



NATIONAL STRATEGIC PLAN FOR TUBERCULOSIS 2016-2020

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National Tuberculosis Programme

Full Version

FOREWORD

Tuberculosis is one of the major Public Health issues in Myanmar, and the country has been included in the list of 30 countries with the highest TB burden globally identified by the World Health Organization. To implement an effective strategy to combat and control TB, the National Tuberculosis Programme (NTP) applied the 3 in 1 principle: one coordinating body (TB Technical Strategic Group under Myanmar Health Sector Coordinating Committee), one National Strategic Plan (Five-year TB NSP 2016-2020) and one National Monitoring and Evaluation System (National M&E Plan 2016-2020).

Based on the results of the recently completed nationwide TB Prevalence Survey and the current national population census, the NTP has revised TB epidemiological data, impact targets, policies and control strategies and funding requirements to be better equipped to reach the Sustainable Development Goals (SDGs). Targets were also guided by the WHO End TB Strategy promoted by the World Health Organization. Indicators were aligned with the national M&E system to allow easy reporting to the Ministry of Health and Sports, the World Health Organization and Donors.

This National Strategic Plan (NSP) was developed with various stakeholders involved in TB control activities and technically supported by the Ministry of Health and Sports, the World Health Organization and the USAID funded Challenge TB Project. A series of meetings with intensive group work involving all stakeholders was held to develop the final document and to endorse its contents.

The National Strategic Plan constitutes a reference document for the implementation of TB control activities in Myanmar with the support of funding sources including the Ministry of Health and Sports, the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM), the 3MDG Fund and the United State Agency for International Development (USAID), reflecting the 3-in-1 principle described above. An operational plan, a monitoring and evaluation plan, and a concise version of the NSP were issued as supplements to the full narrative version of the NSP (2016-2020).

I am confident that this NSP and the related documents will provide a reference and guide for delivering quality TB prevention and care services to the entire population, as an integral part of the country's move towards Universal Health Coverage.

Last not least, I would like to express grateful appreciation to the USAID funded Challenge TB Project for its technical assistance in the person of Dr. Christy Hanson, whose concerted efforts have resulted in a high-quality document fully in line with the current international standards for TB care.



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The writing team conducted extensive consultations with departments in Ministry of Health and Sports (Department of Public Health, Department of Medical Services, Department of Health Professional Resource Development and Management, Department of Medical Research, Department of Food and Drug Administration), Prison Department, Social Security Board, Defense Services Medical Academy, UN Agencies, WHO and other national and international NGOs and donor agencies.

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- Burnet Institute
- Clinton Health Access Initiative
- CESVI
- Health Poverty Action
- FHI 360
- International Organization for Migration
- Mateser International
- Management Sciences for Health (SCMS)
- Médecins du Monde
- Médecins sans Frontières-Holland
- Médecins sans Frontières-Switzerland
- Medical Action Myanmar
- PACT Myanmar
- Population Services International
- Shoklo Malaria Research Unit
- The Union
- World Health Organization
- World Vision International

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ACRONYMS

3MDG	The Three Millennium Development Goal Fund	MHSCC	Myanmar Health Sector Coordination Committee
ACE	Active Case Finding	MMA	Myanmar Medical Association
AHRN	Asian Harm Reduction Network	MMCWAA	Myanmar Maternal and Child Welfare Association
AIDS	Acquired Immunodeficiency Syndrome	MNCH	Maternal, Neonatal and Child Health
AMW	Auxiliary Midwife	MOHS	Ministry of Health and Sports
ART	Antiretroviral Therapy	MRCs	Myanmar Red Cross Society
ASEAN	Association of South-East Asian Nations	MSF-H	Médecins Sans Frontières-Holland
BHS	Basic Health Staff	MSF-CH	Médecins Sans Frontières-Switzerland
CHAI	Clinton Health Access Initiative	MWAF	Myanmar Women's Affairs Federation
CHV	Community Health Volunteer	NAP	National AIDS Programme
CHW	Community health worker	NFM	New Funding Model
CPT	Co-trimoxazole Preventive Therapy	NGO	Non-governmental Organization
CXR	Chest X-Ray	NSP	National Strategic Plan
DFID	United Kingdom Department for International Development	NTP	National Tuberculosis Programme
DMO	District Medical Officer	NTRL	National Tuberculosis Reference Laboratory
DMR	Department of Medical Research	OPD	Out-patient Department
DOT	Directly Observed Treatment	OR	Operations Research
DST	Drug Sensitivity Test	PHC	Primary Health Care
EGA	External Quality Assurance	PHS	Public Health Supervisor
FHI 360	Family Health International	PICTS	Programme to Increase Catchment of Tuberculosis Suspects
FIND	Foundation for Innovative New Diagnostics	PLHIV	People living with HIV/AIDS
FM	Fluorescence Microscopy	PMDT	Programmatic Management of Drug-resistant Tuberculosis
GAVI	Global Alliance for Vaccines and Immunization	PPM	Public-private or Public-public Mix
GF	Global Fund to Fight AIDS, Tuberculosis and Malaria	PSI	Population Services International
GP	General Practitioner	PWID	People Who Inject Drugs
HIV	Human Immunodeficiency Virus	RHC	Rural Health Centre
HRD	Human Resource Development	RIT	Research Institute of Tuberculosis-Japan
HSS	Health Systems Strengthening	RR	Rifampicin Resistance
IFRC	International Federation of Red Cross and Red Crescent Societies	R/S	Region/State
INGO	International Non-governmental Organization	SDG	Sustainable Development Goal
IOM	International Organization for Migration	SHG	Self-help Group
IPC	Infection Prevention and Control	SOP	Standard Operating Procedure
IPT	Isoniazid Preventive Therapy	STD	Sexually Transmitted Disease
JICA	Japan International Cooperation Agency	STI	Sexually transmitted infection
JNM	Joint Monitoring Mission	TB	Tuberculosis
LIMS	Laboratory Information Management System	TOR	Term of Reference
MCH	Maternal and Child Health	TSG-TB	Technical and Strategic Group-Tuberculosis
MIDG	Millennium Development Goal	TMO	Township Medical Officer
MDM	Médecins du Monde	UHC	Universal Health Coverage
MDR-TB	Multidrug-resistant tuberculosis	UNAIDS	Joint United Nations Programme on HIV/AIDS
MHAA	Myanmar Health Assistant Association	UNFPA	United Nations Fund for Population Assistance
		UNOPS	United Nations Office for Project Services
		USAID	United States Agency for International Development
		WFP	World Food Programme
		XDR-TB	Extensively Drug-resistant TB

NATIONAL STRATEGIC PLAN FOR TUBERCULOSIS

This NSP builds on the past experiences of the National Tuberculosis Programme and its partners. It boldly moves the NTP in-line with the WHO End TB Strategy as it describes evidence-based approaches to:

- a) accelerate the decline in the prevalence of drug-sensitive and drug-resistant TB through integrated, patient-centred care;
- b) introduce bold policies and systems to support TB prevention and care as part of Universal Health Coverage; and
- c) pursue an ambitious research agenda to enhance the prevention, detection and care of TB patients.

PART I

1. EXECUTIVE SUMMARY

The Ministry of Health and Sports, National Tuberculosis Programme presents its National Strategic Plan 2016-2020 in-line with its:



The National Strategic Plan (NSP) for Tuberculosis (TB) 2016-2020 builds on the past experiences of the National Tuberculosis Programme and its partners. This NSP provides a roadmap for delivering quality TB prevention and care service to the entire population, as an integral part of the country's move toward Universal Health Coverage. Between 1990 and 2015, Myanmar reduced the prevalence of TB by 50%, meeting the targets set by the Millennium Development Goals. Going forward, the country aims to further accelerate the rate of decline.

The NSP is fully aligned with the World Health Organization End TB Strategy and is organized according to three Strategic Directions, highlighted below. It also embraces four key principles:

- i) government stewardship and accountability, with systematic monitoring and evaluation;
- ii) formal engagement of civil society organizations and communities,
- iii) protection and promotion of human rights, ethics and equity; and
- iv) adaptation of the strategy and targets at decentralized levels, with National Tuberculosis Programme coordination.

Strategic Direction I: Integrated, Patient-centred Care and Prevention

Under this strategic direction, the NSP sustains the current strengths of the programme while tackling key challenges. Most notable among these is the high rate of drug resistance among new and retreatment cases. A third national drug-resistance survey completed in 2013 estimated 5.0% (CI: 3.1%- 6.8%) multi-drug resistance (MDR) among new TB cases and 27.1% (CI: 15% - 39.2%) among retreatment cases. The roll-out of GeneXpert has begun, enabling the detection of more MDR-TB patients. The NSP plans for further scale-up of GeneXpert, bringing access to the entire population and optimizing the use of GeneXpert based on lessons learned from the introductory phase. While the numbers being enrolled on treatment have doubled over the past year, treatment scale-up has not kept pace with diagnosis. MDR-TB treatment commensurate with diagnostic scale-up is reflected in the NSP. By 2020, all MDR-TB patients will be enrolled on treatment within two weeks of their diagnosis.

With ambitious plans to expand service coverage to the entire population, all care providers and communities must be engaged. The NSP presents evidence-based interventions to improve the quality of care provided by non-MOHS providers and seeks to engage non-health sectors in TB control through schools, workplaces, prisons, housing, and institutions, etc. Evidence regarding knowledge, attitudes and care-seeking practices of the population provide the foundation for an advocacy, communications and community-engagement strategy as an integral component of the NSP.

The NSP take into account the special needs of high-risk populations as it seeks to intensify case finding and successful treatment among these groups. Evidence drawn from years of pilot projects seeking to address these populations has been harnessed and the scale-up of successful models is planned. Targeted interventions are proposed, tailored to the socio-economic and epidemiological determinants related to increased risk of TB among the health workers, miners, migrants, prisoners, the urban poor, and drug users.

Little is currently known about the provider practices that have led to over a quarter of all notified cases being among children < 15 years of age. Epidemiological evidence suggests that paediatric TB is likely being over-diagnosed, especially among children 5-14, and under-diagnosed among children < 5. Plans to better understand the situation and build an evidence-base for a systematic response are included among the operations research priorities. Innovative strategies to improve the quality of paediatric diagnosis, such as the creation of an external quality-assurance system for X-Ray will be employed. Concurrently, expanded use

of GeneXpert for increasing the proportion of child TB cases that are bacteriologically confirmed is planned. Prevention of TB in children, primarily through enhanced contact tracing and implementation of isoniazid preventive therapy, is envisaged.

