the NTP and strengthen partnerships within and beyond the health sector, including with those affected, communities and care providers; provide universal access to chest X-ray (CXR) and rapid diagnostics; come up with a special response for the Yangon region without losing more time; ensure social protection to patients and their families to spare them the catastrophic costs of TB care; and secure and sustain enhanced funding to accomplish all this and accelerate progress to meet the targets set for this NSP and beyond.

This document is divided into two parts. The first part starts with an introduction, followed by details of the methods adopted to develop the NSP. After the section on methods is a description of Myanmar's national demographic and health profiles. The latter touches upon the country's Universal Health Coverage (UHC) policy and the Essential Package of Health Services (EPHS); human resources for health and TB services; and financing for health. The current TB situation in the country, including epidemiology and the progress made under the previous NSP, are then described. Part I also discusses the implications of the findings of the recent prevalence survey for this NSP and financing for a comprehensive TB response. Part II has a chapter each on

the five identified Strategic Directions (SDs) of this NSP and the key intervention areas defined under them. Each intervention area is described in a standardized way under five subheadings, which include: situation analysis, challenges, strategic approaches, essential interventions, and indicators and targets.

PART 1

1. Introduction

Table 1 presents the NSP at a glance. In line with the End TB Strategy framework, this NSP builds on the successes of the previous NSP. It addresses unfinished work and sets out new tasks. Making Myanmar free of TB by 2050 remains the vision of this NSP. The goal is to reduce TB incidence to less than 10 cases per 100 000 population by 2035. However, the goal for the current NSP is to achieve a 50% reduction in TB incidence, compared with the 2015 baseline, by 2025.

Table 1. The NSP 2021–2025 at a glance

<table>
<tr><td>Vision</td><td>TB-free Myanmar

(Zero deaths, disease and suffering due to TB by 2050)</td></tr>
<tr><td>Goal</td><td>End the TB epidemic in Myanmar

Fewer than 10 cases per 100 000 population by 2035; 50% reduction in TB incidence compared with 2015 baseline by 2025</td></tr>
<tr><td colspan="2">Objectives

Expand TB services as part of UHC and strengthen partnerships

Minimize TB transmission by intensifying preventive efforts and reaching high-risk populations

Achieve a faster decline in TB burden through an accelerated multisectoral TB response</td></tr>
<tr><td colspan="2"><table>
<tr><th>Key impact indicator</th><th>2015 (benchmark)</th><th>2018 (baseline)</th><th>2021</th><th>2022</th><th>2023</th><th>2024</th><th>2025</th></tr>
<tr><td>Prevalence rate</td><td>459</td><td>436</td><td>NA</td><td>NA</td><td>NA</td><td>NA</td><td>219</td></tr>
<tr><td>Incidence rate</td><td>391</td><td>338</td><td>280</td><td>258</td><td>235</td><td>211</td><td>190</td></tr>
<tr><td>Mortality rate</td><td>57</td><td>39</td><td>26</td><td>23</td><td>20</td><td>17</td><td>14</td></tr>
</table></td></tr>
<tr><td>Strategic direction 1

Progress towards achieving universal access to TB care and prevention</td><td>• Expand quality TB screening and diagnostic services.
• Detect and treat all forms of drug-sensitive TB (DS-TB) and drug-resistant TB (DR-TB)
• Strengthen management of TB in children
• Undertake joint TB/HIV programming and decentralize integrated services
• Expand collaborations to manage TB comorbidities
• Strengthen infection control and expand preventive treatment for TB</td></tr>
<tr><td>Strategic direction 2

Reach the unreached populations and accelerate a coordinated TB response</td><td>• Target actions to reach all at-risk populations
• Accelerate TB response in Yangon region through coordinated action across sectors</td></tr>
</table>

Strategic direction 3 Expand partnerships and community engagement and improve communications	• Engage all care providers, including NGOs and private sector, in TB response • Promote and strengthen community engagement • Implement a robust communication strategy, targeting a wide range of stakeholders
Strategic direction 4 Strengthen systems and update policies for a multisectoral TB response	• Ensure availability of essential human resources • Strengthen procurement and supply systems for efficient care delivery • Ensure inclusion of TB in UHC and wider economic and development policies, plans and activities • Promote and coordinate a multisectoral TB response • Secure finances to enable implementation of NSP
Strategic direction 5 Promote research and innovation and strengthen surveillance for programme monitoring and evaluation	• Strengthen research culture and capacity at different levels • Implement updated, prioritized research agenda • Strengthen TB surveillance, monitoring and evaluation • Develop and make available evidence to update policies, design and develop interventions

The objectives of this NSP are geared to achieving a logical continuation, acceleration and expansion of Myanmar's current efforts towards ending the TB epidemic. They inform and help define the SDs and the intervention areas the country needs to pursue during the next five years. The TB-specific interventions will be within the framework of the NHP and integrated into the UHC policy and plans. A major task ahead for the NTP would be to achieve universal access to TB care and prevention with a wide implementation of the available tools and technologies. With a view to achieving this, the NTP will redouble its efforts to enhance partnerships within and outside the health sector, including communities (Objective 1).

Making further progress will also require preventing TB by decreasing the transmission of the disease in the community. To this end, the NTP and its partners will reach out to high-risk groups and unreached populations for the early detection of TB cases and intensify efforts in areas that have very high levels of TB, such as the Yangon region. The NTP will also pursue efforts to prevent and control infection and rapidly scale up the provision of preventive treatment to eligible populations (Objective 2).

The expansion of services for TB care and prevention will need a commensurate strengthening of the health systems. Moving screening and diagnosis closer to the community by making (CXR) services available at the level of station hospitals needs to be highlighted. Intrasectoral coordination with programmes, such as those for HIV, reproductive, maternal, newborn and child health (RMNCH) and noncommunicable diseases (NCD), and collaboration with ministries, such as finance, social welfare, education, home affairs, and migration, are a prerequisite for a more rapid decline in the TB burden (Objective 3).

The five SDs will help address the objectives of the NSP. The first three SDs spell out strategies, approaches and interventions to achieve universal access to high-quality diagnosis, treatment, care and prevention services. This will be achieved by providing relatively greater inputs for the expansion of services and outreach to high-risk groups and unreached populations through partnerships with all relevant stakeholders. The fourth SD is about strengthening health systems and eliciting a multisectoral response, while the fifth focuses on improvising strategies for enhancing the performance of the programme through innovation and research, and monitoring and evaluation to measure the progress of the programme and the impact of the interventions.

Table 2. Strategic directions, intervention areas and essential interventions

Strategic direction 1: Progress towards achieving universal access to TB care and prevention	
Intervention area	**Essential intervention**
1. Expand quality TB screening and bring diagnostic services closer to community	• Ensure availability of adequate human resources • Expand quality-assured diagnostic services • Strengthen linkages and communication between diagnostic and treatment sites • Ensure regular supply of laboratory commodities • Introduce risk assessment, biosafety, infection prevention and control • Expand recording and reporting systems for laboratories
2. Detect and treat all forms of DS-TB and DR-TB	• Management of DS-TB • Programmatic management of DR-TB
3. Strengthen management of TB in children	• Intensify case-finding • Expand the use of CXR • Strengthen contact tracing among children • Expand the coverage of TB preventive treatment (TPT) for child contacts of TB patients • Set up specialized centres for childhood TB (Ministry of Health and Sports [MOHS]) • Strengthen links between TB/HIV and MNCH activities, including those under the Expanded Programme on Immunization (EPI) • Provide access to childhood TB formulations • Update national guidelines and training programmes
4. Undertake joint TB/HIV programme and decentralize integrated services for TB and HIV	• Integrate coordination • Increase human resources for health • Strengthen TB infection control practices and ensure that essential HIV and TB care services are provided in timely manner, both in TB and HIV clinics • Ensure that TB/HIV collaborative activities are monitored and evaluated • Pilot one-stop TB/HIV services
5. Expand collaborations to manage TB comorbidities	• Expand collaboration with NCD (diabetes mellitus [DM], tobacco use and mental health) activities • Expand collaboration with programmes for hepatitis

6. Strengthen infection control and expand TB preventive treatment	• Lay emphasis on TB infection prevention and control • Provide TB preventive treatment to all household contacts of TB patients and people living with HIV/AIDS (PLHIV)
Strategic direction 2: Reach the unreached populations and accelerate a coordinated TB response	
Intervention area	**Essential intervention**
1. Target actions to reach all at-risk populations	• Improve the quality and coverage of active case-finding through mobile teams, community-based tuberculosis care (CBTBC) and contact investigation • Improve the quality and coverage of accelerated case detection among high-risk groups attending community health clinics (those with NCDs, the elderly), antenatal and postnatal care facilities, and clinics for those under 5 years of age, and improve sputum transportation activities • Improve the TSR among high-risk populations: the elderly, prison inmates, congested urban /peri-urban population, hard-to-reach population, high-risk workers, migrants, ethnic minorities, inhabitants of camps for internally displaced persons (IDP)
2. Accelerate TB response in Yangon region through coordinated action across sectors	• Implement Yangon subnational operation plan • Find missing TB cases by strengthening strategies and adopting innovative strategies • Reduce the gap between diagnosis and treatment of both DS-TB and DR-TB • Improve treatment adherence • Strengthen TB/HIV collaborative activities • Strengthen interventions for infection control • Strengthen TB surveillance system • Conduct regular supportive supervision at township level

Strategic direction 3: Expand partnerships and community engagement, and improve communications	
Intervention area	**Essential intervention**
1. Engage all care providers, including NGOs and private sector, in TB response	• Develop and implement a national scale-up plan for involving all public and private care providers in TB services, diagnosis and treatment or referral • Find innovative ways to improve public–private partnership models to promote early case detection and treatment, improvement in quality of care and reduction of costs for patients • Ensure that private practitioners are updated regularly on new programmatic aspects of TB and technical advances • Enhance capacity of all public–private mix (PPM) partners • Strengthen referral network and coordination between the NTP and partners, especially at the field level • Establish strategic purchasing as a model for PPM engagement
2. Promote and strengthen community engagement	• Scale up CBTBC • Regularly update and review CBTBC guidelines for community health workers (CHWs) • Promote awareness of TB to address stigma and discrimination through community engagement • Strengthen coordination mechanisms for CBTBC • Establish and strengthen support groups • Enhance the capacity of CHWs and civil society organizations (CSOs) • Strengthen monitoring and evaluation of community engagement
3. Implement a robust communication strategy targeting a wide range of stakeholders	• Identify the key target groups and determine communication objectives for each group • Define the desired behaviour for each target group, develop key communication messages and determine the communication channels and tools for the groups • Secure funding and implement communication strategies • Increase the use of digital technology to enhance patient–provider communication, particularly in hard-to-reach areas

Strategic direction 4: Strengthen systems and update policies for a multisectoral TB response	
Intervention area	**Essential intervention**
1. Ensure availability of essential human resources	• Advocate with the MOHS to fill vacant posts • Ensure continuation of seconded staff • Strengthen training programmes • Promote digital and on-the-job learning • Monitor and supervise health workers' performance • Establish specialized centres
2. Strengthen procurement and supply systems for efficient care delivery	• Harmonize and standardize TB medicines, diagnostics and supplies at health facilities at all levels • Strengthen and institutionalize forecasting, supply planning, stock monitoring and early warning methodology, practices and tools at all levels of TB supply chain • Strengthen procurement system and comply with the procurement strategies of the MOHS • Ensure gradual integration with other AIDS, TB and malaria programmes, including establishment of common warehouses, and transportation and distribution systems at central, regional and TB treatment facilities • Expand mSupply up to the TB treatment facility level to improve the visibility and availability of Logistics Management Information System (LMIS) data • Collaborate with the Department of Human Resources for Health (DHRH) of the MOHS for health workforce and Human Resource Capacity Development (HRCD) for development of the supply chain workforce • Promote quality assurance, safety and rational use of TB medicines and health technologies • Ensure adequate waste management of TB medicines, health technologies, unusable and hazardous material
3. Ensure inclusion of TB in UHC and wider economic and development policies, plans and activities	• Health policy development • Include TB in the EPHS • Mainstream NTP activities within UHC, the Myanmar Sustainable Development Plan (MSDP) and restructured MOHS framework

4. Promote and coordinate a multisectoral TB response	• Develop a multisectoral accountability framework • Form a Yangon region multisectoral coordination committee to specifically address Yangon TB situation • Strengthen intra-ministerial collaboration • Collaborate with other ministries and governing bodies on the broader components of TB response • Develop and implement policies • Review and revise national guidelines in a timely manner and develop new guidelines, when necessary • Nurture engagements with existing and potential donors • Engage with community and ECBHOs to extend the reach
5. Secure finances to enable implementation of the NSP	• Advocate for Government commitment to finance anti-TB drugs and staffing of TB operations • Strengthen MOHS capacity in the areas of public financial management and grant management • Ensure financing of the TB operational budget
Strategic direction 5: Promote research and innovation and strengthen surveillance for programme monitoring and evaluation	
Intervention area	**Essential intervention**
1. Strengthen research culture and capacity at different levels	• Promote research culture by providing support for research and participation in conferences • Strengthen research capacity in implementation and operations research in collaboration with the Department of Medical Research (DMR) and partners
2. Implement updated, prioritized research agenda	• Implement remaining and new prioritized research agenda • Promote pilot studies for adaptation and roll-out of new tools/technologies • Conduct periodic nationwide assessments to evaluate programmatic impact
3. Strengthen TB surveillance system and monitoring and evaluation of programme	• Strengthen TB surveillance system in all basic management units (BMUs) • Strengthen electronic-based data management system • Strengthen vital registration for more consistent recording of TB-related deaths

4. Develop and make available evidence to update policies, and design and develop interventions	• Promote utilization of available data and research evidence for policy development and decision-making • Facilitate data utilization and ownership at all levels

In line with the End TB milestone of a 50% reduction in the TB incidence rate, this NSP aims for a reduction of 51% compared to 2015. A 2017 prevalence survey adjusted the incidence reduction rate at 4.9%, while the targeted reduction rate beyond 2023 has been set at 10%. The number of TB deaths is set to fall by 75% in 2025, compared to 2015, and the End TB milestone is close to being reached. Despite coordinated responses in this NSP (2021–2025), the 2025 End TB milestone of 'zero TB-affected families facing catastrophic costs due to TB' could not be reached. With the integration of TB services into the strategies of the broader health system and targeted interventions to increase accessibility to TB services, this NSP's target for TB treatment coverage is 97% by 2023 and for the TB TSR, 90% by 2025.

Table 3. Key impact and outcome indicators with targets for 2021–2025

Impact indicator	**2015** (benchmark)	**2019** (baseline as in 2018)	**2021**	**2022**	**2023**	**2024**	**2025**
TB prevalence rate per 100 000 population	459	436	NA	NA	NA	NA	219
TB incidence rate per 100 000 population	391	338	280	258	235	211	190
TB incidence rate per 100 000 population for monitoring and evaluation and operational planning (annual reduction of 5%) [a]	391	338	290	275	261	248	236
TB mortality rate per 100 000 population	57	39	26	23	20	17	14
Prevalence of rifampicin-resistant TB (RR-TB) and/or multidrug-resistant TB (MDR-TB) among new TB patients: proportion of new TB cases with RR-TB and/or MDR-TB [b]	5.1%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%
TB/HIV mortality rate per 100 000 population	7.7	6.9	TBD	TBD	TBD	TBD	TBD
Percentage of TB-affected households that experience catastrophic costs due to TB	60	60	60	60*	50*	50	50
Outcome indicator	**2015** (benchmark)	**2019** (baseline)	**2021**	**2022**	**2023**	**2024**	**2025**
Case notification rate of all forms of TB per 100 000 population – bacteriologically confirmed plus clinically diagnosed, new and relapse cases	268	256	270	265	253	229	204
Case notification rate per 100 000 of population with bacteriologically confirmed TB	93	105	123	126	126	116	104
Notification of RR-TB and/or MDR-TB cases	2 793	3 205	5 121	5 437	5 598	4 864	4 638

TSR of all forms of TB – bacteriologically confirmed plus clinically diagnosed, new and relapse cases	86%	88%	90%	90%	90%	90%	90%
TSR of RR-TB and/or MDR-TB cases	83%	80%	80%	81%	82%	82%	82%
TB treatment coverage [c]	67%	75%	93%	96%	97%	TBD	TBD

** Patients' cost survey is proposed in 2022/2023. Policy and target will be amended.*

[a] *5% annual decline of incidence rate between 2018 and 2023 from WHO's incidence estimate in 2019 for 2018. WHO incidence and its trend estimates are based on TB prevalence surveys' results in 2010 and 2018. Averaged annual decline rate of incidence between 2010 and 2018 was 4.9%. (Global TB Report 2019, page 66).*

[b] *Target setting will be done after 4th DRS (2021). Currently kept at 4.9% as per Gene Xpert data of 2018 as in Global TB Report 2019*

[c] *Until when acceleration of decline of TB incidence aimed by NSP is proven by Epidemiological review or studies or WHO revises the estimate, TB incidence with estimated annual decline rate of 5% is used to calculate case detection coverage. Case detection that exceeds treatment coverage rate of 90% or higher could be observed due to expansion of active case detection with appropriate selection of target populations. Chronic TB patients staying in community without TB diagnosis and treatment will be detected. Hot spot communities have two- or three-times higher prevalence than annual notification. The estimated case notification for 2024 and 2025 will be revised when the decline in TB is estimated next.*

2. Methodology

The NSP was developed by the NTP and the Technical and Strategic Group (tuberculosis), or TB TSG, in consultation with various stakeholders, including affected populations. WHO played a secretariat role to facilitate the process and provided the support of national and international experts.

The process of developing the NSP was launched in August 2019, together with the preparation for the 6th JMM, which was to evaluate the NTP and make recommendations to strengthen the TB Programme. A series of epidemiological assessments carried out before this provided critical background information for the JMM. These were the Standard and Benchmark Analysis of TB Surveillance (Research Institute of Tuberculosis, Japan and WHO), Assessments of Active Case Detection (RIT, WHO and Challenge TB-FHI360), 4th National TB Prevalence Survey and Re-estimation of the TB Burden (WHO Global Task Force on TB Impact Measurement).

The timeline for the development of the NSP was discussed by the TB TSG in April 2019. A preparatory group was then formed with core members of the TSG and a few volunteers from the expanded TSG. The group discussed the progress made under the NSP 2016–2020 and reviewed the gaps between WHO's global standards and guidelines and the current practice in Myanmar. The conclusions of these discussions were circulated among the members of the TSG who were requested to provide inputs for the TOR of the JMM, and WHO compiled them as Asks to JMM. The first consultation meeting of TSG members with state and regional officers and other stakeholders was held in July 2019 to inform them of the epidemiological situation and the progress of the Programme to bring everyone on the same page and learn what they expect from the NSP 2021–2025. Though the revised estimates of the TB burden based on the National TB Prevalence Survey were published in the Global TB Report in October 2019, a short report of the survey was shared with the stakeholders prior to the JMM.

The JMM made nine overarching strategic recommendations and detailed technical recommendations related to 13 thematic areas. It held a high-level debriefing session with the Minister of Health and Sports and government officials and a technical debriefing session with the TSG members in August 2019. The draft report of the JMM was circulated among the TSG members.

The vision, goals and objectives of the NSP were formulated during the second consultation meeting of the NSP core group, held in September 2019. The three SDs of the 2016–2020 NSP were split into five as the areas of work were expanded under the End TB Strategy. Members and focal persons were nominated for the five teams which would work on the five SDs, and a core team was formed to coordinate and compile the work of these teams with the consensus of the TSG core group and NTP. Technical assistance was provided by the staff of WHO Myanmar, which also recruited two national consultants (full-time) and a short-term international consultant to the core group to review and compile the NSP. International Centre for AIDS Care and Treatment Programs (ICAP) and Chemonics, an *international* development consulting firm, also offered national staff to the core group. The WHO Regional Office for South-East Asia provided an epidemiological model for the expected impact of the efforts towards ending TB, including the expansion of the latent tuberculosis infection (LTBI) treatment. WHO's new estimate of the TB burden – an annual decline of 5% in TB incidence – was adopted as a baseline assumption. For this NSP period, the TSG agreed to set a bold target that would enable Myanmar to achieve the 2025 Sustainable Development Goals (SDGs) and the End TB benchmark target of a 50% reduction in TB incidence compared with 2015. The aim was to accelerate the annual reduction in the TB burden (incidence) from 5% in 2019 to 10% by 2025.

Several intensive meetings were held among the SD groups from the end of September to the beginning of December 2019. In October 2019, the group dealing with SD 5 met the NTP Programme Manager, Deputy Director General, Department of Public Health (DOPH) and Director, Disease Control to reach a consensus on the key impact and outcome indicators. Policy-makers then provided directions for the important policy changes across the thematic areas of the NTP. Following this, the core group organized coordination meet-

ings with the strategic group leaders and provided them information on the important policy changes and initial feedback on each thematic area.

The NSP working group members held the third round of consultation in October 2019 to develop a consensus on essential interventions and output targets. The TB TSG members were apprised of important policy changes and a consensus was reached. In November 2019, a zero draft on the NSP was collected from each thematic group.

In November 2019, a consultation was held in Mawlamyaine with ethnic and community-based health organizations (ECBHOs) on HIV, TB and malaria. The intention was to seek support on the development of the NSP. The ECBHOs were asked about the current situation and the challenges faced. They were also requested to present their proposed interventions for the NSP 2021–2025.

A national dialogue was conducted on TB, HIV and malaria for the NSP 2021–2025. In November 2019, priorities for 2021–2023 were discussed with CSOs. The private sector and former MDR-TB patients were included in this. They were presented with the draft NSP and asked to suggest recommendations, as well as share their ideas on what the priority activities should be for the first three years.

In the first half of November 2019, a writing exercise was carried out together with the international consultant. This was reviewed by the WHO team. Following this, the NSP core group met the international consultant. Together with the international consultant, WHO made general comments on the NSP draft and pointed out certain discussion points on which a consensus had to be arrived at with the TSG. Each thematic group was asked to submit a revised NSP draft in the third week of November 2019. At the same time, each thematic group held meetings and discussions on operational plans. Each group provided a draft operational plan for the NSP.

The WHO writing team and international consultants refined the draft towards the end of November. This was followed by a meeting of the core group of the TSG to develop a consensus on the discussion points for the NSP.

A workshop on the operational plan and costing was held in the first week of December 2019 to reach a consensus on the detailed activities, and costing was done according to the operational plan agreed upon. The costed plan was finalized by the costing team set up specifically for this task. Then WHO Secretariat team revisited the NSP draft based on the operational plan and costing exercises.

A meeting of the core groups of the TSGs for TB and HIV was held in December 2019 to present the costed NSP and reached a consensus. Following this, dialogues were conducted with the Government and the NSP's activities and areas that needed support from the Government were presented. This process involved exchange of information among different departments and ministries.

The contents of the NSP were finalized by the NSP writing group and TSG and the final draft was circulated among the NSP core group members in the last week of December. The approved costed NSP was submitted to the MOHS for endorsement in January 2020.

3. Background

3.1 Country profile

3.1.1 Geography and demographics

The Republic of the Union of Myanmar is the largest country in mainland Southeast Asia, with a total surface area of 676 578 sq. km. It borders China to the northeast, India and Bangladesh to the west, Laos to the east and Thailand to the southeast.

The United Nation's Population Division has estimated that the total population of Myanmar was 54 045 000 in 2019. The annual population growth rate of 0.65% (2015–2020) is expected to increase to 0.76% during 2020–2025. Life expectancy at birth is estimated to be 65.7 years for males and 70.8 years for females. The proportion of the aging population (above 64 years) was 6% in 2019 and is estimated to increase to 7.4% by 2025. The majority of the population (69%) resides in rural areas.[1]

According to the Myanmar Living Conditions Survey of 2017, the self-reported literacy rate (defined as "could read and write a simple sentence in any language") among persons of 15 years of age and above was 88.9%. The literacy rate among the urban population (94.5%) was higher than that among the rural population (86.5%). Also, males had a higher literacy rate (92.8%) than females (85.6%).[2]

3.1.2 Economy

Myanmar is classified as a least developed country and one of the lowest in terms of development in the East Asia and Pacific region. Its gross domestic product (GDP) per capita was US$ 1298.88 in 2017 and the World Bank estimates that 24.8% of the population lives below the poverty line. The poverty headcount in rural areas (30.2%) is higher than in urban areas (11.3%). The state of Chin has the highest poverty rate (58%), which is more than four times higher than that in most regions.[3] The economic indicators, however, have been showing positive growth trends. Since the Government initiated an ambitious economic, political and governance reform programme in 2011, Myanmar has seen sustained economic growth. The GDP grew at 6.2% in 2018–2019 and an increase of 6.6% is projected for 2020–2021.[4]

3.1.3 Political structure and policy context

Since the approval of a new Constitution in 2008, Myanmar is formally divided into seven states, seven regions and one union territory, which includes the capital city of Nay Pyi Taw and the surrounding townships. There are six self-administered zones within the country. Urban wards, towns and village tracts are grouped together into townships, which are inhabited by 100–200 000 people. Collections of townships are organized into districts, which then form states and regions. States and regions are constitutionally equivalent. In total, there are 458 towns, 330 townships and 75 districts in 17 states and regions.[5]

Under Article 367 of the 2008 Constitution, "Every citizen shall, in accordance with the health policy laid down by the Union, have the right to health care." The Union Ministry of Health and Sports (MOHS) is responsible for the promotion of health, and the prevention, care and treatment of disease.

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1 United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, Volume I: Comprehensive Tables (ST/ESA/SER.A/426)

2 Central Statistical Organization (CSO), UNDP and WB (2018) "Myanmar Living Conditions Survey 2017: Key Indicators Report", Nay Pyi Taw and Yangon, Myanmar: Ministry of Planning and Finance, UNDP and WB

3 Poverty Report - Myanmar Living Conditions Survey 2017, The World Bank, 2019

4 Myanmar Economic Monitor Report, The World Bank, June 2019

5 "Data | General Administration Department". Gad.Gov.Mm, 2020, http://www.gad.gov.mm/en/content/data. Accessed 11 November 2019.

3.2. Health profile

3.2.1. Health system structure

The MOHS is responsible for planning, financing, administering, providing and regulating health care. The delivery of health-care services in Myanmar relies on a mix of public, private for-profit, private not-for-profit and ethnic health organization (EHO) providers. The MOHS has six health-related departments: the DHRH, Department of Medical Services (DMS), DOPH, DMR, Department of Traditional Medicine and Department of Food and Drug Administration (FDA). Other ministries also provide health care for employees and their families. These include the Ministry of Defence, Ministry of Home Affairs, Ministry of Transport and Communications, Ministry of Electricity and Energy, Ministry of Labour, Immigration and Population and Ministry of Social Welfare, Relief and Resettlement.

The public health sector system is an integrated, layered one, incorporating primary health care with secondary and tertiary hospitals for referred cases. The health system is decentralized and offers services at the ward/village, township, district, state/regional and national levels. The township health department is the backbone of primary and secondary care. Each township has a township hospital. In addition, a township may have one or two station hospitals and four to seven rural health centres (RHCs) to provide services to the rural population. Every RHC has four to seven satellite subrural health centres, each of which is staffed by a midwife and a public health supervisor grade-II (PHS2). Outreach services are provided by midwives supported by volunteer auxiliary midwives (AMWs) and community health workers (CHWs).[6] Responsibilities for disease control have been task-shifted from midwives to PHS2. Urban health centres with school health teams, as well as health centres focused on maternal and child health, take care of the urban population.[7]

The private health sector has also played a major role in the provision of services since the inception of the health system. According to a 2015 estimate, 57% of medical doctors in the country were working in the private sector. Private services tend to be confined to urban settings and have evolved from primary and ambulatory services. The sector now offers more institutional services and intensive care in major urban centres, especially in Yangon, Mandalay and Nay Pyi Taw. In 2017, there were 3759 general practitioners (GPs) and 215 hospitals in the private health sector.[8] In line with the NHP, national NGOs also provide health services.

3.2.2. Universal Health Coverage

Under the SDGs, Myanmar has committed to achieve UHC by 2030. The plan is to have a basic EPHS by 2020, an intermediate EPHS by 2025 and a comprehensive EPHS by 2030. The basic EPHS emphasizes the critical role of primary health care and the delivery of essential services and interventions at the township level and below, starting with the community. The NHP (2017–2021) serves as a road map to achieve UHC, and the main goal is to give the entire population access to the basic EPHS, while increasing financial protection.[9] Strengthening of the health systems will rest on four pillars: human resources, infrastructure, service delivery and health financing.

3.2.3 TB services as part of EPHS

The NTP and its partners have been expanding the prevention of and care for TB by delivering quality services to all who need them. The protection of patients from catastrophic costs by bringing TB care and prevention closer to the community is consistent with the spirit of the NHP. Accordingly, free detection and treatment of TB, including active case detection and contact tracing, are some of the key elements of the basic EPHS of the NHP 2017–2021.

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6 Myanmar SRMNAH Workforce Assessment, UNFPA 2016

7 Health in Myanmar 2014, Ministry of Health and Sports, 2014

8 Myanmar Statistical Yearbook 2017, Central Statistical Organization, 2017

9 Myanmar National Health Plan 2017-2021, Ministry of Health and Sports, 2016

The stated periods of the NSP and NHP do not match exactly. The new NSP (2021–2025) will overlap with the current NHP for nine months, from January to September 2021. The next NHP (2021–2026) is yet to be developed and the precise content of the intermediate EPHS, which is meant to improve secondary care services, has not yet been defined. This may pose some problems in the preparation of activity plans for integrated TB services under the current NSP. The TB services included in the current basic EPHS, planned in close consultation with the National Health Plan Implementation Monitoring Unit (NIMU), include the use of X-rays as the standard equipment in hospitals at the township and sub-township levels and the availability of binocular microscopes in all type C laboratories. The months available between the launch of this NSP and that of the next NHP provide the NTP with an excellent opportunity to undertake active advocacy with the MOHS on the inclusion of some additional and essential interventions of this NSP in the intermediate EPHS. These include preventive therapy for TB and the decentralization of TB diagnosis and treatment to below the township level.

3.2.4 Human resources

The NHP states that bolstering the health system by orienting it to primary health care (PHC) facilitates the achievement of UHC. The Human Resources for Health Strategic Plan 2018–2021 also emphasizes, both in terms of policy and strategy, the development of the optimum health workforce for primary health care. As a result, the MOHS has committed to set up a national accreditation system to vet all training institutions. Professionals outside the public sector have been engaged and partnerships with the private sector, NGOs, CSOs and EHOs have been strengthened. The MOHS emphasizes that the entire health workforce within and outside the public sector should be oriented on and trained in the delivery of the basic EPHS. A human resource information system is being developed. It could help track the turnover and retention of all cadres. However, tracking village-based health workers serving in the community as CHWs, AMWs and others poses some challenges.[10] The training of village health workers, including those in EHO areas, will gradually be harmonized with national standards. [11]

3.2.5 Health financing

The government used to be the main source of health financing and the provision of health services was virtually free until 1993, when user charges were introduced for cost-sharing. Since then, household out-of-pocket (OOP) expenditures have become the main source of financing for health care. According to the Global Health Expenditure Database (WHO), the last five years have seen increasing health expenditure. The health expenditure per capita increased 2.7 times from US$ 23.28 in 2012 to US$ 62.11 in 2016. Similarly, OOP expenditure increased from 69.26% in 2012 to 73.98% in 2016. An anticipated funding gap of about US$ 23 million was reported for the TB budget of US$ 62 million under the NSP (2015–2020). The available funding included domestic funding of US$ 1.8 million (4.7%) and international donor funding of US$ 37 million (95%).

[10] Human Resources for Health Strategic Plan 2018-2021, Ministry of Health and Sports, 2018

[11] Myanmar National Health Plan 2017-2021, Ministry of Health and Sports, 2016

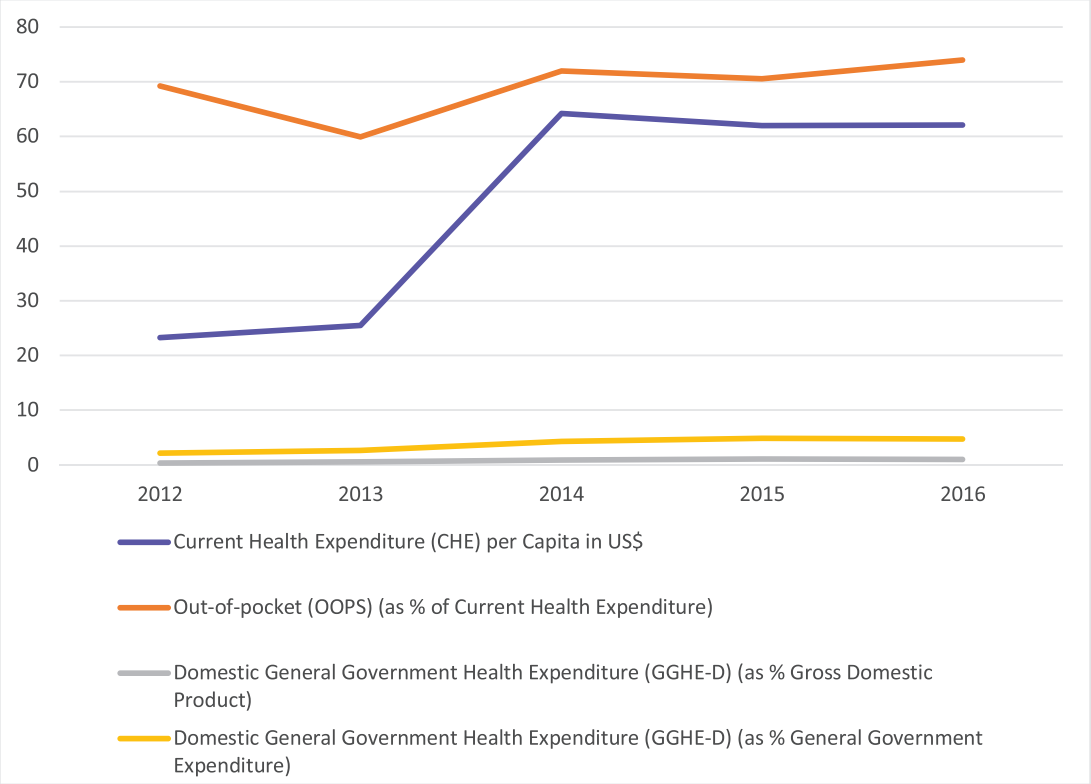

Fig. 1. Health expenditure trends (2012–2016)[12]

3.3 TB prevention and care

3.3.1 The epidemiology of TB

With its triple TB burden of TB, DR-TB and HIV-associated TB, Myanmar has long been among the world's top 30 countries with a high TB burden. Over the years, it has made significant progress in tackling the problem of TB. Its NSP for 2016–2020 was based on WHO's End TB Strategy and its stated targets. To develop the next strategic plan and accelerate the response to TB, it is essential to have a more accurate knowledge of the current TB situation.

A series of analyses were undertaken to assess the epidemiology of TB over the last three years. These included:

- analysis of benchmarks and standards of TB surveillance;
- analysis of the data available to discuss whether "the recent reduction of the TB notification rate reflects a real decline in the trend of TB incidence";
- analysis of the impact of accelerated case detection;
- analysis of the results of the National TB Prevalence Survey undertaken in 2017–2018; and
- analysis of the outcomes of a re-estimation workshop on the country's TB burden.

On the basis of these analyses, WHO revised its estimate of the TB burden of Myanmar in the Global TB Report 2019, as shown in Table 4.

[12] Global Health Expenditure Database, World Health Organization https://apps.who.int/nha/database/ViewData/Indicators/en (accessed 14 November 2019)

Table 4. Estimates of TB burden, 2018

TB burden	Estimate	Rate (per 100 000 population)
Total TB incidence	181 000 (119 000–256 000)	338 (222–477)
HIV-positive TB incidence	15 000 (10 000–22 000)	29 (19–41)
MDR/RR-TB incidence	11 000 (7400–16 000)	21(14–30)
HIV-negative TB mortality	21 000 (12 000–31 000)	39 (23–58)
HIV-positive TB mortality	3 700 (2 500–5 200)	6.9 (4.6–9.7)

3.3.2 Situation and trends in control of TB

Case notification trend

The notification rate of TB cases was on the rise during the 2000s and 2010s and peaked at 305/100 000 population in 2012. However, since 2012, the rate has been declining continuously, except in 2018 (Fig. 2). The following findings suggest that there has been a true reduction in the incidence of TB at the country level.

- The positivity rate of smear tests among those tested has declined, despite the fact that an increasing number of presumptive TB cases are undergoing smear tests.
- The overall TB notification has declined, despite an expansion in aggressive active case-finding (ACF). The expansion of ACF activity possibly prevents secondary infections by the early detection of TB cases and, therefore, reduces the build-up of prevalent TB cases in the community. It could also reduce the burden due to the detection of TB cases by CXR, which was not used under the passive case-finding approach.
- A decrease in TB cases among children suggests a reduction in new infections due to the interruption of chains of transmissions in the household and community. However, this might also be related to potential over-diagnosis of TB among children in the past, a trend which has recently declined. A significant decline in TB meningitis among children also shows that the risk of TB transmission in the community has diminished.
- The assessment of the standards and benchmarks shows that Myanmar's TB surveillance system produces good quality data.

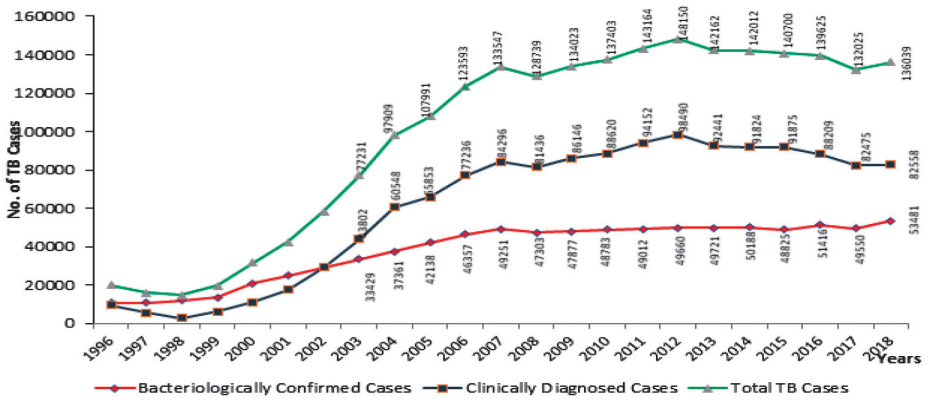

Fig. 2. TB case notification, 1996–2018

Impact of accelerated case detection

As shown in Figs 3(a) and 3(b), the number of TB cases detected increased over 2013–2018 due to the expansion of ACF under CBTBC and the activities of mobile teams. ACF cases accounted for 1.9% of annual TB notifications in 2011 and 24% in 2018. Of the 32 633 TB patients detected by ACF in 2018, 19 568 (60%) were referred by community volunteers (CBTBC) and 8424 (26%) were detected by mobile CXR teams.

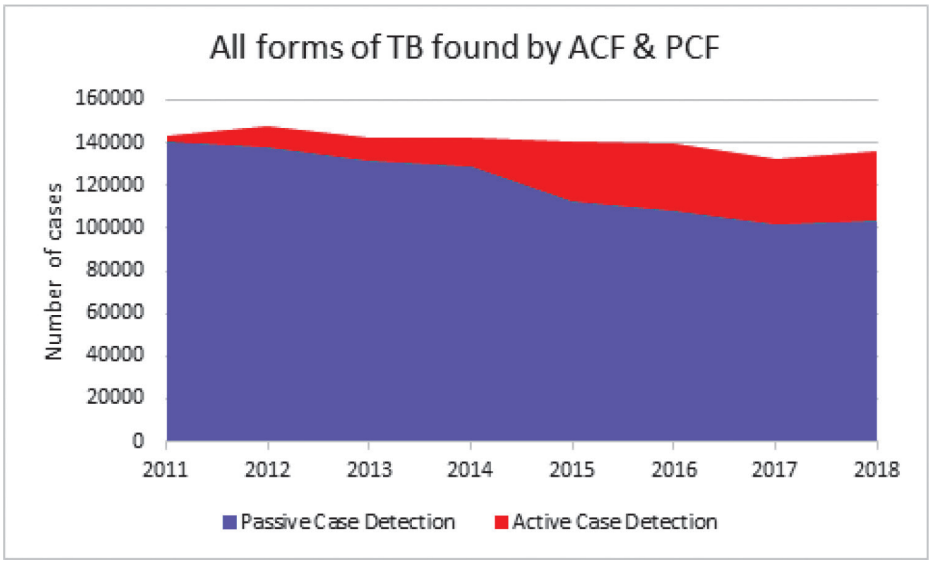

Fig. 3(a). Number of all forms of TB by mode of detection

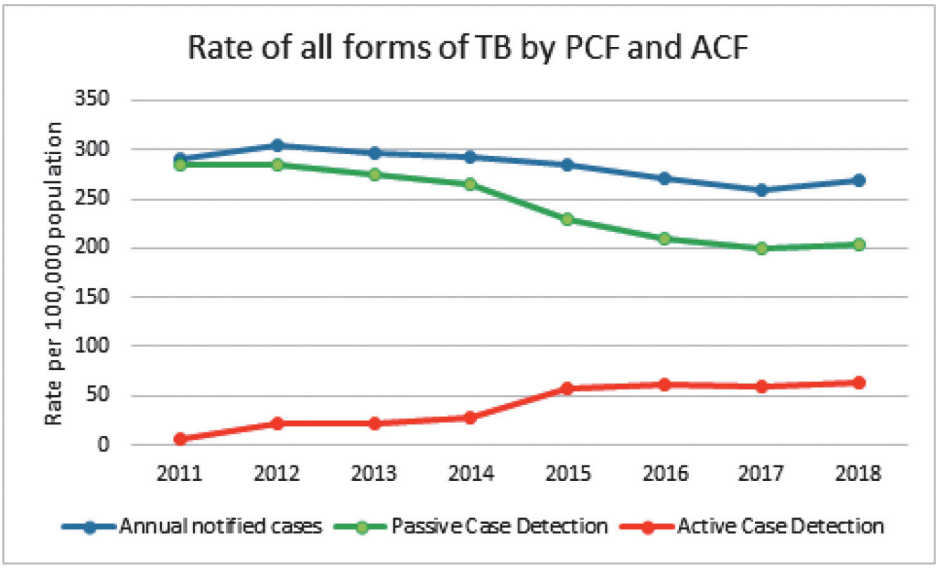

Fig. 3(b). Rate of detection of all forms of TB by mode of detection

Treatment outcomes

The TSR among new and relapse cases has reached 87% (2017 cohort), while that for MDR (RR)-TB is 79%. However, to achieve the TSR of 90% for all forms of TB under the End TB Strategy, the high mortality rate among PLHIV and people with DR-TB must be addressed urgently. The prevention and early detection of TB among PLHIV and the management of comorbidities among ageing TB patients are essential for achieving a high TSR. Universal access to drug sensitivity testing (DST) may improve treatment outcomes by helping to select the appropriate treatment regimen for the first treatment.

3.3.3 Overview of progress during 2016–2020 Plan

TB/HIV

In 2018, the estimated HIV prevalence among the adult population in Myanmar was 0.57% (UNAIDS). HIV is concentrated among key populations, including people who inject drugs (PWID), men who have sex with men, female sex workers and the partners of these key populations. In 2016, collaborative activities concerning TB/HIV, including HIV testing among TB patients, were expanded rapidly to reach all townships. In 2018, the HIV status of 89% of TB patients was known, with 9% of them living with HIV. However, the positivity rate varies a lot depending on the state and region. It is as high as 30% in Kachin, around 10% in Shan North, Yangon, Mandalay and the areas bordering Thailand, and much lower in other states and regions. The mortality among TB/HIV patients is much higher than among HIV-negative patients (16% vs 5%). It is a matter of concern that there has been no significant decline in the number of TB/HIV patients and that mortality during TB treatment is high. Urgent steps need to be taken to prevent TB among PLHIV.

MDR-TB

Since 2013, the results of the third National Drug Resistance Survey (NDRS) have been used to estimate the MDR-TB burden, which is 5% (3.1–6.8%) among new cases and 27.1% (15–39.2%) among retreatment cases. However, the major efforts made since then to treat more than 10 000 MDR-TB patients successfully should have had a positive impact on the epidemiology. The fourth NDRS, planned for 2019–2020, will use whole genome sequencing (WGS) to gain a wider understanding by going further than just estimating the levels of drug resistance to first-line drugs. Meanwhile, Xpert testing capacity is being expanded in the states and regions, to provide data that makes routine monitoring of drug resistance levels feasible. In 2018, 4.9% of new and 20% of retreatment TB patients who had valid Xpert rifampicin testing results were RR-positive. Assuming that those who were not tested had the same chance of having RR, the estimated MDR-/RR-TB incidence would be 11 000 (7 400–16 000), as presented in the Global Report 2019. Xpert testing has been more widely used in the Yangon region, where the incidence of RR-/MDR-TB is higher than elsewhere in the country. If Xpert testing capacity is expanded to rural and remote areas, and if the use of Xpert testing is standardized for all pulmonary TB patients across the country, the incidence estimates of RR-/MDR-TB may decline. Though the incidence of TB in Myanmar seems to be declining steadily, the higher prevalence and incidence of TB among younger adults in Yangon is of great concern as it suggests that the transmission of MDR-TB is increasing in congested urban areas.

Childhood TB

Although the case notification rates of TB among children are falling, the proportion of TB in children (0–14 years of age) among all TB cases is still high, at 19%. A decline in TB cases among under-5 children suggests that there is a reduction in ongoing transmission within households and the community. However, the possibility of under- and over-diagnosis among these children underscores the need for caution in the interpretation of the data. A more reliable indicator of a decline in childhood TB is the decline in TB meningitis among children from 2011 to 2018. BCG coverage gradually increased over this period (Table 5), but the most likely explanation for the reduction in childhood TB is the decrease in TB transmission within the community. This is also supported by the most recent National TB Prevalence Survey.

Table 5. Childhood TB, TB meningitis and BCG coverage

Year	TB meningitis			Childhood TB	Proportion of TB meningitis	Proportion of BCG coverage
	0–4 years	5–14 years	Total	Total		
2010	370	468	838	32 471	2.6%	93%
2011	256	311	567	37 733	1.5%	93%
2012	163	128	291	42 434	0.7%	87%
2013	151	130	281	35 813	0.8%	88%
2014	134	145	279	36 301	0.8%	92%
2015	112	140	252	34 930	0.7%	94%
2016	103	103	206	31 633	0.7%	94%
2017	71	45	116	28 662	0.4%	91%
2018	49	51	100	26 235	0.4%	91%

National TB Prevalence Survey, 2017–2018

During the National TB Prevalence Survey, 2017–2018,[13] methods recommended by WHO were used to obtain prevalence figures at the national level, as well as at the levels of the three strata (states, regions other than Yangon and Yangon region independently). The national prevalence of Xpert-positive pulmonary TB among adults was 468 (398–546)/ 100 000.