This NSP reflects a patient-centred approach to care, both in the planned devolution of capacity to ensure quality services where patients live and in the management of the "whole" person. The NTP will, in particular, collaborate with other programmes of the Ministry to ensure comprehensive management of TB concomitant with HIV and diabetes.

Strategic Direction II: Bold Policies and Supportive Systems

The NSP will be implemented in the context of a devolving health system and national progress toward Universal Health Coverage. As such, the NSP both builds upon and aims to strengthen several core aspects of the health system. Vital to successful case detection and treatment will be the availability of uninterrupted, quality-assured laboratory commodities and anti-TB drugs. The NSP acknowledges the needs to strengthen supply chain management systems, optimally based on demand as expressed through an electronic case-based recording and reporting system with links between laboratories and healthcare providers.

The NSP prioritizes the filling of vacant posts and expansion of partner implementation sites to best cover populations that remain under-served. It simultaneously proposes innovative models for building human resource capacity through the mentorship and study tour to well-performing sites and townships.

Finally, this NSP is a roadmap for the country, not only the Ministry of Health and Sports. It acknowledges the important role of partners, non-health sectors, and communities. It offers a framework for efficient coordination and consistently high standards to be employed by all in the fight against TB in Myanmar.

Strategic Direction III: Intensified Research and Innovation

The NSP recognizes that a robust and responsive surveillance, monitoring and evaluation (M&E) system is important for ensuring evidence-based planning, implementation of quality TB control activities and tracking progress towards achieving NTP goals. To address specific knowledge gaps, the NSP builds on Myanmar's rich history of employing operations research. Implementation of a prioritized research agenda is envisaged, led by NTP collaborated with academic institutions and implementing partners such as the Department of Medical Research (DMR) and the universities of medicine and university of public health. For the period of this NSP, the NTP will focus on a shift to electronic data capture and management systems, including the use of GIS technologies, integration of TB into the emerging DHIS and LMIS systems, strengthening of vital registration for more consistent recording of TB-related deaths, decentralization of data analysis skills, and enhanced evidence base for future policy and practice through operations research.

Strategic directions of national strategic plan

Strategic Direction I: Integrated, Patient-centred Care and Prevention

Interventions

- 1.1. Accelerate the appropriate diagnosis of TB
- 1.2. Identify and treat all forms of TB, among all ages and including drug-resistant and drug-sensitive
- 1.3. Prevent transmission and the emergence of active TB
- 1.4. Intensify targeted action(s) to reach marginalized and at-risk populations
- 1.5. Implement a robust communication strategy, extending from policy makers to patient education
- 1.6. Engage all care providers, including NGOs and the private sector, in appropriate TB diagnosis and care
- 1.7. Promote and strengthen community engagement
- 1.8. Joint TB and HIV programming to enable decentralized and integrated services for TB and HIV

Strategic Direction II: Bold Policies and Supportive Systems

Interventions

- 2.1. Secure human and financial resources for implementation of the NSP
- 2.2. Promote a coordinated and multi-sectoral response and policy development
- 2.3. Ensure inclusion of TB in UHC and wider economic development plans and activities
- 2.4. Ensure a stable and quality-assured supply of drugs, diagnostic tests and commodities
- 2.5. Human resources for health

Strategic Direction III: Intensified Research and Innovation

Interventions

- 3.1. Implement the prioritized research agenda
- 3.2. Enhance evidence-based programme monitoring and implementation

Summary of intervention areas and key activities in national strategic plan

Intervention areas	Key activities
<p>1.1 Accelerate the appropriate diagnosis of TB</p>	<ul style="list-style-type: none"> • Expand the diagnostic network to include X-Ray in all townships, microscopy in all station health units, GeneXpert in all districts, and culture & first line DST in 6 states and regions and second line DST in Yangon and Mandalay. Introduce district-designed sputum transport systems to cover all remote populations. • Ensure sufficient and qualified human resource capacity within the expanded diagnostic network (Training). • Accelerate the communication of results between diagnostic and treatment sites, enhancing the recording and reporting system(s) for laboratories to align with the treatment monitoring systems, including for PMDT facilities, and introducing electronic systems. (covered upto district level) • Design and introduce an EQA system for X-Ray interpretation, while expanding access to digital X-Ray nationwide. • Ensure biosafety and infection prevention control measures in all TB laboratories and sputum collection sites. • Guarantee a regular supply of laboratory commodities, including centralized supply pro-curement. • Update and disseminate guidelines and Standard Operating Procedures (SOPs).
<p>1.2 Identify and treat all forms of TB, among all ages and including drug-resistant and drug-sensitive</p>	<p>1.2.1 Core DOTS</p> <ul style="list-style-type: none"> • Implement essential services of TB prevention, diagnosis and care services nationwide – decentralizing care provision. • Address barriers to treatment completion. • Build on successful models; establish decentralized centres of excellence as models for training, mentoring and supervision of other sites. • Intensify capacity building, operations research in and support to poor performing areas. • Intensify case finding among the hard-to-reach and most-at-risk populations. <p>1.2.2 Programmatic management of drug-resistant TB</p> <ul style="list-style-type: none"> • Expand implementation of essential services for PMDT to all districts and townships, ensuring appropriate and timely provision of care. • Expand MDR-TB diagnostic capacity, including paediatric diagnosis, decentralizing the availability of GeneXpert testing down to the district level. • Improve treatment outcomes; bolstering patient and provider education and ensuring the consistent provision of a patient support package. • Update communications, diagnosis-to-treatment completion tracking, and recording and reporting systems (down to district level). • Systematize contact tracing for all household contacts of MDR-TB patients. • Pilot and adopt new tools, including treatment regimens and diagnostic tests according to latest WHO recommendations.

Intervention areas	Key activities
1.2 Identify and treat all forms of TB, among all ages and including drug-resistant and drug-sensitive	<p>1.2.3 Paediatric TB</p> <ul style="list-style-type: none"> Strengthen appropriate use of X-Ray as a diagnostic tool, introducing an EOA system for X-Ray, and promote bacteriological confirmation. Intensify case finding in areas experiencing under-diagnosis; engaging all providers of paediatric services, partners, and schools; supporting contact tracing of all childhood contacts of TB patients. Nurture centres of excellence for paediatric TB diagnosis and care to serve as trainers for other providers. Enhance TB/HIV collaborative activities among children. Accelerate preventive measures, including updating isoniazid therapy among childhood contacts of TB patients and expanding BCG coverage.
1.3 Prevent transmission and the emergence of active TB	<ul style="list-style-type: none"> Engage township disease control teams as coordinators of the roll-out of infection prevention and control (IPC). Introduce a simplified IPC assessment tool(s) and job aides. Introduce a comprehensive package of prevention, screening and care interventions for health workers. Incorporate TB/IPC in Occupational Health and Safety programmes; monitor TB among workers at high-risk/high-volume work settings. Develop and sustain TB IPC interventions as an integral part of prison health programmes. Address the disproportionate burden of TB among high-risk and hard-to-reach populations, namely a) health care workers, b) prisoners, c) migrants, d) miners, e) urban and rural poor, f) elderly, g) people living with HIV or diabetes, and h) ethnic minorities. Identify and scale-up the cost effective screening algorithms and active case finding modalities per risk group and setting. Expand human resource capacity for case finding; engaging communities and general health services and HIV programme staff.
1.4 Intensify targeted action(s) to reach marginalized and at-risk populations	<ul style="list-style-type: none"> Strengthen and expand the number of sample collection centres in hard-to-reach areas. Roll-out structured contact investigation across the country, based on revised national guidelines that include paediatric index cases. Revise the recording and reporting system to monitor consistency and effectiveness of contact investigation. Increase the use of Isoniazid preventive therapy for contact of TB patients, especially PLHIV and children.
1.5 Implement a robust communication strategy, extending from policy makers to patient education	<ul style="list-style-type: none"> Identify relevant information and targeted messages needed to reach those who can influence individual, community, provider, government or donor behaviour. Increase the use of electronic and mobile tools to enhance patient and provider communications, particularly in hard-to-reach areas.

Intervention areas	Key activities
1.6 Engage all care providers, including NGOs and the private sector, in appropriate TB diagnosis and care	<ul style="list-style-type: none"> Establish centres of excellence among existing and well-performing a) private general practitioners; b) public hospitals; c) private hospitals. Use CoE to sensitize, train and promote quality TB service delivery among an expanded number of a) general practitioners; b) public hospitals; and c) private hospitals engaged in quality TB service delivery. Pilot test and expand models to engage a) drug sellers and traditional healers; and b) corporate sector / large employers.
1.7 Promote and strengthen community engagement	<ul style="list-style-type: none"> Enable community volunteers to engage in active TB case finding, contact tracing, income generation activities for TB patients, peer support, sputum collection, default tracing, and DOTS. Establish village-based support groups and other self-help groups (SHG) that are supported by volunteers, BHS and the NTP. Create a network of community-based organizations committed to supporting TB activities, especially in hard-to-reach areas.
1.8 Joint TB and HIV programming to enable decentralized and integrated services for TB and HIV	<ul style="list-style-type: none"> Expand the implementation of essential TB/HIV services nationwide and at all levels of the health system. Establish functional TB/HIV coordinating bodies at national, R/S, district, township, and in all hospitals caring for both TB and HIV patients. Ensure human resource capacity for TB/HIV collaborative activities with regular training of new staff at all levels, quarterly supportive supervision and annual refresher training of existing staff, nationwide dissemination of guidelines and development of supportive, on-the-job tools. Conduct TB symptom screening during the initial and follow up visits, as an integral part of chronic care of PLHIV. Provide HIV testing, counseling, and prevention services to all patients with presumptive and diagnosed TB. Initiate early ART for all TB patients with HIV infection. Provide isoniazid preventive therapy to all PLHIV who do not have active TB disease. Provide co-trimoxazole preventive therapy for TB patients living with HIV. Link data systems to enable monitoring of care and treatment for patients with TB and HIV. Test a model for TB/diabetes collaborative activities in selected States / Regions, including screening for diabetes among TB patients, and establishment of a referral network for patient care.
2.1 Secure human and financial resources for implementation of the NSP	<ul style="list-style-type: none"> Sustain and increase financing for the TB operational budget, including drugs and human resources, from the government. Include reimbursement for TB services in national health insurance policy. Build government capacity to serve as PR for Global Fund grants PR; develop an internal auditing system.