Table 6. Cases and prevalence rates for states, regions other than Yangon and Yangon region (National TB Prevalence Survey, 2017–2018)

Strata	Cases in the sample	Prevalence rate/ 100 000 adults (95% CI) *
States	65	355 (253–458)
Regions other than Yangon	149	485 (362–608)
Yangon region	108	607 (468–747)
National	322	468 (398–546)

*Multiple imputations with weights and post-stratification

Though the 2009–2010 survey had shown that the states had a higher prevalence of TB (838 [560–1252]) than the regions (523 [412–649]), this survey indicated that the prevalence in the states is now lower (Table 6). Despite good access to health-care services, the prevalence of TB in Yangon remains high. As shown in Fig. 4, patients in Yangon are much younger than those in states and regions other than Yangon. In general, the prevalence of TB among the oldest age group is seven times that among the youngest group. Since people in the older age groups are often caregivers for young grandchildren in Myanmar, the prevalence of Xpert-positive active pulmonary TB (around 1%) among them is of serious concern.

[13] For details of the prevalence survey methods and findings, see Report of National TB Prevalence Survey 2017-2018 (to be published in 2020). Main results were cited in Global TB Report 2019

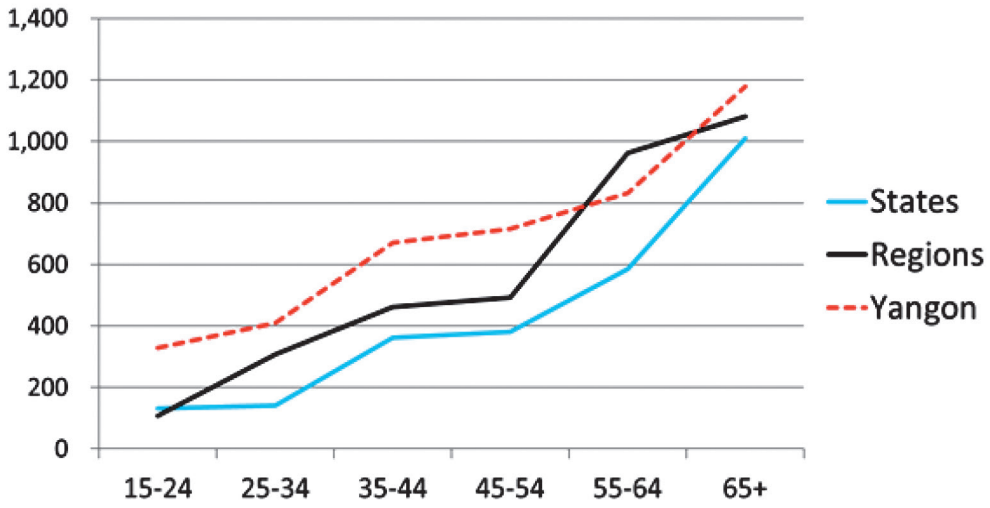

Fig. 4. Prevalence/100 000 of strata by age groups

Great public health success: decline of TB burden in states

The decline in the prevalence of TB has been greater in the states where the NTP and its partners have invested heavily in expanding TB services in the last 10 years. The significant expansion of laboratory services, community-based TB care, and mobile clinics has helped to bring TB services closer to the people, thus contributing considerably to the decline in prevalence. However, it is essential to continue to make investments in the states as they still have a high burden of TB.

Re-estimation of TB burden- TB Incidence

In the light of the results of the National TB Prevalence Survey, a workshop was held in Naypyitaw from 28 to 30 May 2019 to re-estimate the TB burden. As Table 7 shows, the re-estimated incidence of TB for 2018 was 338 (222–477)/ 100 000) and the annual rate of decline of TB incidence was estimated at 4.9%. Given that efforts continue at the current level, Myanmar will become one of the few countries in Asia that have a high TB burden to achieve the 2020 targets of the End TB Strategy and the SDG (20% reduction in TB incidence from the 2015 baseline).

Table 7. Re-estimation of TB burden

TB burden	2009	2018	Remarks
Prevalence	802 (508–1 095)	436 (361–511)	Decline: 6.8 %/year
Incidence	526 (307–802)	338 (222–477)	Decline: 4.9%/ year
Notification*	258	256	
Notification/ incidence ratio	49%	76%	

**Global TB database*

TB mortality

The national verbal autopsy study in 2017 indicated that TB mortality was much lower (13.3 (11.2–15.7)/ 100 000, 95% CI) compared with the current WHO estimate of 39 (23–58)/ 100 000. However, mortality as determined verbal autopsy was almost the same as the number of deaths that occurred during TB treatment (5%, with a case notification rate [CNR] of 260/ 100 000). This suggests an underestimation of TB mortality. More data are required for a better estimate. Further development of vital statistics, including reliable certificate of death, is essential.

Programmatic implications of the Prevalence Survey

Notwithstanding the fact that Myanmar has made remarkable progress, the Survey showed that the TB burden is still high. Also, the country will have to deal with emerging challenges, such as unplanned urbanization, migration and ageing population. Wider or multisectoral approaches are essential. Further, decentralization of basic TB services and integration of these into facilities at the primary care level, which would facilitate the care of the elderly, should be considered. The programme needs to address:

- patients in communities that do not have access to basic TB services
- patients who can be detected and treated by the new technologies recommended by WHO
- people with a high risk of TB that is preventable.

Uneven distribution of TB burden

Myanmar still has unreachable, hard-to-reach or inaccessible populations, such as the elderly, the populations of some remote villages and migrants living in urban slums. The top 10% of the survey clusters with a higher burden account for 30% of the prevalent cases detected by the survey; and the top 20% clusters account for 50% of the prevalent cases. It is time to introduce specific measures for the extremely high-burden areas and hotspots, where the prevalence of bacteriologically confirmed TB cases is 1% or higher.

Need to decentralize basic TB services and integrate them into primary care facilities

In rural clusters, the greater the distance to a TB diagnostic centre, the higher is the prevalence of TB. The survey found that on an average, patients in rural areas had to travel 13 miles to seek treatment and spend 10 000 kyat (US$ 6.7) on transport for return travel. This is most probably due to the absence of basic TB services in facilities at the primary care level in most places. Diagnostic and treatment centres for TB are found mostly at the township level (330). Station hospitals (694) and rural health centres (1824) rarely provide TB diagnostic services, initiate treatment or conduct follow-up examinations.

Higher TB burden among the elderly

The prevalence of TB rises with advancing age in Myanmar. This probably implies that older patients have poor access to TB diagnostic services. As a programme is being launched to provide care for the elderly, TB screening and treatment in facilities at the primary care level will become essential. Decentralization of basic TB services and their integration into facilities at the primary care level are important also because unlike younger people, who can travel to townships to seek care, the elderly may not leave the community as it is hard for them to travel.

High TB burden in urban areas, especially Yangon region

The prevalence of TB is significantly higher in the Yangon region than in other states and regions, even though this region has better access to health services. More than 1% of adults have Xpert-positive active pulmonary TB in quite a few congested urban clusters in Yangon. Most patients in Yangon first seek care in private sector facilities. PPM activities, including approaching drug sellers and pharmacies, should be strengthened further. The region requires a specifically designed initiative, based on a comprehensive and multisectoral plan.

Future role of more sensitive diagnostic technologies

In the current context, it is essential to provide early and easier access to more sensitive technologies, such as radiology and molecular technology. Access to CXR through the general health services should be improved so that TB can be detected earlier. Although Xpert is now available in most districts, its contribution to case detection is limited since the current criteria do not include the use of Xpert for presumptive cases by routine TB case detection. The WHO guidelines and standards should be followed to improve access to molecular

technologies for the diagnosis of cases other than MDR-TB. In townships with limited infrastructure, the introduction of alternative technologies such as loop-mediated isothermal amplification (LAMP) should be considered. This is because the prevalence of RR-TB and TB/HIV are low in most rural and remote townships with infrastructural limitations.

Possible lower prevalence of MDR-TB and TB/HIV

According to the prevalence survey, RR+ was detected among 10 (3.1%) of 322 study cases, and 3 of the 10 had been treated previously. Among 290 patients with documentation related to treatment, only 2 were HIV+. This figure was lower than that routinely observed in clinical cases. As for MDR-TB, a more precise picture will emerge once the Xpert surveillance results become available, owing to the introduction of the District Health Information System2 (DHIS2) in TB surveillance and the expansion of examination criteria across the country. The NTP and WHO are also planning to conduct an NDRS with WGS in 2020.

Consequences of past case detection gaps

One of the big challenges in Myanmar is the presence of a very large number of people who survived TB without treatment. The CXR finding of 4% of the Study participants was "TB possible or other abnormality", and of 4% "healed TB". The majority of them were not counted as prevalent TB cases, unless the culture proved the presence of *Mycobacterium tuberculosis* (*M.tb*). However, these people might be the highest attributable risk group to develop active TB. Unfortunately, there is no clear guidance on how to cope with this risk group of CXR abnormality consistent with past TB disease in the absence of a proper treatment history.

Smokers among highest risk groups with undetected TB

The Survey shows that smokers have a significantly higher risk than others in the community of not having Xpert-positive TB detected. While smokers accounted for 21% of the Study participants, they comprised 46% of Xpert Ultra-positive people in the community. Moreover, chronic cough due to smoking may mask TB symptoms. This calls for close collaboration between the TB programme and the Tobacco-Free Initiative.

Financing of TB prevention and care

Myanmar is currently going through a critical process of democratization, and is embracing many opportunities and challenges along the way. The country has experienced rapid growth in recent years, becoming one of the world's fastest growing economies. However, imbalances have also emerged periodically, requiring vigilance and the implementation of anti-inflationary and other counter-cyclical policies. Today, Myanmar has a historically low inflation rate, besides monetary and fiscal stability. Myanmar's levels of external debt are among the lowest in the region. The GDP is growing steadily, and external investment has increased, shifting from humanitarian assistance to development assistance, in alignment with increased government investments in the social sectors.

The major source of finance for health-care services is the Government. Funding from development partners, external aid, loans and community contributions are among the other sources. Government expenditure on health grew from 0.2% of the GDP in 2009 (the lowest in the world) to 1.2% in 2018.[14] The Government's annual health spending increased both in current and capital accounts. The total government health expenditure rose from kyat 7688 million in 2000–01 to kyat 1 131 806 million in 2018–2019.

Since 2016, the health sector has received over kyat 3 300 000 million (US$ 22 million) through external support, especially for the purpose of strengthening health systems. Although these investments are not TB-specific, strengthening of the health systems will have a positive impact on TB care and prevention. Project-based funding for TB activities comes primarily from the Global Fund, Three Millennium Development Goals Fund, or 3MDG (now Access to Health) and the United States Agency for International Development

[14] Myanmar National Health Policy 2020–2030, Ministry of Health and Sports (unpublished)

(USAID), which support a number of technical and implementing agencies.

There was a huge increase in Government spending on TB control starting from 2014, and then a gradual increased annually. The government gives financial support mainly for first- and second-line anti-TB drugs, infrastructure and human resources. Since 2017, the MOHS has been procuring 100% of the first-line TB drugs used in the country and 40% of the second-line ones. It has instituted an effective procurement and distribution system for TB drugs. Notably, the JMM has not observed or reported any stock-outs of drugs.

PART 2

1. Strategic direction 1: progress towards achieving universal access to TB care and prevention

An expansion of quality TB screening and diagnostic services will increase the access to TB services. If the direction indicated by the NHP is followed, microscopy and radiography services will be decentralized to the level of station hospitals and more advanced laboratory services will be provided, according to a tiered system. The laboratory network will be linked with treatment services to reduce the initial drop-out rate and delay in treatment. The NSP will continue to emphasize quality assurance mechanisms, the integration of infection control practices, and strengthening of the information management systems of laboratories. Increasing the coverage of rapid tests and the integration of new tools, as recommended by WHO, will be of immense help in early detection of cases and appropriate diagnosis. Although this NSP aims to greatly increase the coverage of TB treatment, the TSR will be maintained at an optimal level by ensuring the availability of quality TB treatment services at the community level and social protection mechanisms. Coordination will serve as the backbone of the implementation of integrated TB services, such as TB/HIV, TB in NCDs, and hepatitis. Infection control measures will be strengthened by infrastructural renovations, the introduction of policies and guidelines, and screening of health workers. This NSP considers the management of LTBI a priority and it will thus aim to cover all household contacts and PLHIVs.

1.1 Bring quality screening and diagnostic services closer to community

Situational analysis

X-ray services

Chest X-ray is a sensitive tool to detect lung abnormalities, including TB. In the recent Prevalence Survey, the CXR of 83% of Xpert-positive cases showed active TB disease, while only 48% of these cases had any symptom suggestive of TB and only 13% were smear-positive. The fact that CXR has a higher sensitivity than screening of symptoms and sputum examination makes it a better screening tool in TB case-finding.

Chest radiograph is available in the majority of townships and tertiary care hospitals. By the end of 2018, 14 state and regional TB centres had installed digital X-ray machines. Fourteen mobile X-ray teams were formed in the states and regions for case-finding activities in various settings. Access to CXR at the township and station levels depends on the availability of machines from hospitals that are under the Medical Care Service. Among the services included in the basic EPHS, which is being implemented by NIMU, is access to CXR. One of the NHP's objectives is to cover all township-level facilities with basic EPHS by 2021. Medical officers at the township and lower levels have been trained on how to read and interpret CXR by the NTP.

Laboratory services

Laboratory services are coordinated by the national TB programme in collaboration with the National TB Reference Laboratory (NTRL). They are supported by two BSL-3 laboratories in Mandalay and Taunggyi. Technical direction is provided by the National Health Laboratory, while administration is the responsibility of the NTP. The technical working group of TB laboratories provides guidance on the diagnostic aspects, supply chain management, development of training modules, SOPs, operational research and laboratory quality management system. Various laboratory-related national guidelines and tools set out the technical standards for TB diagnosis.

> *Tiered structure of diagnostic services:* Diagnostic services are provided through a tiered structure, composed of complex testing at the higher levels and basic microscopy and X-ray services closer to patients' homes. The laboratory network is divided into four levels, according to the Myanmar National Policy on TB Laboratory Standardization and Harmonization, which was introduced in September 2019.[15]

[15] National Policy on TB Laboratory Standardization and Harmonization, National TB Reference Laboratory, Ministry of Health and Sports, 2019

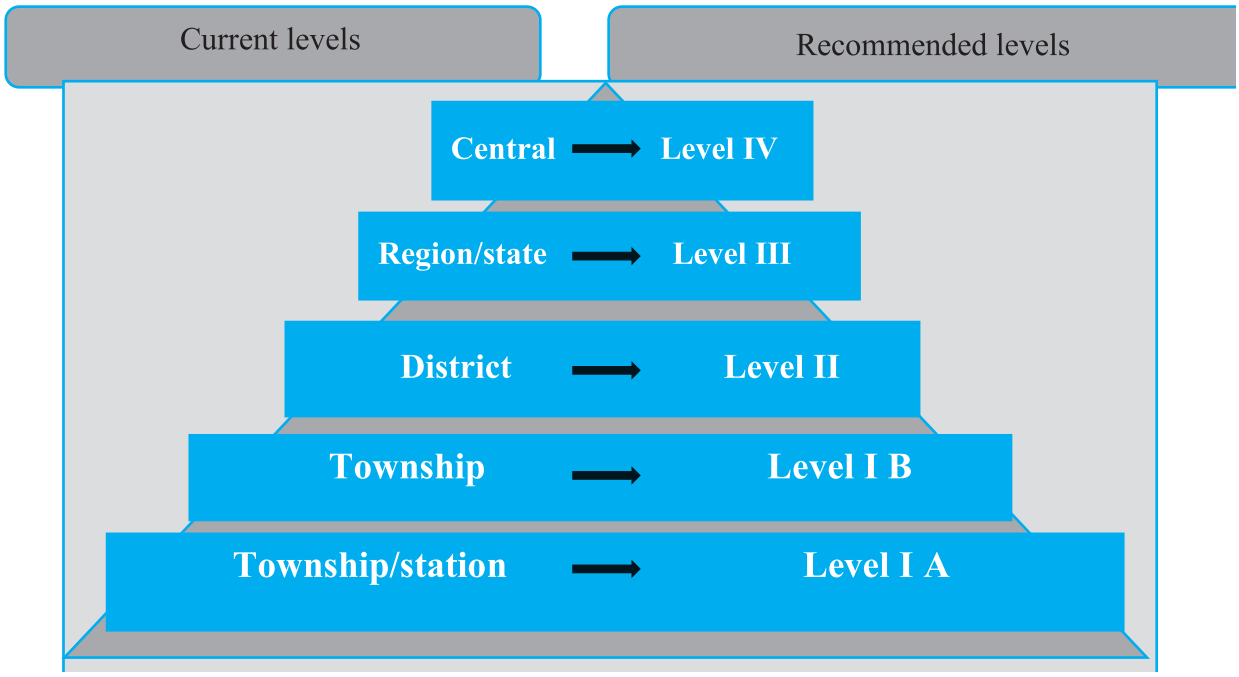

Fig. 5. Tiers of the laboratory network

Level IV laboratories perform TB culture/DST and molecular diagnostic tests. Level III laboratories perform the GeneXpert MTB/RIF test, fluorescence microscopy (FM), bright field microscopy with ZN staining and other programmatic tasks. As for Level II laboratories, they conduct the GeneXpert MTB/RIF test and provide fluorescence microscopy services. These laboratories will be made available in more than 50% of townships under this NSP. Level IA and IB laboratories provide either bright field microscopy or FM services

Sputum smear microscopy: Sputum smear microscopy has been the mainstay of TB diagnosis. At present, it is provided through a network of 516 laboratories, most of which are distributed throughout the general health services. Fifty-three (10%) of the laboratories are in health centres, 262 (51%) in township/district hospitals, 98 (19%) in station hospitals and 29 (6%) in PPM hospitals are in the public sector, while INGOs manage 74 (14%) private laboratories. Of the microscopy centres, 92% participate in the external quality assurance (EQA) network. Around 13% (98/746) station hospitals have the capacity to diagnose TB. Nationally, microscopy coverage has reached 1 per 100 000 population in most areas.

BSL-3 laboratories: There are three BSL-3 laboratories that serve as TB reference laboratories (Level IV). These are the NTRL in Yangon, and the BSL-3 laboratories in Mandalay and Taunggyi. These laboratories have the capacity to conduct line probe assay (LPA), solid and liquid culture, and first- and second-line DST. The Mawlamyaing State TB Laboratory was upgraded to a BSL-3 laboratory in 2019 and will start functioning by 2020.

Molecular techniques: The molecular techniques currently available in the country are as follows.

1. Line probe assay

   The MTB DRplus assay was introduced in the NTRL, Yangon and Mandalay in 2010. In 2016, the NTP introduced the second-line LPA to detect resistance to fluoroquinolones and/or aminoglycosides in the early stages of RR-TB/ MDR-TB. It is being routinely used in all RR patients detected in the Yangon and Mandalay regions since 2018. The practice was adopted in the Bago and Ayeyarwaddy regions in 2019.

2. GeneXpert MTB/RIF test

   The GeneXpert MTB/RIF test was introduced by the NTP in Mandalay in 2011 and in Yangon in

2012. Until the end of 2019, there were 108 machines, including three 16-module machines, in 90 sites across the country. The number of patients who underwent GeneXpert testing increased from 26 240 in 2014 to 144 846 in 2019. In additional, the GxAlert (connectivity solution) system was installed in 99% of GeneXpert machines to assist in routine management and monitoring of data. A pilot study with Foundation for Innovative New Diagnostics (FIND) on GeneXpert Ultra was completed in 2018 in Yangon. Xpert Ultra was also used for the Prevalence Survey in 2017–2018.

3. LAMP and other molecular technologies

   The NTP conducted a collaborative pilot study of TB-LAMP with the Japan Anti-*tuberculosis* Association (JATA) in two townships in the Yangon region in 2018. The lessons learnt will be applied for scaling up the use of this test.

4. Whole genome sequencing

   Since 2016, the NTP has been conducting a collaborative pilot study for the utility of WGS for the diagnosis of DR-TB with the Otago University, New Zealand. It planned to use WGS in the fourth NDRS 2020 by developing capacity in the reference laboratories, in collaboration with the Otago University and SRL Chennai.

   Culture and DST services: Solid culture was introduced as a treatment monitoring tool for DR-TB in the reference laboratories in Myanmar in 1968. However, its use has declined because of the long turnaround time. Liquid culture was introduced in 2010. Both solid and liquid culture and DST services are available in the three BSL-3 laboratories (Yangon, Mandalay and Taunggyi). Currently solid and liquid culture are being used in an alternate manner for monitoring DR-TB management. However, liquid culture will be used as the main tool from 2020 onwards to achieve rapid culture results. In 2018, the BSL-3 laboratories performed 15 863 liquid culture tests, 38 liquid DST, 13 061 solid culture tests, and 53 solid DST.

Specimen transportation system

Mechanisms have been established for the transport of sputum from townships to GeneXpert sites, GeneXpert sites to culture/DST laboratories, and centres for the programmatic management of DR-TB (PMDT) to culture/DST laboratories for PMDT follow-up. Sputum transportation services from the primary care level/community to TB diagnostic centres are very limited in the public sector. Sputum transport services from townships to GeneXpert sites exist mostly at the district level. Thus, each facility uses its own mechanism and the transportation charges are reimbursed. Transportation from PMDT centres/townships to culture/DST laboratories often relies on the public transportation system.

External quality assurance for laboratory services

A total of 477 microscopy centres using either ZN or FM microscopy have been established at the township level and are part of a national EQA system. In 2018, 92% of microscopy centres were covered by EQA, consistent with a rise in the supervision of laboratories by microbiologists and senior technical laboratory supervisors. Laboratory technicians in all states and regions participate in biannual panel testing for smear microscopy conducted by the National Health Laboratory. An increase in correct diagnostic practices was reflected in declines in major errors from 0.66% in 2014 to 0.31% in 2018, and in minor errors from 0.68% to 0.37% for the same years.

Quality assurance of GeneXpert MTB/RIF results was introduced in 2017 in 45 selected sites, and extended to 80 sites in 2018. The performance of GeneXpert EQA result is monitored by microbiologists from the NTRL.

External quality assurance for first- and second-line DST and first- and second-line LPA has been temporarily interrupted. The last EQA was performed in 2015, in collaboration with the Supra National Reference Laboratory (SNRL), Bangkok. A memorandum of understanding has been signed with the SNRL (National Institute for Research in Tuberculosis, Chennai, India) to initiate EQA activities again.

In 2015, the NTRL BSL-3 and Mandalay BSL-3 laboratories initiated a pre-assessment of the quality management system of laboratories, with the aim of obtaining ISO 15189 certification. They were supported by Challenge TB through FHI360. Laboratory quality management system (LQMS) assessment was conducted in the Yangon and Mandalay BSL-3 laboratories by experts from the DATOS Laboratory Strengthening Service from the Netherlands. With respect to progress in the implementation of LQMS with the Global Laboratory Initiative (GLI) tool, Yangon BSL-3 and Mandalay BSL-3 achieved approximately 50% in 2019. In Mandalay and Yangon, quality control of culture and DST is performed with the guidance of the SNRL through the proficiency testing programme.

Supply chain management

The NTP has standardized TB diagnostic tests and requires that laboratory supplies be available for health facilities at different levels. Further, training has been provided for stock management in Yangon and Mandalay. The training was the result of a coordinated effort by the USAID Global Health Supply Chain Program–Procurement and Supply Management (GHSC–PSM) project after standard operating procedures (SOP) were drawn up in 2019. Forecasting and supply planning are done quarterly by using stock monitoring and early warning system practices at the central, regional and state levels. The eLMIS (mSupply) is currently running at the central level, as well as in Yangon and Mandalay and some regions and states. Laboratory commodities are stored at the NTRL and Senko warehouse before distribution.

Challenges

Shortage of human resources

Understaffing in the public health sector remains one of the primary challenges for TB diagnosis services. This is particularly the case when it comes to specialized personnel, such as microbiologists, laboratory technicians, biomedical engineers, radiologists and X-ray technicians, and administrative staff, including those who work on infection control. According to the updated National Policy on TB Laboratory Harmonization and Standardization, the requirement for human resources in the NTRL is 39. However, the number of staff is only 27 and half of the vacancies are filled with staff seconded from partners. BSL-3 laboratories have no in-country local experts to certify biosafety cabinets and need to outsource experts.

Limited geographical coverage of TB microscopy services

Despite the fact that microscopy sites have been scaled up, there is still wide geographical variation in access to these sites. Five states and regions (Bago, Magway, Kayin, Mandalay and Ayeyarwaddy) have not reached the national coverage target of 1 per 100 000 population.

Operational challenges with GeneXpert

The absence of continuous and stable power supply, lack of availability of quality UPS and Internet, dearth of competent staff, and unreliable maintenance and repair system pose operational challenges to GeneXpert.

Problems related to LPA and culture DST

When nontuberculosis mycobacteria are detected, the species can be identified in the reference laboratories by MTB CM, using LPA. Evaluation of common and atypical species of *M.tb* is not being performed to determine the magnitude of environmental nontuberculous mycobacteria (NTM) and potential contamination at some sites. While RR-TB can be diagnosed by the GeneXpert MTB/RIF test rapidly, isoniazid mono-resistant TB can be missed and may lead to MDR-TB. DST for new drugs, such as bedaquiline, delamanid, linezolid and clofazimine, has not been done yet.

Poor quality of X-ray interpretation

At present, there is no system in place to ensure the quality of CXR, except for the system put in place in

Yangon by the Myanmar Anti-TB Association. The Yangon project has a central reading system for quality control for mobile X-rays to strengthen urban TB care. As a result, there is a potential for over-diagnosis or under-diagnosis especially in other states and regions.

Insufficient maintenance of equipment

The NTRL experiences delays of two to three months when procuring accessories and spare parts through the United Nations Office for Project Services (UNOPS). Emergency maintenance and repairs of equipment and air pressure systems cannot be handled immediately as there is no local company available for such maintenance. BSL-3 laboratories have no in-country local experts for the certification of biosafety cabinets, which is an essential requirement for BSL-3 laboratories. Technical support for troubleshooting and repairing GeneXpert machines is being provided by microbiologists and engineers. The maintenance of X-ray machines in facilities at the township and lower levels faces several problems. The maintenance and repair of machines under the care of hospitals requires inter-departmental collaboration.

Weaknesses in quality control

The EQA report of 2018 showed that 20% of microscopy centres in the country report at least one major error in a year's time. In some geographical areas, supervision of TB diagnostic centres is insufficient or irregular. The Yangon and Mandalay BSL-3 laboratories have yet to obtain ISO 15189 certification.

Diagnostic delays

There is a need to strengthen all levels of the system for transporting samples between health facilities and laboratories for diagnosis, screening with GeneXpert, further testing with culture and DST, and follow-up culture. There is no electronic system linking laboratories to treatment centres.

Weakness in supply chain management of laboratory commodities

No dedicated staff is available for the management of the supply chain of laboratory commodities.

Limited infection control

Not all sputum collection centres and laboratories have sufficient infrastructure, such as ventilated simple hoods (especially in GeneXpert sites), exhaust fans and natural ventilation (windows) to ensure adequate infection control. Further, there is still no systematic implementation of practices for the safe disposal of hazardous waste.

Strategic approaches

- Ensure the availability of adequate human resources, with appropriate capacity for laboratory and radiology services, at all levels.
- Expand quality TB diagnostic services, including the introduction of new diagnostic tools through implementation research.
- Establish and strengthen linkages and accelerated communication between diagnostic and treatment sites, and ensure efficient mechanisms for sample transport and an effective feedback system.
- Ensure a regular supply of laboratory commodities, including consumables, through the systematic management of the supply chain.
- Introduce risk assessment and biosafety, as well as measures for the prevention and control of infection in all laboratories and sputum collection sites.

- Expand electronic recording and reporting systems nationwide, along with the regular use of programmatic information.

Essential interventions

To strengthen the nationwide coverage of high-quality diagnostic services and with a view to improving overall access, the following interventions will be implemented across the country.

Ensure availability of adequate human resources

It is crucial to address the shortage of skilled human resources for laboratories, including the BSL-3 reference laboratories and radiology services at all levels. This NSP will prioritize the filling of vacant posts, especially the posts of microbiologist, laboratory officer and technician, and X-ray technician. This should ensure that there is sufficient capacity to cope with the anticipated scale-up of the diagnostic network. The training of all new recruits will be completed and refresher courses will be designed for future training. Routine supervision will be carried out as a part of capacity-building. This will be done on the lines of the human resource plan for the laboratory network developed in 2019 as a part of the National Policy on TB Laboratory Harmonization and Standardization in collaboration with the National Health Laboratory. (Refer to SD 4, section 4.1 for details).

Expand quality-assured TB diagnostic services

Microscopy service: Priority will be given to setting up microscopy sites in low-coverage areas. The target is to achieve 1 microscopy site per 100 000 population in urban areas and 1 microscopy site per 50 000 population in hard-to-reach areas. Expansion to station hospitals will be taken up on a priority basis and private hospitals will also be covered. Microscopy facilities in townships that perform an average of > 40 smears per day will be prioritized for upgradation to FM, while LED FM will be phased in nationwide as microscopes are replaced. All microscopy sites, public and private, shall be enrolled in the national EQA programme to ensure high-quality services. The national programme shall implement the existing plan for capacity-building for microscopy. Its other responsibilities will include providing refresher training on all protocols for acid-fast bacillus (AFB) testing, reporting and EQA compliance, as well as general biosafety and waste management practices. District/township TB coordinators will coordinate routine supervision of all laboratories through a cascade of monthly visits, using an updated supervisory checklist.

GeneXpert MTB/RIF sites and testing criteria: The NSP calls for expanding the use of GeneXpert for the testing of all pulmonary TB patients, presumptive TB cases with CXR abnormalities, children, and health workers. GeneXpert sites will be expanded to the remaining districts and townships that have a high TB caseload. Special regions and EHO areas may also be considered if they have the requisite laboratory infrastructure in place. Molecular technologies endorsed by WHO, such as TB-LAMP and TrueNAT TB, will be utilized in remote areas that face an infrastructural challenge.

Revised GeneXpert diagnostic and referral algorithms have been developed and will be disseminated as the number of sites expands. Further revisions will be considered upon demand, workload, and updated national guidelines. Annual refresher training has been planned at regional, state and district levels. Advocacy will be undertaken among clinicians and programme officers.

The NTP plans to replace the current MTB/Rif cartridges with MTB/Rif Ultra cartridges for early case detection, especially among smear-negative cases, HIV/TB suspects and children.

An integrated approach for GeneXpert testing together with testing for HIV and hepatitis C will be piloted at hospital sites and then expanded gradually, depending on capacity.

Rapid diagnostic technologies:

- All registered retreatment patients will be tested by LPA (MTBDRplus Assay) for the detection of isoniazid monoresistant TB and MDR-TB, where RR-TB has been ruled out by GeneXpert. Diagnostic criteria will be expanded in a phased manner to cover all registered TB patients by MTB DRplus Assay.
- The testing of RR-TB patients by LPA (MTBDRplus Assay) for the early detection of pre-XDR and XDR-TB will be expanded. The first phase of expansion to cover the Bago and Ayeyarwaddy Regions will be followed by expansion to other states and regions in a stepwise manner.
- From 2020, the use of solid and liquid culture in alternation to monitor the treatment of DR-TB will be replaced by the use of only liquid culture. BSL3 laboratories will carry out further investigations by culture and identification. They will also conduct LPA for common and atypical Mycobacterium to identify NTM species.
- The lateral flow urine lipoarabinomannan assay (LF-LAM) will be used for the diagnosis of HIV/TB as per the national guidelines, which follow the WHO recommendations 2019 (to be revised).
- MTB/XDR cartridges for the rapid detection of XDR-TB will be introduced (when the cartridge is launched by the manufacturer and necessary evidence is available).
- Alternate diagnostic technologies endorsed by WHO will be piloted in remote areas as part of a patient-centred approach.
- A WGS facility will be established at the NTRL and used to detect mutations related to first- and second-line drug resistance in targeted DR-TB patients.
- DST will be used for drugs such as bedaquiline, delamanid, linezolid and clofazimine in targeted DR-TB patients after a supranational reference laboratory has certified the quality of the testing.
- Sputum transport media will be piloted/introduced to enable access to new technologies by remote populations.

Quality assurance capacity for culture and molecular tests: To achieve the WHO recommendation of 1 culture laboratory per 10 million population, culture and DST facilities will be expanded to increase the number of BSL-3 reference laboratories to five.

Proficiency testing for culture/DST and LPA will be revised with the guidance of the National Institute for Research in TB, Chennai, India. The NTRL and Mandalay BSL-3 laboratories will continue with the LQMS process in line with the GLI tool with the aim of obtaining ISO 15189 accreditation, while LQMS will be initiated in the Taunggyi BSL-3 laboratory.

EQA will be conducted continuously, regularly, and systematically for all GeneXpert centres. The NTRL will conduct two rounds of quality control programmes per year for all GeneXpert machines with assistance from the National Lung Hospital, Vietnam. It will also develop a dried tube specimen panel with technology transfer from the Centers for Disease Control and Prevention (CDC) for EQA services for GeneXpert machines all over Myanmar.

X-Ray capacity: Under this NSP**,** CXR capacity will be strengthened at the district/township level for the screening of all presumptive TB cases to reduce the number of such cases needing to undergo GeneXpert testing, which is currently available only at the district level.

- SOPs will be developed and updated for CXR interpretation, which is central to the early detection and successful treatment of cases. Regular training of radiographers and medical officers, especially newly recruited staff, will be undertaken in accordance with the SOP.

- A recording and reporting system will be put in place to monitor the use of CXR in all presumptive TB cases, a major change in diagnostic algorithm. The NTP will design forms and registers to capture all the information required to monitor the programme, including logistic management. CXR results will also be reflected in treatment registers, including case-based electronic databases.
- Setting up an EQA system to control the quality of CXR interpretation, may pose challenges for the NTP. However, random centralized reading of CXRs by mobile teams will be conducted and feedback provided to assess and control the quality of interpretation in the field.
- Under this NSP, the NTP may explore the option of shifting the procurement, maintenance, and operational tasks to the private sector through strategic purchasing. If successful, this will help increase the access to CXR.
- While expanding the installation of digital X-ray machines in the country, a pilot study of computer-aided detection (CAD) will be undertaken to gain knowledge and experience to obtain evidence on its application.

Implementation research: Operational and implementation research will be undertaken, where required, for the introduction of new diagnostic tools and innovative approaches, as well as to provide a basis for the revision or modification of the diagnostic algorithm as part of evidence-based policy-making.

Strengthen linkages and communication between diagnostic and treatment sites

To improve access, all microscopy sites will be networked to facilitate communication between health facilities and the referral of specimens from sites without microscopy facilities. Efficient and systematic sample transport systems (e.g. courier service) will be designed and implemented to ensure that nearby townships and station hospitals have access to GeneXpert testing.

The sputum transport system will be strengthened to facilitate the culture/DST and LPA of samples from DS-TB retreatment patients for the detection of isoniazid monoresistant TB and MDR-TB and for monitoring DR-TB patients.

Ensure regular supply of laboratory commodities

In order to ensure the uninterrupted availability of laboratory supplies, a buffer stock will be maintained at the central (50% of forecasted quantities), state/region (12% of forecasted consumption) and township (8% of forecasted consumption) levels on the basis of the case load at each level.

By using an early warning system tool, developed by the NTRL and PSM, the NTP will monitor for any excess or shortage of laboratory commodities, and also monitor data accuracy and reporting at region- and state-level laboratories. With the expansion of eLMIS up to the region and state level, the availability of data on all TB laboratory products will increase. The stock monitoring and early warning system will continue to be implemented by TB laboratory stores at the central to the state/region levels to support the management of stocks at all levels of the TB laboratory supply chain.

The use of eLMIS will strengthen the electronic requisition system further, which will help shorten the lead time and hasten the flow of commodities. The core set of activities to ensure the regular supply of laboratory commodities presented in the NTP's SOPs for the laboratory logistics management system will be adhered to.

Introduce risk assessment, biosafety, infection prevention and control measures

The NTP will implement infection control measures for all laboratories, from BSL-3 laboratories to microscopy centres, in accordance with the standard WHO guideline. The existing SOPs, guidelines and policies will be continuously reviewed and brought up to date every two to three years, as necessary.

The infection control strategy will focus on all health-care settings where TB patients, their family members and health-care workers handle sputum or culture materials. The SOPs will be available both in the Myanmar and English languages. A group of laboratory experts and TB officers will contribute to the development of the national guidelines on waste management at different levels. Adherence to the strategy for infection control will be monitored directly by team leaders and during routine supervision by the NTP. The checklist will be revised and updated.

Expand recording and reporting system for laboratories

An electronic laboratory management information system will be developed, piloted and rolled out to accelerate the communication of results between diagnostic and treatment facilities. Internal communication, such as an intranet system, will be established for the sharing of data within BSL-3 laboratories in Yangon, and will be extended to the Mandalay BSL-3 laboratory. The electronic laboratory system will be in alignment with the treatment monitoring system and will ensure that there are information links between GxAlert and PMDT facilities. Electronic systems will be developed to facilitate rapid data sharing, automated communication of results, management of laboratory commodities, and communication of EQA reports.

Table 8 shows the indicators and targets for laboratories.

Table 8. Indicators and targets for laboratories

Standard indicator	Benchmark 2015	Baseline 2019	Target				
			2021	2022	2023	2024	2025
Number of station hospital laboratories with sputum AFB microscopy service	NA	118	146	196	246	296	346
Number of PPM hospital and private laboratories with sputum AFB microscopy service	NA	107	108	109	113	117	121
Percentage of laboratories showing acceptable performance in external quality assurance for sputum AFB microscopy	92%	97%	97%	97%	97%	97%	97%
Percentage of health facilities (in townships) employing GeneXpert and other diagnostic tools such as TB LAMP, urinary LAM	53% (district)	25% (80 townships)	40%	50%	55%	60%	65%
Percentage of GeneXpert sites using connectivity solution	94%	99%	98%	98%	98%	98%	98%
Number of district TB centres with digital X-ray	2	17 (regions/states)	30	40	50	52	55
Number of regions and states with capacity for culture, FL-DST and SL-DST	2	3	4	4	4	5	5
Percentage of DST laboratories with acceptable performance using EQA	100%	100%	100%	100%	100%	100%	100%
Percentage of level 1 laboratories that are equipped with and employ the minimum package of infection control practices specified for their level	NA	70%	72%	75%	80%	90%	90%

Standard indicator	Bench-mark 2015	Baseline 2019	Target				
			2021	2022	2023	2024	2025
Percentage of level 2 and 3 laboratories that are equipped with and employ the minimum package of infection control practices specified for their levels	NA	75%	77%	78%	79%	80%	90%
Percentage of level 4 laboratories that are equipped with and employ the minimum package of infection control practices specified for their level	NA	90%	100%	100%	100%	100%	100%
Number of reference laboratories and state and region laboratories using the electronic Laboratory Information Management System (LMIS)	0	1	2	2	4	4	5

# of Gene Xpert sites in 2025- 209 (health facilities) + 22 for ECBHO and hard-to-reach areas (total=231)

1.2 Detect and treat all forms of DS-TB and DR-TB

1.2.1. Management of DS-TB

Situational analysis

According to the TB Prevalence Survey of 2018, the incidence of TB declined from 526 per 100 000 population in 2009 to 339 per 100 000 population in 2018. The prevalence of TB also declined from 802 per 100 000 population in 2009 to 436 per 100 000 population in 2018. Thus, the incidence and prevalence rates showed an annual decline of 4.9% and 6.8%, respectively, in this period. Given this rate of decline, Myanmar will be among the few countries in the world to achieve the first milestone target of the End TB Strategy (20% reduction in TB incidence in 2020 from the 2015 baseline).

The Survey revealed that the TB burden was high among the elderly, suggesting that there are more patients in whom past infection has been reactivated than patients who have contracted a new infection. Since people belonging to the older age groups are often caregivers for their grandchildren in Myanmar, the fact that the prevalence of GeneXpert-positive active pulmonary TB is around 1% poses a serious threat of transmission in children.

The prevalence of TB in the states is lower than in the regions. The CNR varies across the states and regions (Fig. 6) and Yangon has the highest CNR (481 per 100 000 population).

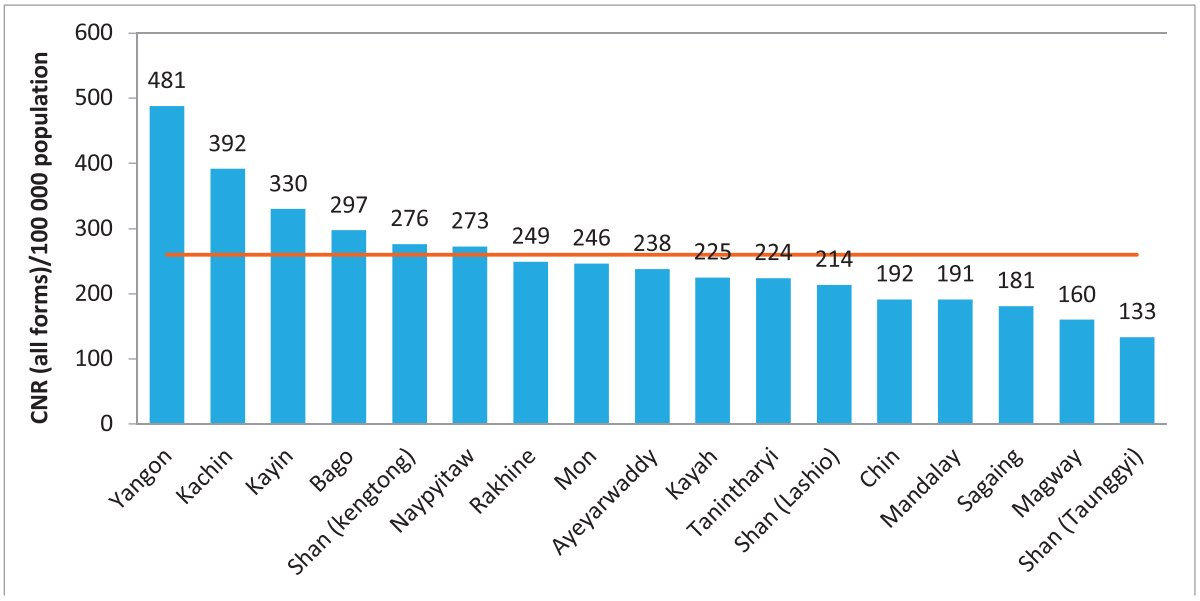

Fig. 6. Region-/state-wise case notification rate of TB (all forms), 2018

The epidemiological decline notwithstanding, Myanmar continues to have a high TB burden. While Yangon accounts for 12% of Myanmar's population, it contributes 25% of the total notified TB cases in the country. The JMM pointed out that the Yangon region is almost facing a crisis situation, not only with respect to MDR-TB but also TB in general, and that urgent action is required.

The TSR for all forms of TB cases was 87% for the 2017 cohort. There were two states (Kayin and Shan-North) with a TSR of below 85%.

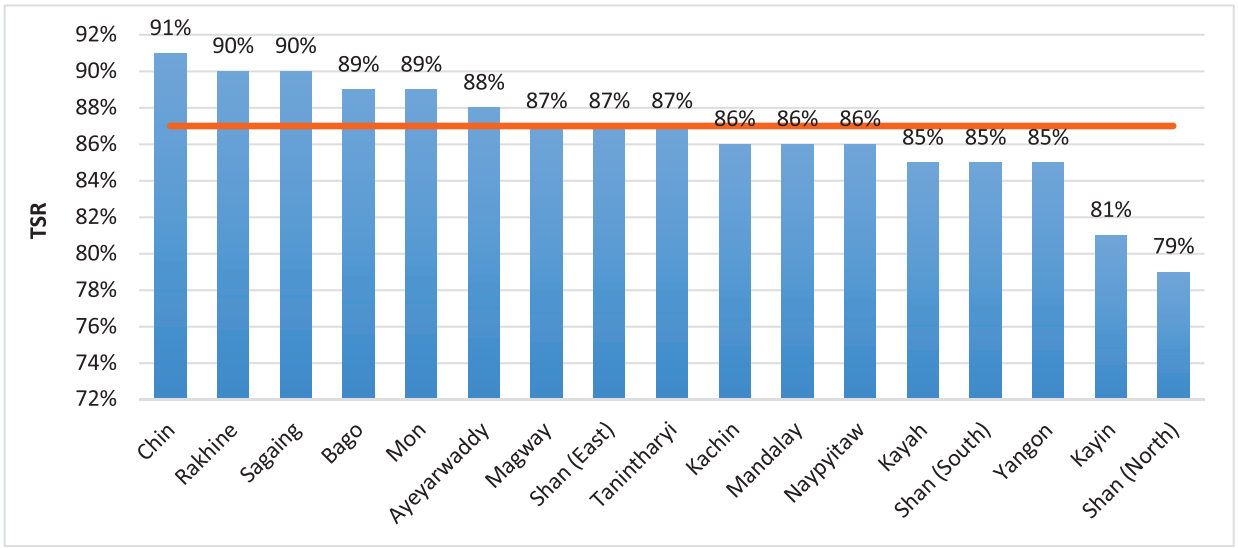

Fig. 7. Region-/state-wise treatment success rate of TB cases (all forms), 2017 cohort

The Survey also illustrated that the private practitioner is the community's most common first contact for care-seeking, followed by the pharmacy. The utilization of public health facilities as the first contact for care-seeking was the more common in the states (43%) than in the regions (33%). In Yangon it was only 15%.

The 2015 survey on the costs incurred by TB patients and their families revealed that 57% of DS-TB patients and all DR-TB patients face catastrophic costs.

The NTP has formulated policies and guidelines in line with international norms and standards. However, there is a need to update the existing policies and guidelines on the basis of the results and recommendations of the 2018 prevalence survey.

Challenges

Limited access to services: The population in the rural areas, especially those below the township level, still has inadequate access to TB care services. The availability of TB diagnostic services at station hospitals and rural health centres is limited. Patients in the rural areas have to travel 13 miles on an average to seek care. The farther the TB diagnostic centre, the higher the prevalence of TB.

Limited engagement with other departments and private sector: There is limited engagement with other departments, particularly for NCDs. The engagement with the department of NCDs is limited mostly to the area of TB and diabetes mellitus. Not much is being done in areas such as TB and tobacco control, and TB screening and treatment for the elderly. There is a need for greater engagement with other related ministries, too, to improve TB treatment and care services. The relatively low level of engagement with public and private hospitals is one of the biggest gaps in the country's efforts to detect TB cases. Further, most GPs are reluctant to comply with the requirements of recording and reporting.

Lack of region-/state-specific TB response plan: Some of the country's states and regions are prone to conflict and natural disasters, which can hamper the effective implementation of TB control activities. In recent years, a number of research papers have focused on the country's TB response activities. However, the findings of these papers have hardly been utilized and the country has not been able to translate these findings to bolster evidence-based decision-making in programme design and implementation. Though the distribution of the TB burden is uneven and there are variations in the performance of the programme across the country, there is no subnational planning for region- and state-specific TB response.

Strategic approaches

- Decentralize and expand of TB diagnosis and treatment services to station hospitals, in line with the NHP. This should include making provisions for CXR for all presumptive TB referrals, expanding the use of GeneXpert and ensuring efficient sample transport mechanisms and a feedback system.
- Ensure human resource capacity with appropriate expertise at all levels of the health system by addressing human resource constraints, providing regular training, and using innovative learning approaches.
- Apply lessons from areas that are performing well to those which are poor performers. In addition, develop subnational plans for each state/region, in line with the country's strategic plan, but adapted to the local context and TB epidemiology.