Strategic Direction II: Bold Policies and Supportive Systems	
Intervention areas	Key activities
2.1. Secure human and financial resources for implementation of the NSP	<ul style="list-style-type: none"> Nurture existing donor relationships; and leverage non-TB-specific donor funding for health; e.g. World Bank. Support NGOs and INGOs for mobilization of own resources; track and coordinate with all sources of funding. Establish and monitor a TB sub-account within the national health accounts.
2.2. Promote a coordinated and multi-sectoral response, and policy development	<ul style="list-style-type: none"> Steward a multi-sectoral approach, engaging other government Ministries; e.g. Labour, Education, Social Welfare. Engage and ensure coordination of partners in civil society and NGOs. Maintain updated normative guidelines and policies; adapt for various audiences and constituents. Convene regularly with the focal points for UHC to ensure the proactive engagement of TB actors.
2.3. Ensure inclusion of TB in UHC and wider economic development plans and activities	<ul style="list-style-type: none"> Include TB service and control activities as an integral part of the essential health package at all levels. NTP will participate in planning of the health sector policy for integrated drug policy and rational use of TB. Realign NTP activities within UHC and restructured MOHS framework.
2.4. Ensure a stable and quality-assured supply of drugs, diagnostic tests and commodities	<ul style="list-style-type: none"> Establish standard forecasting methods and tools for quantification of TB medicines and related commodities, e.g. laboratory products. Design and roll-out Logistic Management Information System (LMIS) linked to TB case management systems. Establish a dynamic procurement system which can respond to an Early Warning System of TB medicines. Improve storage and distribution practices of TB commodities. Build HR capacity across the NTP supply chain.
2.5. Human Resources for Health	<ul style="list-style-type: none"> Develop a detailed human resource development strategy in year one. Advocate for filling of authorized positions and establishment of ATM integrated disease control teams in all townships. Establish Centres of Excellence to strengthen human resource development through mentorship and shadowing. Roll-out formal training through a cascade system with the central NTP maintaining its normative roles for the development of training materials and the R/S maintaining responsibility for prioritizing and disseminating new technical norms through training. Development and introduction of novel e-based and on-the-job learning tools.

Strategic Direction III: Intensified Research and Innovation	
Intervention areas	Key activities
3.1. Implement a prioritized research agenda	<ul style="list-style-type: none"> NTP and implementing partners in collaboration with DMR will design training and conduct workshops to build capacity among NTP staff for operations research using programme data, and facilitate an evidence-to-policy/practice continuum. Promote impact assessments and prioritize research, including completion of 20 prioritized operations research studies, that will address programme challenges. To conduct periodic survey, such as Prevalence Survey (2017), DR-TB Survey (2018) and Mortality Survey (2020).
3.2. Enhance evidence-based programme monitoring and implementation	<ul style="list-style-type: none"> Evaluate electronic data capture systems already being used in Myanmar and other countries to identify the best platform for the NTP. Design, piloting and eventual roll-out of an electronic system will occur during the span of the NSP. Systematize linkages between the emerging electronic systems such as Logistics Management Information System (LMIS), laboratory monitoring system with national approved electronic system, and DHS-2. Ensure linkages, using unique identifiers (Master Patient Index) to data systems for HIV and diabetes patients and beneficiaries of any social support platforms. Conduct routine and systematic data quality assessments (DQA) at township, district and national level to improve data completeness, consistency and accuracy. NTP in collaboration with DMR will establish and strengthen research capacity including design and training on analytical protocols for use by decentralized levels/townships. Maintain a designated focal point for M&E and Research at central and state and regional levels to oversee all aspects of data management. TSG to review any new policy guidance issued by WHO and relating to the global endorsement of new medicines, diagnostics, vaccines or other tools, and to advise the NTP on the potential relevance for uptake in Myanmar. NTP and DMR to collaborate in the design of pilot and evaluation projects to assess new tools in local contexts and to adapt global policy recommendations for the Myanmar context. NTP and TSG to review evidence from pilot evaluations and to update technical policies.

Key Impact and Outcome Targets for NSP

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
Impact Indicators							
TB prevalence rate per 100,000 population (Reduce the prevalence of all forms of TB by 40% by 2020, compared to 2010 baseline)	Total Population	525 (2010)	427	406	386	366	348
TB incidence rate per 100,000 population (15% reduction by 2020)	Total Population	369 (2014)	358	348	337	327	317
TB mortality rate per 100,000 population (Reduce the mortality due to TB by 35% by 2020, compared to the 2015 baseline)	Total Population	53 (2014)	48	45	43	41	34
RR-TB and/or MDR-TB prevalence among new TB patients/(reduce the prevalence of MDR-TB among new TB cases by 20% by 2020, compared to 2015)	Total number of new TB cases with DST/ GeneXpert result	5%	4.80%	4.60%	4.40%	4.20%	4.00%
TB/HIV mortality rate per 100,000 population		7.7					<5
Reduce the affected families facing catastrophic costs due to TB by 2020			To be defined				

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
Outcome Indicators							
Case notification rate per 100,000 population - all forms of TB i.e. bacteriologically confirmed+ clinically diagnosed	Total Population	276	294	292	290	288	285
Case notification rate per 100,000 population - bacteriologically confirmed TB	Total Population	97	106	108	110	112	114

Treatment success rate - bacteriologically confirmed	Total number of bacteriologically confirmed cases registered for treatment	85%	≥85%	≥85%	≥85%	≥85%	≥85%
Notification of RR-TB and/or MDR-TB cases	Estimated number of RR-TB and/or MDR-TB cases among all notified TB cases new and retreatment	2,793	4,662	4,787	4,905	5,014	5,115
Treatment success rate RR-TB and/or MDR-TB	Total no of bacteriologically confirmed RR-TB and/or MDR-TB cases	79%	81%	81%	≥82%	≥82%	≥82%

2. METHODOLOGY

The NSP development process started with the completion of an Epidemiological Assessment in November 2014, by WHO and the Research Institute of Tuberculosis (RIT), Japan. This served as a critical background document for 5th Joint Monitoring Mission, which took place during December 2014. These two assessments were reviewed and considered during an initial stakeholder meeting in May 2015. The stakeholder meeting was convened immediately following the Annual Laboratory Review and Annual TB Evaluation 2014. As such, participants benefited from an up-to-date review of progress, plans and challenges across the country. The first stakeholder meeting involved central level staff of various departments of the Ministry of Health and Sports, and nearly 100 representatives from State and Regional Governments, civil society and non-governmental organizations, donors and other partners. Priorities for the coming 5-years were discussed and consensus reached on the impact and outcome targets, and strategic objectives for the NSP. A writing team for each thematic area was derived from the participants of these initial stakeholder meetings and the strategic priorities for each technical component of the NSP was prepared. Based on these inputs, a preliminary draft of the NSP was developed, shared and discussed with the TB Technical and Strategic Group in August 2015. Revisions were incorporated and a second stakeholder meeting was convened in August 2015, to seek wide inputs to the draft NSP. Comments were taken into account by the writing teams and a second draft was prepared. Finalization of the technical sections occurred through thematic writing groups, in consultation with the TSG and NTP, during September–December 2015. A financial costing, operational plan and monitoring and evaluation plan were developed at the conclusion of the drafting process. The final draft was shared virtually with all interested parties and comments considered by the National TB Programme.

3. BACKGROUND

3.1 Country Profile

3.1.1 Geography and Demographics

With a total surface area of 676,578 km² (261,227 sq mi), the Republic of the Union of Myanmar is the largest country in mainland Southeast Asia and it borders China to the northeast, India and Bangladesh to the west, Laos to east and Thailand to the southeast.

According to the provisional results of the 2014 Census, Myanmar had a total population of 51,486,253 people¹ with a population density of 76 people per km². Between 2003 and 2014 the population grew by 0.89% per annum, a consistent decline from the 2.02% growth observed between 1973-1983 and 1.8% between 1993-2003. Although the population grew from 35.3 million in 1983, the growth rates of Myanmar are among the lowest in Southeast Asia. This reflects a decline in fertility rate, currently at 2.29 children per woman in childbearing age. By 2020 it is predicted that the population will total 54,297,523.

The age composition of the population consequently experienced considerable shifts, with a surge in the proportion of people between 15-64 from 54.9% in 1973 to 65.6% in 2014 and over 65 from 3.7% to 5.8%. The number of people under 15 years old instead declined by more than 30% in the same period, from 41.5% to 28.6% of the population. Overall life expectancy at birth is currently 66.8 years for both sexes, with 69.9 years for females and 63.9 for males. Life expectancy also presents a clear urban-rural divide with 72.1 years for urban dwellers and 65.5 for people in rural areas².

Myanmar's population remains primarily rural with 35,401,957 people (70%) residing in rural areas and 14,877,943 people (30%) in urban areas with Yangon being the largest urban conglomerate. In terms of literacy, 89.5% of people aged 15 and older were literate in 2014, with 93.7% of urban and 83.8% of rural residents able to read and write.

Based on 2014 data, the GDP per capita is \$1,105, one of the lowest in the East Asia and Pacific region (World Bank). The World Bank estimates

¹ The 2014 Myanmar Population and Housing Census

² The 2014 Myanmar Population and Housing Census

that between 26% and 37.5% of the population lives below the poverty line. Economic indicators, however, are displaying positive growth trends. Following an ambitious economic, political and governance reform programme¹ initiated by the government in 2011, Myanmar has experienced sustained economic growth with GDP growing at 8.3% in 2013/2014 and a projected 8.5% increase in 2014/2015 (World Bank).

3.1.2. 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 containing the capital Nay Pyi Taw and surrounding townships². There are six self-administered zones within the country. Urban wards, towns and village tracts are grouped together into townships, which consist of 100-200,000 people. Collections of townships are organized into districts that then form regions or states. Regions and States are constitutionally equivalent. In total, there are 330 townships and 75 districts³.