Essential interventions

Implement all essential TB care services nationwide

This NSP aims to reduce disparities in case detection and treatment success across population groups and geographical areas by addressing context-specific barriers; strengthening and enhancing TB control activities and programme performance at the township, district, state/region levels; and seeking ways to adopt and adapt new technologies for improving case finding and case holding. The main activities to be undertaken are as follows.

- The NTP will formulate or update policies, set and update norms and standards, and extend support (training, technical assistance, supervision, commodity management and partner coordination) to the states/regions for their implementation (detailed in SD 4).

- The number and capacity of human resources at all levels of the health system will be enhanced (detailed in SD 4).
- The diagnostic network will be strengthened in accordance with the updated diagnostic algorithm. The use of GeneXpert as the frontline test for the diagnosis of persons with symptoms and/or radiological abnormalities (detailed in the diagnosis section) will be increased. Same-day (pre-test) CXR reading and GeneXpert testing will be promoted for one-stop diagnosis. CXR services will be made available at the township level, and a sputum transport mechanism will be set up to transport samples from communities and townships. A functional EQA system will be ensured in sputum microscopy laboratories and radiology units within the NTP network, and a recording and reporting system linked to care providers will be put in place. An uninterrupted supply of laboratory commodities will be ensured.
- The decentralization of treatment services will be strengthened. Station hospitals will be enabled to initiate treatment in line with the NHP and CBTBC. In addition, directly observed treatment (DOT) will be taken as close to the patients' homes as possible, by strengthening the roles of basic health staff (BHS) with a well-defined job description, enlisting the support of community volunteers and health workers, and using digital adherence technology (DAT) such as 99DOTS and video observed treatment (VOT).
- Contact investigation will be bolstered by enlisting the support of BHS and community volunteers, who will follow the national contact investigation guidelines; expanding contact investigation to cover all household and close contacts; and enhancing and sustaining the current contact investigation effort in HIV care and treatment settings in collaboration with the National AIDS Programme (NAP).
- Routine supervision will be conducted through a cascade of dedicated health staff and quarterly evaluation meetings/cohort reviews will be held at the township level. Data recording and reporting will be standardized to facilitate the analysis and use of data for decision-making. A move toward electronic data capture is envisioned (detailed in SD 5).
- Communities and care providers at all levels of the health system will be engaged, with the coordination of township public health teams or disease control teams (detailed in SD 3).

Build capacity of basic health providers at all levels

- Organize regular (at least annually or ad hoc, as necessary) refresher training for the existing staff and introductory training for new staff on updates on policies, procedures and guidelines on TB control activities. Also, ensure that TB-specific tasks are updated in revisions of basic training programmes for all categories of the health staff, as well as in supervision checklists.
- Provide regular supportive supervision and regular training (at least annually or *ad hoc*, as necessary) to general laboratory staff performing smear microscopy. It is also necessary to appreciate and acknowledge their contribution.
- Use different learning approaches such as online training and webinar training programmes and introduce them wherever feasible. (Start with pilot projects in the urban areas and expand using tablets.)

Develop subnational plans for all states and regions

- On the basis of the NSP and guidance from the central NTP, each state and region will develop a subnational plan (a two-yearly operational work plan) to address context-specific barriers by developing locally tailored interventions. An emergency response plan, with a disaster response plan and

political situation response plan, will be drawn up as part of the subnational plan in consultation with all the relevant stakeholders.

- Each state and region will organize an annual review meeting to evaluate the effectiveness of its TB control activities vis-à-vis its subnational plan.

Strengthen the integration of TB package under UHC

As part of UHC, Myanmar will define a basic EPHS package by 2020. This will cover 11 areas, including TB control activities to be undertaken nationwide through the existing system, and those to be expanded gradually to reach universal coverage by 2030. The NTP and its partners will undertake advocacy and work closely with related departments to include, secure and strengthen activities for TB care and prevention in the EPHS.

- The NTP will collaborate with NIMU to explore further opportunities for integration or collaboration with general health services and to jointly define a proper balance between the need for specific NTP/TB staff and general health services. The role of each level of health care – from community care, subcentres, RHCs, urban health centres (UHCs), station hospitals (without diagnostic facilities), station hospitals (with X-ray and/or microscope) to township hospitals/TB centres – in TB care and control through basic EPHS will be clearly defined. Since 2003, the township-level facilities have been diagnosing TB and initiating treatment. Equipping station hospitals with X-ray and/or microscopes will facilitate the decentralization of TB diagnosis and treatment, and will enable these hospitals to deliver services close to the community.
- The NTP will hold discussions with NIMU to determine which station hospitals could be additional diagnostic sites for TB, specifically in areas where accessibility is a challenge and there are no existing diagnostic sites nearby.
- Together with NIMU, the NTP will identify the needs of type C laboratories in providing TB services. The ideas emerging from the discussions will be incorporated in the plan for capacity-building of the laboratories.
- As part of the UHC infrastructure initiative, the NTP and NIMU will jointly determine the placement of CXR at the levels of township and below.
- The NTP and the relevant stakeholders will develop a learning agenda for the supply-side financing of TB activities. This will cover strategic purchasing approaches for both curative care and public health functions.
- The NTP will join NIMU and other stakeholders in the UHC infrastructure initiative to develop a comprehensive framework for social protection to reduce medical costs, for the families of DS-TB and DR-TB patients.
- The NTP will further clarify the roles and responsibilities of health workers (midwives and PHS2) under the DOPH to ensure implementation and their adherence to applicable job descriptions. This should also include a plan for task shifting between midwives and PHS2.

Undertake intensive identification of presumptive TB cases

Strengthen the identification of presumptive TB cases through the following measures.

- Carry out systematic screening to identify patients with respiratory symptoms in the outpatient departments of general hospitals and RHCs for sputum examinations and CXR. Prioritize facilities, including private ones, where the sputum positivity rates are high.

- Strengthen the sputum transportation network to enhance access to TB diagnostic services at the subtownship level and villages.
- Expand the identification of presumptive TB cases by enhancing the participation of community health-care workers and volunteers.

Harmonize patient support incentives

The NTP and its implementing partners will provide incentives to TB patients to enable them to access diagnosis, treatment and care services.

- On the basis of the findings of the National TB Prevalence Survey, incentives to support patients, especially travel allowance, will be defined at standardized rates. The rates will differ for urban, rural and hard-to-reach areas, and they will be applied across the programme.
- The financial barriers to adherence to TB treatment will be addressed effectively through social protection mechanisms and interventions, in collaboration with NIMU and ministries such as the Ministry of Social Welfare and Ministry of Labour.
- Nutritional support will be introduced for DS-TB patients.

Table 9. Indicators and targets for DS-TB

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
TB treatment coverage (new and relapse)*	67%	75%	93%	96%	97%	TBD	TBD
Number of notified cases of all forms of TB (bacteriologically confirmed plus clinically diagnosed), all forms	140 700	134 120	151 076	149 562	144 288	131 811	118 463
Number of notified cases of all forms of TB (bacteriologically confirmed, clinically diagnosed), new and relapse cases	140 700	132 238	149 112	147 618	142 412	130 097	116 923
Number of notified cases of bacteriologically confirmed TB, all forms	48 825	54 895	67 984	70 294	70 701	65 906	59 232

* Till an acceleration in the decline of TB incidence is proven by an epidemiological review or studies, or WHO revises the estimate, an estimated annual decline rate of 5% in the incidence of TB is being used to calculate case detection coverage. A case detection rate exceeding the treatment coverage rate of 90% or higher may be observed due to the expansion of active case detection as a result of the appropriate selection of target populations. Chronic TB patients in the community without a TB diagnosis and treatment will be detected. The prevalence of TB among hotspot communities is two or three times higher than the annual notification. The estimated case notification for 2024 and 2025 will be revised when the decline in TB is estimated next.

1.2.2. Programmatic management of DR-TB

Situational analysis

Myanmar is one of the 30 countries with a high burden of MDR/RR-TB, the estimated incidence of which was 14 000 (8000–21 000) in 2017. However, there was a downward revision of the estimated incidence on the basis of the results of the National TB Prevalence Survey (2017–2018). The re-estimated incidence of MDR/RR-TB in 2018 was 11 000 (7400–16 000). The situation as it stands now will become clear after the fourth NDRS in 2020.

The NTP launched DOTS Plus pilot projects in 10 townships in the Yangon and Mandalay regions, in close collaboration with WHO and Médecins sans Frontières–Operational Centre Amsterdam (MSF–OCA) during 2009–2011. The DOTS Plus package consists of five elements: political commitment; case detection through quality-assured bacteriology; standardized treatment with supervision and patient support; affective drug supply and management; and monitoring and evaluation with impact measurement. Till June 2019, there were 59 MDR-TB centres. The remaining district TB centres and township health departments have been serving as decentralized MDR-TB service delivery points. They administer daily injections, provide DOT, manage minor side-effects, and provide social and nutritional support.

By the end of 2019, 108 GeneXpert machines had been set up in all 17 states and regions. The criteria for GeneXpert testing have been expanded for the diagnosis of MDR-/RR-TB among all notified cases of TB. The NTP allows presumptive TB cases to undergo GeneXpert testing if the patient is HIV-positive or a contact of a MDR-TB patient. In late 2017, the NTP adopted the WHO recommendation of carrying out universal DST by not only expanding the GeneXpert criteria, but also by introducing rapid molecular testing for susceptibility to second-line drugs.

After the NTP started the DOTS Plus pilot project in 2009, the number of patients enrolled in the programmatic management of drug-resistant TB increased significantly, from 359 in 2009–2011 to 2802 in 2018. However, the distribution of such cases was uneven across the country. Yangon had the highest national burden of MDR-TB (47%), followed by Ayeyarwaddy (10%), Bago (8%) and the Mandalay region (6%). The rest of the states and regions constituted 29% of the country's case load in 2018.

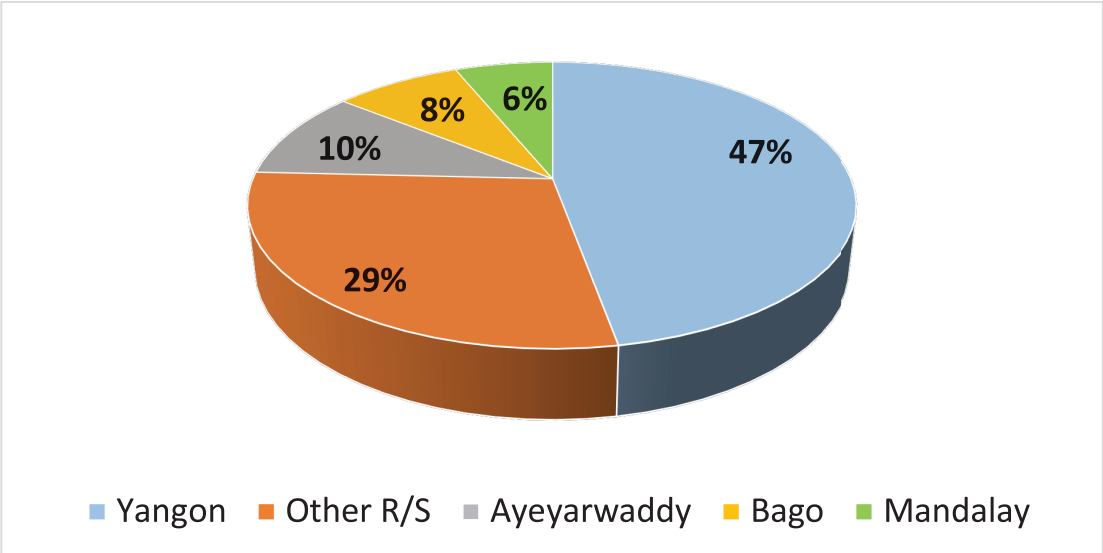

Fig. 8. Distribution of MDR-/RR-TB patients on second-line drugs in regions and states (n=2633, 2018)

The national guidelines for the management of DR-TB were last updated in 2017.

A pilot for the introduction of the short-term regimen (STR) for MDR-TB, recommended by WHO, was launched in the Yangon and Mandalay regions in November 2017. The preliminary treatment outcomes of

the STR were encouraging and the outcomes of the first 200 patients led to the expansion of the STR to other regions in 2019. However, the NTP has now adopted the WHO 2019 consolidated guidelines on the management of DR-TB and rapid communication. The STR being used now and the conventional second-line regimen will be replaced with oral regimens under this NSP.

The treatment of DR-TB with new and repurposed drugs started in collaboration with MSF-OCA in Yangon in 2016 and Mandalay in 2017. Enrolment for this treatment increased significantly from the first quarter of 2018; 19, 25, 169 and 173 patients were started on it in 2016, 2017, 2018 and January–June 2019, respectively. These patients included MDR-/RR-TB patients with additional resistance to fluoroquinolones or second-line injectables, and DR-TB patients who were intolerant to second-line medicines of the standard regimen.

The NTRL started second-line DST in 2014. The expanded use of MTBDRsl to test all MDR-/RR-TB patients for resistance to second-line drugs was initiated in the Yangon and Mandalay regions in 2019. Following this, more and more MDR/RR-TB cases with additional resistance to fluoroquinolones and/ or second-line injectables are being identified.

The NTP, assisted by its technical partners, such as WHO and the USAID-Challenge TB project, established a system for active TB drug safety monitoring and management (aDSM) and organized clinical workshops for better clinical care in 2018 and 2019.

Challenges

Treatment gap and delay: The gap between the percentage of notified MDR/RR-TB cases and that of those on treatment fell to around 20%. Nonetheless, further reduction of this gap is a challenge for the programme. There continue to be delays in the initiation of treatment, either due to delay on the part of the system or on the part of patients. Security problems in some areas, such as the states of Shan (North) and Rakhine, are an obstacle to the achievement of targets.

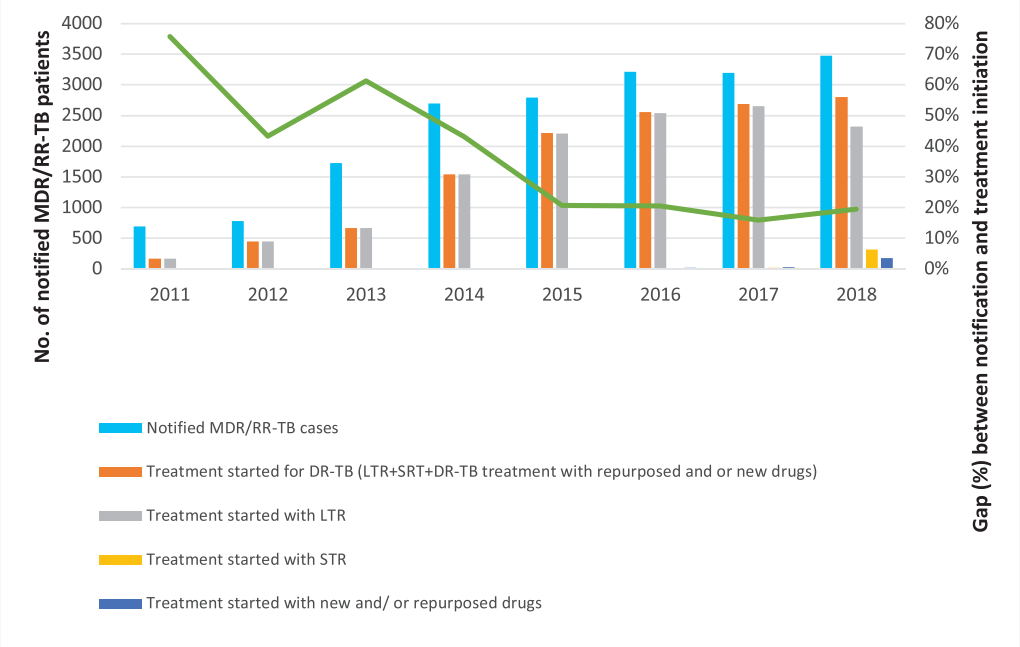

Fig. 9. Number of notified MDR-/RR-TB cases and patients started on treatment (2011–2018)

Limitation of human resources: An important challenge is that due to insufficient human resources, the workload of the existing human resources has increased. Although the NTP has expanded treatment and care for MDR/RR-TB under a borderless approach, the quality of care and routine monitoring of the programme

activities have remained suboptimal during the expansion phase. Operationalizing PMDT has largely been dependent on seconded staff, especially in the Yangon region.

Access to new drugs and regimens: The introduction of rapid DST has resulted in an increasing demand for treatment with new and repurposed drugs. The NTP, however, faces certain constraints when it comes to supplying new drugs because of the existing SOPs. The newly established aDSM mechanism may be of help in this when it is fully implemented. Limited infrastructure hampers the use and regular maintenance of equipment (audiometers and ECG machines). Besides, there has been an increasing demand for quality laboratory results to ensure timely and effective clinical management.

Diagnosis of childhood DR-TB: There is no systematic approach to case-finding and diagnosis of childhood DR-TB.

Comorbidities: Comorbidities such as HIV, diabetes mellitus, hepatitis, and mental health problems negatively affect treatment outcomes. There is a deficiency in providing care in a holistic manner. Hospitalization criteria for patients receiving new and repurposed drugs have not been defined yet.

Recording and reporting: Individual databases for DS-TB, MDR-/RR-TB, and XDR-TB create complexities and lead to the overlapping of registered cases. The sustainability of a case-based database for PMDT, in particular the OpenMRS, is being explored.

Strategic approaches

- Strengthen the existing model of care and all its essential components, including expanding the use of GeneXpert, enhancing HR capacity, implementing aDSM, and improving supply chain management and the recording and reporting system. There should be a specific focus on high-burden regions such as Yangon, Ayeyarwaddy, Bago, and Mandalay.
- Replace the present regimens of injectables with all oral regimens, in line with the new WHO guidelines.
- Strengthen support to patients and families through improved communication and social support packages and use of digital technology to improve adherence.
- Enhance engagement with communities, using standardized package adapted to the settings.
- Update guidelines and tools periodically through regular meetings of the expert DR-TB committee and conduct trainings to disseminate the updated guidelines and tools.

Essential interventions

Expand PMDT services

- The expansion of GeneXpert testing will be undertaken as detailed under Section 1.1. Childhood TB diagnosis with GeneXpert testing will be enhanced as detailed in Section 1.3. The integration of GeneXpert utilization with HIV and hepatitis C programmes will be ensured. The coverage of second-line DST will be expanded in a stepwise manner, as recommended by the fourth NDRS. Liquid culture will be used for baseline culture/DST and monitoring of DR-TB treatment. In addition, WGS will be introduced for to optimize patient management.
- Appropriate HR planning will be undertaken as detailed in SD 4. Capacity-building of township medical officers (TMOs)/medical officers (MOs) will be carried out under this NSP, and the responsibility of MDR-TB management will be shifted to township teams. The treatment of pre-XDR and XDR-TB will be decentralized gradually to all states and regions having defined patient hospitalization criteria. The time lapse between notification and treatment initiation will be reduced to no more than

7 working days. A patient-centred approach will be adopted, aided by appropriate counselling.

- The capacity and clinical skills of attending physicians will be enhanced via regular and refresher training. This will include optimal case management of DR-TB patients with comorbidities and detection and management of adverse effects of treatment. DR-TB CME with TB specialists from Aung San and Patheingyi TB hospitals will be conducted regularly for clinicians and health-care providers of hospitals, NTP and partners.
- The supply of quality-assured second-line medicines and ancillary drugs will be ensured down to the township level with the help of quantification and supply chain management systems described in SD 4, Section 4.2
- The current recording and reporting system will be updated to include data on the notification of cases of MDR-/RR-TB with additional resistances, different types of DR-TB, new regimens and serious adverse events (SAEs) of "possible and above" in the routine system. OpenMRS will be updated according to new modalities.
- Case-holding will be enhanced via health education and counselling, collaboration between the township health departments and other organizations, including civil society organizations, as well as timely and effective management of side-effects. The latest digital adherence technologies, such as VOT and mobile health (mHealth) tools, will be used to improve adherence.
- The baseline standard support package for patients will include: financial support both for patients and their MDR-TB care/DOT provider; evening DOT for MDR-TB patients; monthly travel allowances for patients; provision of training on personal infection control and masks; health education and counselling on adherence; investigation and referral of household contacts; and monitoring of and referral for side-effects. Malnourished DR-TB patients with a BMI of less than 16 will be given nutritional support consisting of ready-to-use therapeutic food and high-energy biscuits.
- To facilitate early case detection and prompt treatment, the number of initial home visits will be increased and household contacts will be systematically screened. The transport expenses incurred by BHS/ volunteers/ presumptive cases will be reimbursed.
- The implementing partners will fully engage the communities affected to respond to the measures for the care and prevention of DR-TB. While the package of activities will be standardized, operationalization will be based on the disease burden and subnational plan. Palliative care for DR-TB patients will also be strengthened. The investment for CBTBC will be shared by the local government.
- National meetings of the expert DR-TB committee will be held every two months to oversee all aspects of the PMDT, to guide the NTP in the adoption of WHO's new recommendations, and to follow up and offer advice on pilot projects. Region- and state-level meetings will be held quarterly for all members, including physicians engaged in patient-centred care. These meetings will also be attended by all relevant partners in order to facilitate integrated efforts.
- The existing regimens with injectables will be phased out to introduce and expand all oral regimens, according to the WHO's guidelines

Ensure early detection and treatment initiation

- The fundamental objectives of this NSP are to reduce the gap in DR-TB detection and minimize the delays in the initiation of treatment. The interventions will include raising public awareness of DR-TB, providing timely updates on new policies and guidelines and disseminating these, conducting proper pre-test counselling for presumptive TB/DR-TB and reducing the turnaround time for TB/ DR-TB diagnostic tests. The linkages between MDR-TB treatment centres, GeneXpert sites, and TB/

HIV, TB/DM and BSL-3 laboratories will be strengthened. Together with this, they will collaborate with general hospitals and PPM hospitals for early case referral, case detection and initiation of treatment.

- To expand access to new regimens and new drugs, the NTP will continue to adopt new modalities in DR-TB diagnosis and treatment, as recommended by WHO and in line with global best practices. The NTP will strive to pilot and adopt new regimens, introduce new drugs, expand the STR, and make sure that patients receive effective and less toxic regimens.
- There will be regular updates on the national guidelines and scope of practice[6] to keep up with the evidence-based practices and follow WHO recommendations and international standards of practice in DR-TB treatment. These updates and revisions will be followed by training of trainers (ToT) and cascade trainings for patient-centred care.
- The NTP envisages further strengthening of aDSM, an essential component of DR-TB treatment and the care package, to cover all DR-TB patients. It will be scaled up nationwide in a stepwise manner. The NTP will regularly build the capacity of all health-care providers at the regional/state levels. Recording and reporting under aDSM will be strengthened at DR-TB management sites at all levels.
- Campaigns, activities and the social media will be used to raise public awareness of DR-TB. The treatment providers' awareness of DR-TB will be enhanced through continuing medical education (CME) and the Myanmar Medical Association (MMA) network. (See SD 3, Section 3.1.)
- Regular monitoring, supervision and evaluation will be strengthened by using the standardized monitoring and supervision (M&S) checklist.
- Engagement with other health departments will be enhanced for early case detection among outpatients and inpatients; better clinical management; and infection control.
- Operational research will be conducted for innovative treatment approaches (new drugs and regimens) or new models of care, in accordance with the priorities of the NTP.

Table 10. Indicators and targets for DR-TB

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
Percentage of TB patients with DST result for at least rifampicin among total number of notified cases in a year	NA (new) 67% (retreatment)	49% (among bacteriologically confirmed) 92%(new) and 84% (retreatment)	80%	85%	90%	90%	90%
Number of bacteriologically confirmed DR-TB cases (notified)	2 793	3 205	5 121	5 437	5 598	4 864	4 638
Number of cases with DR-TB that began second-line treatment	2 217	2 891	4 763	5 110	5 318	4 621	4 406
Percentage of cases with DR-TB that began second-line treatment	79%	90%	93%	94%	95%	95%	95%
Percentage of confirmed DR-TB cases tested for resistance to second-line drugs	NA	66%	68%	70%	>70%	>70%	>70%

Number of XDR-TB cases diagnosed	19	27	136	146	152	132	126
Number of XDR-TB cases started on treatment	10	23	95	102	106	92	88
Percentage of cases with RR-TB and/or MDR-TB started on treatment who were lost to follow-up during the first 6 months of treatment	3% (2013)	2.6%	<3%	<3%	<3%	<3%	<3%
Number of DR-TB treatment initiation centres with renovated wards for IPC, including isolation (cumulative)	NA	3	17	18	19	20	21
Treatment success rate of RR-TB and/or MDR-TB	83%	80%	80%	81%	82%	82%	82%
Proportion of DR-TB patients receiving social support (nutrition)	NA	100%	100%	100%	100%	100%	100%

#The assumptions (e.g. proportions of MDR/RR-TB with additional resistances) used in the operational plan and budget calculation came from routine program monitoring data. These will be replaced with more accurate data after the fourth national drug-resistant survey is completed.

1.3. Strengthen management of TB among children

Situational analysis

The trend of the paediatric TB CNR in Myanmar has shown a gradual decline since 2012, but there was a slight rise in 2018, during which 26 235 cases (260 per 100 000 population) were notified among children < 15 years of age.

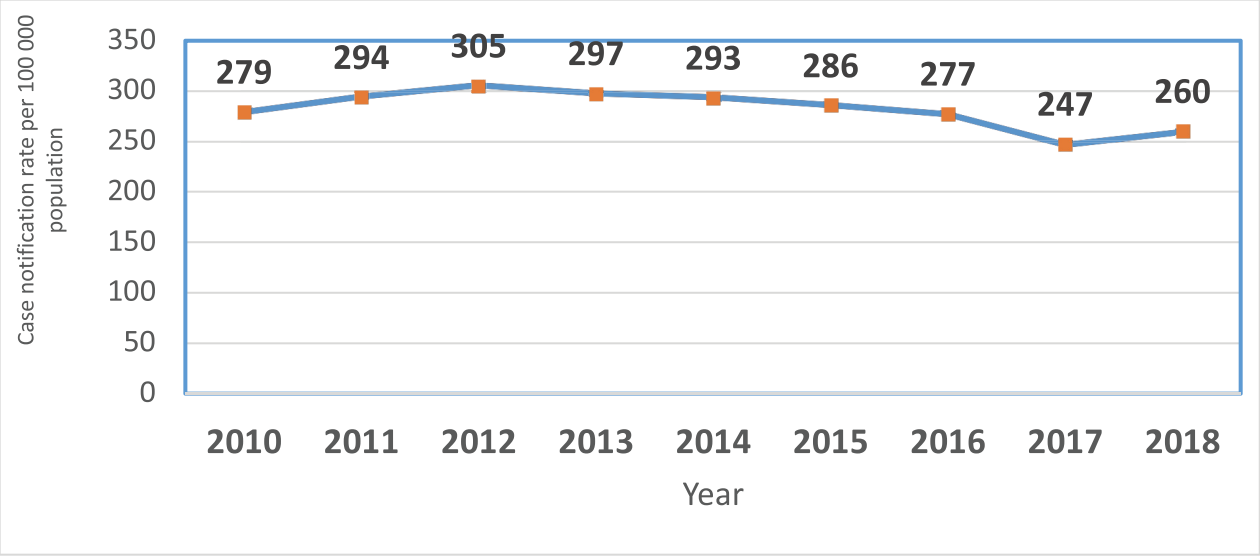

Fig. 10. Trend of paediatric TB case notification rate (2010–2018)

However, less than 50% of paediatric TB cases were diagnosed among children under 5 years of age, who represent a more vulnerable population. This suggests that there may be over-diagnosis among older children and/ or under-diagnosis among young children. The proportion of paediatric TB countrywide declined gradually from 25.6% in 2014 to 19.3 % in 2018 (with a projection of 17.6% for 2019). A decrease in DS-TB cases among children suggested a reduction in new infections due to the interruption of chains of transmission in

the household and the community. However, this finding must be interpreted with caution because of the potential of overdiagnosis among older children and/or underdiagnosis among young children.

The proportion of paediatric TB varied widely between states and regions. The state of Chin had the highest proportion, while the Yangon region had the lowest. The reported adult population with TB in Chin was low and no paediatric TB cases were treated in the private sector.

The TSR for children below the age of 15 years was high, at 96%, in the 2017 cohort.

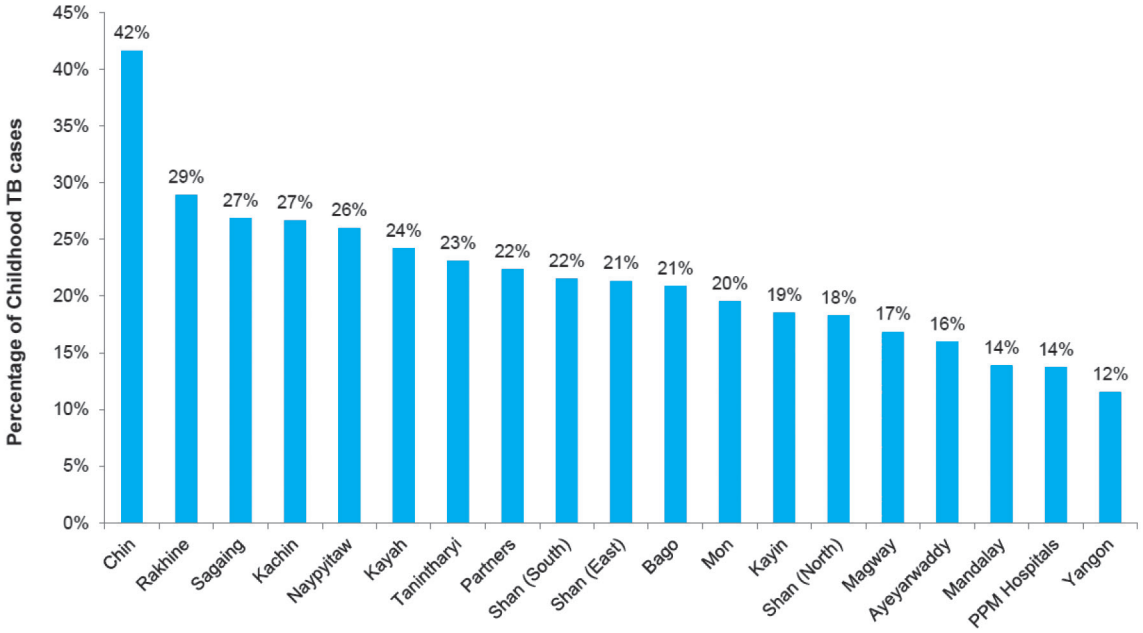

Fig. 11. Proportion of paediatric TB cases by state/region, 2018

There was a significant decrease in TB meningitis cases among children of the age of 0–4 years and those in the age group of 5–14 years, with the number of cases declining from 370 to 49 in the former group from 2010 to 2018, and 468 to 51 in the latter group in the same period. The coverage of BCG vaccination, one of the important measures to prevent TB meningitis and severe TB among children, increased gradually from 2011 to 2016. This trend could partially explain the reduction of TB meningitis during the period. However, it can also be that there was a decrease in the risk of TB transmission in the community. Eighty per cent of the paediatric TB cases (0–14 years of age) were tested for HIV in 2018 and 80% of child HIV cases will be screened for TB in 2020.

Training in paediatric TB was imparted in the Yangon and Mandalay regions, as well as the Union Territory of Nay Pyi Taw, from 2016 to 2018. This led to an improvement in the capacity of medical officers, TB coordinators, and PPM private practitioners.

Basic health staff throughout the country received training in *Integrated Management of Neonatal and Childhood Illness* (IMNCI). However, integration with MNCH services is necessary to ensure adequate access to routine diagnostic pathways. Neonatal BCG coverage in 2018 was excellent (>90%), although interruptions and shortages of vaccine were reported in some remote areas, particularly areas affected by conflicts.

The national policy on contact investigation requires that preventive treatment for TB be given to children under 5 years of age whose household contacts have bacteriologically confirmed pulmonary TB. However, this is rarely practised. The 2019 JMM recommended the large-scale use of 3HR as TPT among these children as the combination is well tolerated by children.

Challenges

Underreporting of childhood TB by private sector: The private sector, especially private hospitals, have been underreporting childhood cases of TB. In 2018, private hospitals were mandated to notify TB cases, including paediatric cases. Previously unreported paediatric TB cases were notified. For example, one private hospital in the Yangon region, where many well- known paediatricians are practising, notified 163 paediatric TB cases by the third quarter of 2019.

Low IPT coverage: The coverage of isoniazid preventive therapy (IPT) was very low (2% in 2018) among children below 5 years of age who have a household contact with a TB patient with bacteriologically confirmed pulmonary TB. The treatment adherence of the children to the six-month IPT was also poor. In addition, paediatricians and parents had a negative attitude towards giving IPT to children. The other barriers included fear of the adverse effects of the drug and the fear that IPT might fuel drug resistance.

Childhood TB diagnosis with GeneXpert: There have been very few instances when gastric aspirate specimens from presumptive paediatric TB cases have been obtained and sent for AFB microscopy and the GeneXpert MTB/RIF test. This is because gastric aspiration is not widely practised in district hospitals. Moreover, the percentage of treated paediatric MDR-TB cases was only 0.7% in 2018.

HIV testing in childhood TB cases: The extent of HIV testing among paediatric TB cases was low compared to that among adults, both in the public and private sectors. GPs involved in PPM activities were also reluctant to provide provider-initiated HIV counselling and testing (PICT) to paediatric TB cases. They did so particularly for cases in which HIV was suspected.

Recording and reporting: Extrapulmonary TB cases among children were not reported separately in the routine quarterly report.

Strategic approaches

- Intensify case-finding in the pediatric population, particularly among those under 5 years of age and those with severe disease by utilizing the usual entry points of care for children and ensuring the integration of childhood TB into the IMNCI programme; and ensuring access to CXR and other diagnostics.
- Enhance the quality of diagnosis, particularly in areas experiencing over- and under- diagnosis, through training and mentoring, improvements in CXR interpretations, and expanding access to GeneXpert.
- Enhance the quality of pediatric TB treatment, care and prevention by setting up specialized centres that will serve as models of service provision and venues for sharing and learning. In addition, strengthen contact investigation and expand the coverage of TPT to all children in contact with bacteriologically confirmed pulmonary TB patients; enhance TB/HIV and TB/MNCH collaborative activities; and ensure the uninterrupted availability of child-friendly formulations for DR-TB.

Essential interventions

Intensify case-finding

The NTP will intensify activities to help identify TB cases in the age group of 0–5 years as the proportion of this group among childhood TB cases is less than that of children in the age group of 5–14 years. The integration of childhood TB with IMNCI will be carried out to screen children (particularly those under 5 years of age) for TB. The use of GeneXpert will be enhanced, especially for children who are contacts of MDR-TB cases.. Training of care providers and patient support will be given, and GeneXpert Ultra cartridges will be used to strengthen gastric aspiration and sputum induction procedures. The use of stool samples will be introduced

in line with the new recommendation by WHO.

Strengthen use of CXR

Recognizing the complexities of diagnosing TB in children and the integral role of CXR in the diagnostic algorithm, the NTP will focus on introducing a comprehensive package of activities to train and mentor staff to ensure the quality of X-ray reading and interpretation. It will:

- expand access to CXR at the township level in line with the NHP; and
- intensify capacity-building for CXR reading and interpretation through cascade training for medical officers, radiologists, paediatricians and other care providers engaged in TB diagnosis at the township level or below.

Strengthen contact investigation

Contact tracing of all children in the households of TB patients will be sustained by all facilities engaged in the diagnosis and treatment of both DS- and DR-TB. Communities will be engaged in contact tracing. Patients and BHWs will be provided with adequate financial and logistical support for referrals, DOT provision and follow-up.

Expand coverage of TPT for child contacts of TB patients

Basic health workers and community volunteers will conduct initial home visits, DOT provision for TB and TPT. An assessment of the attitude of such care providers, as well as the parents/guardians towards the provision of TPT for child contacts of TB patients will be undertaken and the findings will be used to strengthen the NTP's policy on TPT (see SD 5, Section 5.1 for details). Implementation research will be conducted in 2020 on the use of 3HP as TPT for children under the age of 5 years who are household contacts of TB patients. The results of the research, which are expected in 2021, will be reviewed before the countrywide implementation planned for 2022.

Set up specialized centres for childhood TB

Each region/state will have a specialized centre for the diagnosis and treatment of childhood TB/MDR-TB. These will be set up in a step- wise manner from 2021 until 2025 and will serve as the conveners and hosts of periodic training and refresher sessions to provide hands-on training and an opportunity to witness best practices.

Strengthen TB/HIV and MNCH collaborative activities

The NTP will strengthen TB/HIV and MNCH collaborative activities for children. In addition, BCG immunization at birth will be strengthened in collaboration with the EPI run by the MOHS.

Ensure availability of childhood TB formulations

The NTP will continue to procure second-line drugs, including child-friendly formulations for paediatric MDR-TB cases through the Global Drug Facility (GDF), in line with the recommendations of WHO.

Update national guidelines

The NTP, assisted by specialists, will review and revise the national paediatric DS-TB and DR-TB guidelines in line with the recommendations made by WHO, and provide trainings and refresher trainings after each revision.

Table 11. Indicators and targets for childhood TB

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
Percentage of childhood TB among all cases	25%	18%	16%	15%	14%	13%	12%
Percentage of under-5 among childhood TB cases	40%	47%	48%	49%	50%	51%	52%
Treatment success rate among childhood TB cases	95%	96%	>95%	>95%	>95%	>95%	>95%

1.4 Undertake joint TB/HIV programme and decentralize services

Situational analysis

Myanmar has a low prevalence of HIV in the general adult population. However, recent estimates showed a prevalence of close to 1% in the Yangon region and 2.76% in the state of Kachin. Myanmar is among the 30 countries that have the highest burden of TB/HIV, with TB being a leading opportunistic infection among PLHIV.

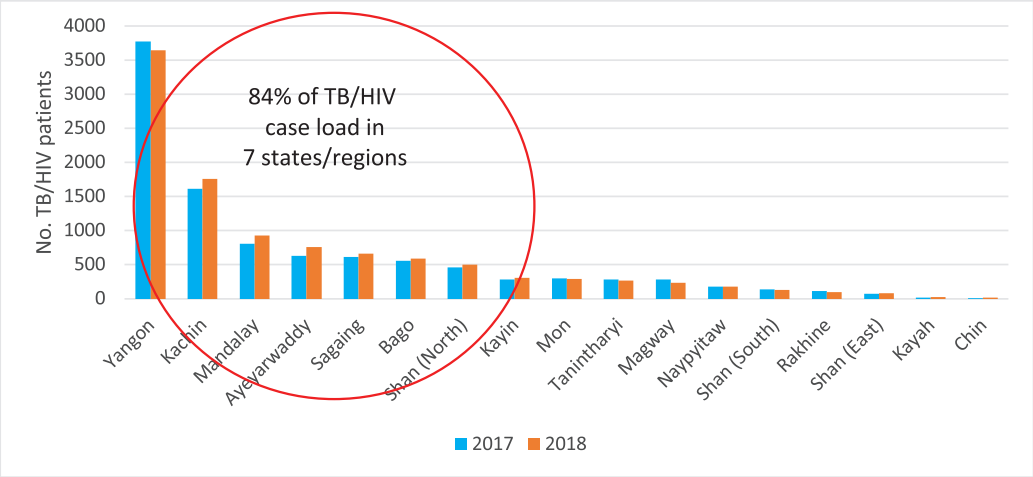

Fig. 12. Number of TB/HIV patients (new and relapse) registered in 2017 and 2018 by region and state

The routine monitoring system of the NTP documented that 8.5% of TB patients (new and relapse) were infected with HIV in 2018. Annual sentinel surveys showed a steady, albeit gradual, decrease in coinfection rates up to 2016, and a slight increase in 2018 (see Fig. 13).

In 2005, TB/HIV collaborative activities were started in seven townships. With stepwise expansion, all 330 townships were covered by TB/HIV collaborative activities by 2016.

Training of trainers and cascade training have been provided in all regions and states to enable health-care personnel to provide essential TB/HIV services in HIV clinics and TB clinics. The cross-referral system was strengthened to promote timely initiation of ART. The proportion of registered new and relapse TB cases with a known and recorded HIV status was 89.8% and 91.6% in 2017 and 2018, respectively. The progress was quite evenly distributed among the states and regions.

The proportion of HIV-positive among new and relapse TB patients with known and recorded HIV status in 2017 and 2018 was the highest in the states of Kachin and Shan (North) and in the Yangon region.

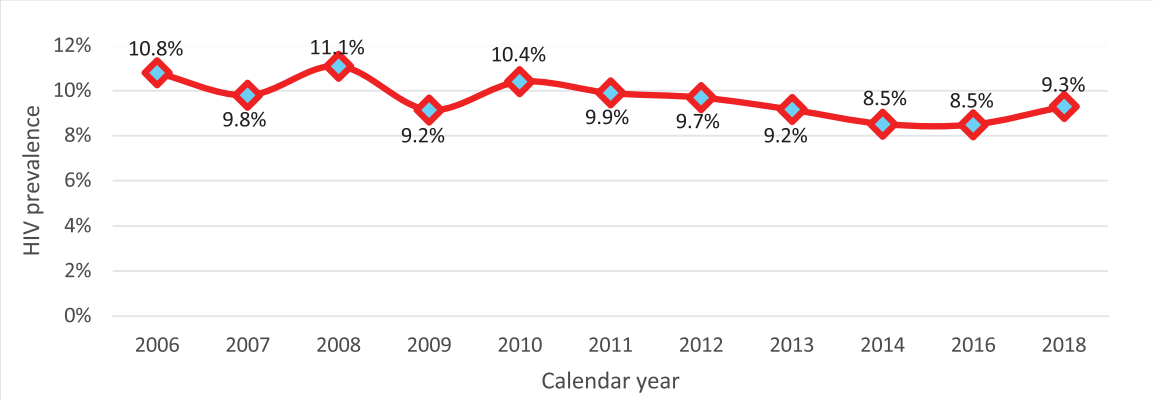

Fig. 13. Trends of HIV prevalence among new TB patients, HSS 2005–2018

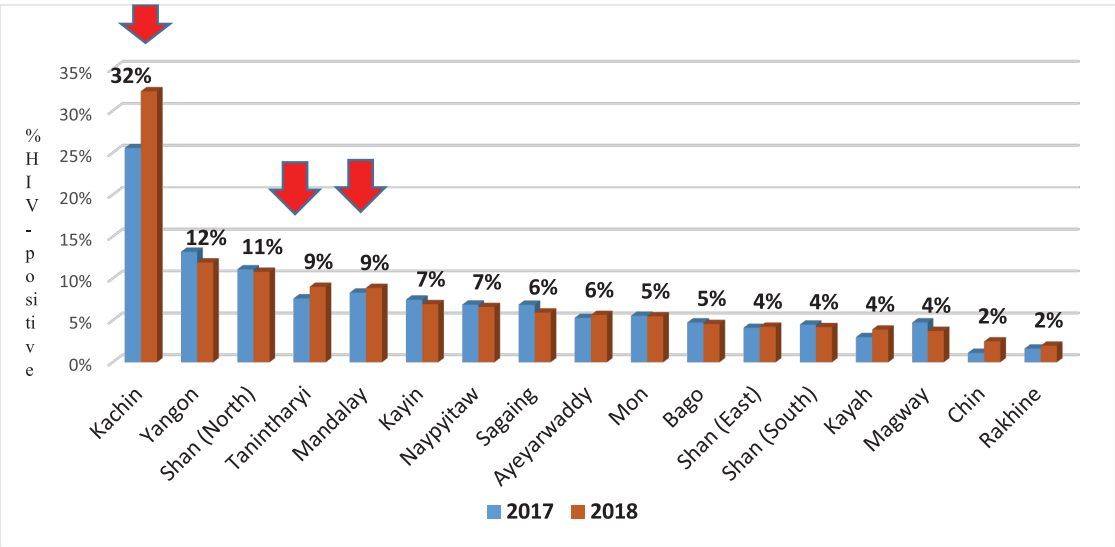

Fig. 14. Proportion of HIV-positive among new and relapse TB patients with known and recorded HIV status (2017 and 2018) by region and state

Coverage for co-trimoxazole preventive therapy (CPT) and antiretroviral therapy (ART) were 88.2 % and 71%, respectively. It is obvious that the country has made significant progress in the implementation of TB/HIV collaborative activities since 2012.

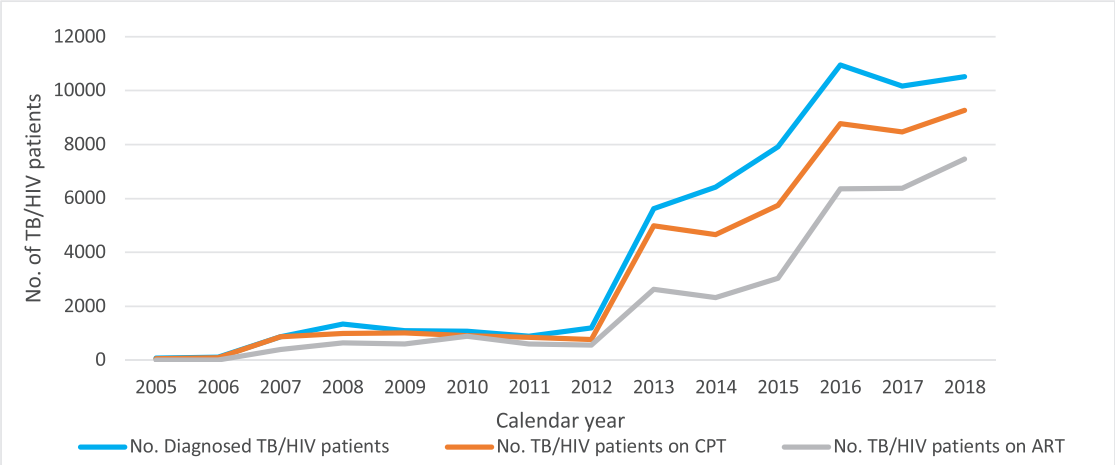

Fig. 15. Progress of TB/HIV collaborative activities (2005–2018)

Despite this, the case fatality ratio among TB/HIV patients was quite high: 16% among registered cases in 2015 and 2016. This figure decreased slightly, to 14%, in 2017.

Table 12. Evaluation and treatment of TB/HIV patients

Year	No. of TB/HIV patients evaluated	No. cured	No. in whom treatment completed	No. treatment success	No. with treatment failure	No. who died	No. lost to follow-up	No. not evaluated	No. moved to second-line drugs
2015	11 291	2271 (20%)	5739 (51%)	8010 (71%)	200 (2%)	1820 **(16%)**	914 (8%)	239 (2%)	108 (1%)
2016	10 598	2512 (24%)	5 140 (48%)	7652 (72%)	107 (1%)	1679 **(16%)**	819 (8%)	236 (2%)	105 (1%)
2017	10 234	2685 (26%)	4655 (46%)	7340 (72%)	312 (3%)	1426 **(14%)**	846 (8%)	190 (2%)	120 (1%)

WHO estimated that the number of deaths due to HIV/AIDS in Myanmar in 2018 was 7800 [5900–11 000],[16] while TB/HIV mortality estimate for the same year was 3700. NAP promoted timely initiation of ART for TB/HIV patients by allowing all decentralized sites to start ART under the management of township medical officers in late 2017.

Intensified TB case-finding at HIV clinics became the usual practice under NAP and reached 100% in 2018. However, TPT coverage for newly enrolled HIV patients was only 16% in 2018 against the set target of 50%. Besides, the treatment of LTBI must be strengthened in all HIV service delivery points to reduce suffering and the high number of deaths among PLHIV due to TB.

16 *GHO | By category | Number of deaths due to HIV/AIDS - Estimates by country* (2020). Available at: https://apps.who.int/gho/data/node.main.623?lang=en (Accessed: 06 October 2019).

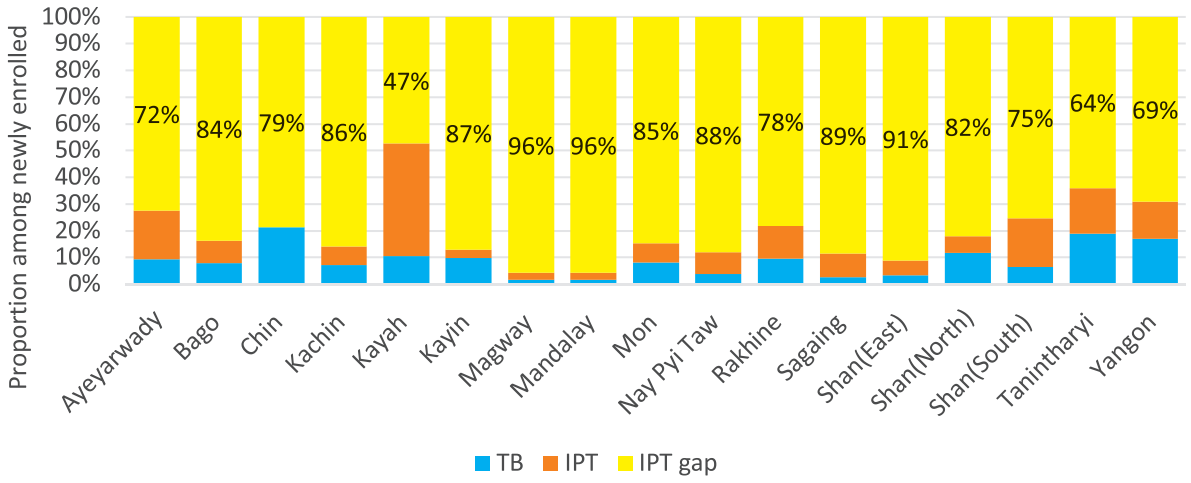

Fig. 16. IPT gap among newly enrolled patients (January–December 2018)

Challenges

Limited engagement and coordination: Although TB/HIV coordination meetings have been organized regularly, monitoring and evaluation have not received adequate attention. Also, some key partners (international NGOs which run HIV clinics) and other health programmes (methadone programme) have not yet been engaged.

Slow uptake of LTBI treatment: There has been a significant gap between the diagnosis of TB and initiation of treatment of LTBI across the country. Strategies have not been formulated to tackle the perspectives of either providers or service users.

Suboptimal ART initiation for TB patients: While access to integrated TB/HIV services is improving, access to ART remains suboptimal. Both the NTP and NAP are finding it difficult to make progress in reaching the set target (85%) of starting TB/HIV patients on ART by 2020. Although NAP allows the initiation of ART for TB/HIV patients at the township level, township teams are reluctant to initiate ART for patients coinfected with TB. The concerns of township teams need to be addressed by NAP to remove barriers at the township level.

High rates of loss to follow-up and mortality in some areas: Loss to follow-up and mortality rates have been very high in some areas with a high prevalence of drug use and in areas with security issues. The NTP has also encountered problems in improving the TSR of TB/HIV patients due to low literacy levels and language barriers in special regions.

Limited one-stop TB/HIV services: Although 118 townships started using a specific integrated model in 2016,[17] one-stop shop TB/HIV services have been limited to a few specialty hospitals and general hospitals. At these facilities, the attending physicians provide overall case management, including the management of adverse drug reactions. The establishment and expansion of fully integrated services with TB/HIV services offered under one roof by the same health-care worker or a team, and one patient record would still be a challenge for this NSP.

Strategic approaches

- After the expansion of TB/HIV collaborative activities to all townships, the interventions will be

17 Myo su Kyi, Aung si Thu, Mcneil E, Chongsuvivatwong V (2019). Evolution of tuberculosis/human immunodeficiency virus services among different integrated models in Myanmar: a health services review. Trop Med Infect Dis. 4(1): 2. doi:10.3390/tropicalmed4010002.

enhanced so that the collaborative activities have a desirable impact. This NSP targets states and regions with a high TB/HIV case load (Fig. 12), while area-specific TB/HIV activities are to be implemented according to the subnational plans of the NTP and NAP.

- Activities to build sufficient capacity will be followed by supportive supervision to ensure the early initiation of ART at the township level. Continuous advocacy with and engagement of authorized persons and clinicians from medical care services will be promoted through the joint efforts of the NTP, NAP and TB/HIV partners in order to scale up the treatment of LTBI nationwide.
- Attempts will be made to work in partnership with the methadone programme, prison department, international NGOs and NGOs and CSOs to make the TB/HIV collaborative activities more productive. Optimal utilization of the diagnostic tools available, such as GeneXpert Ultra and urine LAM, will be instrumental in improving the diagnosis of TB.

Essential interventions

The NSP aims to enhance the standard package of collaborative TB/HIV activities in all 330 townships and intensify activities according to the subnational plans of the NTP and NAP.

Strengthen TB/HIV coordination at all levels

All established TB/HIV coordinating bodies at several levels – national, state/ region, district, township, and all hospitals caring for both TB and HIV patients – must be kept functional. Annual meetings will be held at the central level to oversee all TB/HIV collaborative activities, and biannual meetings will take place at the region/state level to guide the disease control teams in the districts and townships. At the township level, each disease control team will designate a lead for TB/HIV, and in collaboration with external partners, it will meet quarterly, with the aim of ensuring consistent delivery of integrated care. The latter includes a functioning referral system across partners and facilities, and review of monitoring and evaluation data on TB/HIV collaborative activities.

Improve capacity of human resources

The NTP will build the human resource capacity for TB/HIV collaborative activities by conducting regular training of new staff at all levels. Further, it will provide quarterly supportive supervision and annual refresher training for the existing staff. The guidelines will be disseminated nationwide and supportive, on-the-job tools will be developed. The NTP and WHO TB unit will also ensure that advancements in medical science and new WHO recommendations (new tools and new drugs) and implementation models are included in revised guidelines in a timely manner. The innovative and sustainable approaches to training of in-service staff will include self-taught modules, including digital- or tablet-loaded learning modules.

Strengthen TB infection control practices and ensure HIV/TB care services in TB and HIV clinics

- Standard practices for infection control will be enhanced in all TB and HIV clinics.
- Facilities for HIV testing, counselling on HIV and services for the prevention of HIV will be provided to patients with presumptive and diagnosed TB. Information, education and communication (IEC) material developed by NAP and its HIV partners will be utilized effectively in TB clinics.
- As an integral part of chronic care of PLHIV, screening for TB symptoms will be conducted not only during the initial visits, but also at the follow-up visits. All testing and care sites for HIV will have on-the-job tools for screening of TB symptoms. These sites will receive quarterly supervision from a focal person from the district disease control team. The staff will receive refresher training as part of supervisory visits to be made at least annually. Presumptive TB patients will be asked to submit a good-quality specimen for GeneXpert (GeneXpert Ultra) testing to the nearest TB diagnostic centre.

- The use of urine LAM will be expanded, according to the national guidelines and in line with the WHO recommendations of 2019.
- According to the national guidelines, TPT will be provided to PLHIV in whom active TB disease has been ruled out.
- The early initiation of CPT will be bolstered for TB patients living with HIV.
- It will be ensured that all TB patients with HIV infection are started on ART early. Attending clinicians both in TB clinics and HIV clinics will have to be aware of drug–drug interactions. They must follow good clinical practices during the period that the transition to new drugs/ regimens is ongoing in both programmes.
- Data systems will be linked to enable the monitoring of care and treatment for patients with TB and HIV.

Ensure monitoring and evaluation of TB/HIV collaborative activities

The established monitoring and evaluation systems for TB/HIV collaborative activities will be strengthened further. An annual joint programme review will be conducted by the NTP and NAP. An external review mission will be organized in 2023 to perform a mid-term evaluation of this NSP, to assess whether all the efforts made have been on the right track.

Pilot one-stop TB/HIV services

Preparations to introduce one-stop TB/HIV services will start in 2020. The preparations will entail coordination and collaboration among the NTP, NAP, TB/HIV partners and medical care services. The implementation of the services will begin in 2021. Implementation research will be conducted along with service delivery. The main TB centres in the Yangon region will become specialized centres for TB/HIV and will serve as training centres.

Table 13. Indicators and targets for TB/HIV

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
HIV prevalence among TB patients	8.3%	7.8%	<9%	<9%	<9%	<9%	<9%
Percentage of registered new and relapse TB cases with known and recorded HIV status	65%	95%	95%	95%	96%	97%	98%
Percentage of HIV-positive new and relapse TB patients on ART during TB treatment	38%	75%	81%	85%	88%	89%	90%
Percentage of HIV-positive new and relapse TB patients on CPT during TB treatment	72%	90%	91%	92%	93%	94%	95%
Percentage and number of PLHIV on ART who initiated TB preventive therapy among those eligible during the reporting period (NAP)	NA	NA	35% (31 005)	50% (44 728)	70% (51 377)	80% (43 276)	90% (50 862)

1.5 Expand collaborations to manage comorbidities

The management of TB cases requires a holistic approach to improve treatment outcomes and case fatality, especially when there are associated comorbidities. Such an approach requires collaboration between different departments and units. Keeping this in mind, a multisectoral accountability framework for TB will be established together with a memorandum of agreement with different departments (see details in SD 4).

1.5.1 TB and diabetes mellitus

Situational analysis

Diabetes mellitus (DM) triples the risk of TB and increases the probability of adverse treatment outcomes such as failure, death, and recurrent TB.[18] The increasing prevalence of DM means that DM needs to be addressed if TB-related milestones and targets are to be achieved. TB/DM collaborative activities benefits TB patients by identifying undiagnosed DM and offering treatment to prevent or delay diabetes-related complications and improve TB treatment outcomes. They also contribute to reducing the large pool of undiagnosed DM patients.

The prevalence of DM in Myanmar in 2014 was 10.5% (9.1% among males and 11.8% among females),[19] with increasing age and urban residence among the significant risk factors. The prevalence of DM in Yangon increased from 8.3% in 2004 to 10.2% in 2014 among the general population, while among the elderly, it increased from 14.6% (95% CI: 11.7–18.1) to 31.9% (95% CI: 21.1–45.0) (p = 0.009).[20] The prevalence among urban and rural populations in 2014 was 12.1% and 7.1% respectively (p=0.039).[21]

In 2017, the MOHS published the National Strategic Plan for Prevention and Control of NCDs (2017–2021). Among the key strategies of the Plan is "Expanding the implementation of the package of essential NCD interventions to the whole country in a phased manner" with the outcome of universal coverage of the population with an essential package of NCD services.

In 2018, the National TB Programme and the DM project set up a collaboration body for the TB/DM project and develop national guidelines for collaborative activities. Prior to the implementation of the joint project, ToT and cascade trainings on programmatic and clinical management were provided to township medical officers, TB coordinators, and nurses at the implementation sites. Bi-directional screening and treatment of TB and DM was conducted in 32 TB/DM sites in 23 districts of Myanmar in 2018, overachieving the NSP target. IEC materials were developed and distributed to all TB/DM sites in townships and a recording and reporting mechanism was established for TB and DM clinics.

Challenges

The challenges that need to be addressed by this NSP are as follows.

Insufficient collaboration with NCD programme: There is a need to strengthen collaboration with the Non-communicable Diseases Programme for the expansion of TB/DM sites in the townships covered by the Package of Essential NCDs (PEN).

18 Harries AD, Kumar AMV, Satyanarayana S, Lin Y, Zachariah R, Lönnroth K, et al. (2016). Addressing diabetes mellitus as part of the strategy for ending TB. Trans R Soc Trop Med Hyg 2016; 110:173-179.

19 Ministry of Health and Sports Myanmar (2014). *Report on National Survey of Diabetes Mellitus and risk factors for non-commiunicable diseases in Myanmar 2014.* https://www.who.int/ncds/surveillance/steps/Myanmar_2014_STEPS_Report.pdf

20 Aung, W. P., Bjertness, E., Htet, A. S., Stigum, H., & Kjøllesdal, M. (2019). Trends in Diabetes Prevalence, Awareness, Treatment and Control in Yangon Region, Myanmar, Between 2004 and 2014, Two Cross-Sectional Studies. *International journal of environmental research and public health*, *16*(18), 3461. https://doi.org/10.3390/ijerph16183461

21 Aung, W. P., Htet, A. S., Bjertness, E., Stigum, H., Chongsuvivatwong, V., & Kjøllesdal, M. (2018). Urban-rural differences in the prevalence of diabetes mellitus among 25-74 year-old adults of the Yangon Region, Myanmar: two cross-sectional studies. *BMJ open*, *8*(3), e020406. https://doi.org/10.1136/bmjopen-2017-020406

Patient-centred care: TB and DM clinics are situated at different places. Therefore, TB patients with DM have to visit different clinics for diagnosis and treatment. Optimal case management should be offered in one clinic for TB/DM patients.

Referral for TB diagnosis from DM clinic and vice versa: Clinicians in DM clinics need to have a high index of suspicion of TB when they encounter TB-related symptoms and vice versa. Often, there are dropouts during referral from one clinic to another.

Feedback mechanisms: Comorbid patients reaching referred clinics are underreported due to an irregular feedback system. Strengthening of the existing feedback mechanism is required for better collaboration between the two projects.

Strategic approaches

- Expand collaborative activities for TB/DM to all townships.
- Implement capacity-building activities, followed by the provision of supportive supervision to strengthen collaborative activities. Engage private clinics under the MMA and PSI, and profit-making as well as non-profit-making DM clinics in collaborative activities. Arrange for annual CXR screening of DM patients to promote TB case-finding.

Essential interventions

Strengthen the policy and strategy framework

The NCD programme will be incorporated into TB/DM collaborative activities to improve access to TB/DM services at the grassroots level.

Expand TB/DM activities in collaboration with NCD programme

TB/DM sites will be expanded to all townships where the NCD programme is being implemented.

Build capacity for TB/DM activities

Training in the clinical management, recording and reporting of TB/DM will be provided to health-care providers. ToT and cascade training will be held at the state/regional levels for all focal persons in townships were TB/DM activities are initiated. Refresher training will be provided to all clinicians in townships where such activities are currently being implemented.

Collaborate with private clinics

The project will be expanded to the profit-making and non-profit-making private DM clinics and PPM clinics under the MMA and PSI.

Provide regular updates of national policy/guidelines and communication materials

The policy for TB screening among DM patients will be reviewed as new evidence is built from the TB/DM collaborative activities. The national policy/guidelines and communication materials will be updated accordingly.

Strengthen monitoring and evaluation and programme review

Staff at the state and regional levels and focal persons from the NCD will jointly supervise all TB/DM sites. An annual review meeting will be held with the aim of bolstering the recording and reporting mechanism and the management of the programme. A sentinel surveillance system will be established for TB among diabetic patients (see Section SD 5).

Table 14. Indicator and targets for TB/DM activities

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2021
Number of townships with TB/DM collaborative activities	2	102	330	330	330	330	330

1.5.2 TB and tobacco

Situational analysis

While TB is on the decline in Myanmar, the use of tobacco continues to rise. The 2014 National Survey on Diabetes Mellitus and Risk Factors for Noncommunicable Diseases revealed that the percentage of current smoking was 26%, having risen from 17% as found by the national NCD risk factor survey conducted in 2009.

In 2014, the overall percentage of current smokers was 26.1%, the percentage for males being 43.8% and that for females, 8.4%. Nearly 80% of the current smokers were daily smokers. The average age at which tobacco users started smoking was 19.8 years and the mean duration of smoking years among daily smokers was 24.2 years. Current smoking was more prevalent in older age groups (33% in the age group of 55–64 years vs 22% in age group of 25–34 years).[22] The Global Youth Tobacco Survey conducted in 2016 reported that 11% of the youth (13–15 years of age) were current smokers.

The MOHS has started the process of updating its policy, formulated in 2006, and developing new legislation on the control of smoking and the consumption of tobacco products. At present, the MOHS is adhering to the WHO **MPOWER** policy package for the implementation of its tobacco control activities. The constituents of MPOWER and the steps taken by Myanmar towards implementing them are described below.

- **M**onitor tobacco use and prevention policies: Together with its partner organizations, the MOHS conducts the Global Youth Tobacco Survey, STEP Survey and Sentinel Surveillance Survey.
- **P**rotect people from tobacco smoke: The MOHS is making strides in the prevention of exposure of people to conventional smoking, as well as to newly developed tobacco products. In particular, it is trying to protect the youth against tobacco commercials. Positive results have been achieved in the establishment of smoke-free environments, more commonly known as the creation of smoke-free environments. The MOHS is working on projects together with the People's Health Foundation (PHF), South East Asia Tobacco Control Alliance (SEATCA) and the International Union against Tuberculosis and Lung Disease (the Union) to create smoke-free cities and environments. Champions for smoke-free cities include Pindaya, Inle, Pyin Oo Lwin and Kyauk Ta Da.
- **O**ffer help to quit tobacco use: Support for cessation is quite limited in Myanmar. There is greater emphasis on conducting counselling and education sessions than on providing support, such as nicotine replacement therapy.
- **W**arn about the dangers of tobacco use: This is addressed by one of the projects of the Union. The project includes placing pictorial health warnings and text warnings on cigarette packs. The Union is currently assessing the mock-up of Year 4 Pictorial Health Warnings.
- **E**nforce bans on tobacco advertising, promotion and sponsorships: The MOHS is extremely keen on implementing this measure and works closely with the state and regional NCD focal persons to

22 Ministry of Health and Sports Myanmar (2014). *Report on National Survey of Diabetes Mellitus and risk factors for non-commiunicable diseases in Myanmar 2014.* https://www.who.int/ncds/surveillance/steps/Myanmar_2014_STEPS_Report.pdf

this end. The MOHS monitors noncompliance by the tobacco industry and orders the respective township/district to take action. However, more effective actions are required to make sure that the tobacco industry complies with the tobacco legislation.

- Raise taxes on tobacco products: The MOHS collaborates with the Ministry of Planning and Finance to achieve this, though more needs to be done to meet the requirements of WHO's Framework Convention on Tobacco Control.

Myanmar is committed to the effective implementation of the WHO Framework Convention on Tobacco Control as part of the National Strategic Plan for Prevention and Control of NCDs (2017–2021) and had formulated the Myanmar Tobacco Control Policy and Plan of Action in 2006.

Challenges

Insufficient coordination: There is insufficient coordination between the NTP and NCD unit and the various stakeholders involved in TB and tobacco control programmes.

Lack of community awareness: The awareness of the community regarding the TB–Tobacco linkage is poor.

Access to tobacco cessation services: The TB programme does not have adequate capacity to offer tobacco cessation services.

Strategic approaches

- In support of the interest of the MOHS in tobacco control policies and the action it has taken in this area, the NTP aims to espouse the "MPOWE" segments of the WHO MPOWER policy package for tobacco control. It will focus particularly on the "O" segment, in other words, the integration of support for tobacco cessation in the NTP.
- The NTP will expand its collaborative activities with the NCD unit nationwide through joint planning and monitoring. It will strengthen the current activities, including the diagnosis and management of TB undertaken by tobacco control programmes.

Essential interventions

Initiate collaborative activities between NTP and tobacco control programme

This will entail the integration of tobacco control activities in the existing activities, as well as the expansion of the implementation of these activities. For example, TB patients who use tobacco will be counselled and referred to tobacco cessation clinics. In order to improve adherence to treatment and the outcomes, standardized screening tools for tobacco use will be developed, as will IEC materials for TB–tobacco. The ABC (ask, brief advice, cessation support) approach will be used.

Improve awareness among patients and communities

Generating awareness of the link between TB and tobacco will be a part of the overall education and communication efforts of both the TB and tobacco programmes. The TB programme and tobacco control programme will collaborate with each other in the development of joint IEC materials for TB and tobacco. Efforts will be made to raise the awareness of patients and communities regarding the link between TB and tobacco through public events, organized jointly by both programmes, around World TB Day and World No Tobacco Day. The TB and tobacco programmes will jointly develop educational programmes on TB/tobacco for specific target groups, especially schoolchildren, in line with the national tobacco control policy and action plan.

Ensure screening of tobacco use

All registered TB patients will be screened for tobacco use with the help of standardized screening tools. A

referral system will be set up to refer TB patients who use tobacco to cessation centres, with a view to improving their treatment outcomes.

1.5.3 TB and mental health

Situational analysis

Mental health care was included in the 1993 National Health Policy. According to Myanmar's NHP, the government is committed to provide the EPHS, which is expected to cover mental health and promote accessibility to mental health services.

According to the data available for the Yangon region, a psychiatrist is assigned to look after the mental health issues of DR-TB patients. From the data for July–November 2018, a total of 245 patients with mental health disorders were seen by a psychiatrist. Of these, 208 were on the standard MDR regimen and 37 on the shorter treatment regimen. These data represent DR-TB patients only from the Yangon region and, therefore, this is only the tip of the iceberg as far as mental health issues among TB patients are concerned.

Challenges

Underestimation of the problem: Mental health problems and substance abuse are underestimated and not considered a significant barrier to the control and elimination of TB.

Limited assessment and care: There is a lack of personnel and tools for mental health assessment. TB patients at the primary and township levels do not receive adequate support. Mostly, there is a reliance on medications for the treatment of anxiety and depression, and less emphasis is laid on appropriate assessment, case management and psychological support for TB patients.

Weak data recording and reporting: There is no proper recording and reporting of data for mental health disorders among TB patients.

Strategic approaches

- Establish a system for the integration of mental health care with TB, TB/HIV and MNCH, with the aim of closing the gap in mental health care. This should increase access to mental health services and consequently improve the TB/DR-TB treatment outcomes.
- Include a chapter on mental health in the national TB/DR-TB guidelines and training modules for the staff involved in TB/DR-TB care.

Essential interventions

Collaborate with NCD mental health project

The NTP will collaborate with the NCD mental health project to improve awareness of mental health issues among TB patients and to increase access to mental health services.

Strengthen existing services

The existing mental health counselling support services will be strengthened. More robust tools for mental health assessment will be explored and implemented by health-care staff. Efforts will be made to devise a model for care (such as for substance use and alcoholism) to be used in TB/MDR-TB sites at the township level. Efforts will be made to provide integrated one-stop services for TB, TB/HIV, hepatitis and mental health at the township level.

Build capacity of human resources

A pool of psychiatric nurses will be developed in a phased manner at the township level to allow for better access to mental health services. A chapter on mental health care will be incorporated in the national TB/DR-TB guidelines. Training will be provided on the assessment and management of mental health issues to TB health-care staff at the township level (TMO, MO, TBC). Front-line primary care staff (BHS, community midwife, PHS2) will receive cascade training and then refresher training for the retention of knowledge.

Implement WHO Mental Health Gap Action Programme Intervention Guide

The WHO Mental Health Gap Action Programme Intervention Guide (mhGAP-IG) will be contextualized to the Myanmar setting and implemented to scale up mental health services for TB patients.

Use standardized screening tools

The utilization of standardized screening tools for mental health assessment will be made an integral part of practice at TB/DR-TB treatment centres. This will cover structured counselling and referral mechanisms, and linkages with mental health clinics and other mental health services offered by other UN agencies, international NGOs, CSOs and private clinicians.

1.5.4 TB and hepatitis

Situational analysis

A national prevalence survey conducted in 2015 showed that the disease burden for hepatitis B and C in the general population was 6.51% and 2.65%, respectively.[23] Some states with a high prevalence of drug use (e.g. Kachin and Shan North) also reported a HIV and hepatitis prevalence.

Challenges

Limited knowledge of management: The guidelines on managing TB patients with alcoholic hepatitis, especially the use of liver-sparing treatment regimen, are not being followed properly.

Lack of collaboration: The collaboration between the NTP, NAP, hepatitis control programme, methadone programme and the prison department is not adequate. TB is treated as public health disease, while hepatitis is treated as a medical disease.

Strategic approaches

- Explore the feasibility of an integrated approach to screening, testing, clinical evaluation and treatment for TB and hepatitis along with linkages in care.

Essential interventions

Establish a TB/hepatitis/HIV collaborative framework

The NTP will establish a collaborative framework for the National Hepatitis Control Programme (NHCP) and NAP for integrated care.

Provide integrated services

Diagnostic services for TB, TB/HIV and hepatitis will be integrated by the combined use of genotypic diagnostic methods under one roof. The provision of one-stop services for the three chronic infectious diseases will be explored.

23 Myanmar National Strategic Plan on Viral Hepatitis, Ministry of Health and Sports, 2016–2020

Prioritize TB testing among high-risk groups

Testing for TB among hepatitis patients with a history of drug use will be prioritized. As will testing among the homeless and prisoners suffering from hepatitis (detailed in SD 2).

Build capacity

The capacity of MOs for the clinical management of TB/hepatitis and drug-related side effects along with laboratory monitoring schedule will be enhanced in collaboration with the DMS.

1.6 Strengthen infection control and expand preventive treatment

Situational analysis

The NTP, with the support of partners, has implemented TB infection prevention and control (IPC) as envisioned in the TB NSP 2016–2020. Some important achievements in this regard are as follows.

- The National TB IC Manual (published bilingually) and related training materials were updated in 2017.
- In May 2016, 133 NTP officials from all states/regions, clinicians from TB specialist hospitals, and TB focal persons from partner organizations participated in ToT. Cascade trainings were organized for over 440 health service providers in all states/regions in 2016–2018.
- Checklists on TB IC assessment and planning were developed for health facilities. Specific measures were initiated for TB IC in health facilities.
- Screening plans for health-care workers were developed and shared with state/regional TB teams and partners. Though many hospitals have conducted such screening, the coverage is still low, and data are not collected systematically
- Supportive supervision and assessment of TB IC were conducted in health facilities. This resulted in a significant increase in the number of health facilities complying with international TB IC standards, from 3 out of 7 health facilities (43%) to 26 out of 41health facilities (63%)) in 2017 and 2019, respectively.
- The national coverage of BCG was 92% in 2016.[24]

The guidelines on the management of LTBI released by WHO in 2018, recommend TPT for all household contacts of TB patients, in addition to the previous recommendation to target children under 5 years of age who are household contacts of TB patients, and PLHIV. The recommendation was based on the evidence that all household contacts, regardless of age or status of TB infection, were at higher risk for progression to active TB than the general population.[25] The coverage of TPT for children under 5 years of age has been very low (only 2% in 2018). It is also low among newly enrolled PLHIV. In 2018, 5776 newly enrolled PLHIV (15%) received TPT out of the estimated 22,000.

24 Public Health Statistics Report 2014–2016, MOHS, 2017

25 Latent TB Infection : Updated and consolidated guidelines for programmatic management. (2020). Retrieved 1 October 2019, from https://www.who.int/tb/publications/2018/latent-tuberculosis-infection/en/

Challenges

TB IPC is not a priority: Though guidelines and monitoring checklist are available, the implementation status in each health facility is not known and not monitored regularly. Until the end of 2018, only 41 health facilities had been evaluated for adherence to international TB IC standards.

Inadequate screening of health-care workers: The current efforts to screen health-care workers is not adequate. The coverage is low and the activity is not systematically documented and monitored.

Low coverage of TPT: Though guidelines are available and the target set for coverage is low, TPT among children under 5 years of age who are contacts of TB patients is only 2%, which is below the target. TPT coverage among PLHIV too is low, at 15% . There is a need to identify the specific reasons for low coverage. The possible reasons for low coverage are as follows.

- The recording and reporting system focuses on curative action and not on preventive treatment action. There is a lack of integration of TPT activities with contact tracing, active case-finding, and treatment of newly enrolled PLHIV from initiation until treatment completion.
- There is a lack of acceptance of the benefits of TPT among patients' families and treatment supporters. They may refuse TPT because of pill burden, possible side effects, or because they do not feel sick.

Strategic approaches

- Scale up prevention and control of TB infection in all health facilities. Also, make provisions for the early detection and treatment of TB among health workers dealing with TB patients.
- Provide TPT to the population which has a higher risk of developing TB disease. Scale up TPT among children under 5 years of age who are in contact with TB patients and among PLHIV to achieve the maximum coverage. Introduce TPT among wider risk groups, such as children above 5 years of age who are in contact with TB patients and school students when there is an outbreak.

Essential interventions

To prevent the emergence of TB disease, transmission must be stopped, and the infection must be prevented from progressing to active TB disease. For this, it is crucial to scale up the implementation of TB IC measures in all health facilities. It is also essential to protect people from contracting TB by promoting early detection of TB and prompt treatment of patients.

Enhance TB infection prevention and control

- TB IC standards will be implemented in all health facilities. Priority will be given to hospitals delivering DR-TB treatment, PPM general hospitals, district/ township hospitals and station hospitals, where TB treatment will be decentralized.
- Priority will be given to the renovation of certain health facilities to help them conform to the IC standards. For example, township TB clinics and DOTs corners at PPM hospitals will be renovated. Collaboration with the donors and implementing partners will be strengthened to design and implement the renovation work.
- The TB IC manual will be disseminated among the relevant health workers and the NTP will make sure that it is available at all health facilities.
- The NTP will advocate for the integration of the TB IC intervention into the infection control guidelines of health facilities.

- The NTP will conduct coordination meetings to advocate the implementation of the TB IC manual in private health facilities.
- Monitoring of the progress of TB IC implementation in all health facilities will be improved by using a simple checklist, scheduling visits and assigning township teams to conduct the monitoring.
- The NTP will impart training in TB IC to the responsible or focal person/team in health facilities. Health facilities offering DR-TB and TB treatment will be prioritized.
- The NTP will work towards making an annual CXR and six-monthly symptomatic TB screening bavailable to all health workers in health facilities, with priority being given to those who work directly with TB patients, and all TB laboratory staff.
- The NTP will coordinate with the EPI to obtain data on the coverage of BCG vaccination.

Provide TPT to all household contacts and PLHIV

- The NTP will update the LTBI management interventions in various TB guidelines (for example, those for childhood TB, TB/HIV and contact investigation) so that they incorporate the latest evidence-based recommendations.
- Training will be organized on the management of LTBI for doctors/clinicians, BHS and CHWs.
- The coverage of TPT for PLHIV and children under 5 years of age and those of 5 years of age and above who have household contacts with TB will be increased.
- A shorter TPT regimen will be rolled out to improve adherence and reduce side-effects.
- IEC materials will be produced and used for the target audience of health workers, community workers and the general population to improve awareness of TPT.
- The NTP will coordinate with NAP to achieve a high coverage of TPT among PLHIV.
- The recording and reporting system for the LTBI treatment cascade will be updated and its implementation strengthened.

Table 15. Indicators and targets for IPC

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2021
Percentage of centres delivering DR-TB treatment complying with TB IC standards[1]	NA	NA	100%	100%	100%	100%	100%
Percentage of township TB centres complying with TB IC standards[1]	NA	30%	60%	70%	80%	90%	100%
Percentage of health workers in TB/DR-TB centres undergoing annual CXR screening	NA	50%	70%	80%	90%	90%	95%
Percentage and number of eligible < 5-year-olds with household contacts with TB starting TPT	NA (553)	7% (1 226)	70% (14 571)	75% (16 341)	80% (17 745)	85% (17 787)	90% (17 128)

Percentage and number of eligible > 5-year-olds with household contacts with TB starting TPT	NA	NA	0%	20% (52 658)	40% (105 926)	60% (148 112)	80% (177 484)
Number of people in contact with TB patients who began TPT - Age (U5, 5-14, 15+)	NA	1 226 (U5)	14 571	68 999	123 671	165 899	194 612
Percentage and number of PLHIV on ART who initiated TPT among those eligible during the reporting period[2]	NA	NA	35% (31 005)	50% (44 728)	70% (51 377)	80% (43 276)	90% (50 862)

[1] Evaluated using minimum TB IC checklist. Compliance means that 80% of the points in the checklist are fulfilled.

[2] TB preventive treatment among PLHIV will be followed up by NAP.

NTP will monitor BCG coverage and TPT among PLHIV, which are to be reported by EPI and NAP.

2. Strategic direction 2: Reach the unreached populations and accelerate a coordinated TB response

This NSP aims at providing universal access to TB services and thus, targeted interventions will be implemented to reach at-risk and vulnerable populations. The quality of active case-finding by mobile teams with X-ray services will be improved and the coverage of active case-finding will be increased to different target groups. Among the other features will be capacity-building, provision of support for CBTBC services and contact investigation. Through coordinated responses, an attempt will be made to strengthen accelerated case detection among high-risk groups attending community health clinics, such as NCD and MCH clinics. To make diagnostic services accessible to those seeking care below the township-level primary health services, the necessary support will be provided for sputum transportation. The NSP also mentions specific interventions in response to the TB burden among high-risk groups, such as the elderly, prison inmates, urban congested/peri-urban population, hard-to-reach population, high-risk workers, migrants, ethnic minorities and those in IDP camps. Given the high burden of TB and MDR-TB in the Yangon region, this NSP calls for a multisectoral coordinated response, together with intensive diagnosis and treatment services in Yangon.

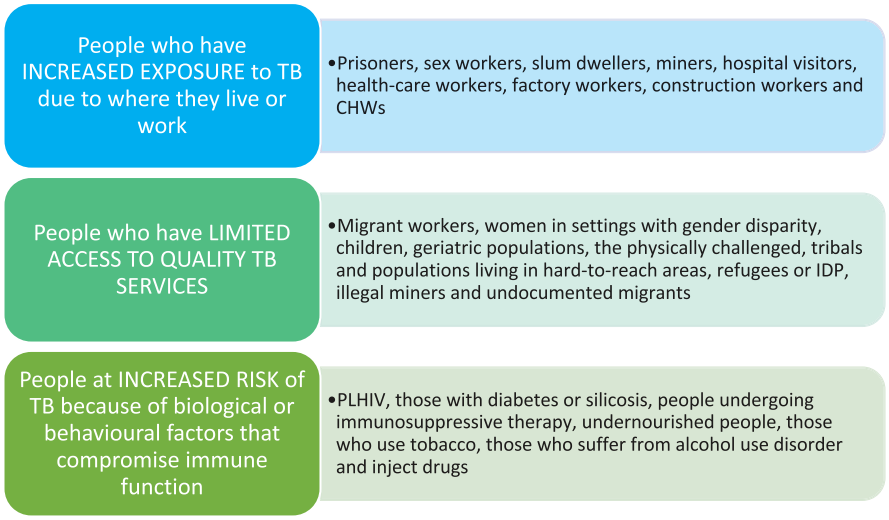

Fig. 17. People at a higher risk of contracting or developing TB

2.1 Target actions to reach all at-risk populations

Situational analysis

Active case-finding: Since passive case-finding does not suffice to detect all TB cases, the NTP has introduced ACF activities all over the country. The CNR declined in 2017 even though there was an increase in ACF activities.

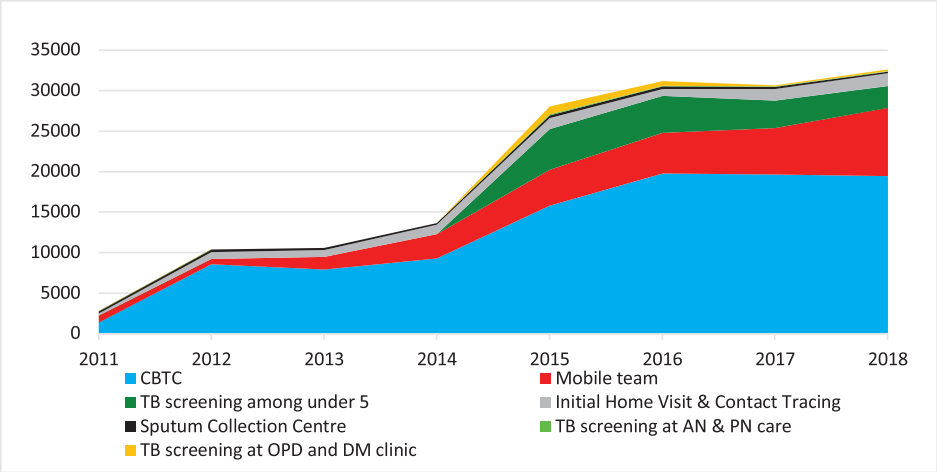

Fig. 18. Number of notified TB cases from active case-finding and accelerated case detection activities (2011–2018)

The current ACF strategy includes mobile team activities, CBTBC and contact tracing.

Mobile team activity: The NTP has developed SOPs for mobile teams and trained all team members. Additional human resources were contributed by local and international NGOs. The number of mobile teams operating across the country with funding support from various sources rose from 11 in 2017 to 22 in 2019. In 2017, the 11 mobile teams operated in the regions and of these, seven were in the Yangon region. Of the 22 mobile teams in four regions and nine states in 2019, 13 were operated by the NTP and nine were managed by partners. Each team consisted of a team leader, a radiographer, an X-ray assistant, a laboratory technician, a data assistant and a driver.

In 2018, 431 mobile team visits were made. Of these, 70 were to urban sites, 269 to areas considered hard-to-reach, 75 to prisons and prisoners' worksites, 14 to industrial sites and 3 to IDP camps.

Community-based TB care: With the help of community health volunteers from local or international NGOs and in collaboration with drug sellers, CBTBC refers presumptive TB cases for early diagnosis. CBTBC involves screening for symptoms and referring presumptive TB patients for diagnosis to the nearest TB diagnosis facility in station and township hospitals. Since 2010, Myanmar has experienced a significant decline in the incidence of malaria, leading the MOHS to realize that the well-trained and highly effective cadres of front-line malaria volunteers were a valuable national resource. Thus, in 2017, the Ministry developed a new strategy to expand the role of these volunteers to address five additional communicable diseases: TB, HIV, dengue haemorrhagic fever, filariasis and leprosy. Their role in TB would include identifying cases of presumptive TB and referring them to the nearest diagnostic centre. In 2018, CBTBC activities referred 170 298 presumptive TB patients.

TB contact tracing: The SOPs for the investigation of contacts were developed in November 2018 and the BHS was trained after that. The households of about 40% of registered TB cases were visit-

ed by BHS personnel and a similar proportion of contacts identified was screened for symptoms in 2018. Around 1.3% of cases of all forms of TB was detected as a result of the screening of household contacts.

Accelerated case detection: In accelerated case detection, the health provider initiates screening for symptoms among patients seeking specific services in health facilities. These patients include pregnant and lactating mothers at antenatal and postnatal clinics, children under 5 years of age in all facilities at the primary health-care level, and diabetic patients in the outpatient departments of tertiary-level hospitals in the Yangon (North Okkalapa Hospital) and Mandalay (Mandalay General Hospital) regions and DM clinics. Between 2015 and 2018, a total of 17 919 TB cases were notified through provider-initiated screening for symptom (393 from MCH clinics, 15 667 from under-five clinics and 1859 from among diabetic patients visiting hospitals and clinics).

Sputum collection centres have been established in most rural health centres in hard-to-reach areas. They function on a rotational basis in select townships. In 2018, 7296 samples of presumptive TB cases were collected from 26 select townships, and 174 TB cases were detected from among these.

In the NSP of 2016–2020, the contribution of ACF and accelerated case detection activities to the total notification of cases gradually increased from 2738 (1.9%) in 2011 to 32 630 (24%) in 2018. Community-based activities consistently made the largest contribution to overall case-finding, followed by mobile team activities and contact-tracing.

Reaching out to high-risk populations*:* Certain subsets of the population are at higher risk for TB, given their occupational or socioeconomic conditions. In addition, there are subpopulations that are particularly difficult to reach due to geographical, social and economic reasons, conflicts and political instability.

The elderly: According to the 2014 Myanmar Population and Housing Census, there are 2 897 563 people over the age of 65 (5.8% of the total population). The National TB Prevalence Survey 2017-2018 showed that the prevalence of TB increases with age. The observed GeneXpert positive TB prevalence among the oldest age group of 65+ exceeded 1% (1091/100 000 population), and was seven times that among younger adults. More than 50% of TB patients detected in 2018 were 50 years old or older. This suggests that TB diagnosis, treatment and care services should be made accessible to the elderly population. Systematic screening is recommended for a population in which TB prevalence exceeds 1%.

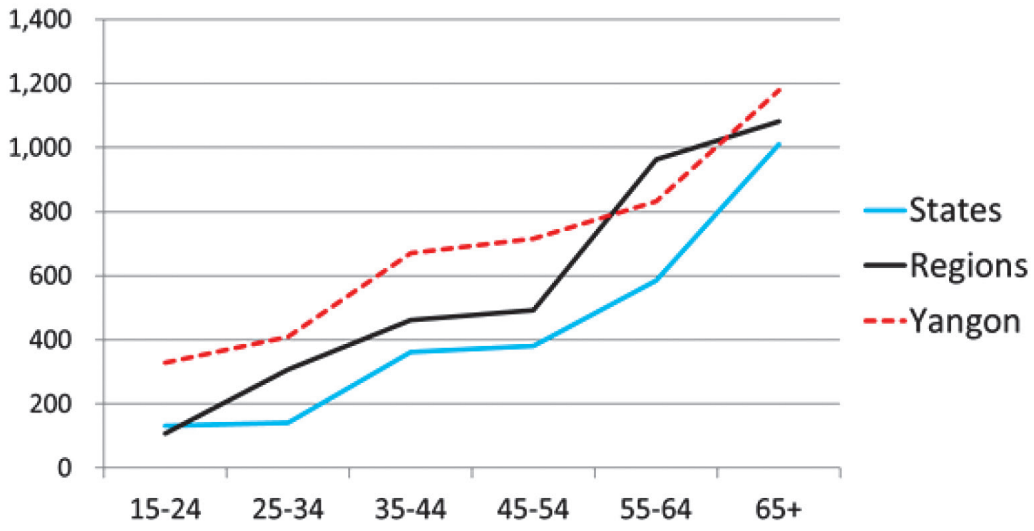

Fig. 19. TB prevalence (out of 100 000) in different strata, by age group (2018)

Prison inmates: There were 85 000–90 000 inmates in 46 prisons, 20 remand prisons, and 48 camps in 2018.[26] Prison services collaborate with the NTP through township TB departments to provide TB treatment. In 2012, a TB and MDR-TB treatment centre was established in the Insein Central Prison Hospital, and since 2016, entry screening for TB and HIV has been conducted in the Insein and Mandalay central prisons. In 2018, mobile teams conducted 75 visits to prisons and work camps. In all, 32 202 inmates were covered, 2388 presumptive TB cases were detected and 326 cases of all forms of TB were treated by the mobile teams. Of the inmates covered, 582 were laboratory-confirmed TB cases and 21 were MDR-TB patients. There were 2976 HIV-positive inmates, out of which 74 were coinfected with TB.

Urban congested/peri-urban population: The 2014 Myanmar Population and Housing Census Report revealed that there is significant internal migration. Overall, 19% of the total population are lifetime migrants. North Yangon, which has expanded its industrial base over the last decade, is the main destination of migrants, and this has contributed to the TB crisis situation in the region. The industrial zones established outside Yangon also attract workers.

From the 2017–2018 TB Prevalence Survey results, in congested clusters in Yangon, more than 1% of adults were *M. tb* positive with GeneXpert, and Yangon has the highest TB prevalence rate among the states and regions. Most patients in Yangon seek care from private practitioners or pharmacies.

Hard-to-reach population: The TB Prevalence Survey showed that clusters further away from township hospitals had a higher TB prevalence. Patients in rural areas had to travel 13 miles on an average and spend 10 000 kyat on transportation. Of the 75 clusters with a high prevalence rate, 21 were more than 20 miles from the nearest TB centre.

Workers at high risk: Miners, factory workers, public transport drivers, health workers and those who work in highly congested or/and enclosed areas are at a high risk of being infected . The prevalence of TB among miners has been documented to be as high as 1700/100 000 in some mines and up to 2700/100 000 in the mining community.

Ethnic minorities: Ethnic minorities mostly inhabit hard-to-reach border areas with poor road and communication networks. In addition, these areas have seen long-standing conflicts. Both these factors have resulted in very poor health services in these areas. Consequently, ethnic groups have established their own health services through ECBHOs. These organizations are well established in Kachin State and Shan State, and the states of Kayin, Mon and Kayah in the north-east However, the services delivered by the ECBHOs are mostly basic because of limited resources, trained health personnel, organizational capacity, and coordination.

Since 2018, the NTP has been supporting the EHOs in building capacity and garnering the support of volunteers, as well as conducting mobile team activities. Data reported in 2018 showed that 430 TB cases were diagnosed in the states of Kayin, Mon and Shan (SR2 and SR4).

Migrants: According to the 2014 Myanmar Population and Housing Census Report, over 2 million people from Myanmar are living abroad, of which approximately 70% are in Thailand. In 2018, 4% (5888) of notified cases were reported from 16 townships along the border, especially Myawaddy, Kawthaung, Tachileik and Dawei (in order of importance).

Migrants were identified as one of the priority populations in the NSP 2016–2020. The NTP works with partners such as the International Organization for Migration (IOM) in Mon, Kayin, and Rakhine; Shoklo Malaria Research Unit (SMRU) in Kayin; European Commission Humanitarian Aid and Civil Protection (ECHO) in Bago, Kayin, Mon and Tanintharyi; and World Vision Myanmar (WVM) in Tanintharyi. The current activities designed for migrants include capacity-building of volunteers on TB screening; referral and treatment support;

26 The prison health services include one hospital in Insein Central Prison with 50 beds and two hospitals in Mandalay and Tharyarwaddy prisons with 25 beds each. These serve as PPM hospitals. Every prison or camp has an outpatient clinic, staffed in principle with 1 doctor, 1 health assistant, 2 nurses and 2 nurse aides.

ACF through mobile teams; health literacy promotion; strengthening of the recording and reporting system (mobile application for follow-up and reference); and networking among providers and collaboration with neighbouring countries.

Internally displaced population: Myanmar is ranked third out of the 187 countries in the Global Climate Risk Index and is also one of the most disaster-prone countries in Asia. Moreover, floods in some parts of Myanmar have exacerbated the existing vulnerabilities and necessitated additional relief in several states during these years. Over 244 000 displaced people remain in camps or camp-like situations in Kachin, Shan, Rakhine and Kayin States according to the report of Humanitarian Needs Overviews by United Nations and Partners in December 2018.[27] Over half of the population comprises children and approximately 97 000 people in Kachin, Shan and Kayin remain displaced as a result of the armed conflict.

People who use/inject drugs: The Integrated Biological and Behavioural Survey of 2017–2018 estimated that the number of PWID as 93 215 (49 677–124 287). Therefore, the number who use drugs must be higher than this. HIV infection is still concentrated among certain key populations, whose risk of developing TB disease is also high. TB screening among the HIV key populations, especially PWID, provides an opportunity to identify the disease at an early stage and start preventive treatment.