The township health department is the backbone of primary and secondary care. In each township there is a township hospital, which may be 16, 25 or 50-bedded depending on the population. Each township has at least one or two station hospitals and four to seven RHCs under its jurisdiction to provide services to the rural population. Urban health centres with school health teams, as well as health centres focused on maternal and childcare, take care of the urban population. Each RHC has 13 sanctioned positions. In line with the National Health Policy, national NGOs are also taking a share of service support. The Ministry of Health and Sports is

gradually expanding the number of facilities.

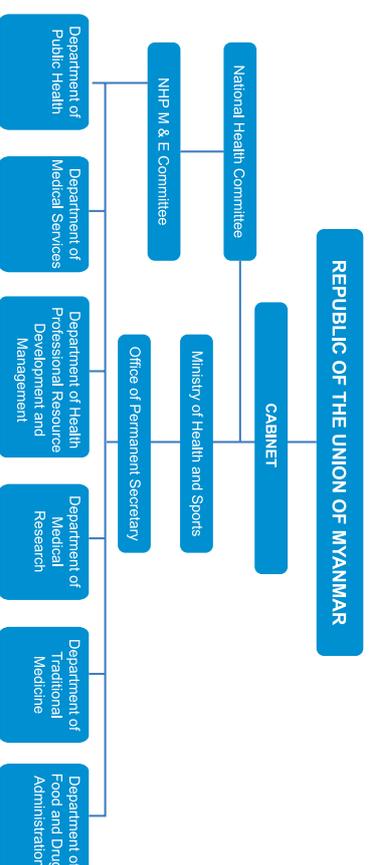
Under the country's Constitution, the Union Ministry of Health and Sports is responsible for health promotion, disease prevention, care and treatment. Health service delivery is provided within the public health sector through an integrated, layered system based on primary healthcare, with secondary and tertiary hospitals for referred cases.

3.2. Health Profile

The Ministry of Health and Sports is the major player in the health sector both as a governing agency and as a provider of comprehensive healthcare. However, key actors are playing increasing roles with the evolving political and administrative circumstances. Historically, the health system has been shaped by the five distinct periods of administrative regimes and political systems: the colonial period, the parliamentary period, the BSP period, the SLORC and SPDC period and the democratization period.

The health system comprises a pluralistic mix of public and private systems both in financing and provision. The MOHS is divided into six departments: Department of Health Professional Resource Development and Management (DHPRDM), Department of Medical Services (DMS), Department of Public Health (DOPH), Department of Medical Research (DMR), Department of Traditional Medicine (DTM) and Department of Food and Drug Administration (FDA). There are also other ministries that provide healthcare for their employees and families including the Ministries of Defense, Railways, Mines, Industry, Energy, Home and Transport⁴.

Figure 1: The Organization of the Health System in Myanmar¹



Health service provision is extended to rural settings through a network of healthcare facilities at different administrative levels. The MOHS is responsible for planning, financing, administering, regulating and providing healthcare. The DOPH is the service provider for public health concerns and disease control, including TB control, especially at the primary level, while the DMS is taking care of treatment at the hospital level.

The private health sector has also been a major source of service provision since the inception of the health system in the country. Private services tend to be confined in urban settings and have evolved from primary and ambulatory services to more institutional and intensive care in major urban centres, especially Yangon, Mandalay and Nay Pyi Taw. Although it has grown in recent years, the private sector still relies on medical professionals operating in the public sector. A law relating to Private Health Care Services regulates this sector. The Medical Association and its branches also

connect practitioners in the private sectors with their counterparts in the public sector to ensure that private sector practitioners also partake in public health activities².

Traditional medicine also remains a part of the health system. There are currently 14 traditional hospitals run by the State³. NGOs are also playing an increasingly important role, especially considering the growing needs for collaboration in the health policy and provision fields⁴.

Health policy is primarily designed at the top of the administration and health policy guidelines have been included in each Constitution. The 2008 Constitution included the following health-related Article 367⁵:

“Every citizen shall, in accordance with the health policy laid down by the Union, have the right to healthcare.”

¹ World Bank, Myanmar

² The Asia Foundation, State and Regions Governments of Myanmar

³ The Asia Foundation, State and Regions Governments of Myanmar

⁴ Health in Myanmar (2014) - Ministry of Health of the Union of Myanmar

¹ Asia Pacific Observatory on Health Systems and Policies

² Health in Myanmar (2014) - Ministry of Health of the Union of Myanmar

³ Health in Myanmar (2014) - Ministry of Health of the Union of Myanmar

⁴ Health in Myanmar (2014) - Ministry of Health of the Union of Myanmar

⁵ Health in Myanmar (2014) - Ministry of Health of the Union of Myanmar

Another important legislative body in health policy in Myanmar is the National Health Committee (NHC). The NHC is a high inter-ministerial policy-making body concerned with health matters, formed in 1989. It takes active leadership in implementing health programmes systematically and efficiently. It is chaired by the Vice President of the Republic and has 19 members. A major task of the NHC is the Assessment and evaluations of each cycle of National Health Plan before the next round. Considering the new constitution and political agenda, there is also the opportunity for more inclusiveness and participation by stakeholders in this process¹.

3.2.1. Health Financing²

The government used to be the main source of financing, with the provision of services virtually free until user charges were introduced in the form of cost sharing in 1993. Since then, household out-of-pocket (OOP) expenditures have become the main source of finance, standing at 79.3% in 2011.

General government health expenditure (GGHE) as part of general government expenditure (GGE) and GDP was low between 2003 and 2011, at 1% and 0.2-0.3% respectively. With the new constitutional order and government established in 2011, GGHE has increased significantly to 3.14% of GGE and 0.76% of the GDP.

The National Health Account was established to monitor sources of finance, types of spending and types of healthcare providers from 1998 to 2011. Total health expenditure increased significantly between 2001 and 2011, from 73.7 billion kyat in 2001 to 810.3 billion kyat in 2011. Similar growth is observable in terms of per capita health expenditures that increased by an average of 28.5% annually in nominal terms.

The government share to the health sector as a percentage general government expenditures for the last five financial years are indicated in the table below:

Table 1: Government health expenditure trends (2010-2015)

Financial Year	Government Health Expenditures (as % of GDP)	Government Health Expenditures (as % of GGE)
2010-11	0.20	1.03
2011-12	0.21	1.05
2012-13	0.76	2.82
2013-14	0.89	3.15
2014-15	0.99	3.38

¹ "The Republic of the Union of Myanmar Health System Review" (2014), Health Systems in Transition, Vol.4

² "The Republic of the Union of Myanmar Health System Review" (2014), Health Systems in Transition, Vol.4

3.3. TB Prevention and Care

3.3.1. Epidemiology of TB

Myanmar is among the 30 highest TB burden countries worldwide. In 2014, 142,012 cases of TB were recorded¹. In 2014, 5,632 cases of MDR-TB were confirmed, 3,005 of those were recorded among retreatment cases.

Global TB report in 2009 estimated all forms of TB cases at 598/100,000 population². WHO estimates that the country experienced a consistent decline in the prevalence, incidence and TB death rates from 1990 through 2014, as indicated in the table below:

Case notification increased sharply between 1999 and 2007. Since then it has only risen marginally, even though about a third of cases were thought to remain undiagnosed. Overall TB case notification increased with the expansion of DOTS, and more recently with the expansion of PPM approaches and ACF activities in some parts of the country (Fig.5). Treatment success in the 2014 cohort was 85% for new cases and 79% among DR-TB cases. There was almost one microscopy laboratory for every 100,000 people and three culture capable laboratories nationally. There were 24 sites performing GeneXpert®/MTB/RIF tests.

Table 2: Tuberculosis indicators trends in Myanmar 1990-2014

TB indicator	1990	2010	2011	2012	2013	2014
TB prevalence rate (per 100,000) per year	922	525	506	489	473	457
TB death rate (per 100,000) per year	133	51	49	48	49	53
TB incidence rate (per 100,000) per year	404	384	381	377	373	369

Source: Global TB report

¹ TB Control Achievement of National Tuberculosis Programme (2014)

² WHO. Review of the National Tuberculosis Programme Myanmar, 7-15 November, 2011. World Health Organization, Country Office for Myanmar

Figure 2: Mortality, prevalence and incidence rates of tuberculosis in Myanmar

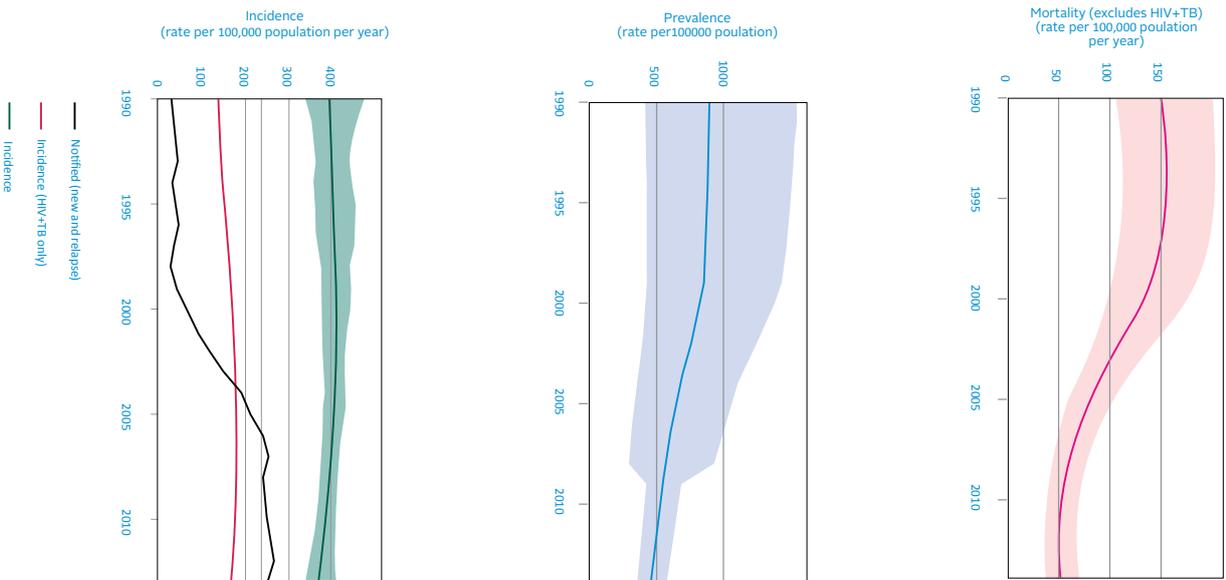


Figure 3: Trend of HIV prevalence among new TB patients (HSS 2005-2014)

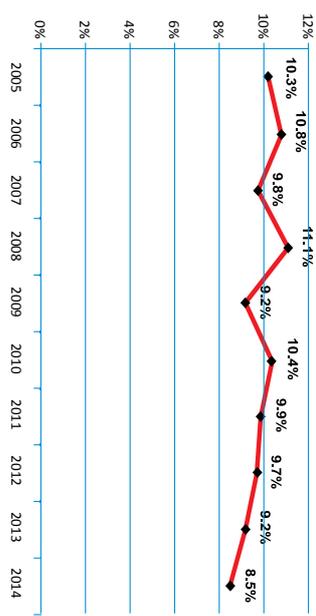
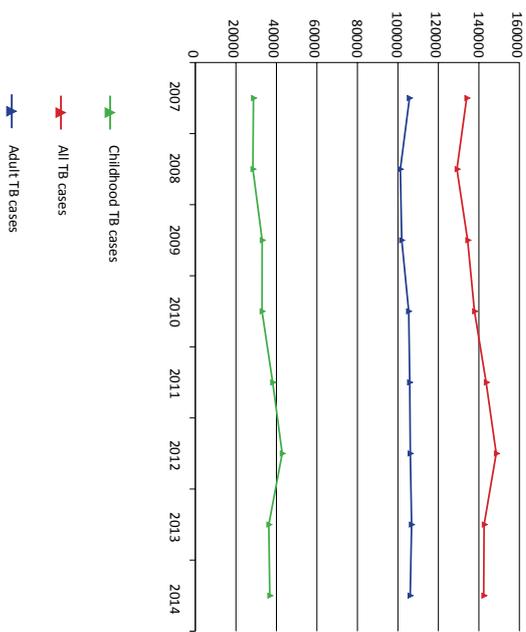


Figure 4: Trend of Childhood TB, adult TB & total TB Cases load (2007-2014)



New childhood TB case notifications (all forms) in 2014 comprised 25% of total notifications (all ages), totalling 37,549 cases, a considerably higher percentage compared to the expected range for a low-income country (5-15% of all TB cases are expected to be in children). There is strong evidence of over-diagnosis of primary complex disease among the 5-15 years age group. Concurrently, there is likely an under-diagnosis of children under 5 years of age.

3.3.2. Epidemiology of Co-morbidities

3.3.2.1. HIV/AIDS and TB/HIV

According to UNAIDS 2013 estimates, there were 189,000 PLHIV in Myanmar (CI: 170,000-220,000), with an adult (15-49) prevalence rate of 0.6%, a decline from 0.94% in 2009¹. As of 2013, 37% of the HIV positive individuals were female and 63% male. HIV remains relatively high among injecting drug users (18.7%), men who have sex with men (10.4%), female sex workers and their clients (8.1%). The number of estimated annual deaths due to AIDS has been declining steadily, from 19,609 in 2010 to 15,176 in 2013 and projected to decline to 11,429 in 2015².

Myanmar is one of the 30 high TB/HIV burden countries in the world. In 2014, only 60% of TB patients knew their HIV status. Of these, 11% were HIV-positive, 36% received ART, and 85% of HIV patients were screened for TB in 51 sites but IPT was low³. In 2014, 60% of TB patients were tested for HIV and 8.5% were HIV positive, totalling 7,660 confirmed cases of TB/HIV. The estimates derived from sentinel surveys show a consistent, very gradual decrease. Presumably, the difference is at least partially due to clinicians asking for HIV test in certain patients. In addition, TB/HIV activities

are carried out in townships with a known higher prevalence of HIV. The NTP aims to test 100% of TB patients by 2020.

3.3.2.2. Diabetes

The prevalence of diabetes mellitus in Yangon was at 12% in 2003-04 and it was estimated at 10% nationally with rates that have likely increased in the past 10 years⁴. Two tertiary hospitals (in Yangon and Mandalay) screen for TB in diabetes clinics.

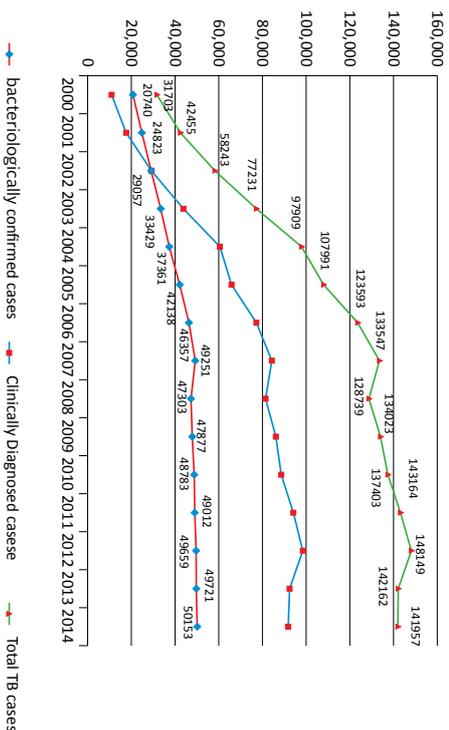
3.3.3. Situation and Trends in Control of TB

3.3.3.1. NTP Implementation

In 2014, the NTP achieved a 79% case detection rate of all forms of TB with an 85% treatment success rate. Among notified cases, 4.6% died, 4% failed treatment, 5.2% were lost to follow-up and 1.6% transferred out.

In 2013, NTP reported that TB/HIV activities were occurring in 28 townships, value that surged to 136 by the end of 2014 and it is expected that by 2016 all 330 townships will be covered. Remarkable progress has been achieved in scaling up HIV testing and counseling for TB patients. If in 2013 only 12% of TB patients knew their HIV status, but by the end of 2014, in TB/HIV townships, 70% of patients knew their status. This was possible because of significantly improved availability of HIV testing kits resulting from NTP procurement and distributions to TB teams and laboratory staff. Provision of ART, however, remains limited considering this rapid scale-up of testing. Enhanced through improvement of ANC services that include pre and post-partum TB testing.

Figure 5: Trends of TB case notification (2000-2014)



3.3.3.2. Laboratory Services

There are 514 microscopy centres, 49 GeneXpert sites, 3 culture laboratories and 2 BSL 3 laboratories (including 1st and 2nd line DST) existing in Myanmar as of 2015.

3.3.3.3. Partner Activities

The NTP had productive collaborations with arrange of partners. The main international implementing partners were: PSI (Private sector engagement), AHRN and MDM (Working with drug users), IOM (Migrants), MSF (Holland and Switzerland) and the Union (MDR-TB and TB/HIV), JICA, Maltesser International and World Vision (Community Involvement)

Technical partners also included WHO, FHI 360 Burnett and the Clinton Health Access Initiative (CHAI). UNOPS, Save the Children USA are the main fund managers while the main sources of funding of national and international NGOs were the Global Fund, 3M/DG and USAID.

The network of collaborations was wide but fragmented. 119 townships have MMA-affiliated GPs and 197 have GPs franchises under the PSI Sun Quality Health care scheme (some overlapping exists). Services provided by the Union were delivered through public facilities with some NGOs targeting specific populations in their own clinics parallel to township TB centres. Other NGOs, although not directly involved in care delivery, did provide linkages between health facilities and the community. Substantial contribution of partners in case notification was observed (Figure. 6).

Partners had a particularly pivotal role in hard-to-reach populations, including migrants, post-conflict areas residents, urban poor and other vulnerable populations.

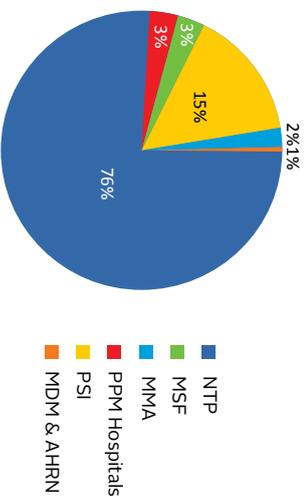
Different partnership models with private sector and communities are in place. Some partners, including JICA, worked with pre-existing community structures while others recruited their own community volunteers for TB work (the Union, PSI, and World Vision). Some organizations

¹ Global AIDS Response Progress Report Myanmar

² Global AIDS Response Progress Report Myanmar

³ 2014 TB/HIV Annual Report of NTP

⁴ 5th Joint Monitoring Mission for Tuberculosis Care and Prevention in Myanmar

Figure 6: Distribution of all notified cases in 2013 by provider

provided incentives (paid per item of services, PSI), token incentives (annual gifts, MMA). Work also varied, ranging from running clinics and treatment to filling gaps in TB control, but in all scenarios there was collaboration with the NTP.

Some challenges in partner's work include overlapping versions of approaches between NGOs and government and at times within the NGO itself, and also different models implemented by the same NGOs in different areas. Furthermore, NGOs tended to focus only on their own activities, in their own catchment areas increasing the risk of replacing existing services rather than adding value.

3.3.4. Overview of Progress from 2011-2015 Plan

3.3.4.1. Summary of findings from JMM, GLC and paediatric missions

Myanmar has already met the 2015 target for incidence and mortality, and is on track for the prevalence target. The JMM was concerned, however, by the slow increase and even stagnation of case detection since 2007, given the significant gap between estimated incidence and notifications (32% of cases not notified in 2013) although this gap has narrowed in recent years. The JMM noted that

it was too soon to determine if the ACF measures are having the desired impact.

The downturn in case notifications between 2012 and 2013 was also concerning although there was some evidence that this could have been caused by a deliberate (and appropriate) increase in the stringency of the diagnostic criteria for primary complex, especially in the 5-14 years age group.

Disappointingly, the introduction of new technology, specifically GeneXpert, was not resulting in an increase in notifications. However, in both the Union's PICTS project and in Ayeayawaddy Region the proportion of total cases that was bacteriologically confirmed increased in 2013, and this was attributable to the deployment of GeneXpert® MTB/RIF. In childhood TB, the JMM found that there was effective corrective action of over-diagnosis in the 5-14 age group, but noted that under diagnosis in those aged 0-4 should be explored.