The recent JMM identified effective programmes addressing the needs of marginalized groups that warrant expansion. Some examples are the programme for female sex workers in the Chanayetharzan urban centre in Mandalay, and the comprehensive programme for people who use/inject drugs implemented by the Asian Harm Reduction Network (AHRN). The latter integrates HIV and TB services in Kachin, Shan and Sagaing and supports 54 000 clients annually with the full harm reduction cascade. In close coordination with and reporting to the respective national programmes and township health administrations, the AHRN provides methadone maintenance treatment, and testing, treatment care and support for HIV, hepatitis C, and TB, including ACF.

Challenges

Notification gap: It is estimated that in 2018, Myanmar had 185 120 TB cases of all forms and of these, 136 039 were notified to the programme (76%).

Limited human resources: In the view of partners, commitment and limited number of human resources in TB programme (delegation from NTP to partners seconded staff to conduct mobile team activities) have been the challenges.

Barriers to accessing TB diagnosis and treatment: Early TB diagnosis and treatment are hindered by the low coverage of CBTBC activity, the lack of a supported system for sputum transport and the absence of a supportive environment for marginalized populations.

Low sustainability of volunteers: The retention of the volunteer workforce is low, partly because their incentives have not been standardized.

27 2019 Myanmar Humanitarian Needs Overview, United Nations and Partners, Humanitarian Country Team, https://reliefweb.int/sites/reliefweb.int/files/resources/2019%20Myanmar%20HNO_FINAL.PDF

Table 16. Challenges in reaching high-risk populations

Elderly	o Delays in care-seeking due to low priority given to chronic symptoms o Poor access to TB services in underserved areas
Prison inmates	o Inadequate collaboration with Ministry of Home Affairs (MOHA), which is responsible for prison services o Low mobile team coverage of prisons and screening at entry o Weak referral mechanisms after release from prison o Poor post-release treatment outcomes
Urban congested/ peri-urban population	o Access to public health services limited by working hours o Treatment follow-up and monitoring of adherence impeded by mobility
Hard-to-reach population	o Inadequate access to care o High costs of care o Poor treatment completion
High-risk workers	o Poor access, especially beyond working hours o High cost of health-care services in the private sector o Absence of health insurance schemes at workplaces
Ethnic minority population	o TB services rarely available in hard-to-reach areas o Many ECBHOs not trained for TB screening and referral o Cultural and language barriers to accessing services in public health facilities o Problems greater among women and children
Migrants	o Access to care dependent on contracts, work permits and insurance o Problems in following up TB treatment o Unrecorded or double recording of TB treatment o Fear of deportation among undocumented migrants, limiting access to TB care o Poor treatment completion o Lack of migrant-specific data to inform decision-making o Absence of systematic referral mechanism
Internally displaced population	o Problems related to access due to armed conflict, displacement, underdevelopment and marginalization of ethnic minority groups o Restrictions on movement to reach health facilities or other services o Weak surveillance, weak prevention measures

People who use/inject drugs	o Absence of integrated care o No provision for TB symptom screening in programmes targeting these populations o High prevalence of hepatitis C and problem with TPT

Strategic approaches

- Scale up ACF strategies, targeting groups that do not have access to TB diagnostic and treatment services and groups with a higher risk of TB infection and TB disease.
- Strengthen accelerated case detection through the existing medical services, such as antenatal and postnatal clinics, clinics for children under five years of age, NCD (diabetes) clinics and the sputum transportation system.
- Improve the delivery of TB services to population groups which face obstacles in accessing and completing TB treatment to achieve a high TSR.

Essential interventions

Improve the quality and coverage of ACF

- The NTP will prioritize mobile team visits and CBTBC for high-risk populations.
- It will collaborate with partners, NGOs and the private sector to increase capacity and the coverage of ACF activities.
- Community involvement will be promoted by increasing awareness of the need for ACF among community and religious leaders.
- CHWs who are involved in TB case-finding and tracing contacts will be included in the human resource plan of the NHP.
- The NTP will undertake advocacy to secure resources from the national budget and donors to support increased coverage of ACF activities.
- Volunteer networks will be strengthened through the provision of adequate training, mentoring and support (financial or nonfinancial). Attempts will also be made to protect them from TB disease.
- The NTP will provide adequate training and support to BHSPs for the investigation of close contacts of bacteriologically confirmed TB cases, PLHIV and childhood TB cases.

Improve the quality and coverage of accelerated case detection among high-risk groups attending community health clinics

- Measures will be taken to build capacity to conduct TB screening among the staff in NCD and MCH clinics in township and station hospitals, and RHCs.
- The NTP will strengthen collaboration with MNCH to continue with TB screening of women visiting the service. Grandparents will be encouraged to undergo TB screening at a site close to their area.
- In collaboration with other services, the NTP will undertake systematic TB screening of persons above the age of 50 years in facilities providing various services, especially NCD clinics.

- The sputum transportation system will be expanded and fortified to enable the collection of sputum in RHCs, improve linkages between sputum collection centres and TB diagnostic laboratories (at township and station hospitals), and enhance coordination with mobile teams. Prioritization will be in accordance with the proportion of the sputum positivity rate among notified cases because high sputum positivity rate could mean low detection of TB in the community.

Improve TSR among high-risk populations

Elderly

- The NTP will develop IEC materials on TB among the elderly to encourage them to undergo TB screening and to obtain the support of their family for the completion of their treatment.
- Elderly persons will be referred for CXR screening by CBTBC to health facilities or mobile teams.
- Private practitioners will conduct symptom screening or refer people above the age of 50 years for TB screening.
- The NTP will coordinate with MNCH to recommend TB screening to the grandparents of neonates and children under five years of age.

Prison inmates

- The NTP will undertake advocacy with the MOHA to scale up pre-entry screening for TB in all prisons.
- Mobile team activities for TB will be bolstered for the inmates and staff of prisons.
- The NTP will provide training on TB to the health staff in prisons and worksites by inviting them to participate in regional and township-level training.
- Peer volunteers will be recruited from among the inmates, to refer inmates with TB symptoms to the prison clinic and support inmates on TB treatment.
- The NTP will undertake advocacy with the MOHA for the introduction of IPC activities in prisons, including regular TB screening of prison staff.
- The NTP will work towards the inclusion of TB screening, diagnosis and treatment in the prison health SOP.
- The referral mechanism for post-release treatment of inmates will be strengthened by making referrals to the nearest TB service and coordinating with community TB volunteers or mobile teams.

Urban congested/peri-urban population

- The NTP will collaborate with all health providers to provide standardized TB care that is adapted to the situation of the population (e.g. opening hour, ease of access).
- The NTP will strengthen PPM activities first, by engaging drug sellers and pharmacies to encourage patients with a long-standing cough to visit TB facilities. Next, a system can be set up whereby drug sellers and pharmacies will refer presumptive TB patients to TB facilities.
- To cover most of the urban slums, the frequency of mobile team visits will be increased.
- CBTBC will be strengthened in identified urban congested areas, as will the use of mapping of the addresses of TB cases to identify hot spots.
- Innovative approaches will be adopted to increase the generation of demand. These include campaigns to raise awareness, strengthening of networking among community volunteers, formation of peer groups, community empowerment, and integration of TB activities with other disease control activities.

Hard-to-reach populations

- Diagnostic and treatment services for TB will be made available closer to the population.
    - In collaboration with NIMU, the essential health package will be scaled up. This will include setting up diagnostic and treatment services for TB in station hospitals.
    - Easy-to-instal and practical diagnostic tools/technology, such as GeneXpert Omni or TB LAMP, will be set up in station hospitals or RHCs.
- The CHW network and the referral mechanism will be strengthened to facilitate the referral of presumptive TB cases, sputum transportation, and the provision of treatment support to TB patients in their area.
- Coordination will be ensured between mobile teams, CBTBC and BHS to strengthen active case detection and ensure the delivery of services to hard-to-reach populations.

High-risk workers

- A high-level advocacy meeting will be held with the Ministry of Transport and Communication, Ministry of Labour, Immigration and Population, Ministry of Industry, Ministry of Investment and Foreign Economic Relations, Ministry of Social Welfare, Relief and Resettlement, owners/boards of factories and industries and associations of industries. The meeting will discuss the current situation of TB in Myanmar, focusing on the near-crisis situation in Yangon. It will also highlight the need to make changes in the labour law, as well as the need for social protection of the workforce and the prevention of the catastrophic effects of TB on this population.
- The NTP will coordinate with ministries to formulate and strengthen a policy for the protection of workers. Routine screening for TB, infection control at the workplace, job security and supportive activities for TB cases are the other areas in which coordination will take place.
- IEC activities for workers will be stepped up. A study will be conducted on workers' health-seeking behaviour or a patient pathway analysis will be done to inform programmes and policy-makers.
- The NTP will make TB screening compulsory for drivers (public transport and express) seeking to renew their licence.
- Mobile team visits will be conducted targeting workers in places such as harbours, bus terminals and vehicle license offices.

Ethnic minority groups

- The coverage of TB services will be expanded by the decentralization of TB diagnostic and treatment services in hard-to-reach areas where high-risk ethnic minority populations reside. Digital X-ray facilities will be set up in some EHO clinics and the staff will be trained to read and interpret CXR images. Simple diagnostic tools, such as TB LAMP or GeneXpert Omni, will be provided in some EHO clinics and sputum transportation link will be established with the nearest TB laboratory.
- The NTP will engage EHOs, NGOs and the community to improve linkage between the community and referral facilities for sputum collection, diagnosis, treatment and contact investigation.
- It will endeavor to bring services closer to beneficiaries and ensure that these are practical and cost-effective and culturally appropriate. It will also develop information materials in ethnic languages.
- Special approaches, such as shelter-based treatment (SMRU model), will be piloted in areas inhabited by minority groups.

- Gender-specific needs will be addressed.
- The referral mechanism and services offered in referral facilities will be made more minority-friendly, for example, by raising awareness of the risks and vulnerabilities of ethnic minorities among health-care providers and referral facilitators.
- The NTP will collaborate with EHOs to develop certifications and capacity-building programmes in the appropriate language to allow EHO providers to implement TB services.
- The NTP must recognize the importance of implementing partners in facilitating collaboration and networking with EHOs, given the limitations of government channels.
- NTP will conduct regular coordination and trust-building exercises with EHOs, at the central, state and township levels; as well as between the MOHS focal person and EHO focal person.
- The coverage and quality of case recording and reporting by EHOs will be strengthened.

Migrants

- A plan will be prepared to reach migrant populations (documented and undocumented), the dependants of migrants, cross-border migrants, urban migrants, and migrants in detention centres. Mapping of migrants and their partners will be conducted to expand partnerships and networks, including linkages with migrant groups. The NTP will promote the use of the public–private partnership mechanism to address TB among highly mobile migrants.
- ACF will be promoted in collaboration with mobile digital CXR teams in targeted cross-border areas and migrant hot spots. The migrant population's lack of access to services will be addressed through the use of GeneXpert testing for diagnosis, the sputum transportation system, assisted referral and a cross-border referral mechanism.
- The health system will be sensitized on the migrants' situation to raise awareness of their vulnerability due to cultural and linguistic barriers. To improve service delivery, the NTP will evaluate their health-seeking behaviour with respect to TB symptoms and make adaptations in service delivery to reach specific groups of migrants.
- To ensure the continuity of care for migrants and harmonize treatment protocols across borders along migration corridors, the NTP will develop and agree on a digital platform for information-sharing and disease notification. This platform will be linked with the regional database for migrants.
- The NTP will contemplate and carry out advocacy for the formulation of policies, enactment of laws, and updates on practices to ensure that migrants have access to TB services, and that they have financial and social protection.

Internally displaced population

- To improve the situation of IDP, the NTP will advocate for and strengthen multisectoral coordination between the general administration department, IDP camp authorities, state and township health departments, EHOs and local community-based organizations (CBOs).
- The NTP will work towards the inclusion of TB services in essential health-care services for the efficient utilization of the human resources available in the camp setting.
- A health network of volunteers will be established and strengthened for the referral of presumptive TB cases. The network will also be involved in the transportation of sputum and the provision of treatment support.

- The NTP will conduct regularly scheduled visits by mobile teams for TB screening and treatment in IDP camps.
- An emergency stock of medicines will be maintained to serve IDPs.

People who use/inject drugs

- NAP and Drug Dependency Treatment and Research Unit (DDTRU) will collaborate on the introduction of TB screening among people who use/inject drugs.
- The NTP will collaborate with the NHCP to ensure that people who use/inject drugs are screened and treated for hepatitis B and C, then for adverse reactions to TB treatment.
- Information on TB will be included in the IEC materials developed for people who use/inject drugs.
- The NTP will advocate for and ensure friendly services for people who use/inject drugs and have TB disease.
- The capacity of CHWs, staff of harm reduction clinics and NGOs will be developed to enable them to provide TB services.

Table 17. Indicators and targets for high-risk populations

Standard indicator		2015 (Benchmark)	2019 (Baseline)	Target				
				2021	2022	2023	2024	2025
Number of mobile team visits[#]	• Prisons and worksite camps	NA	80	92	92	92	92	92
	• Urban congested and hard-to-reach areas	NA	627	795	1 095	1 300	1 290	1 280
	• Workplaces	NA	31	15	20	25	30	35
	• IDP camps	NA	16	10	15	20	25	30
Percentage of bacteriologically confirmed TB patients whose household contacts evaluated		NA	60%	65%	70%	80%	90%	95%
Percentage of DR-TB patients whose household contacts evaluated		NA	39%	70%	80%	85%	90%	95%
Number of presumptive TB cases referred by ANC/ PNC/under-5 clinics		NA	11 570	18 000	20 000	22000	24 000	26 000
TSR of notified TB cases among high-risk groups		NA	NA	70%	72%	75%	78%	80%

[#]NTP: 17 teams (1 team in each state/region), 2 visits/month, 408 visits/year

Implementing partners: 17 teams (1 team in each state/region), 3 visits/month, 612 visits/year; additional teams for high-burden areas; 8 additional teams for Yangon

2.2 Accelerate TB response in Yangon region through coordinated action

Situational analysis

Yangon is the commercial and artistic hub of Myanmar and had a population of more than 8.1 million (15% of the country's population) in 2018.[28] Growing opportunities in industry and business in Yangon is a major factor that draws many migrant populations from other regions and states. Migrants come to Yangon also for educational and social opportunities. Migration accounts for 81% of the population growth in the region.[29] The rapid migration has not been accompanied by a commensurate expansion in formal health, education and social services. Yangon is densely populated, especially in urban townships and peri-urban townships.

In 2018, 35 261 TB cases were notified from the Yangon region, accounting for more than 25% of the total notified cases in the country. Yangon's CNR of 435/100 000 population is much higher than the country's average of 256/100 000 population. Thirteen per cent of notification was attributed to accelerated case-finding activities. Of these, TB screening in PPM hospitals accounted for 2206 cases, mobile X-ray activity for 1468, contact tracing for 300, screening among children under five years of age for 142, CBTBC for 52, sputum collection centres for 28 and screening at MCH clinics for 7. There was a notable treatment gap of 23% related to the cases notified by mobile X-ray activity, of which only 1127 (of 1468) could initiate treatment. Although there are many migrant populations in Yangon, the overall TSR remained relatively high, at 89% among new smear-positive TB cases and 85% among those with all forms of TB.

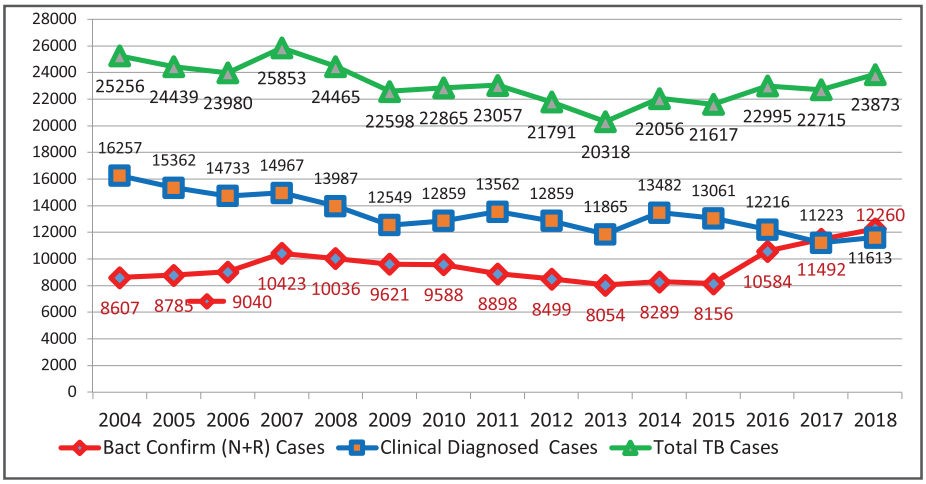

Fig. 20. TB notification (NTP only) in Yangon region (2004–2018)

In 2018, of the 30 819 new and relapse TB patients detected by the NTP and its partners, 29 130 (95%) were examined for HIV or recognized their own HIV status, and 1884 (6.5%) were HIV-positive. Of the latter, 1384 (73%) were put on ART. Yangon accounts for 37% (3818 out of 10 394) of the TB/HIV cases in the country.

Recognizing the big threat posed by DR-TB, Yangon earlier followed the strategy of diagnosing every TB patient with GeneXpert for early detection and initiation of treatment. Twenty GeneXpert machines (including two 16-module machines) have been installed in 14 sites. In 2018, 81% (19 349 of 23 873) of notified TB patients from the Yangon region were tested with GeneXpert. Of these, the partners (PSI, MMA, MDM, Medical

28 Thematic report on population projections, Department of Population, 2017

29 Kyed, H. (2019). Informal Settlements and Migrant Challenges in Yangon. Moussons, (33), 65-94. doi: 10.4000/moussons.4909

Action Myanmar and MSF) tested 57%. A meeting was held with GPs to advocate GeneXpert testing.

Since 2015, all 44 townships of the Yangon region have been covered by activities for the management of DR-TB. In 2018, the NTP initiated second-line treatment for 1237 patients, accounting for 47% of patients started on second-line treatment across the country. Of the 1401 patients diagnosed with DR-TB, 12% could not be started on second-line treatment. Though the case load increased significantly, the TSR was high – 81% of the 2014 cohort of 997 patients. For the management of DR-TB, 318 DOT providers were providing DOTs for 2209 MDR-TB patients in 2016, at a rate of one DOT provider for an average of seven patients.

In the Yangon region, DR-TB treatment with the shorter regimen was started in December 2017. In 2018, 150 patients were enrolled and the treatment was later extended to another 250 patients. There was a total of 80 notified pre-XDR-TB patients, of whom 56 received treatment. As for XDR-TB, 10 out of 12 notified cases received treatment. The treatment of pre-XDR and XDR-TB patients with new and repurposed drugs is provided mostly by the Aung San TB Specialist Hospital, since most such patients need initial hospitalization. To deal with potential barriers to treatment, for example, stigmatization of TB in the workplace and community, it is essential to adopt approaches that go beyond health-related departments.

Challenges

Persistent gap in case-finding: Increasing population density, together with rapid urbanization in peri-urban satellite townships, have limited the access to quality services for TB diagnosis. Also, the communities in these areas are more likely to utilize private medical services to save time and reduce wage losses. Given this situation, the NTP and township TB centres are not notified about cases and patients do not have access to proper management (including GeneXpert testing).

Weak measures to handle treatment refusal: Due to the increased workload of health-care workers, the quality of pretreatment counselling to overcome barriers to treatment is suboptimal. Thus, despite the introduction of universal access to GeneXpert for the early detection of MDR-TB, there is a gap between detection and treatment.

Weak monitoring of TPT among PLHIV and under-5 contacts: Despite the improvement in the coverage of HIV testing and TB treatment, there is no systematic mechanism for ensuring proper management of LTBI.

Strategic approaches

- Roll out a Yangon-specific action plan under the leadership of a regional steering committee to address the challenges related to an effective TB response in Yangon.
- Find missing cases by reaching out to targeted populations, utilizing new diagnostic tools, engaging with the private sector and empowering the community.
- Reduce the initial loss of patients diagnosed with DS-TB and DR-TB by creating an enabling environment for diagnosed patients, and strengthening the referral mechanism between diagnosis and treatment.
- Enhance the TSR by ensuring support to patients, utilizing technologies that facilitate adherence to treatment, decentralizing DR-TB treatment services in prioritized townships and hot spots, and striving to understand the barriers through research.
- Strengthen TB infection control by increasing support for health workers in conducting contact tracing; promoting health literacy among the contacts of TB patients and the general public; ensuring optimal management of TB/HIV collaborative activities; and encouraging compliance with infection control practice in TB treatment facilities.
- Strengthen TB surveillance in the Yangon region by building infrastructure and capacity for case-based reporting, conducting supportive supervision and conducting operations research on prioritized topics.

Essential interventions

Implement Yangon subnational operation plan

- The NTP will continue to implement and further strengthen the urban-specific interventions that go beyond the routine measures for TB care and prevention, as per the Yangon subnational operational plan. The development and implementation of the Yangon regional plan, as well as the multisectoral engagement envisaged, is led by the Yangon regional public health department (RPHD), in collaboration with local and international organizations, the private sector and other stakeholders.

Find missing TB cases through strengthened and innovative strategies

- The NTP will ensure adequate human resources by attempting to fill vacant posts, conducting pre-service and refresher training of health staff (including updates on diagnosis algorithm, health education and interpretation of CXR). It will develop a training package on communications skills for health staff and managers. Capacity will be built in township hospitals for conducting gastric aspiration in childhood TB cases to promote the utilization of GeneXpert for the diagnosis of childhood DR-TB. To encourage referral by BHS, the NTP will adopt a reward/quota system, whereby outstanding BHS will be given rewards in kind.
- The availability of GeneXpert will be expanded and there will be teams for the maintenance of GeneXpert machines at the regional level. The availability of CXR will be expanded through linkages with the private sector. To increase access to TB diagnosis and treatment services, more frequent mobile team visits will be arranged for targeted populations and the sputum transportation system will be strengthened.
- Presumptive TB cases will be screened by CXR and those with abnormalities will be tested with GeneXpert. Symptomatic PLHIV cases will undergo the GeneXpert test as well as have a CXR taken. One-stop TB/HIV clinics will be expanded to strengthen TB/HIV collaborative activities.
- The NTP plans to get TMOs to conduct CXR screening for people with a high risk of TB at MCH and NCD clinics. It will simultaneously upgrade station hospitals to TB diagnosis and treatment centres. CXR screening will be introduced as a part of regular medical check-ups for those with a higher risk of spreading the disease, for example, schoolteachers.
- To minimize the barriers to accessibility, the NTP will collaborate with its partners to have health facilities provide TB services beyond their regular working hours. This will facilitate the utilization of TB services by the urban working population. Approaches such as mobile team visits and contact tracing will be adopted to identify TB hot spots for targeted interventions. The NTP will establish an assisted referral mechanism for presumptive cases of DR-TB contacts and cases who need sputum examination with GeneXpert.
- There will be multisectoral engagement with parliamentarians (to formulate legislation on mandatory TB case notification), the corporate sector (for workplace TB issues) and other ministries (to enhance case-finding activities). The NTP and the RPHD will engage with private health providers to strengthen the implementation of mandatory TB case notification.
- Interventions to increase awareness regarding TB diagnosis will be conducted by collaborating with the Ministry of Education (for teachers' training), Ministry of Information (for health literacy promotion), and by setting up social media platforms to reach more people. The NTP will distribute "invitation cards" to attract the general public to attend mobile team visits. Community involvement will be strengthened through the mobilization of CBOs and advocacy with region/ district/township/village health committees.

Reduce gap between diagnosis and treatment for DS-TB and DR-TB

- The NTP will assist diagnosed patients in ways such as providing transportation allowance for sputum transport and helping to engage with employers for medical leave entitlement. Communication tools will be developed to support treatment (e.g. hotline counselling, video and social media messages). ToT and refresher trainings will be provided to health-care workers.
- The initial loss in case tracing will be reduced by networking with self-help groups and peer volunteers; providing transportation allowance to volunteers; ensuring the recording of the correct address of patients; strengthening mandatory TB case notification and creating communication channels between diagnosis centres and treatment centres.

Improve treatment adherence

- The NTP will ensure initial home visits, daily DOT, linkage with volunteers and the proper management of comorbidities (e.g. insulin injection as part of the TB/DM support package). Technological innovations for treatment adherence (for example, 99 DOTS, VOT) will be piloted. The NTP will introduce patient support for low BMI (<18) patients (for example, allowance, nutrition package, support by CBOs) and provide the transportation cost for follow-up visits.
- Human resource for TB management will be ensured by advocating with the MOHS for the recruitment of BHS and leveraging partners for the recruitment of CHWs (1 volunteer per ward in high-burden townships and 1 volunteer per 5000 population in rural areas). BHS will be trained in treatment counselling, individualized counselling and health education during continuation phase.
- DR-TB management will be decentralized to the township level (downtown area) and the military hospital in Yangon. The NTP will sensitize and train clinicians from the public (outside NTP) and private sectors to follow national DR-TB guidelines for PMDT.
- The NTP and the RPHD will make efforts to decrease the time between diagnosis and treatment by counselling the local authority/head of the family of the patient. It will also conduct research to understand the barriers to treatment initiation of DR-TB patients.

Strengthen TB/HIV collaborative activities

- The NTP in collaboration with NAP and partners will provide training on HIV clinical management to township health staff for the initiation of ART and share updates on TB/HIV management through district-level coordination meetings. Quarterly coordination meetings will be held at the township level to strengthen implementation.
- TB/HIV sites will be expanded to all townships in the Yangon region to strengthen one-stop service, HIV testing among TB patients and ART initiation as early as possible. The NTP will advocate the benefits of TPT, build capacity for TPT and conduct regular visit to ART sites for better TPT coverage among PLHIV. The shorter TPT regime for PLHIV will be piloted in prioritized townships.

Strengthen interventions for infection control

- The NTP and RPHD will conduct workplace contact tracing and facilitate ACF in workplaces with a high TB risk. TB clinics and health facilities will be routinely checked against a standard checklist for infection control and prioritized facilities will be renovated. The NTP will advocate with the MOHS to ensure TB screening of health-care workers.
- TMOs will be encouraged and supported with checklists for the ownership of contact-tracing activities. Risk allowance will be provided to health workers who conduct contact tracing and health workers di-

agnosed with TB will be provided support. The NTP will develop a token system for CXR screening of contacts and expand the system to all townships.

- Standardized messages will be developed for mass communication to increase awareness of TPT. The NTP and RPHD will advocate with paediatricians (using key opinion leaders, for example) for the acceptance of TPT. Parents will be counselled and provided with health education to convince them of the importance of TPT for children. The shorter TPT regime will be introduced after conducting ToT and cascade trainings for health workers.
- The NTP will advocate with the RPHD and regional government stakeholders to promote cough etiquette and infection control measures through the mass media and promotional materials at public places (e.g. stickers and posters).

Strengthen TB surveillance system

- The NTP will advocate for and support an enabling environment for the implementation of electronic registration of cases at the township level by assisting with the recruitment and training of designated staff, provision of user-friendly devices and timely troubleshooting of technical/device problems. It will help build capacity for electronic case-based reporting and ensure interoperability between electronic platforms (e.g. linking DS-TB and DR-TB case-based reporting system to DHIS 2 aggregate system).
- The NTP will advocate for and coordinate efforts to conduct prioritized operation and implementation research to respond to the high TB burden in the region.

Conduct regular supportive supervision at township level

- The NTP will review and revise the monitoring and supervision checklist. There will be quarterly supervision visits to RHCs and UHCs and monthly supervision visits of TB coordinators to high-burden areas. Under the leadership of the RPHD, the NTP will conduct monitoring visits to townships in collaboration with other health services.

Table 18. Indicators and targets for Yangon (2020–2021)

Standard indicator	2019 (Baseline)	2020	2021
Drug-susceptible TB			
Estimated number of cases (all forms) including missing cases	39 210	37 966	35 898
Number of notified cases of all forms of TB (new target with maximum implementation of activities)	NA	36 986	35 401
TB treatment coverage	NA	97.4 %	98.6 %
Drug-resistant TB			
Number of bacteriologically confirmed cases (notified)	1 639	1 627	1 616
Percentage of cases that began second-line treatment	87%	89%	91%
Treatment success rate of RR-TB and/or MDR-TB	80%	80%	>80%
TB/HIV collaborative activities			
Number of coinfected cases	3 593	3 935	3 816
Percentage of HIV-positive new and relapse TB patients on CPT during TB treatment	90%	92%	94%

Percentage of HIV-positive new and relapse TB patients on ART during TB treatment	78%	80%	83%
Childhood TB			
Percentage of childhood TB among all cases	18%	17%	16%
Total notified childhood TB cases	6 078	5 680	5 664
Percentage of under-5 among all children	46%	47%	48%
Contact investigation			
Estimated number of TB cases among household contacts	1 158	1 173	1 248
TB preventive treatment			
Number of eligible under-5 TB household contacts starting TPT	1 225	2 071	3 187

3. Strategic direction 3: Expand partnerships and community engagement, improve communications

The NTP will engage with public and private care providers through the development of a national scale-up plan to build capacity with updated guidelines, strengthen linkages between providers and establish strategic purchasing as a model for PPM engagement. This NSP aims to promote and strengthen community engagement to raise awareness of TB and to address stigma and discrimination related to TB at the community level. CHWs will be involved in TB services through a review of the CHW guidelines, capacity-building initiatives, and strengthening of linkages between the community and treatment facilities. The NTP will implement a robust communication strategy targeting a wide range of stakeholders. The desired behaviour of different stakeholders will be defined, key communication messages will be developed, and communication channels and tools (including mobile technology) will be determined to implement a robust communication strategy.

3.1 Engage all care providers in TB response

Situational analysis

A small-scale pilot of TB case detection and referral from private clinics was conducted in MMA clinics in 1998. In 2004, the PSI formally engaged private GPs in TB case detection, treatment and reporting. This practice has been scaled up annually since then. In 2018, more than 19% of cases were notified by the PPM partners (Fig. 21).

International NGOs have introduced various PPM models in support of expanded TB control. The partners' contributions to case detection are significant, especially among hard-to-reach populations such as migrants, those living in post-conflict areas, the urban poor and other vulnerable populations. Fig. 21 shows which NGOs are currently engaged in PPM TB control activities and their contribution to case notification. In all cases, collaboration with the NTP has made for a cohesive national response to TB.

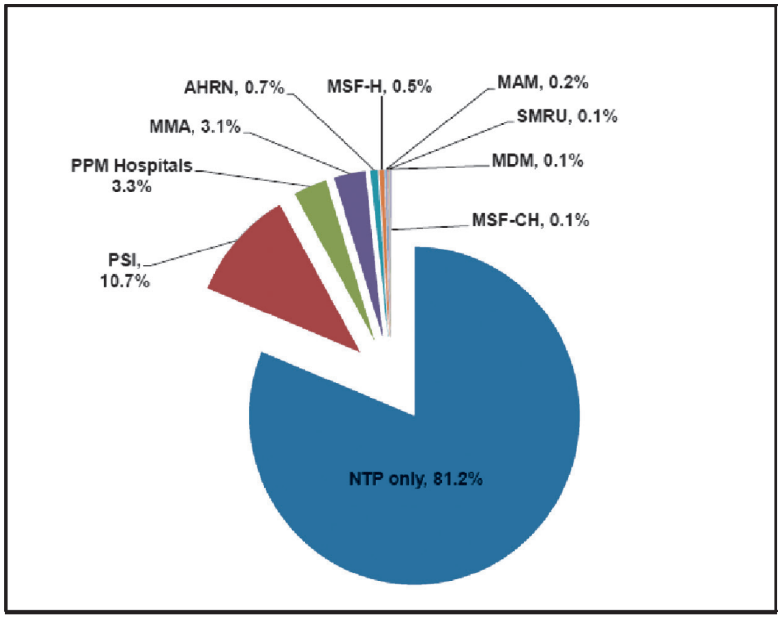

Fig. 21. Contribution of partners to national TB case notification (2018)

Public hospitals: The number of state/region, district and military hospitals engaged in PPM activities increased from 9 in 2011 to 29 in 2018. In 2018, hospitals involved in PPM activities notified 3.3% of all TB cases (all forms). In addition, they referred TB cases for registration and notification in their townships.

Private hospitals: The first private hospital to engage in PPM activities was formally linked to the NTP in 2014. In 2018, 12 private hospitals were engaged in these activities by the MMA. In addition to formal engagement, the MMA started supporting 10 private hospitals in recording cases and reporting under mandatory TB case notification in 2019. A total of 1018 TB cases were notified by the MMA-linked private hospitals from 2015 to 2018. Operational research done by the MMA in 2016 highlighted the need to distribute updated TB control (NTP) guidelines, train medical officers in TB management, and establish TB recording and reporting systems in private hospitals.

GPs: Myanmar is engaging GPs in the private sector through three schemes. Scheme 1 focuses on health education and the referral of people with presumptive TB. Scheme 2 includes health education, the referral of presumptive TB cases and the provision of DOT. Scheme 3 covers referral, diagnosis, treatment, provision of DOT, and recording and reporting. Private GPs involved in PPM activities, supported by the MMA and PSI, provide Scheme 1 and Scheme 3 services. By the end of 2018, 2965 GPs were involved in PPM TB activities, but there are still several GPs who are not engaged in TB control activities. GPs involved in PPM activities are located in more than 200 townships, beyond which there are hard-to-reach areas where public clinics are the main source of health care. Case notification/passive case-finding by GPs has been constantly declining since 2012 (Fig. 22). At first, it was due to the efforts to control overdiagnosis of childhood TB cases (same as with the NTP). Since then, it has probably been due to: (a) a decline in TB prevalence, and (b) an increase in the ACF activities of various partners, including mobile team activities that reach the GPs' catchment area, and the referral of all cases detected by the partners to public clinics. The TSR for all forms of TB treated by GPs was 88% in the 2017 cohort.

Since mid-2018, with the technical and financial support of JATA, GPs not engaged in PPM activities (non-MMA/ PSI) from two townships have been involved in TB case detection and referral links with CBTBC. In a one-year period, 46 TB cases were detected among 107 referred cases by GPs not involved in PPM activities.

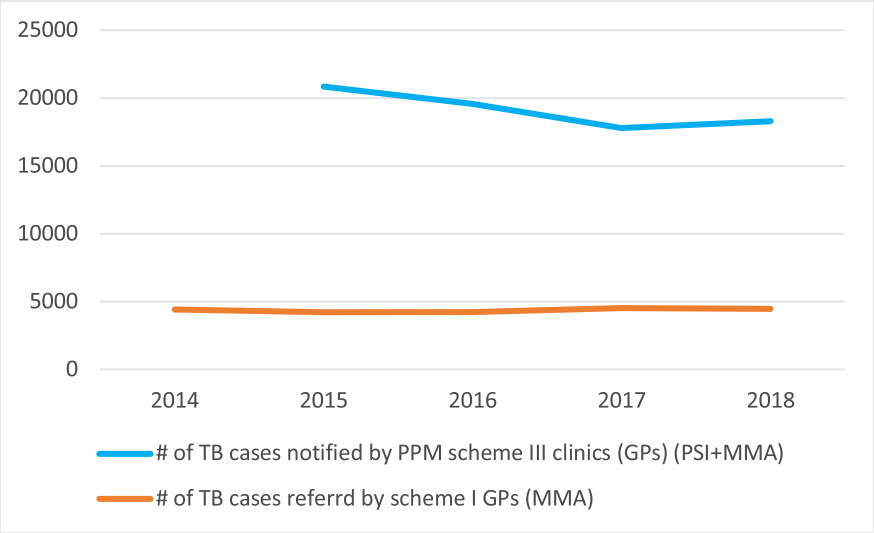

Fig. 22. Contribution of GPs in TB case notification and referral

Pharmacies/drug sellers: It was the PSI which first involved pharmacies in TB case-finding and referral in 2011. In 2012, the Japan International Cooperation Agency (JICA) piloted a model of accelerated TB case-finding by pharmacies in the townships of Hlaing, South Okkalapa and South Dagon. In 2017, the PSI adopted the model and scaled it up to 70 townships. A total of 51 259 cases were referred by drug sellers (2015–2018) and 12 404 (24%) of these were diagnosed with TB.

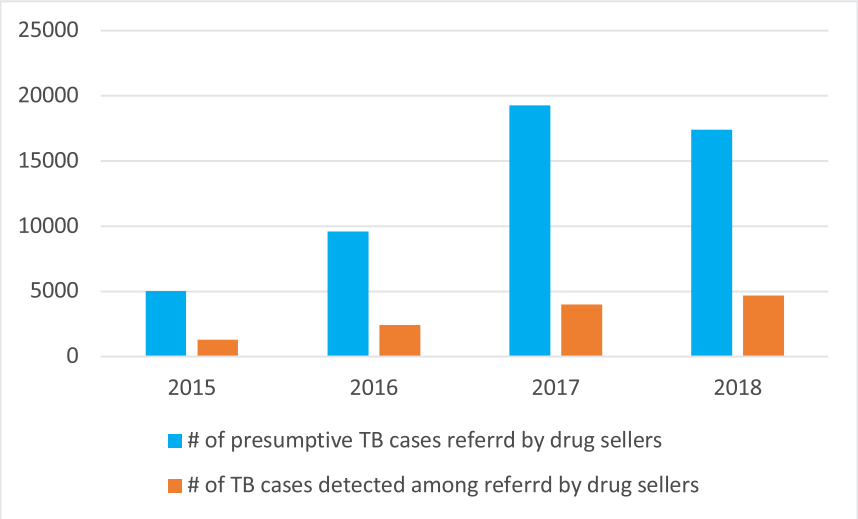

Fig. 23. Contribution of drug sellers in TB case referral

Mandatory TB case notification: In September 2018, the MOHS released a policy statement on mandatory TB case notification. From September to December 2018, 62 TB cases were notified by private hospitals, mostly from the Yangon region. A pilot conducted in four townships that had a high TB burden and were from different geographical areas (North Okkalapa, Insein, Myitkyina and Monywa) reported that 62 cases had been notified within four months, all of them by private hospitals. However, GPs who are not engaged in the PPM programme prefer to refer patients than to provide treatment.

Table 19. Partners providing diagnostic and treatment service

Diagnosis and Treatment Service		
State or region	Partners work with private GP and Hospital	Partners work at own clinics
Ayeyarwaddy	MMA, PSI,	
Bago	MMA, PSI	
Chin	PSI	
Kachin	MMA, PSI	MSF-H, MDM, AHRN,MAM
Kayah	MMA, PSI	
Kayin	MMA, PSI	SMRU
Magway	MMA, PSI	
Mandalay	MMA, PSI	UNION
Mon	MMA, PSI	
Naypyitaw	MMA, PSI	
Rakhine	MMA, PSI	
Sagaing	MMA, PSI	AHRN
Shan (East)	PSI	
Shan (North)	MMA, PSI	MSF-H, AHRN
Shan (South)	MMA, PSI	
Tanintharyi	MMA, PSI	MSFCH
Yangon	MMA, PSI	MSF-H, MDM, MAM

Table 20. PPM contribution to national TB case notification in 2018

Type of PPM	No. of providers/ hospitals	No. of TB cases notified/referred	% contribution to national TB case notification	TSR 2017 cohort
GPs (PSI + MMA)	2 965	18 310	13%	88%
Private hospitals	12	467	0.30%	87%
Public hospitals	29	4 495	3%	69%
NGO clinics	6	2 329	2%	76%
Scheme 1 GPs	1 870	4 485	3%	NA
Drug sellers	2 860	4 693	3%	NA
Total contribution		**34,779**	**26%**	

Challenges

Private sector engagement disproportionate with TB burden: Approximately 40 000 people with TB are estimated to go missing each year in Myanmar. According to the findings of the Prevalence Survey of 2018, many of them are believed to have sought care in the private health-care system, especially in private practitioners' clinics, private hospitals and pharmacies. Not much is known about the quality of the care they receive and these cases are not notified to the NTP. The JMM 2019 found that while there have been successful efforts to engage private pharmacies, GPs and hospitals, the scale of such efforts falls far short of the efforts needed to address the TB burden. According to the draft report on health in Myanmar, 2018,[30] 253 private hospitals and 6590 GP clinics (5705 general clinics + 885 specialist clinics) were registered across the country, but only 29 (11%) and 2965 (45%), respectively, were engaged with the NTP.

Inadequate resources: The engagement of the private sector has been mainly donor dependent. Thus, the Government should consider a sustainable business model or strategic purchasing schemes. The NHP (2017–2021) includes strategic purchasing of services, and pilots for this purpose are being implemented by the PSI with private health-care providers. However, these pilots do not include TB. Mining companies, practitioners of traditional medicine and the corporate sector have not yet been involved in TB prevention and care services.

Weak linkages between private sector and TB programme: The experience of the NTP and its partners has shown that the majority of GPs not involved in PPM activities prefer to detect and refer cases rather than provide treatment. There is no system in place for the referral of presumptive TB case by these GPs. Moreover, there is no systematic linkage for the transport of specimens from private facilities to GeneXpert facilities or culture laboratories. The private sector also requires the support of community volunteers to follow up cases and trace contacts.

Nature of patients: There are mobile and migrant workers, especially in the regions, and providing a continuum of care for these workers is a very challenging task.

GPs' lack of interest: GPs who are newly recruited for engagement in PPM activities often do not remain in the GP pathway, and it is difficult to find new GPs who would be interested in providing TB treatment because of concerns about its being an infectious disease and the data burden.

Gap in building capacity: Private practitioners are not regularly updated on the latest TB treatment guidelines that they should comply with. In a study conducted by the MMA in 2016,[34] covering 22 private hospitals with 143 medical officers and physicians, 90.9% reported not having TB control guidelines and 95.5% said

30 Health in Myanmar 2018, Ministry of Health and Sports (draft).

there was no reporting system. Of the study participants, 96.1% had diagnosed TB using CXR and only 73% were aware of the use of sputum examination for TB diagnosis.

Private hospitals uncooperative: Private hospitals have not been cooperative with respect to mandatory case notification, except when they receive support from intermediatory agencies such as the MMA.

Lack of engagement of private sector in DR-TB: The private health sector (GPs and hospitals) provides treatment for DS-TB, but is not involved in the management of DR-TB. Therefore, DR-TB management relies mainly on the NTP and public hospitals.

Recording and reporting burden: The TB programme's requirement of data has been increasing. These include data related to TB/HIV, GeneXpert, TB-DM, with smoking, tracing of contacts and LTBI treatment coming soon. However, there is a lack of simplified tools and a system for recording and reporting under the mandatory TB case notification.

Strategic approaches

This NSP aims to take the following measures to increase the proportion of TB cases detected and successfully treated by the private sector and public hospital partners.

- The number of formalized and quality-assured PPM and public–private partnership collaborations will be increased through a national scale-up plan. The plan will include capacity-building, giving providers incentives, and introducing digital tools to simplify recording and reporting needs.
- Engagement will be improved with six target groups: (a) GPs, (b) public and private hospitals, (c) drug sellers and practitioners of traditional medicine, (d) the corporate sector / large employers, (e) NGOs, charity clinics and polyclinics, and (f) related ministries, using specific interventions for each group.
- Pilot testing of novel approaches will be undertaken to engage practitioners of traditional medicine, the corporate sector and CBOs.

Essential interventions

Develop and implement a national scale-up plan to involve all public and private care providers

Various models of PPM and public–private partnership approaches will be reviewed to arrive at the most effective one. Mandatory TB case notification will be strengthened. Areas and workplaces with a high TB burden will be prioritized for effective interventions. The notification and recording tools for private providers will be simplified by drastically reducing the number of fields required and electronic medical recording and reporting will be enhanced especially in public and private hospitals.[31] Incentives will be provided to private care providers for the notification and referral of cases and patient support package for DR-TB and DS-TB will be provided to the patients. The MMA may use its professional association mandate to incentivize private providers through non-financial recognitions and credits.

Find innovative ways to improve public–private partnership

- TB diagnosis (through sputum examination and CXR) will be decentralized to private facilities in high-burden areas for better access to diagnosis. It is necessary to scale up the EQA system to cover PPM laboratories.

31 Public–private mix for TB prevention and care: a roadmap (2018). (https://www.who.int/tb/publications/2018/PPMRoadmap/en/ accessed 4 December 2019)

- Innovative technologies such as mobile apps and call centre for recording and reporting will be used, especially for mandatory TB Notification.
- Digital adherence tools (VOT, 99DOTS, digital pill box) will be piloted to improve treatment adherence, especially in urban settings.[37]

Ensure that private practitioners are updated regularly

- Updates on diagnostic algorithms and treatment guidelines and programme information will be disseminated to all TB care providers through state/regional workshops, regular CME training in public and private hospitals, MMA CME sessions and webinars.

Enhance capacity of all PPM partners

- Specialized centres will be set up for GPs, public hospitals and private hospitals. The criteria for these centres, to sensitize and train providers and promote quality TB service delivery, will be defined through PPM working group discussions. Initially, implementing partners will support in setting up these centres.
- The national guidelines for PPM will be updated in accordance with the NTP guidelines and International Standards for TB care. Training/orientation programmes will be developed for use on individual tablets or computers and updated materials and guidelines will be used to train private providers.
- The monitoring and evaluation of PPM partners' activities will be revised. A supervision structure and network will be designed using established PPM sites and partners to ensure routine supervision and quality assurance.

Strengthen referral network and coordination between the NTP and partners

The inventory and referral network, including all PPM and NTP partners providing quality TB care, will be updated annually. Contact information for referral partners, potentially in an electronic format, will be disseminated through township disease control teams. A forum will be created to improve coordination between the NTP and partners, especially at the field level.

Establish strategic purchasing as a model for PPM engagement

NIMU and PSI will be engaged to ensure that TB care provided by the private sector is included in the plans for financing UHC through strategic purchasing approaches and provider payment mechanisms. The NTP will consider the strategic purchase of services, such as laboratory tests, X-ray services and TB treatment services, from the private sector as a model for PPM engagement. The sustainability and effectiveness of this model for PPM engagement will be analysed by the NTP.

Specific interventions for the six target groups

The specific interventions for the target groups of: (a) GPs, (b) public and private hospitals, (c) drug sellers and practitioners of traditional medicine, (d) the corporate sector/large employers, (e) NGOs, charity clinics and polyclinics, and (f) related ministries are as follows.

General practitioners

- Mandatory case notification through TMOs will be scaled up, with a focus on peri-urban areas of regions where the TB burden is high . The current recording and reporting tools will be reviewed and revised and simplified to facilitate upgradation/transformation to paperless reporting. GPs providing or interested in providing TB treatment and care will be advised to link with existing PPM partners to access

quality diagnostic services and drugs. The referral mechanism will be enhanced for GPs who prefer to use mobile technology.