The JMM also observed an increase in public hospitals engaged in PPM from 9 to 24 between 2011 and 2014. TB care provision by NGOs has contributed to an increased involvement of and referrals by community volunteers.

3.3.4.2. Financing for TB Prevention and Care

Since 2011, external partners to the health sector have committed over US\$ 1 billion for health system strengthening¹. These investments, although not TB specific, have positive implications for TB care and prevention as a result of a strengthened health system.

The project-based funding for TB activities primarily comes from larger funds of the Global Fund and 3MDG, which support a number of implementing agencies.

Government spending in TB control hugely increased in 2013, largely for second-line drugs, infrastructure and human resources. The MOHS pays for only a small fraction of first-line TB drugs. Recent policy made all other essential drugs available free of charge through public facilities contributing to a reduction of the weight of out-of-pocket (OOP) payments from 90% of health spending to 60% today.

¹ WHO 5th Joint Monitoring Mission for TB Care and Prevention in Myanmar

PART II

STRATEGIC DIRECTION I: INTEGRATED, PATIENT-CENTRED CARE AND PREVENTION

1.1 Accelerate the appropriate diagnosis of TB

Summary

Programmatic Emphasis

The priorities for the next 5 years are to: a) increase access to quality diagnostic services close to patients' homes, b) accelerate early and prompt diagnosis, and c) strengthen / introduce quality assurance mechanisms for laboratories and radiology services. Myanmar will move toward a streamlined diagnostic network, with intensified focus on improving access to quality diagnostic services in low-service areas.

Summary of Approaches

1. Expand the diagnostic network to include X-Ray in all townships, fluorescent microscopy in all station health units, GeneXpert in all districts, and first-line drug sensitivity test and culture in 6 states and regions.
2. Introduce district-designed sputum transport systems to cover all remote populations.
3. Ensure sufficient and qualified human resource capacity within the expanded diagnostic network.
4. Accelerate the communication of results between diagnostic and treatment sites, enhancing the recording and reporting system(s) for laboratories and X-Ray to align with the treatment monitoring systems, including for PMDT facilities, and introducing electronic systems.
5. Design and introduce an EQA system for X-Ray interpretation, while expanding access to digital X-Ray nationwide.
6. Ensure biosafety and infection prevention control measures in all TB laboratories and sputum collection sites.
7. Guarantee a regular supply of laboratory commodities, including centralized supply procurement.
8. Update and disseminate guidelines and Standard Operating Procedures (SOPs).

Targets

Standard Indicators	Denominator	Baseline 2015	Targets					
			2016	2017	2018	2019	2020	
Number of microscopy sites in EGA programme	Number	500	550	600	650	700	700	
Percentage of laboratories showing adequate performance in external quality assurance for smear microscopy	All laboratories doing smear microscopy	92%	93%	94%	94%	95%	95%	
Percentage of districts that employ GeneXpert or other molecular diagnostics	All districts	53%	66%	80%	93%	100%	100%	
Number of GeneXpert machines	Number	49	64	72	80	80	80	
Percentage of GeneXpert sites using GxAlert	All GeneXpert sites	94	≥94%	≥94%	≥94%	≥94%	≥94%	
Number of R/S TB centres with digital X-Ray	Number	2	3	5	9	14	20	
Percentage of township medical officers having received training on X-Ray reading in the past year	No of townships	0%	30%	60%	70%	80%	90%	
Number of mobile X-Ray team	Number	9	12	15	18	21	24	
Number of R/S that have culture and FL-DST capacity	Number	2	3	4	5	6	6	
Percentage of DST laboratories showing adequate performance on EGA	All DST laboratories	100%	100%	100%	100%	100%	100%	
Percentage of laboratories that are equipped and employ standardized package of infection control practices	Total laboratories	30%	35%	40%	45%	45%	50%	
Percentage of townships that report a laboratory commodity stock out in any quarter over a year	Total townships	0%	0%	0%	0%	0%	0%	
Number of reference and R/S laboratories using electronic LIMS system	Number	0	2	7	12	15	17	

Full Narrative

Situational Analysis

Diagnostic services play a pivotal role in TB diagnosis, early and successful treatment and prevention. Smear microscopy (both bright field and fluorescence), molecular techniques (line probe assay and GeneXpert MTB/RIF), culture (solid and liquid media), and radiology (digital and film, mobile and fixed) are all available in Myanmar for TB and MDR TB diagnosis. Capacity for first and second-line drug sensitivity testing (DST) is being developed in Yangon and Mandalay. Three additional State/Regional laboratories have culture capacity. External quality assurance (EQA) for liquid culture has not yet been introduced.

Diagnostic services are coordinated by the national TB programme in collaboration with the National TB Reference Laboratory (NTRL) and supported by one regional reference laboratory in Mandalay. Technical direction is provided by the National Health Laboratory while administration is provided by the NTP. The TB technical working group provides guidance. Diagnostic services are provided through a tiered structure that houses complex testing at the higher levels and basic microscopy and X-Ray services closer to patients' homes, see (Figure 9) below. The technical standards for tuberculosis diagnosis are embedded within various guidelines including: National guidelines on TB Microscopy (Zehl- neelsen method, Fluorescent staining method), EQA guidelines for solid and liquid culture and drug sensitivity and molecular testing. Given the introduction of new tools, the diagnostic algorithms were recently updated. In 2015, a second annual report on EQA for TB Microscopy was published.

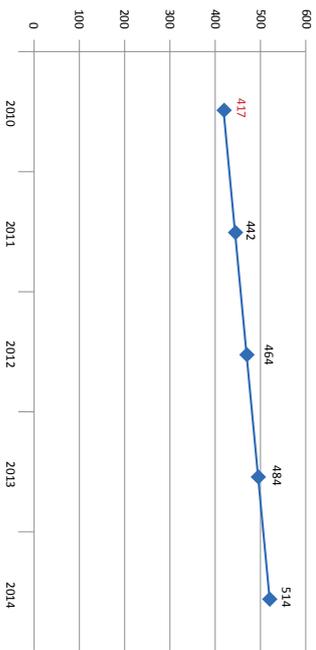
Sputum smear microscopy has been the mainstay of TB diagnosis in Myanmar. Since 2003, all 325

townships have been covered by microscopy services, and the number of microscopy sites has continued to increase. (Figure 5). Smear microscopy is provided through a network of 514 laboratories embedded throughout the general health services. Of these laboratories, 380 (77%) are in health centres and hospitals, 61 (12%) are in the private sector, 28 (6%) are managed by INGOs and 23 (5%) are in PPM hospitals that participate in the EQA network. In terms of coverage, most hospitals 403/998 (40%) have TB diagnostic capacity. Nationally, coverage of microscopy has reached 1 per 100,000 populations in most areas. However, there is wide geographical variation in access. A map of the geographic distribution of laboratories shows continued barriers to access in remote areas. Five regions and states (Magway, Naypyitaw, Kayin, Tanintharyi and Ayeeyarwaddy) have not reached the national coverage target of 1 per 100,000 population.

Coverage of EQA increased between 2010 and 2014 from 90% to 97% of microscopy centres, consistent with a rise in supervision to laboratories by microbiologists and STLS. Microscopy centres also reported a steady increase in correct diagnostic practices, reflected in declines in the average percentages of major and minor errors from 1.52% to 0.66% and 1.05% to 0.68% respectively from 2010 to 2014. Internal variations still persist, with some regions reporting high levels of errors while others report low levels.

Although X-Ray machines are placed in almost all township hospitals, radiology services can only be considered functional in about 75% of township hospitals, as some have shortages of trained radiographers and some machines are in disrepair. Following WHO's 2010 policy recommendation for the use of GeneXpert MTB/RIF assay, three machines were introduced in Mandalay in 2011. In 2012, two GeneXpert sites were added in Yangon.

Figure 7. Microscopy centre expansion in Myanmar (2010-2014)



At the end of 2015, forty-nine machines, including three 16 modules machines were active, with at least one machine in each region/state. The number of GeneXpert tests conducted increased from 3,136 in 2012 to 26,240 in 2014. Approximately 10% of GeneXpert positive tests detected MTB with rifampicin-resistance. Additionally, in the past year GxAlert was installed in all 38 active machines to assist the routine data management and monitoring.

(figure 10). Various sputum transport systems have been introduced in remote areas through basic health staff and volunteers to microscopy centres and GeneXpert sites. Sputum transport systems enable access by remote populations to the newer technologies that are only available at more centralized levels of the health system.

Challenges

1. **Human resource shortages:** The primary challenge for the implementation of a continuous TB diagnostic network is the limited number of specialized personnel, especially biomedical engineers, microbiologists and laboratory technicians. A human resource plan for the laboratory network was developed in 2014 and new posts have been filled since the beginning of 2015. Nonetheless, 10 regions and states report understaffing as one of the primary challenges to successful and prompt TB diagnosis.

There are two existing BSL-3 (i.e. TB containment) laboratories that serve as TB reference laboratories, including the NTRL in Yangon and the UMTBCI laboratory in Mandalay. These laboratories have capacity for line-probe assay (LPA), solid and liquid culture, and DST. Each of the reference laboratories have capacity to conduct first-line drug sensitivity testing (FL-DST). Second-line DST is currently only done by the NTRL, with validation by a supranational reference laboratory.

2. **Limited geographic coverage:** Despite the scale-up of microscopy sites, some populations are still unable to reach services.

That second-line DST expands to Mandalay reference laboratory in late 2015. Plans to expand SL-DST to Mandalay are included in the NSP.

The laboratory network employs the available technologies at different levels of the health system

Figure 8: GeneXpert Implementation sites in Myanmar

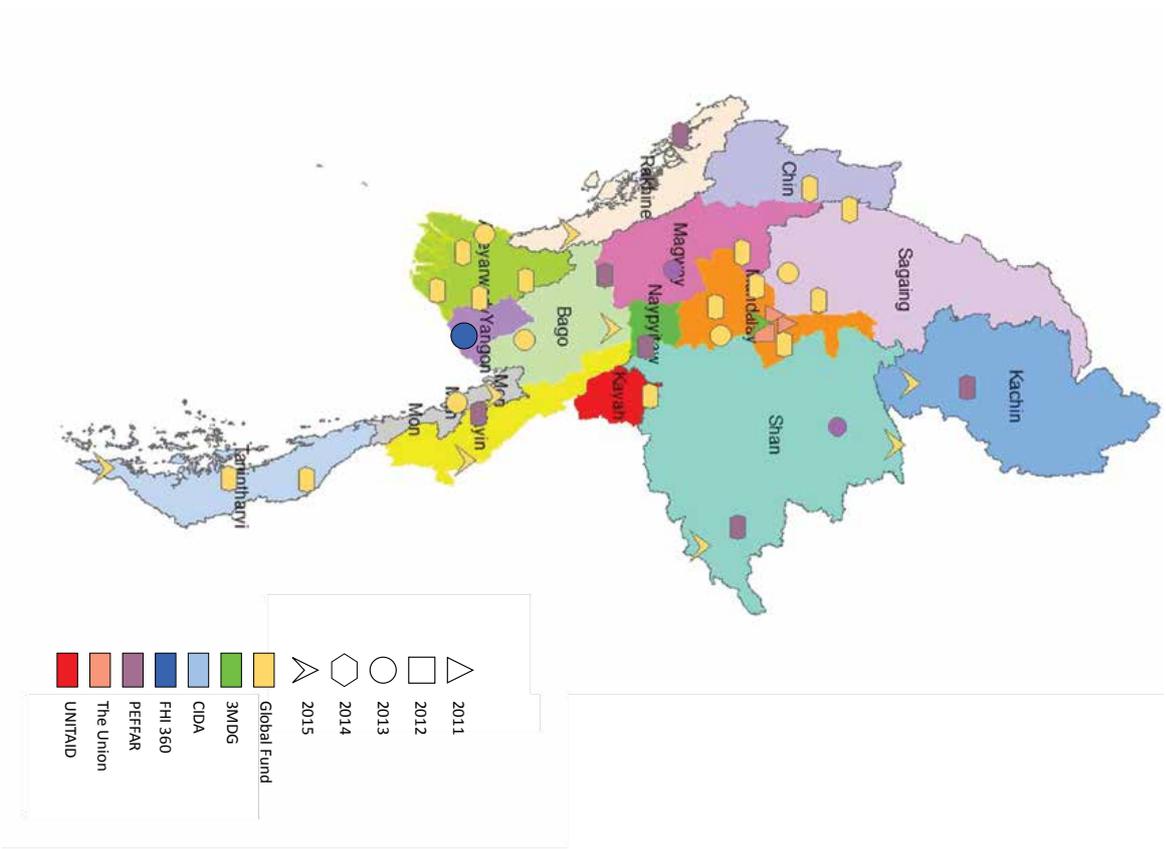
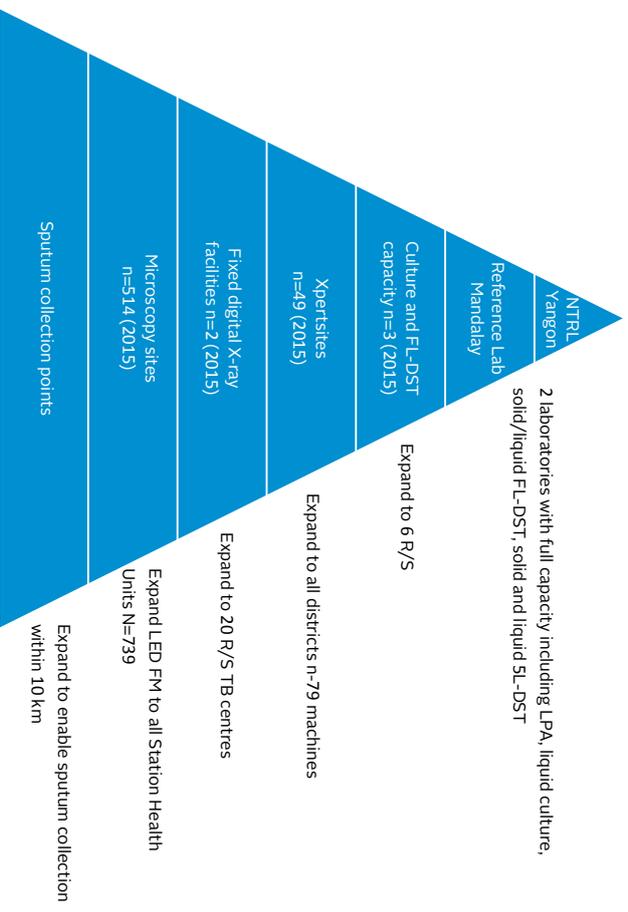


Figure 9. Technologies at different levels of the system



- Quality control:** Steady improvements have been reported in terms of quality control of microscopy. EGA completed in 2014 found that 71% of microscopy centres in the country were free of major errors. However, there is no system in place to monitor the quality of X-Rays, and their appropriate interpretation. In some geographic areas, there is insufficient or irregular supervision of diagnostic centres.
- GeneXpert:** With the expansion of GeneXpert, operational challenges have begun to emerge. Insufficient technical support has been available to ensure trouble shooting and the repair of machines that breakdown. When non-tuberculosis mycobacteria (NTM) are detected, species identification can be done by MTB CM using LPA in the reference laboratories.
- Evaluation by MTB CM** should be done to determine the magnitude of environmental NTM and potential contamination at some sites.
- Diagnostic delays:** Systems to transport samples and communicate results between health facilities and laboratories have not been streamlined, resulting in long delays between the first patient visit and the initiation of treatment. An electronic recording and reporting system for the laboratories that can be linked to treatment data, has not been developed. While declining, the positivity rate for presumptive TB was 14% in 2014, suggesting that insufficient numbers of presumptive cases are being screened and tested.

- Limited infection control:** Not all sputum collection centres and laboratories have sufficient infrastructure, e.g. hoods, exhaust, UVGI, window fans, to support adequate infection control. In addition, disposal of hazardous waste is not yet systematically supported.
- Microscopy in all Station Health Units:** Prioritization will be given to adding microscopy sites in low coverage areas with <1 microscopy site per 100,000 or <1 site within 20km of the population. Township microscopy facilities performing an average of > 40 smears per day will be prioritized for upgrading to fluorescent microscopy, while LED FM will be phased in nationwide as microscopes are replaced. All microscopy sites, public and private, shall be enrolled into the national EGA programme to ensure high quality services. The national programme shall implement the existing capacity building plan for microscopy including refresher training on all protocols for AFB examination, reporting and EGA compliance, as well as general biosafety and waste management practices. Township TB coordinators will coordinate routine supervision to all laboratories through a cascade of monthly visits and using an updated supervisory checklist.

- Poor quality of X-Ray interpretation:** Overreliance on X-Ray is leading, in some R/S to over diagnosis of smear negative TB and paediatric TB. Contributors to poor quality X-Ray include outdated equipment, lack of maintenance, limited reading competencies, and lack of an EGA system for X-Ray.
- Maintenance of equipment:** The NTRL experiences delays of 2-3 months when procuring, through UNOPS, accessories and spare parts. Emergency repair needs for equipment and air pressure systems cannot be handled immediately as there is no local company available for such maintenance.

Essential Interventions

- To strengthen the nationwide coverage of high-quality diagnostic services, the following interventions will be implemented across the country with the aim to improve overall access.
- Human resource capacity:** This NSP gives priority to filling vacant posts, especially microbiologists and laboratory officers to ensure sufficient capacity to manage the scale-up proposed in intervention 2-8 below. Training of all new recruits will be completed and refresher training designed to be implemented as part of routine supervision. Dissemination of the new diagnostic algorithms will be refreshed.
 - GeneXpert technology in all districts:** The NSP calls for expansion of the use of GeneXpert, especially for the testing of children, people living with HIV and health workers. Revised GeneXpert diagnostic and referral algorithms have been developed and will be disseminated as the number of sites expands. Refresher training is planned annually at R/S and district levels. Advocacy among clinicians and programme officers will accompany the addition of new sites. Plans are included to enable districts to design and introduce sample transport systems for ensuring access to GeneXpert testing by all townships and station health units.

4. **Quality culture capacity:** To achieve the WHO recommendation for 1 culture laboratory per 10 million population, culture capacity will be expanded to an additional 3 R/S, resulting in 6 R/S with liquid and solid capacity. The additional culture laboratories will be established at Mawlamyaing in Mon state, Naypyitaw in Naypyitaw council and Patheingyi in Ayeyarwaddy region. Liquid and solid culture capacity is also available in both reference laboratories, i.e. Yangon and Mandalay.
 5. **TB radiology in all township disease control teams:** Fixed radiology sites will be established in all townships. In addition, implementation of the NSP will scale up digital X-Ray capacity with 20 machines and covering all R/S TB centres. In 2015, all State and Regional TB centres, with the exceptions of Bago, Ayeyarwaddy and Mon, had mobile digital X-Ray machines that were used by mobile teams for active case finding.
 6. **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. The electronic laboratory system will align with the treatment monitoring system and will ensure informational links between GxAlert and PMDT facilities. Electronic systems will be developed to facilitate rapid data sharing, automated communication of results, management of laboratory commodities, communication of EQA reports.
 7. **Biosafety and infection prevention and control:** It is infection control measures in TB laboratories and sputum collection sites. NTP implement the infection control measure for all the laboratories from BSL-3 lab to microscopy centre in accordance with standard WHO guide line. The SOPs for all TB diagnostics including Microscopy guidelines, GeneXpert guidelines, Guidelines for laboratory waste management are updated and disseminated. All TB diagnostic testing used in Myanmar are incorporated into the National TB Guidelines.
 1. Infection control strategy will focus on all health care settings where TB patients, their family members and health care workers who handle sputum or culture materials. SOPs will be written in Myanmar language. A group of laboratory experts and TB Officers will gather and contribute to the development of the national guidelines on waste management at different levels. Adherence to infection control strategy will be monitored directly by immediate team leaders and during routine supervision by NTP. Check list will be revised and updated.
 6. **Regular supply of laboratory commodities:** NTP is responsible for ensuring the availability of quality laboratory materials across the country. In order to ensure uninterrupted availability of laboratory supply, the buffer stocks will be maintained at central (50%), districts (25%) and township (25%) levels based on the case load at each respective level. Estimates for laboratory S&E requirements are based on the annual previous consumption, the number of patients treated during the past years and targets set for each year (estimates of TB burden). Using this mechanism NTP will review and adjust the requirements annually. The estimated laboratory S&E costs are based on prices obtained from UNOPS. The maintenance & annual servicing cost also are funded mainly by GF and sometimes by WHO.
 1. The NTRL is responsible for preparing the forecasting of laboratory supplies & equipment, and determining technical specifications. Procurement processes are currently done by UNOPS, as a PR for the Global Fund. Since 2011, Global Fund has funded all laboratory supplies and equipment for sputum microscopy, solid culture & DST. The WHO office in Myanmar facilitates the shipment of all supplies sent from Expand TB. The Central Medical Store Department, DOH takes the responsibility for customs clearance and sends the supplies and equipment to NTRL. Since 2009, the implementation of new technologies in the BSL 3 and laboratory supplies are supported by FIND. Training on proper calculation for chemical requirements and stock keeping (m supply) was provided during 2015.
 1. person can manage for getting reliable quality products and uninterrupted laboratory supplies all over the country. One pharmacist will be provided for store management.
 2. The quality of products will be emphasized, more than low prices.
 3. The quality or brand of a sample and the quality of that procured item must be the same.
 4. For maintenance & servicing of laboratory equipment and BSL-3 laboratories more than one certified company will be provided not to happening delay service.
 1. In addition to the core set of activities listed above, varying emphasis will be given to selected interventions depending on the level of diagnostic coverage and performance.
- Central Level (NTRL) BSL -3 laboratory facility**
1. High proficiency in 1st line and 2nd line Culture and DST.
 2. Advocate for high usage of GeneXpert to clinicians and GPs (once per site per year).
 3. Revise the existing GeneXpert algorithm including testing on health care workers with X-Ray for suspected cases of TB.
 4. Reinforce proper sputum transportation system to GeneXpert sites and update guidelines on sputum collection and transportation.
 5. Conduct workshop session to expand SOPs
 6. Update existing SOPs of culture and DST according to WHO/The Union guidelines and ensure consistent compliance with such guidelines.
 7. Develop comprehensive waste management guidelines for all levels.
 8. Infection control measures and waste management available.