- Cooperation with the township health department will be encouraged to provide treatment for patients referred or transferred from the department.
- Innovative models will be designed for sustainable engagement with GPs. Some examples are social enterprise model for young GPs and call centre approach for referral and mandatory case notification. The use of these models will be scaled up after analysing their effectiveness.
- The quality of standardized services provided by GPs will ensured by:
    - strengthening the capacity of PPM subgroup under TB TSG and this group will perform as working group to lead the PPM activities in line with national guidelines and policies;
    - reviewing and revising the standardized training package annually and holding fresh and refresher training for GPs together with the NTP focal person;
    - conducting joint monitoring and supervision visits regularly using the standardized checklist developed by the PPM subgroup and providing feedback to respective GPs;
    - strengthening linkages with the township health department and TB coordinators to facilitate sputum transportation, contact tracing and tracking of cases in which treatment was interrupted;
    - using digital adherence technology to improve treatment outcome in high-burden areas; and
    - expanding TB screening for diabetes patients and the elderly who consult GPs.
- The availability of the standardized package of patient support will be ensured for eligible patients undergoing treatment under GPs. Collaboration with the social welfare department and the corporate sector will be explored to raise the necessary funds.
- The PPM subgroup, including the NTP, partners and donors, will review and revise the provider support package annually, taking into consideration market prices and the needs of private practitioners. Providing full-time or online diploma and short courses on chest infection to GPS will be considered.
- TB services will be integrated into the strategic purchasing pilot project being carried out by the PSI, with the support of NIMU and the NTP. The results will be reviewed annually to bring about further improvement so that the model is realistic and scalable.

Public and private hospitals

- A plan will be developed and implemented to scale up the involvement of public hospitals at the regional/state and district levels (including specialist hospitals), military hospitals and private hospitals.
    - A governing body with key opinion leaders from public and private hospitals, together with NTP personnel, PPM subgroup members, the MMA and the Myanmar Private Hospitals Association (MPHA), will be formed. The body will develop a scale-up plan, an advocacy package and a training package, and establish operational specialized centres (SEs) for the engagement of hospitals in TB control activities. The preference model shown in Table 21 (Options 1–4) will be used.

Table 21. Models for the engagement of hospitals in TB control activities

Option	Diagnosis	Classification	Start treatment	Treatment	Referral	Clinical follow-up	Reporting
1							
2							
3							
4							

- Mandatory TB case notification will be scaled up, with an emphasis not only on quantity but also quality of treatment. Reporting in line with the national guidelines will be emphasized.

- Patient-centred care models, like DOTs corner at PPM hospitals, will be developed and scaled up to facilitate patient flow and infection control. The existing DOTs corner services will be reviewed and SOPs and a training package will be developed for the staff, in line with updates on the programme. Regular refresher training will be provided to DOTs corner staff.

- The recording and reporting system of both public and private hospitals will be strengthened.
  - A transition from paper-based to electronic recording and reporting will be encouraged and supported.
  - Mobile apps will be used to facilitate mandatory TB case notification and strengthen the referral mechanism.

- The engagement of private hospitals will be enhanced through intermediary organizations, such as the MMA, which will support the recording and reporting of TB case notification. The formal engagement of private hospitals using the standardized package for PPM activities will also be encouraged.

- TB diagnostic services will be decentralized to public hospitals at different levels, up to the level of station hospitals and PPM private hospitals. A system will be developed to link these services with the NTP EQA system. The NTP EQA system will be expanded to cover all decentralized public and private laboratories.

- Private hospitals and specialists will be involved in the care and management of DS-TB cases to improve access to TB services and share the workload of township health clinics.

- Refresher training will be provided to the medical officers of private hospitals to enable them to provide OPD treatment according to the national guidelines.

- Routine supervision and quality assurance from specialized centres (other hospitals) and the NTP will be systematized. Regular coordination meetings will be held with other hospitals to address technical and managerial challenges.

Pharmacies and traditional medicine practitioners

- On the basis of the results of the ACF survey on cost-effectiveness, prioritized townships and cities will be identified for drug seller TB-ACF activity. These activities will be scaled up to reach people who contact drug sellers for health care, and as a result, are not diagnosed and treated on time. Appropriate messages and tools will be developed to persuade drug sellers to involve themselves in ACF activity in project townships.
- The current tools and job aids, including training packages and referral and reporting forms, will

be reviewed and revised so that they are in line with the new national guidelines and programme requirements.

- The NTP will advocate with practitioners of traditional medicine to involve themselves in TB case detection and referral. A standardized package will be developed for them and pilots will be conducted in select areas where they play an important role, especially in rural areas.

Corporate sector and large employers

- In collaboration with the Ministry of Labour, corporate sector institutions like the Union of Myanmar Federation of Chambers of Commerce and Industry and the Myanmar Women Entrepreneurs Association, the leading employers in the formal, for-profit sector will be identified at the national, state and regional, and township levels. Priority will be given to engagement with those employing workers among whom the rates of TB may be high, for example, in mining and manufacturing.
- The NTP will hold an advocacy workshop with stakeholders in the corporate sector, state and regional administrative bodies, the social security board and the social welfare department to seek the commitment of the corporate sector to the inclusion of TB services in their health-care system, ensure sustained employment of and paid leave for patients for a defined period of treatment, and so on that has to be included in their MoU.
- A special package of services relevant to the nature of work and the workplace will be defined for the provision of effective services. For example, mining companies will be engaged in the delivery of TB care and prevention services for mining communities. This may require the adoption of a comprehensive approach, which would cover exposure to dust, silicosis, screening, diagnosis, treatment, rehabilitation, migration and employment-related issues.
- A regulatory body, including the local government, will be established to ensure the provision of services according to the MoU with the corporate sector and link it with work permit, company registration and renewal process.
- Targeted activities for the generation of awareness and advocacy will be undertaken to promote an understanding of the fact that TB is curable. These activities will also touch upon workers' rights and the fact that NTP services are available for workers.

NGOs, charity clinics, polyclinics

CBOs, EHOs, CSOs, special administrative zones, charity clinics and polyclinics will be mapped according to their capacity and potential for the provision of ACF, CBTBC and TB treatment services, as required by the national programme's needs.

- They will be encouraged to involve themselves in TB control activities through township coordination meetings.
- Standardized training packages job aids and IEC will be developed for CBOs, EHOs and charity clinics in line with the national guidelines and the necessary training will be provided.
- The NTP will develop a standardized incentive scheme for CBOs, EHOs and charity clinics.
- It will also provide monitoring and supervision support.

Ministries providing medical care services for their staff

A multisectoral accountability framework (MAF) will be established to improve partnership with ministries (see details under SD 4).

- Meetings of stakeholders will be organized at the national and subnational levels to advocate for the engagement of related ministries in TB diagnosis, treatment and care services. The Social Security Board, Ministry of Social welfare, Ministry of Education, Ministry of Industry, Myanmar Railway, MOHA Prison, and military hospitals and bases need to be engaged.
- Training packages, job aids and IEC for the staff of other ministries will be brought up to date in line with the national guidelines and the needs of specific areas and training will be conducted in accordance with the needs of the ministries.
- Monitoring and supervision support will be provided.

Table 22. Indicators and targets for PPM

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
Number of public hospitals engaged in PPM activities	24	30	39	44	49	54	59
Number of private hospitals engaged in PPM activities	2	15 (MMA)	32	47	62	77	92
Number of registered GPs engaged in PPM-DOTs	2443	1783 (MMA)	3456	3626	3796	3966	4136
TSR among new and relapse TB patients (PPM partners)	85%	83%	90%	90%	90%	90%	90%
Percentage and number of notified TB cases (all forms) contributed by non-NTP, non-community partners – private/non-governmental facilities	17%	20% (27 274)	22.5% (33 992)	23% (34 399)	23.5% (33 908)	24% (31 635)	24.5% (29 023)
Percentage and number of notified TB cases (all forms) contributed by non-NTP, non-community partners – public hospitals sectors	4%	2.7% (3 578)	3.5% (5 288)	4% (5 982)	4.5% (6 493)	5% (6 591)	5.5% (6 515)

3.2 Promote and strengthen community engagement

Situational analysis

Through the involvement of the community, NGOs, international NGOs, CSOs and EHOs, CBTBC aims to reduce the TB disease burden by case-finding, case-holding and increasing the community's awareness of TB. Specifically, these parties could contribute to the referral of presumptive TB cases, to the collection and transport of sputum and in providing health education to the community. They could also help in the provision of home-based DOT to patients, in accompanying presumptive TB cases for diagnosis, and in extend-

ing support to patients on follow-up treatment. The organizations mentioned above are the main linkage between health facilities and communities. According to the current practices of CBTBC, CHVs are given financial rewards by way of transport allowances and/or financial incentives for specific activities (referrals, notifications, treatment success). In addition, CHVs are asked to attend regular meetings and undergo recruitment and refresher trainings to promote their overall motivation and capacity. DS-TB, DR-TB patients as well as presumptive TB cases are financially supported in terms of transport cost for diagnosis, treatment and follow-up at health centres. The funding support has been received from donors such as the Global Fund, Access to Health, USAID and others.

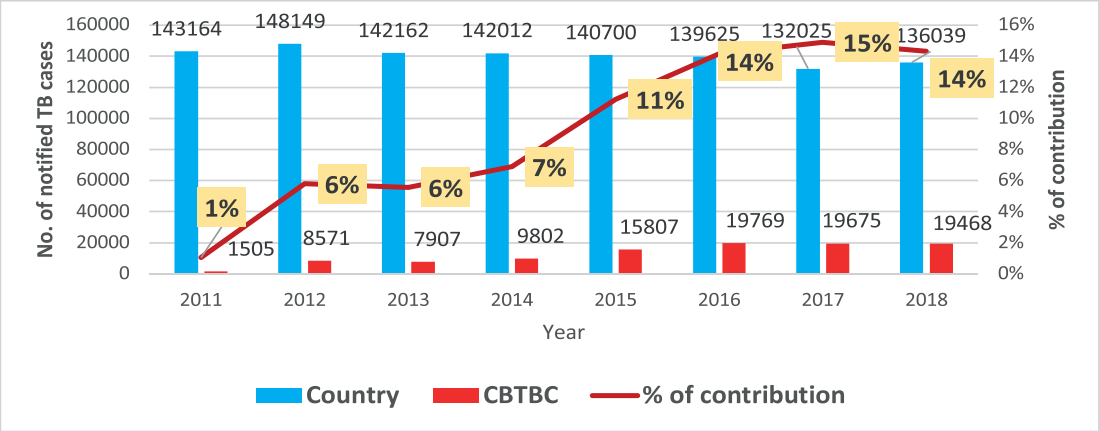

Fig. 24. Yearly contribution of CBTBC to national TB notification

In 2018, 10 NGOs and 9 INGOs implemented CBTBC/integrated community malaria activities in 234 townships with guidance and technical support from the NTP. As a result, 170 367 presumptive TB cases were referred and 19 468 TB cases were detected by CHVs trained by these organizations. This community engagement contributed 14% of the TB case findings in the country in 2018.

Community-based MDR-TB care was provided through CHVs recruited by the MMA, Pyigyikhin, Myanmar Health Assistant Association (MHAA), the UNION and IOM in 60 townships of 7 states and regions, including Yangon, in 2018. This model of care includes the provision of evening DOT, transportation allowance for follow-up visits, health education, infection control measures, monitoring of side-effects and provision of psychological support, contact tracing and referral, hospitalization and nutritional support. In all, 2252 patients were given evening DOT in 2018. However, there is still room for improvement in coverage and the involvement of partners in community-based DR-TB care in areas with a high DR-TB burden. Integrated community malaria volunteer (ICMV) activities were implemented by international NGOs, such as CPI, PSI and MAM, in 46 townships in seven states/regions in 2018, and then extended to 45 more townships in eight states/regions in 2019.

Overall, NGOs providing care and support for DS-TB and DR-TB through CBTBC and ICMV have recruited and trained about 10 700 volunteers in the country. On an average, one volunteer provides community-based TB care to 3200 people in the states, 8000 in the regions and 3900 in Yangon.

Challenges

Role of VHWs: The JMM for TB Care and Prevention in 2019 recommended that the role of voluntary health workers (VHWs) be defined and strengthened to facilitate future decentralization.

Sustainability of funding and volunteers: The sustainability of project funding is one of the main challenges in implementing CBTBC. In addition, most organizations face volunteer attrition issues.

Community-based care for DS-TB and DR-TB: Currently, contact investigation and referral for TPT as prevention measures are not given special attention and not routinely monitored. Among the challenges faced in community-based DR-TB care activities are changes in DR-TB guidelines, which necessitate frequent training for CHVs, rapid turnover of volunteers and infection control. Although integrated community volunteer activities can share resources and manpower, there are certain limitations such as differences in the epidemiology of malaria and TB, inadequate training and supervision, additional needs to facilitate the diagnosis and treatment of TB. Training, supervision, recording/reporting and referral activities need to be strengthened in integrated community care.

Strategic approaches

- With support from the township health department, CHWs will be engaged in ACF, contact tracing, peer support, sputum collection, missed dose tracing, initial loss tracing, DOT and TB prevention.
- Township-based support groups and other self-help groups supported by volunteers, BHS and the NTP will be established.
- The roles and responsibilities of each stakeholder will be clearly defined, and collaboration between the township health department, partners and CHWs strengthened.

Essential interventions

Scale up community-based care

- The coverage of community-based care for DS-TB and DR-TB will be expanded, starting with high-burden and hard-to-reach areas, under the coordination of central, state/region, district and township health authorities. The recruitment of community volunteers will be increased to achieve the target of 5000 population per volunteer in regions; 3000 per volunteer in Yangon and 3220 per volunteer in the states.
- The ongoing ICMV activities will be reviewed for their contribution to TB control and the role of CHWs in providing community-based DS-TB and DR-TB care and in other health areas will be strengthened. HIV volunteers and peer groups will be encouraged to take up community-based TB care activities such as presumptive TB referrals.
- Standardized incentive schemes will be used to provide performance-based incentives to CHWs. There will be regular coordination among health authorities, and the NTP and its partners to improve the mapping of activities and avoid the overlapping of activities in the same area.

Update and review guidelines for CHWs regularly

The guidelines for CHWs will be reviewed and updated annually, in collaboration with NGOs, CSOs and community volunteer representatives.

Promote TB awareness through community engagement

- Various communication tools and channels, adapted to the local context, will be used to raise awareness of TB and address stigma and discrimination, in collaboration with departments such as those for health literacy promotion, NCD and HIV.
- Advocacy, communication and social mobilization (ACSM) will be strengthened, as will TB awareness raising activities of CHWs engaging with BHSPs. ACSM training will be provided to community volunteers for early case detection, spreading awareness, encouraging treatment adherence and helping prevention.

Strengthen coordination mechanisms

Township health department: In order to empower the community and CHVs and facilitate collaboration between them in TB control activities, it is crucial to create an enabling environment at all levels, including national and subnational, and improve service delivery. At the community level, strong collaboration between BHSP and CHVs will bring TB care and support to the individual level.

- Coordination mechanisms will be strengthened at all levels between central, state/regional and township health departments, primary health-care facilities such as RHC and sub-RHC, the NTP, NGOs, CSOs, and EHOs engaged in community-based TB activities. This will be done through regular coordination meetings, reporting mechanisms, regular supervision and monitoring visits at the field level, and promotion of linkages between primary health-care facilities such as RHC and volunteers.
- CBTBC activities will be integrated into the township-level microplans. It will be ensured that NGOs, CSOs, EHOs, and representatives of community volunteers and patients attend the township microplan meetings.
- The township health department, including the township NTP and primary health-care facilities, will coordinate to work on the selection of volunteers and village-level mapping of community-based activities. NGOs will also be involved in these activities.

ACF mobile teams and PPM

- Financial and HR support for mobile teams and PPM will be enhanced. Uniform guidelines will be drawn up to reinforce the linkage between mobile teams and volunteers to increase community support, improve sputum transportation and counselling, minimize initial loss of cases and loss to follow-up, and strengthen DOT support by volunteers.
- Coordination mechanisms will be established with partners to strengthen the linkages between CBTBC and mobile teams and PPM networks for the diagnosis and treatment of TB.
- The recording and reporting of the contribution of CBTBC to mobile teams and PPM networks will be strengthened.

Establish and strengthen support groups

Township/village health committees and civil society: The NTP will advocate and collaborate with township/village health committees and the civil society to involve them in TB control activities.

Role of peer/self-help groups: The lessons learnt from the ongoing activities of the self-help groups of NGOs will reviewed. Guidelines will be developed for the formation of self-help groups for TB control, and for improvements in the linkage of peer groups with the community, volunteers, BHSP and the NTP. The guidelines will be based on the existing models. Dedicated support will be provided for the establishment of self-help groups in order to improve community awareness, TB case-finding, adherence to treatment and TB prevention. This will be done by holding quarterly coordination meetings and supporting NGOs and health authorities in high-burden TB and MDR-TB areas in the task of reporting.

Enhance the capacity of CHWs and CSOs

- A standardized and updated training module, in line with the national guidelines, will be used.
- Annual refresher training will be conducted to reduce attrition of volunteers and increase motivation.

- Partnerships will be forged with CBOs, CSOs and EHOs. The NTP will also build capacity for community-based TB activities.
- CHVs will be trained on updated DR-TB treatment modalities and the management of side-effects, and refresher training will be conducted periodically.

Strengthen monitoring and evaluation

- Mechanisms will be developed and promoted for the monitoring and evaluation of engagement with the civil society, self-help groups, NGOs, and so on.
- Recording and reporting forms for community-based providers of DS-TB/DR-TB care as well as integrated care will be simplified. A realistic reporting system for volunteers will be established, in line with the new indicators set in the NSP.

Table 23. Indicators and targets for community engagement

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
Percentage and number of notified TB cases (all forms) contributed by non-national TB programme providers – community referrals	NA	13% (17 304)	14% (20 867)	15% (22 265)	16% (23 664)	19% (25 062)	22% (26 461)
Percentage of TB patients who received treatment adherence support from CHWs	NA	15%	17%	18%	19%	20%	21%
Percentage of DR-TB patients who received treatment adherence support from CHWs	NA	47%	75%	75%	75%	75%	75%
Number of CHWs engaged in CBTBC for DS- and/or DR-TB	NA	9 424	13 093	15 473	17 853	20 233	22 616

Assumption: The target for the number of CHWs engaged in CBTBC by 2025 is to provide coverage of one volunteer per ward in urban areas and one volunteer for three villages with no primary health-care facilities (sub-RHC).

3.3 Implement a robust communication strategy

Situational analysis

TB is a disease of poverty and risks are significantly higher among disadvantaged populations. During the last decade, the high-risk and special populations were identified as health-care workers, the elderly, prisoners, urban slum-dwellers, the rural poor, migrants, miners and ethnic minority populations. However, not much was done to formulate communication strategies and few investments were made to reach high-risk populations.

Under the END TB Strategy and the SDGs in conjunction with the Delhi Declaration to end TB, high-level meetings were held in Moscow and the UN General Assembly, and a series of multisectoral advocacy meetings were held to facilitate communication within and beyond the health sector. To monitor the progress of the TB response under UHC, the MAF has been discussed among different stakeholders. TB TSG meetings

have been organized regularly to provide all stakeholders a platform for communication. Such coordination meetings are also being held and promoted at the state/region level to improve TB services in the local context, in collaboration with partners.

In Myanmar, stigmatization of TB poses a major threat to the people affected. These people include the working population, the members of which fear losing their jobs due to stigma and discrimination. To make matters worse, employers often shirk their responsibility to take effective TB control and support measures for workers suspected to have TB. Yet, neither the central, nor local governments have come up with a proper communication strategy to reach and conduct advocacy with the business/ corporate sector.

In recent years, access to the Internet has increased in Myanmar. Consequently, digital literacy and the use of social media among the general population have been on the rise.

Challenges

Weak communication with key opinion leaders: Efforts to communicate with key opinion leaders in the private and corporate sectors have been weak. This has been identified as one of the main areas for which more resources should be mobilized to eliminate discrimination in the fight against TB.

Lack of awareness among people and care providers: Delayed access to quality care still poses a challenge. The National TB Prevalence Survey, 2018 revealed that only 54% of clients who had had a cough for two weeks or longer sought care. The main reasons for the failure to seek care were found to be ignorance (41%) and self-treatment (44%). The other problem is the lack of awareness in the private sector about new guidelines and updates. This is why, the JMM in 2019 stressed the need for engagement with private hospitals and polyclinics, not only for mandatory notification but also to ensure that patients notified by the private sector receive standard diagnosis, treatment and continuum of care.

Language barriers: Myanmar has 135 ethnic groups which speak different languages. Despite an improvement in the literacy rate since 2000, there are large variations between economically well-off and disadvantaged groups, and the level of literacy is the lowest in the regions inhabited mostly by ethnic minorities. The presence of diverse ethnic groups which speak different languages and have a poor literacy rate poses major challenges in communication.

Strategic approaches

This NSP is in favour of strong lobbying and communication efforts to increase political commitment and create a supportive environment to reduce disparities with respect to TB among targeted disadvantaged populations, and to end TB disease by the end of 2030. A framework outlining communication strategies for different stakeholders is summarized in Table 24 at the end of this section.

It is widely acknowledged that an effective approach to communication is crucial for increasing awareness among all target groups, accelerating case detection and improving the TSR nationwide. A comprehensive national TB communication strategy will be developed to create an enabling environment through the coordinated action of all target groups, namely, the government, local authorities, industrial sector, nongovernmental agencies, ethnic bodies, media, and commercial and private sectors. Towards this end, the NTP will take the following steps.

- Identify the key target groups with which communication is necessary and determine the communication objectives for each group.
- Define the desired behaviour, develop key communication messages and identify the communication channels and tools for each group.
- Secure sufficient funding and execute communication strategies.

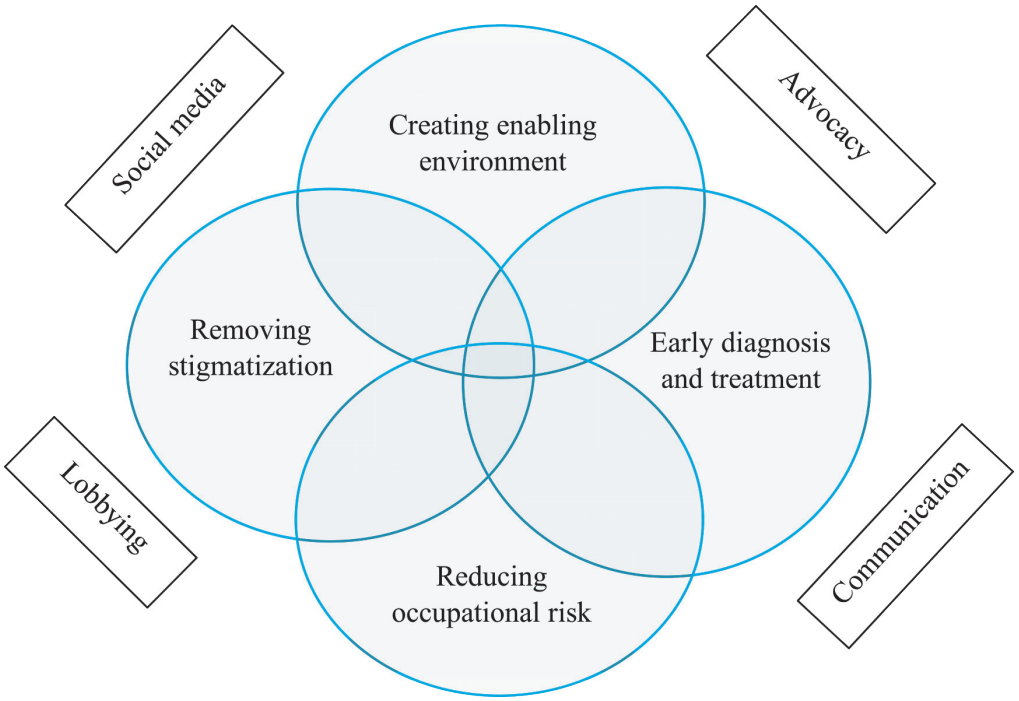

Fig. 25. Role of strong communication initiatives in ending TB

Essential interventions

Identify key target groups and determine communication objectives for each group

Three core target groups have been defined. The primary group comprises TB patients and high-risk groups such as health-care workers, prisoners, the elderly (50 years of age or older), PLHIV, diabetics, the urban poor, and hard-to-reach populations (migrants, miners, the rural poor and ethnic minorities). Effective community engagement with these target populations will require dedicated outreach, as well as culturally relevant and innovative communication, which in turn, will require resources and expertise.

The secondary target group is the general population in the age group of 18–45, especially parents of children who are under the age of five years and those residing in geographically remote and under-served areas. Schoolchildren will be covered under this group because they can serve as the entry point for sending health messages to their parents and families.

The tertiary group is the influencing group, including national and local leaders, stakeholders from the health and other sectors, and NGOs and voluntary organizations. Acknowledging that target groups are varied in terms of interests and the role they may play, clear communication objectives tailored to each group will be developed.

Define the desired behaviour, develop communication messages and identify communication channels and tools

To maximize the effectiveness of communication, the desired actions from each group will be identified. The potential channels and tools for communication activities targeting each group will be determined using existing evidence, programme experience and inputs from the target group. Channels such as broadcasting or the social media and school-based campaigns will be explored for the general community. For people living in areas with a large (ethnic) minority population, the print media, radio or interpersonal communication in local languages may be suitable. Policy briefs and workshops may be designed for donors and policy-makers; guidelines may be formulated for providers, who will receive training; and patients and their families may receive one-to-one counselling.

The NSP envisages engaging media celebrities because they have a strong influence on public opinion. People are more inclined to believe what they see or read on social media feeds than what they learn through traditional modes of communication. Hence social influencers, especially Facebook celebrities, could be important mediators to bring positive changes in attitudes towards TB among all target groups. There will be dedicated advocacy by the NTP and its partners to increase their engagement in the efforts to end TB in Myanmar.

Secure funding and implement communication strategies

Executing a robust communication plan requires financial resources and a dedicated team. Therefore, all activities will be costed and the NTP will take a leading role in ensuring that sufficient funding is dedicated for the communication activities outlined in the NSP. A communication task force will be formed as a subgroup under TB TSG. This group will be jointly led by the NTP and the Health Literacy Promotion Unit (HLPU) and will be supported by the implementing partners. Strategic areas will be identified to develop and execute innovative ideas and interventions to reach target groups. The NSP supports all efforts to explore the existing evidence to adopt creative communication strategies that may contribute to ending the TB epidemic in Myanmar by 2030.

A detailed description of the communication strategy, activities and tools for each group follows. The main points are summarized in Table 24.

Primary target group

High-risk groups: This group includes current TB patients and those at risk of contracting TB disease due to socioeconomic factors such as place of residence and profession. Migrants, prisoners, miners, the urban and rural poor, ethnic minorities, the elderly, PLHIV and diabetics fall under this group. The desired communication outcomes are knowing the symptoms of TB, seeking early diagnosis and treatment, and adhering to the treatment. The main activities in connection this diverse group are as follows.

- The barriers to information/health messages and the preference of communication channels of each subgroup must be identified. The barriers to seeking health care, especially those related to coverage, must be understood. Innovative and culturally relevant outreach, using materials tailored to individual groups, is necessary to reach special populations facing institutional barriers, such as prisoners, miners, PLHIV, diabetics and ethnic minorities.

- Efforts related to insight collection, evidence-based communication tools and human-centred designs will be encouraged. This will help in rolling out effective communication actions to special high-risk groups.

- Technology tools will be explored for effective communication, since the use of digital and social media is a part of the people's daily lives. Several mobile applications and Facebook pages, which provide a range of health-care messages, have been developed by some mobile operators and NGOs. The May May Application and Mate Application are contributing to an improvement in access to information on health-care across Myanmar.

- Digital adherence tools, such as 99DOTS, will be used to improve the TSR, especially among high-risk groups and MDR-TB patients . The 99DOTS approach is a good example of low-cost, mobile-based communication technology, which has the potential to track treatment adherence among TB patients by remotely monitoring their daily intake of medications. The NSP calls for the scaling up of this effort to improve the TSR, especially among high-risk groups and MDR-TB patients.

Health workforce: Health-care providers are at a high risk of contracting TB. Reducing the risk of TB transmission among this particular target group is of the utmost importance as they have daily exposure to TB cases and face an occupational risk of contracting TB. Besides, health-care providers play an important role

in influencing the behaviour of TB patients and thus improving treatment outcomes. While providers in the vertical programme are well informed about the latest diagnostic tools and treatment guidelines, there is limited information-sharing and training as far as health-care providers from other departments within the MOHS are concerned. The same goes for providers from outside the MOHS, including private GPs, providers from private hospitals, providers from EHO/NGO clinics, drug shops and laboratory technicians.

The main interventions for this group are as follows.

- Training manuals/job aids and posters on diagnostic and treatment algorithms will be developed or updated. These will be distributed to all providers during capacity-building training, pre-service training embedded in the medical education curriculum, regular CME for private GPs/laboratory technicians, regular coordination meetings and workshops.
- A simple and pictorial diagnosis and treatment algorithm will be developed for providers from EHOs.
- The option of online training programmes will be explored.

Secondary target group

This group includes the civil society, the family members of TB patients and the communities in which the patients live. The desired communication outcomes are that the general population should know the symptoms of suspected TB, know where to seek care if they have TB symptoms, and be aware that TB is a curable disease. Further, people with TB should receive support to complete treatment and should not be discriminated against. Voluntary and social movements against violations of the rights of TB patients are essential to empower TB clients and remove social barriers to accessing and completing treatment.

- The community will be mobilized and community organization strengthened. Public campaigns, using social media and mass communication with visual aids, will be launched to engage all population groups, especially around World TB Day.

Tertiary target group

Political leaders, administrators and donors: This group of people play a very important role as they have great control over resources and decision-making, which affects both the primary and secondary target groups.

- To secure the commitment of political leaders and influencers and encourage them to play a leadership role, the NTP (with the assistance of partners and WHO) will develop a policy brief (of 1–2 pages) with key messages supported by publications and reviewed evidence, which will be disseminated in small group workshops and meetings. Moreover, political leaders, along with social influencers and celebrities, will be invited to participate in community events, such as World TB Day, panel discussions and public talks.
- To increase the involvement of all administrative bodies from the central government and MOHS to the township and ethnic authorities, the NTP and its partners will use all forms of mobilization, including lobbying, face-to-face advocacy and printed materials. The NTP and all implementing partners will engage with the existing and potential donors to raise and sustain financial support. Based on the type of donor, partnership meetings will be held and individual electronic communications (such as email and Skype) will be used to reach the target group and raise funds.
- As Myanmar's economy has grown, the NTP will explore the option of generating domestic funds by organizing small group advocacy meetings with business houses and inviting them to World TB Day events.

- The NTP will develop an innovative financing strategy for this group. An example is the implementation of a workplace policy, according to which employers will financially support all their employees to go for an annual medical check-up for TB, especially in high-risk work settings. Also, TB patients will be granted paid leave for the first two months. Employers will also be expected to financially support the NTP in setting up a TB diagnostic centre at the hospital/NTP site closest to their worksite/factory.

Industries and private institutions: These are commercial sector entities that give jobs and an income to general working groups. The main objectives of communication with this group are (a) to develop and implement enabling policies for the workplace that allow workers to take leave for TB diagnosis and treatment and when they are sick; (b) to reduce the stigma against TB patients, and (c) to help (including financially) the workers get tested for TB (annual screening for those in high-risk jobs) and help them in receiving treatment, as a part of their corporate social responsibilities.

- To promote positive attitudes among employers towards TB patients working in their industries and to reduce stigma and discrimination at the workplace, formal advocacy meetings will be held with employers and the senior management teams of the corporate sector/factories. Targeted outreach activities will be undertaken and health education sessions held at the workplace. Moreover, sensitization posters and pamphlets will be disseminated, workplace health committees will be formed and committee members will be trained in health education.

- Healthy workplace policies will be implemented to deal with the stigmatization of TB patients and to reduce the financial hardship faced by patients. Since high-level business associations exist to facilitate coordination within each industry (such as the UMFCCI and Association of Mining), high-level advocacy meetings will be held with such associations to obtain buy-ins from factories/worksites.

Table 24. Framework for communication strategies for target groups (2021–25)

No.	Targeted interest group	Desired outcome	Communication objective	Key messages (examples)	Communication tool
1.	**Primary target group**				
1.1	Patients and high-risk populations	• Are aware of TB symptoms • Know where to go when they have symptoms suggestive of TB • Seek early diagnosis and treatment from a qualified provider • Follow cough etiquette	• To increase awareness of TB symptoms, and the fact that TB is curable • To improve awareness of the availability of TB diagnosis and treatment services • To encourage seeking care early from a qualified provider • To encourage adherence to and completion of treatment	• TB is curable! • Do you have these symptoms? Go to nearest TB centre. • High-quality TB diagnosis and treatment are available free of charge! • Complete TB treatment! Protect your family!	• Outreach sessions for IDP, hard-to-reach villages, those employed in high-risk worksites, migrant sites • Peer-to-peer health talks • Posters, pamphlets • Social media campaigns • Mobile app for patients/families
1.2	Health-care providers	• Find more cases, improve treatment outcomes • Provide diagnosis and treatment of standardized quality • Take self-protection measures against TB infection • Apply FAST (find actively, separate, treat) strategy for infection control	• To increase TB case detection and improve treatment outcomes • To adopt patient-centred care approach • To eliminate stigma when treating TB patients • To improve infection control at TB health facilities	• Myanmar aims to end TB by 2030 and you are part of the team that will make this happen. • We are opposed to discrimination against DS-TB patients. They deserve quality treatment. • Protect yourself from TB infection.	• Development and dissemination of training materials/job aids • Training sessions • Coordination meetings • Advocacy workshops for private providers

No.	Targeted interest group	Desired outcome	Communication objective	Key messages (examples)	Communication tool
2.	**Secondary target group**				
2.1	General population, schoolchildren	• Are aware of TB symptoms and how TB is transmitted • Have the appropriate manners to prevent transmission • People with TB infection are supported and treated with respect	• To improve awareness of TB symptoms • To improve cough etiquette • To reduce stigma against TB patients • To support TB patients and treat them with respect	• Always cover your mouth when coughing/sneezing. • Since everyone is at risk of being infected, go and check if you have TB symptoms. • Anyone can get infected, so please treat TB patients with respect.	• Posters, pamphlets • Big events, such as World TB day • Social media campaigns • Communication campaigns through TV, radio • School-based campaigns
3.	**Influencing group**				
3.1	Political leaders, administrators and donors	• Are committed to increasing budgetary allocation for TB programme • Develop and enforce policies and regulations to ensure access to services, to protect TB patients from financial hardship and stigmatization • Increase funding and ensure that the resources are allocated to those most in need • Ensure implementation of the MAF	• To advocate for greater political commitment for increased funding and development of enabling policies • To put the spotlight on TB and its devastating health and socioeconomic impact on the nation • To eliminate institutional stigma against TB patients through legal actions to protect TB patients and their families • To increase HRH for TB and provide universal access to quality diagnosis and treatment	• TB hampers the productivity of the nation. • MDR-TB is a national threat to health. • Let us stand against stigma and discrimination. • Access to TB treatment, prevention, care and support is a fundamental human right. • It is time for action; it is time to end TB.	• Publications • Policy briefs • Advocacy meetings • Big community event (World TB Day) • Social media

No.	Targeted interest group	Desired outcome	Communication objective	Key messages (examples)	Communication tool
3.2	Industries and corporates	• Provide improved social and health protection for workers with TB disease • Develop and enforce policies against discrimination against TB patients in the workplace	• To eliminate discrimination and stigmatization of TB patients in workplace • To empower TB patients by giving them social support to complete their treatment	• Say no to discrimination against TB patients! • Encourage your workers to complete TB treatment to protect your colleagues and yourself from TB infection. • Encourage your employee to complete TB treatment! Enhance productivity!	• Advocacy meetings with employers • Communication events for workers in workplaces/factories • Social media campaigns

Table 25. Indicators and targets for enhancing communication

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
Number of townships where BHS have access to up-to-date technical guidance through mobile tablets	NA	330	330	330	330	330	330
Number of social media pages and webpages (of MOHS, states/regions, partners, UN agencies, donors) used for dissemination of TB messages throughout the year	NA	NA	20	20	20	20	20
Number of multisectoral advocacy workshops held on TB at central level and select states and regions	NA	NA	10	10	10	10	10

4. Strategic direction 4: strengthen systems and update policies for a multisectoral TB response

This NSP notes that the availability of essential human resources is crucial to implement planned interventions. The chronic HR problem will be overcome with advocacy measures to fill vacant positions, and rigorous efforts to recruit temporary staff for essential posts with support from regional health departments

and donor/partner organizations. The capacity of the health workforce will be enhanced through routine/refresher trainings, supportive supervision and the introduction of digital platforms for self-learning. This NSP will ensure the inclusion of TB in UHC and wider economic and development policies, plans and activities. The NTP plans to strengthen the procurement and supply systems for efficient care delivery. Standardization of TB medicines, capacity-building for logistics management, integration of eLMIS at treatment facilities and integration of TB into the ATM stock management will be carried out. This NSP considers quality assurance, safety, the rational use of TB medicines and waste management as priority areas. To make the TB responses a part of the broader health system response, a multisectoral accountability framework will be developed. Intra- and inter-ministerial collaborations and policy applications will enhance the implementation of a coordinated TB response. To secure financial resources, the NTP will advocate for greater commitment from the government and build capacity for financial management.

4.1 Ensure availability of essential human resources

Situational analysis

The NTP, under the DOPH, is responsible for implementing TB control activities in line with the NHP and UHC and within the framework of the End TB Strategy. It collaborates with the medical services, general public health services, private medical sector, CSOs, EHOs, NGOs and INGOs to implement the activities. Though the recruitment of health staff has been increasing since the early 1990s, Myanmar has not reached the global benchmark of 2.28 doctors, nurses and midwives per 1000 population. The NHP (2017–2021) notes that Myanmar had 1.33 health workers per 1000 population (2016), which was lower than the threshold of 4.45 per 1000 population required for UHC, as recommended by WHO.

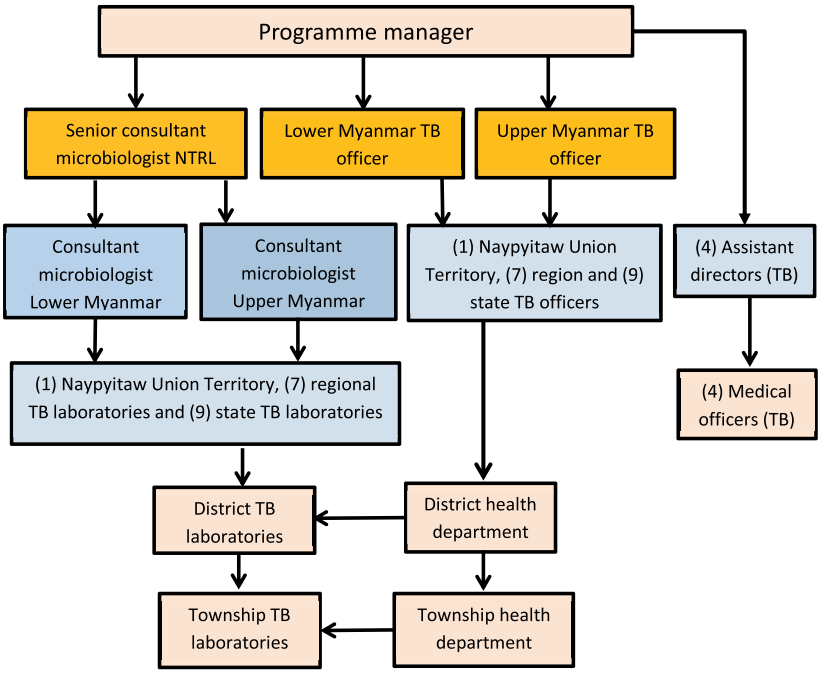

Fig. 26. Organizational structure of the NTP

The central unit of the NTP is headed by the Deputy Director (TB), who is closely guided and supervised by Director (disease control) and supported by the Deputy Director General (disease control). The structural organization of the DOPH, including the NTP, was revised on 7 March 2016.

The management and implementation of the NTP are undertaken at four levels.

1. The central (Naypyitaw) and subnational levels (Yangon and Mandalay) are responsible for administration, planning, coordination, capacity-building, initiation of pre-XDR- and XDR-TB treatment, infection control, monitoring and evaluation, and supervision of TB control activities. They are also responsible for the 300 bedded Aung San TB Hospital (Yangon) and the 200 bedded Patheingyi TB Hospital (Mandalay), under the DMS, which serve as referral centres for pre-XDR-TB, XDR-TB and complicated cases.

2. The region/state level is responsible for planning, training, coordination, secondary referral centres, MDR-TB treatment initiation, TB infection control, monitoring and evaluation, and supervision of TB control activities.

3. The district level is responsible for the diagnosis and treatment initiation of MDR-TB, training, TB infection control, monitoring and evaluation, and supervision of TB control activities. Each 100-bedded district hospital has a general physician to manage ART, MDR-TB, pre-XDR-TB and XDR-TB.

4. The township is the basic level of implementation of TB control and undertakes case-finding, case-holding, contact investigation, LTBI treatment/TPT.

   TB staff in townships is implementing activities in collaboration with PHS1, PHS2 and CHWs. They are closely supervised by the medical officer for township disease control (AIDS, TB, vector-borne d*isease* control, leprosy and prevention of blindness) under the leadership of the TMO. They are also responsible for undertaking health literacy activities, recording and reporting. TB control activities have been integrated into the primary health-care system since the People Health Plan-1 was drawn up in 1978. In rural areas, BHS (midwives and PHS2) are responsible for public health services. In addition, CHWs work with PHS in the areas of public health and disease control. Together with midwives, AMWs focus on community-based MNCH activities at the grassroots level. In view of the changing trends of disease epidemics and community needs, the duties and responsibilities of BHSP were revised in October 2018. In the revised job description, the delivery of TB care is considered one of the main responsibilities of PHS2 and midwives are responsible for other public health activities.

The new NTP organogram approved in March 2016 provides for 2179 TB staff at various levels of the TB programme. In 2019, 24% of the management-level positions at the central, subnational, regional and state levels were vacant. Among the 1434 service delivery staff at various levels, the proportion of vacant posts was 71%. Also, 76% of the positions of programme support staff (such as statisticians and clerks) were vacant.

Achievements under the current NSP

Despite the efforts made, the availability of human resources remains a huge challenge, the gap in all categories of the NTP staff being 75% in 2018 (check). However, the NTP managed to recruit seconded staff for essential positions through different funding sources.

The JMM 2019 identified five main areas that needed to be strengthened.

- The NTP has to engage more with public and private hospitals through professional societies and associations.
- Most of the sanctioned posts need to be prioritized after abolishing chronically vacant positions.
- To motivate and retain staff, career development should be considered for each category of staff.
- Efficient training on TB through online courses and webinars should be planned.
- Effective utilization of resources through integration with other disease programmes should be considered, particularly as far as sputum transportation by community volunteers is concerned.

Table 26. Human resource situation in NTP (2018)

Title	Sanctioned				Appointed	Vacant
	Central/ subnational	Regional/ state	District	Township		
Management	**17**	**17**	-	-	**26**	**8**
Deputy Director	4	-	-	-	4	-
Assistant Director (TB)	6	-	-	-	3	3
Assistant Director (microbiologist)	5	-	-	-	4	1
Assistant Director (TB/leprosy)	-	17	-	-	15	2
Deputy assistant supervisor	2	-	-	-	-	2
Service delivery	**160**	**136**	**148**	**990**	**416**	**1 018**
Medical officer (TB)	19	17	74	330	87	353
Township public health officer	-	-	-	NA	NA	NA
Medical officer (team leader)	-	-	-	NA	NA	NA
Medical officer (microbiologist)	13	-	-	-	2	11
Nurse 1 (DHN)	3	-	-	-	3	-
Nurse 2 (THN)	2	-	-	-	2	-
Medical technologist 2 (drugs)	4	-	-	-	4	-
Medical technologist 2 (laboratory)	18	17	-	-	14	21
Medical technologist 2 (X-ray)	7	17	-	-	10	14
Nurse 3 (TN/SN)	4	17	-	-	12	9
Nurse 3 (TN)	14	17	74	330	121	314
Medical technologist 3 (X-ray)	6	-	-	-	5	1
Medical technologist 3 (laboratory)	26	17	-	-	17	26
Medical technologist 4 (drugs)	4	-	-	-	3	1
Medical technologist 4 (laboratory)	34	17	-	330	132	249
Medical technologist 4 (X-ray)	6	17	-	-	4	19

Support	**165**	**68**	**148**	**330**	**169**	**542**
Administrative officer (laboratory)	10	-	-	-	6	4
Assistant engineer (biosafety)	2	-	-	-	-	2
Senior statistician	2	-	-	-	2	-
Branch clerk	4	-	-	-	4	-
Medical social worker	2	17	-	-	5	14
Health assistant	8	-	-	-	3	5
Nurse 2 (LHV)	7	-	-	-	4	3
Statistician	2	-	-	-	2	-
Junior statistician	3	-	-	330	66	272
Upper division clerk	10	-	-	-	9	1
Lower division clerk	23	17	74	-	30	84
Health assistant 4 (JTW PHS2)	10	-	-	-	-	10
Driver	19	-	-	-	10	9
Office assistant	5	17	74	-	-	-
Guard	14	-	-	-	5	9
Workers (laboratory, X-ray, general, X-ray room)	44	17	-	-	23	38
Total	**342**	**221**	**296**	**1 320**	**611**	**1 568**

Challenges

Vacant positions: As of 2019, 71% of the sanctioned positions in the service delivery category were vacant. Despite the recruitment of essential staff through nongovernment funding, the gap remained at 68%.

Inadequate staff for hard-to-reach and marginalized populations: It must be noted that although only 30% of the country's population is located in urban areas, they receive services from 50% of the health workers. For public health services in rural areas, the positions of only six midwives and six PHS2 (responsible for public health activities, including TB) were sanctioned. This meagre staff covers approximately 20 000 people and the occupancy may be much lower.[32] The average number of field visits among all states (except Mon) was lower than the national average of 25.4 visits per year.[33] The public sector alone is inadequate for accelerating TB case-finding activities in addition to carrying out the routine public health tasks. This is especially the case in hard-to-reach areas. In addition, the appointment of only two medical officers (disease control MO and TMO) for the township does not suffice, in view of the expanded TB response and increase in implementation responsibilities at the township level and below.

Low retention of trained and well-performing staff at all levels: The rate of workforce instability and turnover is higher among BHS and VHWs than medical doctors. This is due to the lack of a formal support system and weak supervision, insufficient compensation and transport allowance, poor infrastructure and inadequate medicines and supplies, chronic understaffing leading to overwork and 'task creep' (especially among midwives), and cultural and linguistic challenges in ethnic minority areas. In 2012 (HRH Profile 2012), the annual attrition of medical doctors was 2.02%, compared with 15–20% for CHWs and 5–10% for AMWs.[34]

32 Myanmar Human Resources for Health Strategy 2018–2021, Ministry of Health and Sports, 2018

33 Public Health Statistics Report 2014–2016, Ministry of Health and Sports, 2017

34 MYANMAR HUMAN RESOURCES FOR HEALTH STRATEGY (2018-2021). (2020). Retrieved 2 January 2020, from http://www.hrh.gov.mm/Main/content/publication/myanmar-human-resources-for-health-strategy-2018-2021

Limited training: Starting from 2014, PHS2 were recruited in large numbers. Nearly 3000 were recruited per year for three consecutive years to achieve the desired ratio of midwives to PHS2 of 1:1 in 2017. This raised questions on the quality of training and the competence of the graduates. Although the revised job description mentioned the main responsibilities of PHS2 with respect to communicable diseases (including TB), the "Course Reference Compendium for PHS2" does not specifically mention TB control activities. The higher turnover rate of BHS in the rural areas and the frequent introduction of new/revised guidelines, along with changing global strategy and recommendations, have made it difficult to build the capacity of health workers at the township level and below.

Supervision, mentoring and training: There is no focal person for mentoring and supervising health-care workers involved in TB control activities. Supervisory visits have not been preceded by detailed planning and are not supported by funding. Moreover, there is no standardized checklist. There is no supervision system to guide follow-up mentoring and provide necessary on-the-job training.

Strategic approaches

- The NTP will advocate for the filling up of sanctioned posts, especially of critical staff, to help implement the NSP.
- It will collaborate with WHO, Global Fund–UNOPS and Access to Health Fund–UNOPS to recruit seconded staff in essential categories. It will foster the development and retention of workforce by prioritizing and identifying areas for development.
- Formal training and training on new approaches will be strengthened after revising and developing the training guidebooks and SOPs, in collaboration with relevant personnel from other programmes and departments.
- A multipronged strategy will be adopted for capacity-building, with the aim of ensuring efficiency in the delivery of training. Systems will be introduced for sustaining capacity through self-directed courses, job aids and shadowing of other practitioners.
- The human resource development plan will be revised to meet the specific needs of human resources for TB.
- Monitoring and supervision of the performance of health workers will be strengthened.
- On-site mentoring, training and supervision will be decentralized across the country through the establishment of specialized centres.

Essential interventions

Advocate with MOHS to fill vacant posts

The NTP will advocate with the MOHS to make sure that essential and prioritized positions are filled during the first two years of this NSP.

Ensure continuation of seconded staff

- The NHP advises states and regions to allocate human resources on the basis of the local needs (minimal functional posts) rather than in accordance with sanctioned posts. So, before the government fills essential posts for TB services, the NTP, in keeping with its usual practice, will utilize temporary employment mechanisms, such as recruiting seconded staff from its partners to fill human resource gaps.
- The NTP will coordinate with WHO, the Global Fund, UNOPS and Access to Health Fund to recruit essential seconded staff. A contingency plan will be developed to address the gaps that arise when support to seconded staff is discontinued.

Strengthen training

- The NTP will roll out the provision of pre-service/orientation training and continuing education through a cascade system, in close collaboration with the relevant personnel of universities of medicine and other health-related universities. The central NTP will ensure the adoption of normative standards in the development of training materials, guidelines and SOPs. It will conduct ToT and the trainers, in turn, will train personnel at downstream levels (regional or township). The responsibility for prioritizing and disseminating new technical norms through training will be decentralized (state and regional NTP). The NTP will build the capacity of health personnel from the private sector.
- The NTP will regularly revise the national guidelines or technical standards as per global standards. It will conduct cascade trainings on new approaches and revise the training guidebooks and SOPs for all relevant staff at various levels. This will be done for different parts of the health system (for example, NAP, NCD, Maternal and Child Health, Department of Food and Drug Administration, Department of Medical Research, PPM, prisons, partners and MMA (Chest Society, Paediatric Society and Radiology Society). Both the public and private sectors will be covered. The NTP will advocate with the DOPH to include material related to TB control and prevention in pre-service education. It will provide training to facilitate the expansion of TB diagnostic and treatment centres at station hospitals.

Promote digital and on-the-job learning

Electronic self-directed courses will be developed for providers in the public and private sectors, based on their individual learning needs. E-training modules, job aids and other on-the-job learning tools will be developed and utilized, and will be integrated into a web-based platform.

Monitor and supervise health worker performance

To sustain the capacity of staff, supportive supervision will be updated, formalized and systematized. The NTP will conduct follow-up monitoring after training as this helps to check whether the trained personnel are working efficiently and effectively. It will use checklists for monitoring and supportive supervision of TB control activities. The findings will be used for follow-up and on-the-job training will be provided when necessary.

Establish specialized centres

The NTP will capitalize on well-performing sites at each level of the health system and in the private sector to establish SEs. At least one SE will be established at each level. At the central level, there will be SEs for laboratory culture and DST (BSL-3, Yangon and Mandalay), for DR-TB management and for ToT trainings (Yangon and Mandalay TB centres). At the state/region level, there will be SEs for DR-TB, DS-TB, TB laboratory and e-recording and reporting, among others. Townships will have SEs for multiplier trainings for BHSP; GPs; staff of hospitals, microscopy laboratories and X-ray facilities; and community volunteers.

There are two major types of training/capacity-building – orientation training and refresher training. Orientation training is conducted for new recruits, or to acquaint staff with new strategy/activity. Refresher training is held to refresh persons who have already been trained after 2–3 years of orientation training or to improve the performance of those who are not faring well.

Table 27. Human resource development actions for areas related to SDs of the NSP

Area		Action
Quality-assured diagnostic services	Staffing	• Prioritize filling of critical vacant posts in line with the NTP's diagnostic services scale-up plan and recruit volunteers • Establish a technical group comprising trained engineers for installation, monitoring, supervision and maintenance of GeneXpert machines
	Training and supervision	• Build capacity of staff through training, especially on EQA and mSupply; train volunteers in sample management • Establish specialized/training centres for DST at BSL-3 laboratories • Provide training package (including computer training) on GeneXpert to all laboratory technicians in GeneXpert sites
DS-TB and DR-TB management	Staffing	• Recruit staff to fill sanctioned positions • Recruit health-care providers, counsellors and CHWs in line with the DR-TB expansion plan
	Training and supervision	• Provide standardized training package on DS- and DR-TB to BHS and volunteers • Provide regular refresher training and supervision, and on-job training to respond to the needs of the staff
Paediatric TB	Staffing	• Establish a serious disease communicable unit team
	Training and supervision	• Provide training on paediatric TB diagnosis and management, including sample collection through gastric aspiration • Provide refresher training to MNCH and school health teams
Management of comorbities, especially TB/HIV and TB–DM	Staffing	• Recruit additional staff for social support and provision of TPT, CPT and ART
	Training and supervision	• Provide pre-service and refresher trainings to NTP and NAP staff • Include TB/HIV diagnostic algorithms and management in the curriculum for health-care providers • Arrange cross-visits between high-performance and low-performance townships • Develop appropriate supervision checklist for TB/HIV collaborative activities • Improve regular monitoring and supervision at all levels

Area		Action
Engagement of all care providers, including NGOs, public and private sectors	Staffing	• Recruit the required staff in a prioritized manner • Assign a dedicated focal person at all levels, for coordination with NGOs, public and private sectors
	Training and supervision	• Include information on PPM and CBTBC activities in the training packages • Identify the need for training and provide training accordingly • Conduct (joint) supervision visits as necessary • Ensure that public and private laboratories are under EQA programme
	Others	• Develop innovative ways to improve engagement of various providers, including electronic recording and reporting (eR&R) and mobile applications
Community engagement	Staffing	• Recruit community volunteers for implementation of CBTBC activities
	Training and supervision	• Seek technical assistance from experts on the CBTBC • Promote capacity-building activities for community advocates, public health clinicians, and community volunteers and their supervisors • Include various services such as TB/HIV, chronic care, PMDT and DOT in the training package for volunteers
Policy and supportive systems	Staffing	• Advocate with Union Civil Service Board (UCSB) to fill vacant posts • Advocate with MOHS for a quick response to the need for human resources
	Training and supervision	• Ensure medical curricula include latest information on TB diagnostics and management
	Others	• Assign staff from current NTP workforce to establish technical group/coordinating body to bring about policy changes and systems development

Area		Action
Accelerated case detection among high-risk groups	Staffing	• Recruit staff to establish mobile teams
	Training and supervision	• Prioritize training needs of staff and revise the pre-service, refresher and on-site training packages to cover areas such as DOT, TB/HIV and PMDT • Provide training on interpreting CXRs to TMOs and staff of partners • Arrange exchange visits between high-performance and low-performance sites for mentorship programme • Train local volunteers in ACF activities for sustainability • Provide TB training to health staff in DICs, laboratory technicians and other appropriate staff • Conduct regular supervision visits, including joint supervision wherever appropriate
Monitoring and evaluation, and operational research	Staffing	• Assign focal persons for M&E at central, region/state, district and township levels • Assign focal persons for operational research at central and region/state levels
	Training and supervision	• Include information from the national M&E Plan for TB Control (2021–2025) in the training package for staff involved in TB care and prevention activities

Table 28. Indicators and targets for human resources

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
Percentage of staff (all categories) posted (denominator: 2 179 posts)	NA	30%	50%	70%	80%	85%	90%
Percentage of townships having PHS1 and PHS2 trained in TB management (denominator: 330 townships)	NA	60%	80%	85%	90%	95%	100%
Number of specialized centers designated and operational - TB treatment center	NA	16	17	18	18	18	18
Number of specialized centers designated and operational – BSL-3	NA	2	3	4	4	4	4
Number of specialized centres developed and operated in the private sector with regional/state MMA branch	NA	NA	1	2	3	4	5
Number of specialized centres developed and operated in the private sector with MMA – private hospitals	NA	NA	1	2	3	4	5

4.2 Strengthen procurement and supply systems for efficient care delivery

Situational analysis

The Operations Plan of National Health Supply Chain (2019–2021) of the MOHS envisages the integration of the supply chain systems of multiple health programmes into one national system. The four priority areas are building a central warehouse and optimizing intermediary warehouses; strengthening the transport and distribution systems; improving governance and leadership; and establishing an e-LMIS for the availability and visibility of data.

The supply chain management for TB is currently led by UNOPS and involves the international procurement of products related to TB. Annual quantification is well established under the leadership of the NTP. QuanTB is used as a standard forecasting and monitoring tool for TB medicines at central, lower and upper Myanmar TB stores.

In 2015, the NTP introduced stock monitoring and set up an early warning system through mSupply at the central and regional levels. It serves as a complementary tool in the forecasting and planning of supplies of TB medicines by providing updated data on stocks to the central and regional TB stores. The LMIS data of the NTP at health facilities at other levels is managed by a paper-based reporting system.

At present, TB medicines and other ATM products are stored separately at the central, regional and township levels.

Stock management and early warning system practices have improved in the last two years in the NTP, with the help provided by GHSC-PSM in training and quarterly stock review meetings.

In order to implement the Operations Plan of National Health Supply Chain, the DHRH is planning to introduce supply chain certificates, and diploma and master's courses for the development of the supply chain workforce.

A report titled, "Review of HIV, TB and malaria warehouse infrastructure, and operations skills in Myanmar (May 2019)" has identified the infrastructural gaps and made recommendations for future investment. These will inform the development of this NSP.

Achievements of previous NSP

- Lists of TB medicines and diagnostic products have been standardized at the central level for annual procurement.
- Methodologies, tools and practices for forecasting and supply planning of TB medicines are well established in the NTP. QuanTB software is consistently used in the NTP for annual TB forecasting and quarterly supply planning of TB medicines at the central level.
- Quarterly stock review meetings are held to support the management of TB stocks.
- eLMIS for TB medicines is fully set up and functional at central and regional TB stores for stock monitoring, early warning and data support for annual quantification.
- The storage conditions in the TB warehouses of central, upper and lower Myanmar have improved in last two years. This is especially true of the NTRL with respect to the storage of NTP laboratory products.
- A national policy has been developed on the harmonization and standardization of TB laboratory services. This policy standardizes the levels of TB laboratory services, TB laboratory tests, equipment, human resources and laboratory supplies.

Challenges

Weak forecasting and supply planning in regions and TB treatment facilities: The methodologies, tools and practices for forecasting and supply planning of TB medicines need to be improved and expanded to the regional and TB treatment facility levels.

The LMIS data of the NTP at health facilities at levels other than the central and regional levels are managed by a paper-based reporting system. The availability of real time data for stock management remains a challenge.

Limited stock management and early warning system practices: The implementation of mSupply is limited to the central and regional levels and still does not cover township and TB treatment facilities. Also, mSupply is underutilized.

No clear MOHS procurement policy and strategy: A disadvantage of the current annual procurement policy is that it may lead to a shortage of some TB medicines. Until now, the MOHS has no clear procurement policy and strategy for the integration of vertical disease procurement systems for the period of 2021–2025.

Inadequate storage capacity: The storage space for TB products is inadequate at all levels. There is no integration of storage spaces for and distribution of ATM products at any level.

Lack of human resource capacity development (HRCD): The NTP supply chain is managed by medical personnel, who are not professionally trained in supply chain management. There is a shortage of dedicated and properly trained or certified supply chain staff even at the central and regional levels.

Lack of uniform quality assurance mechanisms: Collaboration with the FDA and private sector manufacturers, importers and wholesalers needs to be improved to ensure the availability of quality-assured TB medi-

cines and innovative health technologies, both for the public and private sectors.

Lack of waste management policy: There is no clear waste management policy for the collection, storage, transportation, replacement, writing off, safe disposal and environmental compliance of TB products.

Strategic approaches

- Harmonize and standardize TB medicines, diagnostics and supplies at TB health facilities at all levels.
- Strengthen and institutionalize the methodology, practices and tools for forecasting, supply planning, stock monitoring and early warning at all levels of the TB supply chain.
- Strengthen the procurement of TB products and comply with the procurement strategies of the Supply Chain Operations Plan.
- Gradually work towards integration of all ATM health programme storage places, and transport and distribution systems at the central, regional and TB treatment facility level.
- Expand mSupply to the TB treatment facility level for data visibility and availability.
- Collaborate with the DHRH of the MOHS for the capacity development of the workforce in the supply chain.
- Ensure quality assurance and the safety and rational use of TB medicines and health technologies.
- Address the issue of waste management of TB medicines, health technologies, and unusable and hazardous material.

Essential interventions

Harmonize and standardize TB medicines, diagnostics and supplies at all levels

- TB medicines, commodities and laboratory products will be standardized and periodically reviewed at NTP health facilities at all levels.
- The NTP will continue to advocate for the integration of the standard lists of TB products into the EPHS envisaged under the NHP.

Strengthen forecasting, supply planning, stock monitoring and early warning system

- SOPs and guidelines for forecasting and supply planning will be reviewed periodically and the staff will receive regular training on updates. Training on monitoring of stocks, the early warning system and stock management will be incorporated into the mSupply training packages. This training will be conducted at the central, regional and township levels.
- Quarterly meetings will be held at the central level to review the position of stocks with focal persons involved in stock management at the central and regional levels of the NTP.

Strengthen TB procurement and comply with procurement strategies of MOHS

The international procurement and supply planning system and customs clearance procedures will be reviewed and improved. The NTP will comply with the procurement policies and strategies of the MOHS during the implementation of this strategic plan.

Gradually integrate with other ATM health programmes

- Warehouse spaces and the logistic services of ATM will be consolidated into fewer well-equipped ware-

houses. The transport and distribution of NTP products will be integrated into a common ATM transport system. During the period of transition, the existing storage spaces and storage conditions will be improved so that they meet the minimum acceptable standards. Compliance will be ensured with the Operations Plan of National Health Supply Chain.

- The current three-monthly resupply cycle will be reviewed and the NTP will consider increasing the duration of the resupply cycle.

Expand mSupply to TB treatment facility level

- mSupply will be extended to the township level for complete availability and visibility of data. An electronic requisition system linking TB treatment facilities to TB stores at the regional and central levels will be established.
- The NTP will collaborate with other health programmes (HIV, malaria and general medicine for primary health care) to customize mSupply to improve its usefulness in the forecasting, ordering and monitoring of stocks and for the early warning system. Standard lists of TB medicines, ancillary drugs and laboratory products will be integrated into the MOHS EML data dictionary system in mSupply by the adoption of consistent naming, product codes, pack sizes and unit of measurement.

Collaborate with DHRH to develop HR and HRCD in supply chain workforce

The NTP will collaborate with the DHRH in the implementation of the supply chain HRCD plan to build a competent and skilled workforce for TB supply chain activities. Certified and competent staff will be deployed in central, regional and TB treatment facilities.

Ensure quality assurance, safety and rational use of TB medicines and health technologies

The NTP will collaborate with the Myanmar FDA, WHO prequalification programme and private sector manufacturers, importers and wholesalers to undertake the following activities.

- TB medicines and health technologies prequalified by WHO will be registered.
- The in-country quality monitoring system/marketing surveillance for TB medicines and health technologies will be strengthened to eradicate the menace of substandard, spurious, counterfeit, falsified, unsafe treatment and diagnostics.
- The FDA laboratory will be strengthened and its capacity enhanced for testing and analysis of the TB medicines available in Myanmar.

- The rational use of drugs, good prescribing practices and good dispensing practices will be promoted in order to safeguard the public from overuse/underuse, misuse /inappropriate use and microbial resistance to TB medicine.
- The monitoring of adverse drug events, investigation and management systems will be strengthened in the public and private sectors.

Optimize waste management

- The NTP will coordinate with the MOHS, other ministries concerned, policy-makers, partners and other stakeholders to adopt and optimize waste management policies, procedures and mechanisms for TB medicines, health technologies, and unusable and hazardous materials.
- Further, the NTP will link, strengthen and operationalize the waste management infrastructure in the public and private sectors to ensure proper waste management.

Table 29. Indicators and targets for procurement and supply systems

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
Percentage of TB stores and TB treatment centres where LMIS data is reported by eLMIS (mSupply) Denominator: 24 TB stores and 330 TB treatment centres	NA	7% (24+0)	20%	35%	50%	70%	80%
Stock-out rate at TB treatment facilities Denominator: Total number of reporting treatment facilities	NA	0%	0%	0%	0%	0%	0%
Percentage of central and regional stores where stock kept according to plan (optimum stock) as reported via mSupply Denominator: 24 TB stores	NA	77%	>80%	>80%	>90%	>90%	>90%

4.3 Ensure inclusion of TB in UHC and wider economic and development policies, plans and activities

Situational analysis

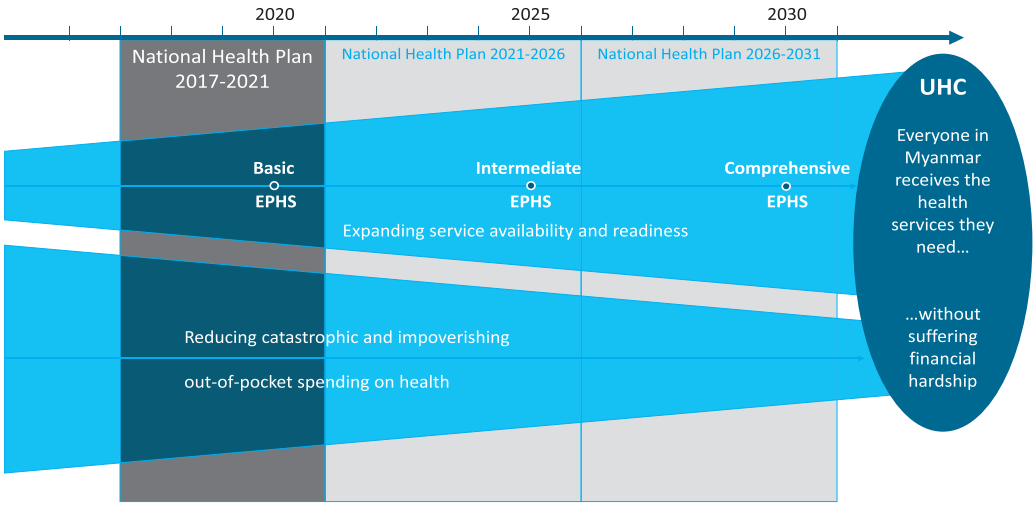

Fig. 27. Conceptual framework for UHC and NHP

The NHP (2017–2021) informs the MSDP 2018–2030. The NHP includes related national goals, lays down the groundwork for achieving UHC in three five-year phases, through the progressive roll-out of an EPHS. In all phases, the NHP is to be guided by the principles of equity, inclusiveness, accountability, efficiency, sustainability, and quality. The NTP plays a part in the planning and implementation of the NHP (2017–2021) and

National Medicine Policy. In particular, it is responsible for planning strategy and implementing integrated health service delivery, strengthening human resources for health, increasing domestic funding for TB, ensuring financial protection for TB patients and promoting the rational use of TB medicines.

The MOHS is now on the way towards UHC. This NSP aims to ensure that TB services and control activities at all levels of health care are integrated into the country's UHC agenda, NHP implementation roadmap and health-care reform plan. The next phase of the NHP in 2021–2026 aims at providing intermediate EPHS, which is an expansion of the basic EPHS to include secondary-care services. In the context of the NTP, this might mean an extension of TB/MDR-TB diagnosis and treatment to the community level, especially for the poor, vulnerable and underserved population in keeping with the "no one left behind" principle of UHC.

TB case-finding and contact investigation, diagnosis and treatment have been listed as part of the basic EPHS. However, the role of each level of health care (community, subcentre, RHC, UHC, station hospital, township hospital) in TB care and control has not been clearly defined.

Challenges

Efforts towards UHC: The End TB Strategy highlights that global progress towards UHC and social protection are fundamental to achieving the global targets for the reduction of TB incidence and mortality. At the country level, the challenges to the elimination of TB are ensuring access to TB-related services in hard-to-reach areas and for underserved populations (for example, prisoners, workers, migrants).

TB response as part of basic EPHS: The integration of TB services and control activities as a crucial component of the EPHS at all levels is limited.

Strategic approaches

- The NTP must engage actively in the process of reviewing and revising of the NHP towards achieving UHC by 2030.
- It must coordinate and plan jointly with NIMU towards achieving the UHC goals, as well as for inclusive township health planning (ITHP) to ensure the proactive engagement of TB partners.
- It must work towards the inclusion of TB diagnosis, treatment and care services as an integral part of the basic EPHS and secure an adequate budget from the Government.
- It must realign its activities in keeping with the restructured MOHS framework.

Essential interventions

Develop health policy

- The NTP will advocate with policy-makers to mobilize more domestic resources for TB/MDR-TB services and control activities at all levels of health-care delivery by using evidence-based decision-making.
- It will develop specific subnational operational plans for all regions and states, and particularly for Yangon Region by engaging with all stakeholders, including the local government, parliamentarians and the community.
- It will coordinate and plan jointly with NIMU to strengthen TB services and control activities at the PHC level to achieve the UHC agenda. It will also work with NIMU towards ITHP to ensure greater access to TB services for underserved populations.

Include TB in EPHS

- The NTP will seek to incorporate TB activities in the UHC agenda and the restructured MOHS to ensure

the comprehensive inclusion of TB care services in the EPHS, health insurance and other UHC schemes. In collaboration with its partners, it will work closely with related departments to include TB care and prevention activities in the basic EPHS. It will advocate for the inclusion of TB prevention measures and LTBI management in the basic and intermediate EPHS. It will collaborate with partners to develop SOPs/guidelines for clinical services at township hospitals and station hospitals as part of the basic EPHS.

- The NTP will ensure the inclusion of supplies for TB services and infection control in the standard list of medicines and medical supplies at the township level and below. It will advocate for the inclusion of essential TB services in the revised basic EPHS as well as the intermediate EPHS.

Mainstream NTP activities within UHC, MSDP and restructured MOHS framework

- The NTP will ensure the provision of TB services (as a component of EPHS) by identifying service providers at different levels of health care; ensuring the availability of SOPs/guidelines, building capacity; advocating for and securing the required resources; providing HR support, and ensuring financial protection of patients.
- The NTP will advocate with the MOHS for a clear definition of the role of each level of health care in providing TB care and control under the basic EPHS. It will advocate for the expansion of the role of district PMDT centres to manage serious side-effects and complications, and build the capacity required.

4.4 Promote and coordinate a multisectoral TB response

Situational analysis

In 2017, Myanmar endorsed the Delhi Call for Action, and committed to promoting a multisectoral response during the WHO Global Ministerial Conference on Ending TB in the Sustainable Development Era in Moscow. Thereafter, during the 2018 United Nations high-level meeting on TB in New York, WHO launched the MAF for TB to accelerate progress towards ending TB by 2030. The MSDP 2018–2030 is in line with the SDGs. The TB NSP 2016–2020 is one of eight guiding documents for the achievement of Goal 4 of the MSDP: human resources and social development for a 21st century society; and strategy 4.2.8, under Goal 4 is related to SDG 3.3. Under the Development Assistance Coordination Unit , the strategic coorganization groups for various sectors, including health (Myanmar Health Sector Coordination Committee [MHSCC]), are now tasked with tracking progress towards the MSDP targets and indicators. The strategic coorganization groups have to report to the Development Assistance Coordination Unit.

The NTP has been developing a national-level platform for a multisector response to TB. It issued a notification in 2018 to make case notification mandatory for all care providers. Subsequently, coordination meetings and training sessions were held for private providers in the Yangon region on mandatory notification. This contributed to a significant rise in case-finding, with 436 cases detected up to the third quarter of 2019 in the Yangon region. Rapidly increasing numbers were observed over the reporting quarters.

For collaboration with other relevant disease programmes, particularly those for HIV, MCH, the elderly, NCD and tobacco control, the NTP has established an expanded TSG. The objective is to include stakeholders beyond the traditional TB partners, that is those who are engaged in health and community care, such as EHOs. In collaboration with the Ministry of Labour, the NTP has also engaged with the corporate sector to promote workplace-based policies and activities. This engagement has contributed to early case detection and completion of treatment within the workforce in the corporate sector. In collaboration with the Prison Department, MOHA, SOPs have been developed for prison health and regular TB screening is in place in all prisons.

National-level policy discussions are ongoing between the divisions of disease control and public health. These divisions have defined the critical elements on which collaboration is to take place. TB is one of the 17 diseases under national surveillance, but is neither listed in The Prevention and Control of Communica-

ble Diseases Law, 1995 (amended 2011), nor as a "principle epidemic disease". It is categorized as a "vaccine-preventable disease" in the course reference compendium for PHS2. The NTP has developed national infection control guidelines and SOPs to be disseminated among all stakeholders.

Challenges

Insufficient interministerial collaboration: The existing collaborative activities are insufficient to accelerate case-finding among marginalized populations, strengthen referral linkages between ministries and ensure a continuum of quality TB care.

Gaps in intraministerial collaboration: The NTP collaborates primarily with the programmes for HIV and MCH. There is a need to improve collaboration with other national programmes, such as those for NCD and the elderly. It is also necessary to collaborate with departments such as those for school health, nutrition and FDA. Engagement within the MOHS needs to be strengthened to deal with broader health system issues such as social security, UHC, health promotion, occupational health, school health, human resource planning, mandatory notification and medical research.

Strategic approaches

- Promote supervision of multisectoral engagement under the WHO MAF. A regional version that pays special attention to the TB situation in Yangon will be developed .
- Develop and update normative guidelines and policies, including legislation such as the Prevention and Control of Communicable Diseases Law (amended in 2011).
- Strengthen engagement and cooperation with civil societies and EHOs.
- Nurture current ties with international agencies and engagement with the corporate sector.

Essential interventions

Develop a multisectoral accountability framework

With the aim of increasing the accountability of governments and all stakeholders, and thus, accelerating progress towards achieving the 2025 milestones of the END TB Strategy, the NTP will develop an MAF to end TB (MAF-TB). Coordination meetings will be held with stakeholders to ensure the inclusion of the essential elements under the four components of the framework: commitments, actions, monitoring and reporting processes, and review mechanisms.

Form multisectoral coordination committee for Yangon region

The Yangon regional NTP will advocate with the regional Public Health Department to form a coordination body to ensure engagement with different stakeholders for the implementation of a Yangon subnational operational plan (2020–2021).

Strengthen intraministerial collaboration

The other departments of the MOHS need to be involved in addressing TB among vulnerable population groups, such as the elderly, PLHIV, drug users, migrants, refugees, prisoners, and people in areas of conflict. Engagement with these departments will be strengthened through advocacy and coordination meetings. The implementation of policies and guidelines on TB case-finding, referral, sputum transportation and TB management will be enforced within other departments of the MOHS.

Collaborate with other ministries and governing bodies

Efforts will be made to engage with other ministries, such as those of immigration, labour, social welfare,

relief and resettlement, education, border affairs, home affairs, and with bodies such as the Yangon City Development Committee to:

- enforce mandatory notification of TB cases (through the Myanmar Medical Council, MMA, etc.);
- facilitate uninterrupted TB care by protecting the jobs and wages of workers (Ministry of Labour, Immigration and Population);
- conduct contact investigation at schools, when necessary (Ministry of Education);
- conduct annual TB screening for specific targets, such as schoolteachers, bus and taxi drivers, and internal migrant workers (various departments across ministries);
- promote health literature related to TB (Ministry of Information);
- strengthen activities for TB diagnosis and care at prisons and worksites (MOHA); and
- ensure the provision of TB diagnostic services and a continuum of care for migrant workers in cross-border areas (Ministry of Border Affairs, Ministry of Labour, Immigration and Population).

Develop and enforce policies

On the basis of the findings of the National TB Prevalence Survey and other TB-related studies, as well as the need for a comprehensive TB response, the following policies will be developed, updated or advocated and their inclusion in broader national policies will be sought during this NSP.

- The TB volunteer policy as part of the human resource development policy (2018–2026): The NTP will make sure that community-level TB services are provided by advocating with departments related to the MOHS.
- National medicine policy: The NTP will work with the FDA to include TB drug safety and antimicrobial resistance in the national medicine policy.
- Migrants' health policy and cross-border policy: In collaboration with other national programmes, the NTP will work towards the ensuring TB services for this marginalized population.
- Policy for TB control at the workplace: The NTP will conduct advocacy with the relevant ministries to strengthen TB services, including social protection, in workplaces.
- The NTP will develop a national TB control policy to further amend the Prevention and Control of Communicable Diseases Law (1995, amended in 2011).
- It will advocate for the inclusion of specific TB infection control measures in the Hospital Infection Control Guidelines (2016) to prevent TB transmission among patients and health-care workers in treatment settings.
- It will continue to work on the development of the National Infection Control Guideline (2016), in order to introduce a coordinated approach to the prevention and management of health-care-associated infections, including TB.
- A policy will be formulated for TB screening of health-care workers. The NTP will conduct advocacy with the Department of HRH for the strengthening of infection control practices among targeted health staff.

Review and revise national guidelines and develop new guidelines

To reflect changing global and national strategies, the political and social environment, and the adoption of

new tools and technologies, the NTP will review and revise the existing guidelines and SOPs and will develop new policies, guidelines and manuals. Among other things, these will relate to DS-TB and DR-TB; mobile teams; TPT; the use of chest radiography and eR&R; data management; and mSupply (for township-level users). They will also include guidelines and manuals for CHWs.

Nurture engagement with existing and potential donors

The NTP will maintain and further strengthen engagement with the existing donors (for example, Global Fund, 3MDG and USAID) through the MHSCC. It will work together with the seven TSGs, including TB TSG, for this purpose. The NTP will engage with potential donors through the inclusion of TB in the areas of interest of other international donors (for example, World Bank, Department for International Development [DFID] and Asian Development Bank). It will also explore opportunities for obtaining support from cooperative sources.

Extend the reach of TB services

- The NTP will extend the reach of TB-related services to unreached areas and populations by establishing treatment and care centres (sanatorium model), recruiting CHWs and extending mobile X-ray services.
- It will provide standardized training packages to CHWs, introduce guidelines and SOPs for health care providers and establish a sputum transport system between townships and below-township level to extend the reach. It will pilot new approaches, build evidence, and ensure an evidence-to-policy pipeline involving partners to improve the access to TB services.

4.5 Secure finances to enable implementation of the NSP

Situational analysis

Government expenditure on health has grown from 0.2% of the GDP in 2009 to 1.2% in 2018.[35] The major source of finance for health care is the Government, though there are other sources, such as funding from development partners, external aid, loans and community contributions. The Government has increased both current and capital health spending annually. Its health expenditure increased from K 7688 million in 2000–01 to K 1 131 806 million in 2018–2019. The JMM noted that an increased proportion of domestic funding is imperative for expanding and sustaining the TB response. The MOHS is advised to set aside a small budget for TB activities alongside the existing streams of donor funding for a coordinated planning of activities. Global Fund plans must be aligned accordingly, with greater partner coordination at the subnational level. Since 2016, external donors have committed over K 3 300 000 million (US$ 22 million) to the health sector, especially for the strengthening of health systems. The increased funding for TB has enabled many international and national NGOs, as well as the NTP, to expand TB care and prevention activities.

Government financing is mostly in the areas of first- and second-line TB drugs, infrastructure and human resources. Since 2017, the MOHS has been procuring 100% of first-line TB drugs and 40% of second-line TB drugs and has instituted an effective procurement and distribution system. Notably, no stock-outs of drugs were observed by the JMM.

The MOHS has recently made all essential drugs available free-of-charge to patients through public facilities. This has helped to reduce out-of-pocket expenditure from approximately 90% of health spending (prior to 2013) to slightly more than 73% in 2016.[36] People are using public health services more than they did before. This stands to benefit TB care and prevention, provided that frontline health workers are alert to presumptive cases among those accessing care.

35 Myanmar National Health Policy 2020–2030, Ministry of Health and Sports (unpublished)

36 Out-of-pocket expenditure (% of current health expenditure) – Myanmar. World Health Organization Global Health database

TB diagnosis, including laboratory investigation, and treatment services are provided free of charge through public health facilities and donor-engaged private facilities (GPs and some private hospitals). However, social support is not available for all TB patients. Most DS-TB patients do not receive support, beyond transport costs. In some hard-to-reach areas, they do receive nutritional support, but it is arranged by partner organizations. The NTP has designed a standard package of support for MDR-TB patients.

The MOHS has endorsed a health financing system to support Myanmar's pursuit of UHC. It specifies the health financing reforms necessary to realize the NHP's objective of providing the EPHS for the entire population.

Challenges

Insufficient government contribution: Myanmar's national expenditure on health, which is 1.2% of its GDP, is still the lowest among the ASEAN countries. The current financing is insufficient to meet the committed targets and external funding will not be sufficient to reduce the financing gap. On the basis of the costing of this NSP and the operational budgets, it is estimated that the NTP needs approximately US$ 445 million for the period 2016–2020. With 37.5% of the population defined as poor, ensuring that funding benefits the poorest is desirable.

Limited financial management capacity at decentralized level: There is an increasing burden on TMOs to complete donor-specific planning, costing and budget reporting. Yet, the capacity for strategic planning and budgeting is insufficient at this level, as is the capacity to meet the requirement of multiple plans and parallel financial accounting systems.

Strategic approaches

- Increase government contribution to financing TB operational budget and build capacity for financial management, including compliance systems.
- Ensure financing for TB operational budget by nurturing existing donor relationships, leveraging non-TB-specific donor funding and mobilizing resources from local government and domestic private resources.
- Ensure financial and social protection through the national health insurance policy and multisectoral engagement.
- Establish and monitor a TB subaccount within the national health account.

Essential interventions

Advocate for Government commitment

- The NTP will advocate for Government commitment to full financing of anti-TB drugs and staffing for the TB response. The budgetary allocation for the TB response is expected to increase by >20% by 2025. The increased budgetary support will mainly cover first- and second-line anti-TB drugs, infrastructure, staff salaries for all positions, laboratory supplies and equipment.
- The NTP will also advocate for a strong MOHS leadership to harmonize donor and domestic financing and direct the use of funds. It will strive to protect the interests of the TB programme.

Strengthen MOHS capacity in management of public finance and grants

- The NTP will seek to build the capacity of MOHS staff in the areas of public financial management and

(https://data.worldbank.org/indicator/SH.XPD.OOPC.CH.ZS?locations=MM, accessed 24 June 2020)

grant management and to serve in the fund management body of the Government. This will be done in collaboration with other departments in the MOHS, donors and fund management agencies.

- The internal audit system will be strengthened and familiarized with external audit system and a compliance system will be established to manage funding of the national programme by external donors.

Ensure financing for TB operational budget

- The NTP will work to establish a financial protection mechanism for TB patients faced with catastrophic health-care expenditure. It will also ensure that reimbursement for TB services is incorporated in the national health insurance policy.
- It will ensure the integration of TB into other health programmes and projects (for example, TB/DM in the NCD programme). The NTP will engage with other ministries to provide social support to TB patients, some examples being the Ministry of Labour, Immigration and Population to prevent unwarranted unemployment and provide compensation for income loss, and the Ministry of Social Welfare, Relief and Resettlement to minimize transportation costs.
- The NTP will advocate for the mobilization of resources from the local government for patient care and social support and develop a scheme to improve treatment adherence and outcomes, especially in remote and hard-to-reach areas.

Conduct national TB expenditure assessment

- The NTP will conduct a national TB expenditure assessment in the second year (2022) of the new NSP.

Table 30. Indicators and targets for securing finances

Standard indicator	2015 (Benchmark)	2018 (Baseline)	Target				
			2021	2022	2023	2024	2025
Government contribution as a percentage of the total expenditure on TB	NA	14%	20%	>20%	>20%	>20%	>20%
Percentage of total TB budget not met (financing gap)	5%	37%	<10%	<10%	<10%	<10%	<10%
Percentage of total health expenditure accounted for by out-of-pocket expenditure	NA	NA	NA	NA	NA	NA	15%

5. Strategic direction 5: promote research and innovation and strengthen surveillance for programme monitoring and evaluation

The NTP will promote a research culture and capacity for research at different levels by providing the necessary support to build research capacity, conduct operational/implementation research and disseminate findings. A prioritized research agenda will be adopted, and will be reviewed and updated in accordance with the priority areas of the TB response. With the emerging new tools and strategies, the NTP will promote pilot studies. The programme's impact will be evaluated by nationwide periodic assessments. This NSP aims to strengthen the TB surveillance system through capacity-building of monitoring and evaluation personnel in electronic data management systems at all levels. The other steps to achieve this end will be the integration of a case-based registration system, strengthening of data quality control measures, and advocacy to improve the quality and increase the coverage of vital registration systems for TB. The NTP will make efforts to utilize the evidence available from the routine surveillance system and research findings in policy development and decision-making.

5.1 Strengthen research culture and capacity

Situation analysis

Myanmar has a culture of undertaking and using the findings of operations research. In 2015, a published annotated bibliography featured 242 TB-related operations research projects, which had been completed in Myanmar between 2007 and 2014. During 2015–2019, 210 TB research projects were conducted (Table 31). The MOHS has promoted a research culture by increasing its allocation of funds for implementation research and operational research since 2017. For the 2019–2020 budget year, the MOHS allotted 3 billion kyats for health research, including TB-related research.

The DMR is planning to establish a research training centre at its Pyin Oo Lwin branch with the aim of promoting a research culture and strengthening the research capacity of the MOHS and the implementing partners. It is already providing technical assistance through its involvement in collaborative research projects undertaken by the NTP and its partners.

Table 31. TB research activity during 2015–2019

Theme of research	Number
TB diagnosis and case-finding	81
Care, treatment and social protection for TB patients	52
TB prevention and infection control	28
Integration, partnership and community engagement	13
TB among marginalized and high-risk populations	36
Total	**210**
Type of dissemination	**Number**
1. Publications in international journals	72
2. Publications in local journals	21
3. Postgraduate theses	30
4.Presentations (oral and poster) in international conferences	20
5. Presentations (oral and poster) in local conferences	67
Total	**210**

During the previous NSP period, there was a total of 210 TB-related publications and presentations. Seventy-two articles were published in international journals and 21 in local scientific journals by the NTP or TB partners. Regarding abstracts (oral or poster presentations), 20 were accepted in international conferences and 67 in local conferences. Thirty postgraduate theses on TB-related topics were disseminated by medical universities and academic institutions.

Efforts to increase the research capacity of the NTP were intensified through the initiation of the Structured Operational Research and Training Initiative (SORT IT) by the DMR, with the support of TDR, the Special Programme for Research and Training in Tropical Diseases co-sponsored by WHO, UNICEF, UNDP and the World Bank, in 2015. Since then, the DMR and DOPH have been conducting SORT IT courses with the support of The Union and funding support from the DFID. Between 2016 and 2019, four cycles of SORT IT training were conducted and 12 NTP staff trained.

In addition to SORT IT, the DMR provides regular research training, such as on research methodology, qualitative methods for health research, essential statistics for health research and effective presentation of health data. Some NTP staff members have participated in international, regional and national research conferences, such as Union World Conferences on Lung Health.

Challenges

Lack of sustainable funding: For training to be sustainable, it is essential to secure funding by the time the current support ends.

Lack of support to trained staff: The NTP has faced problems in retaining trained staff. It is necessary to consider the career path of trained staff. There is no formal or well-defined mechanism to provide financial, technical and administrative support to young researchers for the dissemination of research findings in conferences and publication in journals.

Limited number of studies after training: Great efforts have been made to build the research capacity of the NTP staff in the past five years. However, the NTP has initiated a very limited number of studies, despite the presence of funding opportunities and supportive institutions.

Lack of skills and capacity: Even though health professionals understand the benefits of research, they lack the skills and capacity to conduct research.

Strategic approaches

- Provide technical, financial and administrative support to researchers by promoting a research culture and creating opportunities to conduct research and disseminate research findings.
- Collaborate with the DMR and partners on building research capacity through training and mentorship programmes.

Essential interventions

Promote research culture by providing support for research and participation in conferences

- There are several financial support mechanisms, both domestic and international, for health research. However, research opportunities are still limited to the prioritized research agenda of the TB programme. The NTP, in collaboration with the DMR and partners, will use the financial support available to promote the prioritized research agenda and will advocate for additional funding for research and related training. There is a research subgroup under the TSG. Strengthening of this group will allow for the coordination and tracking of the research-related activities being conducted in Myanmar. It will also help in overseeing opportunities for presenting research findings at international conferences. This will keep health professionals informed and motivated.

- The NTP, in collaboration with the DMR, MMA or partners, will organize a national TB symposium at least once every two years to accelerate the implementation of TB research, and disseminate local evidence for better policy and practice. Not only researchers, but health practitioners too should be able to participate in the symposia, which should help to promote a research culture among them.
- In collaboration with the DMR and partners, the NTP will arrange for young researchers from the NTP and academic institutions to receive technical, financial and administrative support. The NTP will encourage them to conduct TB research and present their findings in international, regional and national conferences. Disseminating their research findings in conferences and publishing articles in peer-reviewed journals would help contribute to regional and global TB research.

Strengthen research capacity for implementation and operations research

- The NTP will encourage newly recruited disease control team leaders (integrated) at the township level and team leaders (TB) at the district level and above to participate in short courses (at least 3–5 days) on basic research methodology. This could be regular DMR training or training organized specifically by the NTP in collaboration with the DMR and partners. The team leaders will be encouraged to share their research with their staff to strengthen research capacity at all levels.
- The demand for qualitative research has been increasing. The NTP will organize training courses on qualitative research methods. These could be regular DMR training or training organized specifically by the NTP in collaboration with the DMR and partners.
- The NTP and DMR have been mentoring and providing intensive training to TB staff to design and implement operations research, using the SORT IT model, in collaboration with TDR and The Union. However, in order to ensure sustainability, the NTP and DMR will establish a similar domestic model, which will be essential for developing the capacity of young researchers and generating local evidence for better policy and practice. The NTP will provide the necessary support to accelerate the implementation of research in collaboration with the DMR and partners.

Table 32. Indicators and targets for operational/implementation research

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
Number of TB-related operational/ implementation research studies conducted and disseminated	NA	NA	10	12	14	16	18
Number of TB-related operational/ implementation research studies published locally or internationally	NA	NA	5	6	7	8	9
Percentage of districts with at least one TB staff member trained in operational/implementation research	10% (S/R)	15%	40%	60%	80%	100%	100%
Number of TB staff members trained in operational/implementation research	NA	20	15	15	15	15	15

5.2 Implement updated, prioritized research agenda

Situational analysis

In close collaboration with the DMR and partners, the NTP developed a prioritized TB research agenda in 2017. The agenda included 38 topics for operational research across eight themes:

- accelerated case-finding
- TB/DR-TB diagnosis
- MDR-TB management
- TB/HIV
- public–private/public–public mix
- community engagement
- TB care in special populations
- TB epidemiology.

In 2019, research on 22 of the 38 priority topics was completed. Research is ongoing on six of the remaining 14 topics, and is yet to be started on eight. Apart from this, several TB-related research studies have been conducted and published in peer-reviewed national and international scientific journals.

Table 33: Current status of research agenda prioritized in 2017

SN	Research agenda	Methodology	Investigator
	Remaining		
1	Acceptance of and barriers to utilization of IPT by providers and patients	Qualitative study	NTP
2	Data quality and challenges in implementation of DHIS2	Qualitative and cross-sectional assessment	NTP
3	Assessment of data quality in recording and reporting system of TB cases managed under PPM projects	Observational/ cross-sectional study	NTP
4	Readiness for and feasibility of establishing sputum collection centres in Naga area	Qualitative study	Implementing partners (MAM)
	Ongoing		
1	Effectiveness, quality and cost-effectiveness of centres of excellence for MDR-TB diagnosis and management at the district level	Cluster randomized intervention study	NTP
2	Barriers to and enablers of sustaining participation of microscopy centres in EQA and factors contributing to the quality of microscopy centres	Qualitative study	DMR (MOHS implementation research grant)
3	Barriers to provision of IPT to children under 5 years of age who are household contacts of sputum smear-positive pulmonary TB cases	Quanti-qualitative study	UM (1) MPTM student

4	Follow-up of communities of National TB Prevalence Survey (2017–2018)	Prospective cohort study	To be undertaken by the NTP at a later date
5	Prevalence and resistance patterns of MDR-TB among migrant populations	Cross-sectional study	NTP
6	Pilot/feasibility study on establishing TB surveillance systems in private hospitals	Cross-sectional study	NTP/implementing partners (MMA)
	Planned		
1	Practical linkage system between BHS and volunteers in TB control activities	Intervention research	NTP
2	Feasibility of engaging self-help groups in TB services	Cross-sectional study, mixed method	DMR
3	Designing locally applicable strategies for TB prevention and control for EHOs	Qualitative study	DMR/medical universities
4	Early TB case detection and perception of TB among workers of transportation services in Yangon region	Cross-sectional study/ qualitative study	NTP/ academic institutions

The NTP has a flexible approach to the adoption of new tools and technology for patient-centred prevention and care of TB, after careful consideration. Updated global policies and guidelines are shared among the TSG members and presentations made at TSG meetings for further discussion and arrival at a consensus. The NTP conducts small-scale studies with the approval of the institutional ethical review committees after the relevant working groups give it the go ahead. The NTP and TSG review evidence from small-scale studies in combination with the logistic requirements in order to update technical policies.

In addition to the studies already mentioned, the NTP has conducted periodic surveys to assess the ground reality and these will be utilized to develop better TB policies and practices. A knowledge, attitudes and practice survey was conducted in 2009, a patient cost survey in 2015–2016, and a national mortality survey in 2017. A national prevalence survey was conducted in 2018. Further, a national drug resistance survey is expected to be completed in 2020.

Challenges

Limited number of research projects conducted by NTP staff: Due to conflicting priorities, only a limited number of NTP staff are able to undertake research, even after being given research training.

Lengthy approval process: The approval of research protocols in general takes a long time and the mechanisms for undertaking research on TB are not always supportive.

Weak monitoring mechanism to track research: There is no proper mechanism to track the completed, planned and future TB research listed in the prioritized research agenda.

Strategic approaches

- Prepare and implement a new prioritized research agenda based on the TB programme review and the latest research priority list in line with END TB Strategy and NHP.
- Systematically evaluate the appropriateness of new technologies and tools for adoption and implementation through pilot projects and TSG review.
- Conduct periodic operational research to assess programmatic impact.

Essential interventions

Fulfil remaining and new prioritized research agenda

- The NTP would like to promote a prioritized research agenda for the next five years after consultation with the TSG. This may include: TB diagnosis and active case-finding; TB care, treatment and social protection; TB prevention and infection control; integration, partnership and community engagement; TB in marginalized and high-risk populations; and adoption and implementation of new tools/technologies.
- The NTP will organize a workshop with the DMR and partner organizations and experts to develop a new agenda, which will include both new and remaining priorities. The prioritized topics will be reviewed and updated annually in consultation with the TSG.
- The NTP will facilitate research on the prioritized topics in the agenda. It will coordinate and provide technical assistance during protocol development. The technical review of the protocols submitted will be conducted by the TB TSG, while ethical clearance will be provided by the Ethical Review Board/Committee of the DMR (or DOPH or academic institutions). Monitoring of the research activities will be undertaken by the research working group of the TSG, in close collaboration with the DMR.

Promote pilot studies for adoption and roll-out of new tools/technologies

- The NTP will promote pilot studies on new tools/technologies. The findings of these studies would facilitate the adoption and implementation of the tools and technologies listed below.

  New tools: Xpert MTB/XDR, WGS

  e-health: electronic data management system, artificial intelligence for diagnosis (for example, digital CXR interpretation), electronic monitoring system for culture and sensitivity test, VOT, GIS for contact tracing

  New treatment regimen: injection-free shorter MDR-TB regimen, injection-free longer MDR-TB regimen

  New strategy: EQA system for CXR

Conduct nationwide assessments to evaluate programmatic impact

- The NTP will conduct surveys which will complement routine surveillance by providing a longer-term view of programmatic impact. The NTP will also benefit from evidence generated by wider health sector surveys that inform the NTP about the health services and social protection for patients in the country. The NTP plans to conduct the following surveys in the next five years:
  - KAP survey (2021–2022)
  - TB patient cost survey (2022–2023)
  - TB-specific mortality survey (2023–2024)
  - National drug resistance survey (2024–2025)
  - TB prevalence survey (2025–2026)

5.3 Strengthen surveillance system

Situational analysis

Data relevant to monitoring the performance of the TB programme are routinely reported from all BMUs on a quarterly and annual basis. Data are collected and compiled at the township level, which is the most basic reporting level, and reports are sent to the regional/state level and then to the central level. The BMUs of implementing partners and PPM report directly to the central level, with a copy to the TMO and regional/state TB officer. The performance and impact of TB activities across the country are assessed at the central level.

In 2017, the NTP began the nationwide coverage of the DHIS2 by health management information system (HMIS) and aggregated data entry in the DHIS2 quarterly/annual report. Data extraction and official reporting of TB notification, treatment outcome, TB/HIV collaborative activities and MDR-TB activities in the DHIS2 of all states and regions was launched in 2019. Other TB-related reports are not included in the DHIS2 yet, so these reports are sent via mail to the central NTP, where they are verified, computerized and evaluated. After the evaluation, clarifications are sought and feedbacks given to the states and regions.

The case-based reporting system is in the introductory phase. Currently, two types of systems are being used for DS-TB – Excel-based and web-based. The Excel system is a stand-alone system (includes TB register sheet and quarterly report sheet) and is being implemented in half of the townships. The web-based system was piloted in Mon in 2019, and has been expanded to Shan (South) and the whole of Mon. Some partners (for example, PSI, MSF and JICA) have piloted various case-based data management systems. OpenMRS, an open-source case-based recording software has been introduced in 46 MDR-TB sites, covering 90% of MDR-TB cases.[37] Currently, the case-based systems are not linked to the DHIS2. The alignment of vertical reporting systems with the national HIS is considered as the core objective of the HIS strategic plan (2017–2021).[38] For interoperability between case-based systems and linkage to the aggregate system, the Master Patient Index (MPI) or Client Registry was piloted.

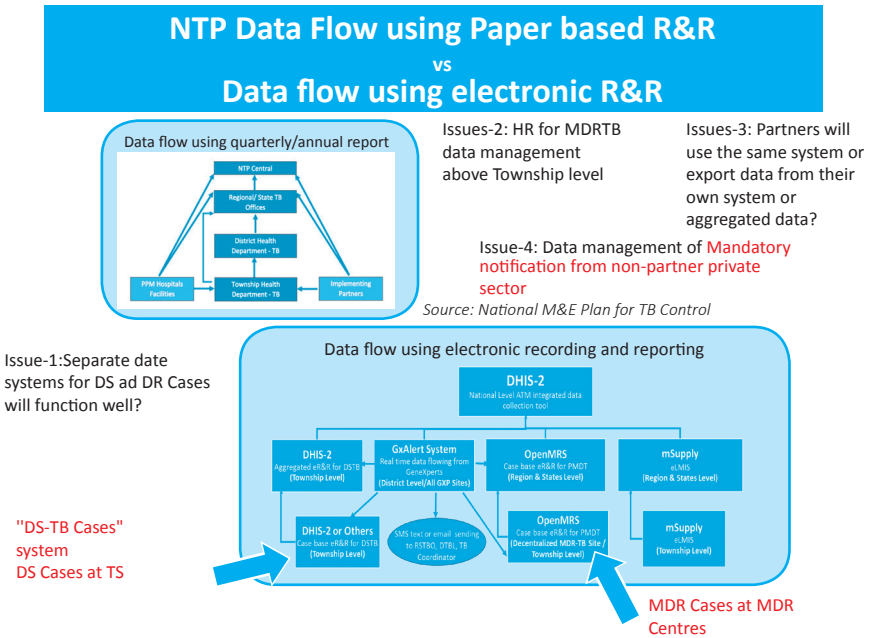

Fig. 28. Paper-based to electronic system: transition and challenges

The NTP has been conducting routine data quality assessments (DQAs) at the township and district levels

37 Draft 6th Joint Monitoring Mission Report, WHO, 2019

38 Health Information System Strategic Plan (2017-2021), MOHS, 2017

(quarterly) and at the central and state/region levels (annually), as part of supportive supervision visits. Data validation meetings and quarterly data review meetings are held at the district level. However, DQA visits by the NTP are not monitored systematically. The current HIS plan (2017-2021) of the MOHS is to adopt the WHO DQA tool to conduct annual assessment of data reported by facilities in their monthly reports.[45] The integration of WHO DQA tool into TB DHIS2 system needs to be carried out.

As for vital registration, 60% of deaths were registered in 2017, of which 75% had usable COD information (consistent with ICD10). The HIS department of the MOHS and the HIS technical working group are implementing activities to achieve the 2021 targets. [45]

Challenges

System to record new TB-related variables below par: More variables have to be incorporated into the existing system, together with the standardized indicator definitions, to meet the needs of intensified case-finding activities among specific high-risk populations (for example, those with comorbidities and migrants).

Limited human resource capacity for monitoring and evaluation: A major constraint for data management is the shortage of human resources in the NTP. Virtually all personnel engaged in data management at the state/region level are seconded staff. Other obstacles are the lack of basic knowledge of computers, high staff turnover and overworked staff in townships (which are the BMUs for TB).

Weaknesses in data analysis and use: Due to limited human resources and limited capacity, data analysis at the township level is conducted for reporting purposes and not usually utilized to guide programme decisions and actions.

Lack of standardized case-based recording and reporting: The two case-based reporting systems for DS-TB and Open MRS for DR-TB are stand-alone systems, which are not linked with each other. Further, there is no system to integrate them into DHIS2. Moreover, various implementing partners are using different systems. As a result, the essential data for TB surveillance is incomplete, the definitions of indicators are inconsistent and analysis becomes time-consuming.

Weak data and reporting from townships: Due to local security issues and infrastructural constraints, some townships face hurdles in recording and reporting. This needs to be addressed when the security situation improves. The monitoring and evaluation system in these areas will have to be strengthened in collaboration with other implementing partners and ECBHOs.

Strategic approaches

- Implement the revised National Monitoring and Evaluation Plan for TB to strengthen the existing TB surveillance system and expand the strategy to cover surveillance of TB disease among TB/DM patients, regional migrants, the elderly, prisoners and people who use/inject drugs.
- Enhance the capacity of staff at all levels in the areas of data management, data quality practices, and analysis and utilization of data.
- Effect a transition from a paper-based to an electronic-based data management system and ensure systematic linkages between the components of the open Health Information Exchange.
- Review and improve the vital registration system for more consistent recording and better capture of TB-related deaths in collaboration with the HMIS, eHealth, Department of Medical Services and Central Statistical Organization.

Essential interventions

Strengthen TB surveillance system at all BMUs

- As the National Monitoring and Evaluation Plan for TB is the core document that defines what is to be monitored and how it is to be monitored with respect to the national TB programme. It will be revised in line with the NSP, NHP, HMIS policy and the global End TB Strategy. The core indicators will be defined clearly. The data sources for the indicators, such as recording, and reporting forms/registers, will be updated and revised to capture essential information. The standardized and up-to-date revised recording and reporting forms/registers will be disseminated, and their availability and use will be ensured.

- DQA is essential to improve the timeliness of the submission of data, and the completeness, consistency and accuracy of data at all BMUs. The NTP will review the existing DQA tools and standardize them for nationwide use. DQA will be incorporated into the cascade of supportive supervision. With the integration of DHIS2, the new tools for ensuring data quality will be considered as a part of routine DQA practices. Data will be validated and reviewed routinely at different levels.

- The NTP will revise the training curriculum for monitoring and evaluation and for DQA. It will also provide ToT, and multiplier and refresher training on new reporting and recording forms and DQA tools. As a part of post-training monitoring, supportive supervision visits and workshops on data validation and quality assurance will be conducted at least once a year. The trained staff will receive immediate feedback onsite. Some of the staff will also be sent for international workshops/training to strengthen the capacity for monitoring and evaluation.

- A TB monitoring and evaluation team, including focal persons from different areas/levels, will be formed to oversee all aspects of TB data management. In addition, the national task force for monitoring and evaluation and research will have to be revitalized to improve the capacity at every level.

- It is clear that the NTP needs to continue with its basic approach to the prevention and control of TB, but it must also consider special approaches to tackle TB among high-risk groups, such as diabetics, the elderly, regional migrants, prisoners and people who use/inject drugs. The NTP will establish a new sentinel surveillance system for TB among these high-risk populations.

Strengthen electronic data management system

- The NTP and its partners have already piloted electronic data management systems, using various platforms. However, there is a need to plan a transition from paper-based to electronic data management systems. The matter should be discussed with all the stakeholders working for the TB programme to facilitate a proper step-wise roll-out of electronic systems. To effect a smooth transition, the electronic data system will be in line with the paper-based system. It will also be in line with the National Monitoring and Evaluation Plan and the National Data Management and Security Policy developed by the MOHS.

- The NTP will facilitate the phased roll-out of eR&R for a DS-TB case-based data management system. This will make real-time evaluation of the programme's performance possible at all levels. A fully electronic system will yield a robust database with comprehensive parameters of patients and automated analytic functions. It will have key performance indicators, to aid in the utilization of the data. The NTP will review the various existing systems for consistency, and ensure that all systems satisfy the national minimum requirements for the establishment of a national standardized case-based data management system.

- Different platforms of electronic health information systems are in use to support different aspects of the TB programme, such as case notification, management of laboratory information, manage-

ment of patients, and surveillance and supply chain management. The existing systems related to the TB programme are listed below.

- DHIS2
- OpenMRS
- mSupply
- eR&R for DS-TB case-based data management
- GxAlert
- Unique identifier (MPI)
- aDSM
- Mandatory case notification
- LIMS

Linkages and interoperability among these will be systematized for more effective programme management.

Strengthen vital registration for recording TB-related deaths

Capturing accurate information on TB-related deaths remains a challenge as the information on death is captured by the national vital registration system, which is limited. To have more accurate information on TB-related deaths, the NTP will advocate for improvement in the quality and coverage of the vital registration system, in collaboration with the DMS and Central Statistical Organization.

Table 34. Indicators and targets for surveillance

Standard indicator	2015 (Benchmark)	2019 (Baseline)	Target				
			2021	2022	2023	2024	2025
Percentage of HMIS or other routine reporting units submitting timely reports according to national guidelines	92%	97%	97%	97%	97%	98%	100%
Percentage of townships implementing annual data quality assessment using WHO DQA tools	7%	NA	75%	80%	85%	95%	100%
Percentage of townships using case-based data management system	NA	76% (districts)	80%	85%	90%	95%	100%

5.4 Build evidence to update policies and design interventions

Situational analysis

Aggregated data is produced automatically from regular reports covering all essential TB indicators in line with the requirements of the Global TB Report. Operational research and periodic surveys complement routine surveillance data, providing a longer-term view of programmatic impact. The NTP also benefits from the evidence generated by wider health sector surveys that inform the NTP about the health services and patient

demand in the country. The findings of previous nationwide surveys conducted by the MOHS and NTP have been used for the development of SOPs, guidelines and strategic plans.

These streams of resources enable the NTP to track its inputs, activities, outputs, outcomes and impact of this strategic plan according to the monitoring and evaluation framework. However, appropriate and effective strategies and plans are developed on the basis of the data and research findings only at the central level. The regional/state level is mainly responsible for collecting and validating data received from the BMUs and submitting the data to the central level. The development of subnational plans has started only in the Yangon, Ayeyarwaddy, and Bago Regions in 2019, so there is a need to start the process of data utilization at the state/regional level. Another problem is that epidemiological estimation and mathematical modelling based on the data still depends on external assistance.

Challenges

Inadequate utilization of research findings: Research findings can be helpful in evaluating programme implementation and effective planning, and qualitative research findings can throw light on routine data analysis. However, there has been very limited utilization of research findings in making decisions and developing plans at different levels, though dozens of research articles were published and their findings disseminated.

Low participation of stakeholders: The NTP needs to get more feedback from stakeholders for routine data review and analysis to develop a comprehensive plan. The participation of stakeholders is also needed to promote management processes.

Low data utilization at subnational level: The utilization of data at the regional/state level is limited due to the constraints of human resources, capacity and frequent turnover of staff, though there has been a dramatic improvement in the surveillance system. Conducting regular training on data interpretation and visualization cannot overcome all the constraints.

Need for standardized monitoring tool: The use of standardized monitoring tools such as dashboard can make the tasks of monitoring and evaluation, as well as data analysis easier. Technical support will be needed to adapt such tools to be in line with the standard indicators.

Strategic approaches

- Promote the use of epidemiological data and research findings at the subnational level to develop evidence-based operational plans and practices for intersectoral collaboration.
- Emphasize capacity-building of staff at the township level in computer literacy and analysing and interpreting routine data to support the development of ITHPs.
- Develop a standardized monitoring tool for the effective analysis, evaluation and utilization of routine data at all levels.

Essential interventions

Promote utilization of data and research evidence

- The NTP and DMR will promote the nationwide dissemination and application of research findings by publishing a national bibliography of and organizing workshops on these findings not only at the central level, but also at the subnational level.
- The collaboration between the NTP and researchers (academic institutions, international partners) will be strengthened to conduct operational research and apply the findings of such research to practice and policy.

- The NTP will facilitate the participation of its staff in workshops and trainings organized by the DMR for translating research and programmatic data into policy and practice.
- It will encourage and assist the staff at the subnational level to use surveillance data and research findings to develop operational plans that reflect the local needs voiced by the stakeholders. The NTP will try to mobilize funding support at the central and subnational levesl to implement the subnational operational plans.

Empower township-level staff to utilize data

- The NTP will provide technical support to the staff at the township level to analyse and interpret routine surveillance data. It will also offer assistance to improve the computer literacy of the staff.
- The NTP will facilitate the adoption of standardized monitoring tools such as dashboard in the DHIS2 to assist the staff in monitoring, analysing, and interpreting data.
- It will encourage and assist the staff at the township level to utilize routine surveillance data for developing township microplans and ITHPs.

ANNEXES

Annex 1. Technical assistance

Overview

WHO is the leading provider of technical support to the NTP in all aspects of TB care and prevention. It also supports the coordination of all organizations involved in TB care and prevention in the country to ensure that the NSP is implemented in line with the End TB Strategy and the international standards for TB diagnosis, treatment and care are followed. WHO has been functioning as the secretariat of TB TSG under the Myanmar Health Sector Coordination Committee.

During the last eight years, the Global Fund has emerged as the principal funding source for TB care and prevention in Myanmar. Significant funding was also provided by the 3MDG, the main support of which came to an end in 2018 and which has been succeeded by the Access to Health Fund. The following agencies have provided regular technical assistance for TB care and control during the last few years: MSF-Holland, JICA, Global Drug Facility and USAID.

Financial resources received by WHO from the Global Fund for TB care and prevention will cover technical assistance. The bulk of the funds will be earmarked to manage a network of international and national professionals to support the NTP. WHO also mobilizes resources from its Regional Office for South-East Asia and headquarters in Geneva, and receives funding from various bilateral and multilateral donors. Currently, the Global Fund's contribution fully complements the inputs from other funding sources, such as USAID (for staff and for technical assistance to fight MDR-TB), Access to Health Fund (for active case detection in Yangon), and WHO's own regular budget (for capacity-building of the NTP).

The provision of technical assistance by WHO is aimed at supporting all areas of TB care and control, mainly through a network of international and national professionals, including service contract holders. These professionals tackle TB care and prevention comprehensively. At the central level, their work is more strategic, while the network of national professionals are involved more in operational matters. The technical support is intended to augment the capacity of the country, in particular, that of the NTP and other implementing partners, to facilitate a coordinated national response against tuberculosis and as such, WHO activities cut across all the objectives of the NSP. In the last few years, the main areas of technical assistance have been: developing policy and strategy; adopting, adapting and disseminating the WHO guidelines; organizing annual missions on DR-TB by the rGLC; and designing, monitoring and analysing national surveys, such as on TB prevalence and the costs incurred by patients. WHO also organized the JMM in August 2019.

USAID has been providing technical assistance mostly through NGOs. In 2017, one adviser on the case management of MDR-TB was deputed for the NTP (in Yangon). The Challenge TB Project of FHI360 came to an end in 2019, and the Infectious Disease Detection Surveillance (IDDS) is now looking for ways and means of supporting the NTRL, which had been supported by Challenge TB till 2019. Chemonics International Inc. has been taking the lead in strengthening procurement supply management. The Clinton Health Access Initiative (CHAI) has been showing the way in the introduction and dissemination of OpenMRS for recording and reporting of MDR-TB cases. USAID also provides funds for technical assistance through the Access to Health Fund and WHO.

Japan is a long-term partner of the NTP. Though there has been a decrease in TB-specific technical assistance in the last five years, JICA and RIT/JATA have been providing technical assistance for capacity development. This includes conducting international TB courses and introducing new technologies and national surveys.

International NGOs, such as MSF and the UNION, have played a pioneering role in the expansion of TB care and prevention beyond basic DOT, such as the clinical management of TB/HIV and MDR-TB cases.

Quite a few other implementing partners also offer technical assistance through the staff at their headquarters and consultants, providing opportunities for the capacity-building of the staff of NTP and other partners.

National professional associations are developing the capacity of local professionals through their nationwide network.

In addition to technical assistance from the traditional partners, there are some new or emerging partners. This assistance is provided on the basis of MOUs with the MOHS, and information is shared through expanded meetings of the TB TSG. The other avenues include the direct provision of technical assistance and training courses by the Global Fund and its principal recipients (PRs), and technical assistance provided by the French 10% initiative.

Table A1.1. Technical assistance areas of WHO

Area	Support for current NSP	Potential support for new NSP
Policy, strategy and guidelines	NSP development and dissemination (2016, 2019–2020) GF concept note (2017, 2020) Introduction, adoption, adaption and dissemination of WHO guidelines	NSP revision (2023) GF concept note (2023 for 2024–2026) Diagnostic algorithm – role of CXR and remote diagnosis/CAD
Coordination	TB TSG secretariat MHSCC consultant	Continue with new structure of TB TSG secretariat MAF MHSCC to be decided
Monitoring and evaluation	MAF JMM (2019) EPI review (2017–2018)	MAF JMM (second half of 2022) EPI review (first half of 2022) Benchmark assessment (2025)
National surveys	Patients' cost survey (2015–2016) TB Prevalence Survey (2017–2019) National Drug Resistant TB Survey (2019–2020)	Patients' cost survey (2021) DR-TB sentinel surveillance system (2021) TB prevalence survey in 2025? May decide in 2022 on a 2024–2026 GF cycle
PMDT	rGLC PMDT annual mission	rGLC annual mission Review of new regimens XDR-TB management
Active case detection, TB in high-risk populations	Impact assessment Urban TB TB among migrants	Continue with the existing activities
TB/HIV	TB/HIV, LTBI	Continue with HIV team
PPM, mandatory case notification	Mandatory case notification	Continue
Surveillance	Standard and benchmark analysis (2017) e-surveillance (DHIS2 and case-based notification)	Standard and benchmark analysis (late 2021 or early 2022) e-surveillance – DQA
Laboratory	SRL collaborations, GLI missions, regional training	SRL collaborations, international training (Regional Office)
LTBI treatment	Pilot implementation research on shorter TPT (3HP) in Mandalay Region (2020)	Policy revision, expansion

Table A1. 2. Assistance for SD 1: progress towards achieving universal access to TB care and prevention

Technical area	Support for current NSP	Potential support for new NSP	Organization
Programmatic management of DR-TB	rGLC PMDT annual mission	rGLC annual mission Review of new regimens XDR management	WHO
Programmatic management of DR-TB	Advisor stationed for clinical management (STAR) Challenge TB: aDSM, infection control	Continue with stationed advisor model and add an MDR-TB advisor	USAID
Programmatic management of DR-TB	A clinical course on DR-TB was started in 2016–2017, but had to be discontinued due to a cut in funding.	Explore availability of funds	The Union
Paediatric TB	Challenge TB: development of guidelines	No plan to support in this area	USAID
Integrated services for TB and HIV	TB/HIV	Continue with HIV team.	WHO
Human resource capacity of laboratories	SRL collaborations, GLI missions, regional training	SRL collaborations, international training (Regional Office)	WHO
Quality-assured TB diagnostic services	Challenge TB: NTRL capacity (ISO)	IDDS	USAID
Quality-assured TB diagnostic services	Xpert EQA handed over	Antimicrobial resistance	US-CDC
Quality-assured TB diagnostic services	EQA for Xpert (with US-CDC) handed over to NTRL	Hand over to NTRL and will provide technical assistance	JICA
Quality-assured TB diagnostic services	Training and QA system		French Initiative
Recording and reporting system for laboratories	CHAI: Gene Alert data network of GeneXpert nationwide GeneXpert Ultra data utilization LIMS for GeneXpert test results	Continue support on LIMS	USAID
Recording and reporting system for laboratories	Q-code system	Continue support for Q-code system for laboratory information and clinical management information	JICA
Implementation research for new diagnostics	Xpert Ultra study		FIND

Table A1.3. Assistance for SD 2: Reach the unreached populations and accelerate a coordinated TB response

Technical area	Support for current NSP	Potential support for new NSP	Organization
Targeted actions to reach marginalized and at-risk population (urban, migrants)	CBTBC CXR TB-LAMP with test kits in 2 townships TB-LAMP with 500 test kits/ month for 2 mobile teams (YGN)	CBTBC CXR	WHO JATA and RIT MMA PSI MATA Pyi Gyi Khin
Targeted actions to reach marginalized and at-risk population (factory workers)		Support active case-finding through empowerment of women in Yangon region Provide digital X-ray and scale-up of Ultra in Yangon region	USAID CHAI
Targeted actions to reach marginalized (PWID) and at-risk population (migrants)	Draft of policy brief on migrants' health submitted to IRD, MOHS and NTP "Situational analysis for migrants (including TB)" report submitted; dissemination in December 2019 Reaching the unreached including PWID	Support formulation of policy Reaching the unreached including PWID	IOM AHRN
LTBI	Pilot implementation research on shorter TPT (3HP) in Mandalay Region (2020)	Policy revision, expansion policy development, treatment algorithms	WHO

Table A1.4. Assistance for SD 3: Expand partnerships and community engagement, and improve communications

Technical area	Support for current NSP	Potential support for new NSP	Organization
Engage all care providers	Mandatory case notification	Continue	WHO

Table A1.5. Assistance for SD 4: Strengthen systems and update policies for a multisectoral TB response

Technical area	Support for current NSP	Potential support for new NSP	Organization
Development of policy and guidelines	Development and dissemination of NSP (2016, 2019–2020) GF concept note (2017, 2020) Adoption, adaptation and dissemination of WHO guidelines	NSP revision (2023) GF concept note (2023 for 2024–2026) Diagnostic algorithm – CXR and remote diagnosis/CAD	WHO
Strengthen systems and develop policies	TB TSG secretariat MHSCC consultant	Continue with new structure of TB TSG MHSCC: TBD	WHO
Coordinated multisectoral response	Develop MAF JMM (2019)	Continue with MAF JMM (second half 2022)	WHO
Coordinated multisectoral response	Fund management **PR UNOPS**: Direct TA to NTP **PR-SC**: Indirect TA support via SR, i.e., PSI	Support for prioritized areas of technical assistance for monitoring and evaluation **PR UNOPS**: Programme reviews at central, state/region and district levels Surveys (e.g., prevalence survey/DRS) **PR-SC**: Not planned yet	GF PRs
Human resources capacity-building	Training of programme managers, laboratories, clinicians, etc.	Continue	JICA and RIT
Quality-assured, safe, effective and economical supplies	PSM	LMIS Quantification/forecasting Stock monitoring/early warning system	USAID Chemonics
Quality-assured, safe, effective and economical supplies	Periodic missions	Periodic missions	GDF STOP TB Partnership

Table A1.6. Assistance for SD 5: Promote research and innovation and strengthen surveillance

Technical area	Support for current NSP	Potential support for new NSP	Organization
Surveillance system at all BMUs	Standard and benchmark analysis (2017) e-Surveillance of DHIS2 and case-based notification EPI review (2017–2018)	Standard and benchmark analysis (late 2021 or early 2022) e-Surveillance for DQA EPI review (first half of 2022) Benchmark assessment (2025)	WHO
Electronic data management system	Expansion of OpenMRS to all MDR-TB centres (90% of data on MDR-TB management has been registered electronically)	OpenMRS scale-up to all MDR-TB centres, interoperability with DHIS 2	WHO CHAI
Utilization of research evidence for policy development and decision-making	ACF cost-effectiveness study		WHO Challenge TB USAID
Utilization of data and research evidence for policy development and decision-making		Data utilization for quality of care, programme management and monitoring and evaluation	WHO CHAI
Utilization of data and research evidence for policy development and decision-making		TIME modelling	WHO GF Geneva London School of Hygiene and Tropical Medicine
Routine surveillance	Data management		WHO US-CDC
Research capacity, operational research	SORT IT		WHO The UNION/ TDR
Research capacity	Study design and analysis	Continue	WHO JATA and RIT
Routine surveillance	TB Prevalence Survey (2017–2019) Patients' cost survey (2015–2016) National Drug Resistant TB Survey (2019–2020)	TB prevalence survey (2025)? (May decide in 2022 for 2024–2026 GF cycle) Patients' cost survey (2021) DR-TB sentinel surveillance (2021)	WHO

Human resources support through donors and implementing partners

Human resources support at the operational level by seconded staff from partners plays an essential role in expanding and maintaining quality TB services by the NTP. In 2019, more than 200 personnel were seconded to support day-to-day service. The expansion of PMDT, active case detection and e-recording and reporting have created greater demands for HR support. Laboratory technicians and data assistants are the two main cadres sustained by support from partners across the country. In addition, clinical service for MDR-TB in Yangon, which accounts for nearly 50% of the MDR-TB burden in the country, has been expanded and sustained by staff recruited through partners. Further, 13 ACF mobile teams of the NTP with CXR facility have seconded staff, while 9 teams are managed by implementing partners.

An important strategic area of this NSP is to recruit additional helping hands and essential seconded staff to foster the development and retention of the workforce. In collaboration with WHO, GF-UNOPS and the Access to Health Fund-UNOPS, the NTP will identify and prioritize the areas that need to be covered.

The MOHS has a plan to recruit, train (non-TB-specific) and assign 350 laboratory technicians. As the newly developed course of medical recording begins to produce graduates, the human resources situation is expected to improve at the implementation level. However, there is still a need to continue and expand support for human resources in TB services under this NSP to assure quality service for the achievement of the End TB Strategy. The situation regarding human resources in TB services should be carefully reviewed in a few years (maybe 2022) to plan for further support in this area. As the JMM discussed and recommended, it is important to develop a task shift plan so that the NTP's core staff at the state and regional levels can concentrate on the NTP's core work. Clinical work and accelerated case detection should be decentralized or delegated. The human resources challenge of laboratories should not become a bottleneck in patient-centred care.

Table A1.7. Central, state/regional staff through WHO

Category	Number
National technical officers (NTO) for central NTP	3
NTOs for states and regions	17
Medical technologists, senior laboratory technicians	12
Data assistants	18
Logistics Assistants, engineers	4
Others	2

Table A1.8. Operational level staff through partners

Category	Number	Partner
Laboratory technicians	24	MMA
Data assistants	10	MMA (1), The Union (9)
Monitoring and evaluation coordinators	15	Pyi Gyi Khin
Medical officers (MDR-TB)	4	The Union
Drivers	2	The Union (2)

Table A1.9. Staff for Yangon MDR-TB response

Category	Number	Partner
Psychiatrists	1	MHAA
Medical officers (MDR-TB)	4	MHAA
Laboratory supervisors	1	MHAA
Counsellors	7	MHAA
Nurses	7	MHAA
Data supervisors	1	MHAA
Data assistants	6	MHAA

Table A1.10. Active case detection teams with mobile X-ray

Category	Teams*
Seconded and managed by NTP	13
Delegated and managed by partners	9

**A standard team consists of 1 team leader, 1 radiographer, 1 X-ray assistant, 1 laboratory technician, 1 data assistant and 1 driver.*

Priority areas to support HR by the seconded staff during 2021-2025

One highlighted strategic area of National TB Strategic Plan (2021-2025) is to recruit additional helping hands and essential seconded staff to foster workforce development and retention. In collaboration with WHO, GF-UNOPS and Access to Health Fund-UNOPS, NTP will do prioritizing and identifying of priority areas to be covered.

At the same time, NTP will advocate MoHS to fulfil critical staff, who are needed to implement activities of the National Strategic Plan. The filling of the vacant appointed posts, during years one and two is important, giving priority to geographical and designation of posts such as Assistant Director (TB and Leprosy), District TB and Leprosy team leaders (MOs), Health Assistants, Microbiologists, Lab/X-Ray technologists, Data assistant/LD and Nurses.

Annex 2. Sixth JMM report

Executive summary[39]

The World Health Organization (WHO), in collaboration with the National TB Programme (NTP) of Myanmar and partners, hosted the Sixth Joint Monitoring Mission (JMM) from 12 to 21 August 2019 to conduct a comprehensive review of the NTP.

The main purpose of the 6th JMM was to review the achievements of the current National TB Strategic Plan (NSP) 2015–2020 developed along the lines of the End TB Strategy, and to advise appropriate strategic directions for the NSP 2021–2025 based on wide ranging field observations, and within the framework of Myanmar's National Health Plan (NHP).

In preparation of the 6th JMM, firstly the epidemiological components were reviewed. A series of analyses undertaken included Standards and Benchmarks of TB Surveillance, results of the National TB Prevalence Survey 2017–2018 and a re-estimation of the country's TB burden. These analyses provided the JMM with rich background information and required careful consideration of programmatic implications.

The review began on 12 August 2019 with an orientation and briefing session for review participants conducted in Naypyidaw. From 13 to 17 August, five separate review teams comprising five to six national and international experts each conducted field visits to states, regions and the Union Territory preselected to cover diverse settings in different geographical areas of the country. These areas included Yangon and Bago (Team 1); Mandalay and Shan North (Team 2); Kachin (Team 3); and Mon and Kayin (Team 4). Team 5 visited Yangon and Mandalay with specific objectives related to drug-resistant TB (DR-TB), TB laboratories, and procurement and supply management as a concurrent annual mission of the regional Green Light Committee (rGLC) and the Global Drug Facility (GDF). Field visits were followed by intensive review meetings on 18 to 20 August in Yangon to share findings. Geographic area-wise and theme-specific findings were presented by each field team and assigned experts. After extensive discussions, key findings, challenges and recommendations for the country were drafted through consensus. A high-level debriefing meeting with government officials within and beyond the Ministry of Health and Sports (MoHS) was held in Naypyidaw on 21 August under the leadership of H.E. Minister of Health and Sports, Dr Myint Htwe. This was followed by a technical debriefing session to members of the TB-Technical Strategy Group (TB-TSG).

The review teams were impressed by Myanmar's programmatic achievements. Over the past decade, the NTP has made major progress in the national fight against TB. A major epidemiological impact demonstrated by a steadily declining TB incidence has been achieved. This has been possible due to, among several other actions, the leadership and commitment of the MoHS to end TB in Myanmar, enhanced national budgetary contribution especially for procuring TB drugs and increasingly successful engagement with non-governmental organizations (NGOs). The MoHS has a well-designed NHP that also conceptualizes a plan for Universal Health Coverage (UHC) into which the policies and infrastructural needs of the NTP will be incorporated.

The JMM identified important constraints faced by the NTP, which could limit further progress. The major ones included: a persistent high TB burden with about a quarter of estimated TB patients nationally going undetected or unreported; a high percentage of TB patients and their families (>60%) face catastrophic costs due to TB care; the serious TB situation in the Yangon region is a particular concern that demands urgent attention given its potential to act as a national amplifier of the epidemic; the human resource challenge facing the health sector as a whole; and critical contribution by partners depending on time-bound and mostly externally funded projects. The JMM also pointed out that while ending TB requires a multisectoral response, the current national TB response remains largely limited to the health sector.

The JMM reviewed 13 thematic areas, namely: diagnosis and treatment of TB; laboratory, diagnostics and

39 Joint Monitoring Mission. (2019). *6th Joint Monitoring Mission report.* National TB Programme.

collaboration with the Supra National Reference Laboratory (SNRL); childhood TB; programmatic management of DR-TB; TB preventive treatment (TPT); TB/HIV; health systems and decentralization; TB surveillance; urban TB control in Yangon; private sector TB care; procurement and supply management; human resource development; and TB research in Myanmar.

Strategic recommendations

The constraints mentioned above were the focus of the nine strategic recommendations of the JMM.

1. Urgently mount a response to the TB situation (close to crisis) in the Yangon region.
2. Provide universal access to quality CXR and GeneXpert and decentralize TB care within health systems, which ought to be strengthened.
3. Engage actively with the broader health sector, clarify roles and responsibilities, and become an integral part of the new UHC agenda.
4. Address the (intractable) problem of human resources to benefit the NTP and general health services.
5. Expand partnerships and enhance the performance of the programme, including that in the areas of TB/HIV, DR-TB and treatment for LTBI.
6. Ensure social protection for TB patients and their families.
7. Secure and sustain enhanced funding.
8. Establish a high-level mechanism for a coordinated multisectoral effort to end TB.
9. Strengthen components of the existing legal and regulatory framework in support of the national TB response.

Highlighted thematic areas

The JMM had extensive cross-cutting discussions on the thematic areas of the nine strategic recommendations. Some highlights are as follows.

- The JMM identified the close-to-crisis TB situation in the Yangon region as the most important issue, requiring **urgent** action. The issue was to be addressed by: (i) informing the regional government leadership, including the Chief Minister, of the seriousness of the situation and engaging the leadership; (ii) strengthening the regional and township capacity to deal with the workload; (iii) with special attention to supervised delivery of treatment, ensuring treatment completion and bacteriologically confirmed cure of all newly diagnosed patients with DS-TB, as well as continuing with and strengthening high-quality treatment of MDR-TB; and (iv) strengthening the engagement of partners and the involvement of private hospitals and other providers.
- The JMM members extensively discussed the decentralization of basic TB care to integrate it into primary health-care services to improve accessibility for rural and remote populations. Access to TB diagnosis will improve if station hospitals (subtownship level) are involved in the NTP network as TB diagnostic centres once they are equipped with CXR and laboratory facilities. The essential health service package of the current NHP will also contribute to this end. Task-shifting and task-sharing are essential to transform clinical services from disease-specific stand-alone facilities to integrated healthcare facilities and should enable the NTP to further strengthen its core functions, such as planning, monitoring, technical supervision, quality assurance and training.

- Access to optimized diagnostic tools needs to be improved further. The JMM strongly recommended changing the primary role of GeneXpert from screening for DR-TB to replacing smear microscopy in TB diagnosis. This would require the expansion of GeneXpert sites from the district level to the township level. Where it is available, CXR should be used as a pre-test of GeneXpert, to lighten the burden on laboratories and reduce diagnostic delay. The digitalization of X-ray imaging is a key to improving screening/diagnostic quality, possibly with remote support for interpreting images. The JMM sought concise recommendations from TB laboratory experts from the GLI and SNRL, Chennai. To increase the number of DR-TB cases detected and placed on treatment, the diagnostic network (of Xpert, culture/DST and LPA) needs to be urgently expanded. Phenotypic DST for second-line agents is currently limited. Linkage with the SNRL, Chennai would provide a good opportunity to expand phenotypic DST for newer second-line agents, quality assurance for all diagnostic tests and support for achieving ISO15189 laboratory accreditation. The diagnostic work conducted in the NTRL should be conducted in the new NTRL once the renovation of the building is complete.
- The JMM highlighted the strong need for the prevention of TB in line with the targets to which the Member States committed as part of the Political Declaration of the United Nations High-Level Meeting on TB (September 2018). The targets set for 2018–2022 was to treat 30 million people with LTBI, including 4 million children under the age of 5 years, 20 million other household contacts of TB patients and 6 million PLHIV. The wide-scale roll-out of TPT (shorter regimen of three months) to children under the age of 5 years who are household contacts of infectious TB cases, PLHIV and others with immunocompromised conditions is urgently required. Improving infection control in hospitals is also essential.
- The JMM recognized the important role played by the private sector and welcomed the introduction of mandatory case notification from September 2018. It would provide a good opportunity to introduce case-based e-surveillance. However, mandatory notification should be linked with follow-up activities, such as ensuring access to DST, contact tracing and social support to patients when required. Multisectoral collaborations are essential to prevent patients and their families from catastrophic costs. Offering support to MDR-TB patients may encourage them to start second-line treatment.
- Frequent updates of global guidelines on DR-TB treatment pose a major challenge to a country to adopt, adapt and disseminate the new regimens. It is essential to make introduce the all-oral DR-TB regimen and scale it up nationwide as rapidly as possible. Active TB drug safety monitoring and management (aDSM) should cover all patients with DR-TB. Close collaborations with other departments in the MOHS and beyond are important. The FDA is a key partner for aDSM, introduction of new drugs, and quality assurance. Since the care of patients has been decentralized to MDR-TB initiation centres at the district level, clinical management function including aDSM at the district level is essential. Social support to patients should be covered in collaboration with the Ministry of Social Welfare.

Annex 3. Budget summary

Budgeting process

A series of discussions and consultation workshops were held to draw up the operational plan for this NSP. The focal person for each thematic group and stakeholders, including implementing partners and donors, participated in the consultations. Costing was done on the basis of the operational plan, using the WHO TB planning and budgeting tool, version 6 (March 2016).

The activities and milestones required for the WHO budgeting tool were derived from the operational plan. Then the focal person of each thematic group and the NSP core writing group discussed and finalized the budget with the guidance of the Director, Disease Control. Each activity was costed in Myanmar kyats (MMK) and then converted to US dollars, using the exchange rate of US$ 1 = 1507 MMK. Since costing was done with MMK, an inflation rate of 2.5% will be applied for subsequent years.

SD 1: Progress towards achieving universal access to TB care and prevention

This relates primarily to improving diagnosis. The expansion of diagnostic services, including culture and DST; procurement of diagnostic equipment and consumables; and other laboratory-related activities fall under this head. For health equipment and commodities, PSM cost of 16% was applied. The following assumptions were made to calculate the cost of screening and diagnostic tests for TB.

Microscopy smears: the number was calculated by adding the following and subtracting twice the number of presumptive cases tested by GeneXpert or other molecular tests from the sum.

Presumptive cases (1% of population at medium growth rate) X 2

All forms of TB cases X 6

DR-TB monitoring cases X 10

EQA slides

CXRs

Presumptive cases (2% of population at medium growth rate)

CXR coverage is applied with increasing trend to get the number of CXRs performed per year.

GeneXpert tests

Presumptive with abnormal CXR, or 40% of CXR tests (based on the prevalence survey data)

The number of GeneXpert tests per year was arrived at after considering the increasing trend in coverage. Presumptive cases among PLHIV were added separately. A 10% (of total tests) margin was left for loss and damage while calculating the final figure.

Care and treatment packages for DS- and DR-TB (drugs, patient support, incentives to providers); childhood TB; TB/HIV; TB associated with other diseases; infection control, including contact investigation and TPT, were costed under SD 1. The PSM cost of 16% was considered for drug-related costing (to cover both international and national distribution and customs cost).

The budget for SD 1 includes the cost of human resources, including expenditure on capacity-building activities. Evaluation meetings and monitoring and evaluation visits related to SD 1 and other SDs were costed under SD 5.

SD 2: Reach the unreached populations and accelerate a coordinated TB response

SD 2 consists of activities related to accelerated case-finding and the Yangon response plan, related human resources and plans to build their capacity.

Mobile teams visit various areas for ACF and the expenditure incurred to reach high-risk populations is covered, according to the operational plan and targets.

As for the Yangon response plan, costs for only additional, new and innovative activities specific to Yangon were calculated, based on the Yangon Region Suboperational Plan 2020–2021. For the subsequent years, the budget was projected on the basis of the two-year operational plan. Routine activities, such as diagnosis, care and treatment both for DS-TB and DR-TB (including the use of general health services), and human resources and capacity-building of these resources, were costed under the relevant SDs. Therefore, the budget under the Yangon plan is intended only for new and additional activities to tackle the region's TB burden.

SD 3: Expand partnerships and community engagement and improve communications

The budget for SD 3 covers activities related to PPM, community-based TB/DR-TB care and ACSM-related activities, based on the operational plan and targets. As with the other SDs, human resources and a plan to build their capacity in terms of community engagement and communications has been budgeted for.

SD 4: Strengthen systems and update policies for a multisectoral TB response

SD 4 budget mainly deals with strengthening human resources for the NTP's TB care and control activities and implementing partners' staff at the central and intermediate levels. The field-level staff was budgeted for under specific SDs. The budgeting of activities related to the procurement and supply chain also falls under SD 4, and was done according to the operational plan and targets. Activities related to the inclusion of TB in UHC and the multisectoral TB response were also costed accordingly. Activities to increase the government's contribution towards TB, the engagement of donors, and the programmatic cost of the NTP and the implementing partners were also budgeted for under SD 4.

SD 5: Promote research and innovation and strengthen surveillance for programme monitoring and evaluation

Research-related activities (capacity-building, operational/implementation research, pilot studies for new tools and interventions) were costed under SD 5. Annual evaluation meetings, routine monitoring and evaluation activities and supervision visits were also budgeted for according to the operational plan. Activities and information and technology equipment related to e-health were also costed. Various surveys, assessments, mid-term reviews and sentinel surveillance system activities were also costed under SD 5, according to the agreed targets.

Table A3.1. Budget at a glance

Intervention areas	2021 (US$)	2022 (US$)	2023 (US$)	2024 (US$)	2025 (US$)	TOTAL (US$)
SD 1: progress towards achieving universal access to TB care and prevention	**45 964 924**	**46 672 252**	**49 670 953**	**46 460 688**	**46 732 493**	**140 800 626**
1.1 Bring quality TB screening and diagnostic services closer to community	15 991 898	17 700 474	18 952 407	15 559 647	16 028 310	84 232 735
1.2.1 Core components of quality-assured TB services	8 156 431	6 544 366	6 576 588	6 366 032	6 101 210	33 744 627
1.2.2 Programmatic management of DR-TB	15 408 549	16 026 638	15 803 137	15 766 486	15 428 291	14 666 499
1.3 Strengthen management of TB in children	848 063	590 919	552 991	491 986	430 935	457 661
1.4 Undertake joint TB/HIV programme and decentralize integrated services for TB and HIV	920 723	942 190	959 633	969 068	976 922	901 459
1.5 Expand collaboration to manage TB comorbidities	283 582	273 897	290 972	284 917	291 543	265 039
1.6 Strengthen infection control and expand preventive treatment for TB	4 355 678	4 593 768	6 535 225	7 022 552	7 475 282	6 532 606
SD 2: Reach the unreached populations and mount a coordinated TB response in Yangon	**9 088 407**	**7 687 134**	**8 897 360**	**8 410 297**	**8 828 405**	**42 911 603**
2.1 Target actions to reach all at-risk populations	8 555 375	7 464 580	8 337 677	8 176 887	8 589 566	41 124 085
2.2 Mount a coordinated response to tackle TB in Yangon region	533 032	222 554	559 683	233 411	238 839	1 787 519

Intervention areas	2021 (US$)	2022 (US$)	2023 (US$)	2024 (US$)	2025 (US$)	TOTAL (US$)
SD 3: Expand partnerships and community engagement and improve communications	**9 822 492**	**11 345 753**	**13 025 765**	**14 541 879**	**16 161 697**	**64 897 586**
3.1 Engage all care providers, including NGOs and private sector, in TB response	1 386 021	1 602 722	1 808 272	1 870 296	1 931 476	8 598 788
3.2 Promote and strengthen community engagement	7 714 993	9 068 904	10 500 673	11 964 571	13 506 767	52 755 907
3.3 Implement a robust communication strategy targeting a wide range of stakeholders	721 478	674 128	716 820	707 012	723 454	3 542 891
SD 4: Strengthen systems and update policies for a multisectoral TB response	**22 065 593**	**22 698 216**	**23 701 030**	**24 049 125**	**24 554 922**	**117 068 886**
4.1 Ensure availability of essential human resources	11 933 064	12 141 743	12 431 099	12 731 957	13 033 041	62 270 904
4.2 Strengthen procurement and supply systems for efficient care delivery	1 322 023	1 316 112	1 357 543	1 380 313	1 455 216	6 831 206
4.3 Ensure inclusion of TB in UHC and wider economic and development policies, plans and activities	2 369	1 734	1 244	1 273	1 303	7 923
4.4 Promote and coordinate a multisectoral TB response	27 810	21 813	32 845	22 877	34 409	139 753
4.5 Secure finances for implementation of NSP	8 780 328	9 216 813	9 878 300	9 912 706	10 030 953	47 819 100

Intervention areas	2021 (US$)	2022 (US$)	2023 (US$)	2024 (US$)	2025 (US$)	TOTAL (US$)
SD 5: Promote research and innovation and strengthen surveillance for programme monitoring and evaluation	**3 267 528**	**2 826 196**	**3 147 946**	**3 805 235**	**3 535 085**	**16 581 991**
5.1 Strengthen research culture and capacity at different levels	267 899	$ 274 597	281 294	287 992	294 689	1 406 470
5.2 Implement updated, prioritized research agenda	214 291	115 825	85 355	537 500	578 920	1 531 891
5.3 Strengthen TB surveillance system and programme monitoring and evaluation	2 547 191	2 302 286	2 690 135	2 463 289	2 509 559	12 512 459
5.4 Develop evidence to update policies and design interventions	238 147	133 488	91 163	516 455	151 918	1 131 171
Total	**90 208 944**	**91 229 552**	**98 443 054**	**97 267 225**	**99 812 601**	**476 961 375**