- | | |
|--|---|
| <ol style="list-style-type: none"> 9. Implement Biosafety measures at BSL-3 lab. 10. Procure and distribute good quality laboratory supplies timely to R/S levels. 11. Allocate sufficient budget for laboratory items and transportation cost. 12. Conduct once-yearly workshops on EGA findings by STLS and TB officers at the national level. 13. Strengthen capability of STLSs for EGA service by given training on newly recruited STLSs. 14. Conduct training on lab technicians for sputum microscopy, culture and DST 15. Supervise and monitor Region and State level TB centre laboratories for EGA and BSL-3 lab once a year 16. Develop annual report on EGA for sputum microscopy 17. Operations research for new diagnostic technologies 18. Electronic database RR system available at the 2 BSL3 Laboratory 19. mSupply system available at Yangon and Mandalay reference Laboratory | <ol style="list-style-type: none"> 10. management available at all levels from specimen collection to specimen transport and all testing. 11. Conduct quarterly supervision and monitoring on microscopy centres for quality assured service and GeneXpert sites in district & township level. 12. Conduct training on laboratory technicians for sputum microscopy, if they have training venue 13. Conduct Operations Research to understand the barriers to care seeking and diagnostic delays 14. Electronic database RR system available at the 2 BSL3 Laboratory 15. Computerized RR system available at R/S TB centre laboratories 16. mSupply system available at state and region levels |
| <p>Intermediate level (Region and State level)</p> <ol style="list-style-type: none"> 1. High proficiency in 1st line and 2nd line Culture and DST in BSL-3 laboratories 2. Expand GeneXpert testing of gastric lavage for children with TB contacts. 3. Expand microscopy centres according to population base (1 MC / 100,000) 4. Expand GeneXpert sites up to 81 sites in 2020 5. Advocate to clinicians and GPs for high usage of GeneXpert (once per site per year) 6. Expand testing of gastric lavage for children with TB contacts 7. Reinforce reliable sputum transportation system to GeneXpert sites 8. GxAlert system available at all GeneXpert sites 9. Biosafety measures implemented at all levels 10. Infection control measures and waste | <ol style="list-style-type: none"> 1. Expand microscopy centres to station hospital level 2. Advocate to clinicians and GPs for high usage of GeneXpert testing (once per site per year) 3. GxAlert system available at GeneXpert sites 4. Expand testing of gastric lavage for children with TB contacts 5. Infection control measures and waste management available at all level 6. Reinforce proper sputum transportation system to GeneXpert sites and microscopy centres 7. Supervise and monitor the MCs from intermediate level for quality assured service 8. Computerized RR system available at District/ Township level 9. mSupply system available at District/Township level |

1.2. Identify and treat all forms of TB, among all ages and including drug-resistant and drug-sensitive

Summary

Programmatic Emphasis

1.2.1. Core DOTS

This NSP aims to drive TB prevalence down by 5% per year. This will require that the country a) intensify case finding, especially by targeting the hard-to-reach and most-at-risk populations; b) accelerate access to quality-assured diagnostic services (addressed in section 1.1); c) extend the 85% treatment success rate to all townships; d) expand contact investigations, infection control and the use of preventive chemotherapy (addressed in section 1.3); and e) further strengthen partner collaboration and involvement.

To this end, the NSP defines the essential services to be implemented nationwide, as well as differentiated approaches for intensified focus, based on the current programmatic performance and epidemiology of geographical areas. In section 1.4, differentiated approaches to target the most-at-risk sub-populations with these geographical areas are described. Well-performing areas, as defined by high presumptive TB examination rate, case notification among general and hard-to-reach populations, low rates of lost-to-follow-up and high treatment success, may serve as models for those needing to strengthen services, be empowered to mentor and train other sites.

1.2.2. Programmatic Management of Drug-resistant TB

With a view to doubling the number of MDR-TB cases initiated on treatment each year, the NSP provides the roadmap for the scale-up of Programmatic Management of Drug-resistant Tuberculosis (PM-DT) to all 330 townships, including sites that will be designated as Centres of Excellence for the training, on-site mentoring and technical assistance for scale-up in other States and Regions. MDR-TB treatment will be systematically decentralized with a) expanded diagnostic capacities at district and township level; b) sputum transport for improved access to GeneXpert and DST services; c) standardized patient support package to enable treatment success rates >80%; d) engagement of all care providers, including public hospitals, BHS and NGO partners; e) efficient data management and expedited information sharing systems; and f) evaluation and introduction of new diagnostic technologies and drugs, such as PAS-containing treatment regimens, as appropriate.

1.2.3. Paediatric TB

The NSP aims to address the likely under-diagnosis of children < 5 years of age, and over-diagnosis particularly among children ages 5-14. The NSP aims to achieve the WHO suggested ratio of 1: 1.5-3.0 for those 5-14 years to children < 5 years diagnosed with TB. The overarching strategic directions aim to: a) enhance the quality of paediatric-specific diagnosis delivered through the NTP network of TB care providers; b) ensure integration of appropriate TB diagnosis and management by providers engaged through the child health programme of the Ministry; c) nurture the adoption of the NTP guidelines for the diagnosis and management of TB in children by private sector providers and public hospitals; and d) accelerate the uptake of isoniazid preventive therapy among child contacts of TB patients.

Targets

Standard Indicators	Denominator	Targets					
		Baseline 2015	2016	2017	2018	2019	2020
1.2.1 Core DOTS							
Number of notified cases of all forms of TB (increase the case notification for all forms by 3% by 2020)	Number	140,700	153,960	154,345	154,643	154,859	154,994
Number of notified cases of bacteriologically confirmed TB cases	Number	48,825	55,425	57,108	58,764	60,395	61,998
1.2.2 Programmatic management of drug-resistant TB							
Percentage of eligible presumptive MDR cases screened by GeneXpert	All eligible presumptive MDR cases	60%	70%	75%	80%	85%	90%
Percentage of previously treated TB patients receiving GeneXpert for RR screening	Total no. of bact. conf. previously treated TB cases	67%	70%	70%	80%	90%	100%
Number of bacteriologically confirmed, drug resistant TB cases (notified)	Number	2,793	4,816	4,787	4,905	5,014	5,115
Number of cases with drug-resistant TB that began 2nd line treatment	Number	2,207	3,130	3,297	3,380	3,510	3,580
Percentage of notified MDR-TB patients started on treatment	All new cases	50%	65%	69%	69%	70%	70%
Number of XDR-TB cases diagnosed	Number	24	35	40	45	50	55
Number of XDR-TB cases initiated on treatment	Number	10	25	30	35	40	45
No of R/S TB centres with renovated wards for IPC, including isolation	Number	4	6	8	11	14	17
No of R/S using electronic R&R	Number	n/a	2	6	10	14	17

Standard Indicators	Denominator	Targets					
		Baseline 2015	2016	2017	2018	2019	2020
Percentage of cases with drug resistant TB (RR or MDR-TB) who were lost-to-follow up during the first six months of treatment	Number of DRTB cases registered and treated	3% (2013)	≤3%	≤3%	≤3%	≤3%	≤3%

1.2.3 Paediatric TB							
Percentage of childhood TB among all cases	All new cases	24%	23%	22%	21%	20%	19%
Percentage of children under 5 among all children	All paediatric cases	44%	46%	47%	48%	49%	50%
Treatment success rate among childhood TB cases	All paediatric cases	95% (2014)	≥ 95%	≥ 95%	≥ 95%	≥ 95%	≥ 95%
BCG coverage	Total no. of eligible pop	93%	≥ 93%	≥ 93%	≥ 93%	≥ 93%	≥ 93%
Percentage of childhood TB cases tested for HIV	All registered childhood TB cases	40%	40%	45%	50%	55%	60%

Summary of Approaches

1.2.1. Core DOTS

1. Implement essential services of TB prevention, diagnosis and care services nationwide – decentralizing care provision to BHS and midwives to reach as close to patients' homes as possible.
2. Address barriers to treatment completion, extend to 85% the treatment success rate in most townships.
3. Build on successful models: establish decentralized centres of excellence as models for training, mentoring and supervision of other sites.
4. Intensify capacity building, operations research in and support to poor performing areas.
5. Intensify case finding among the hard-to-reach and most-at-risk populations.

1.2.2. Programmatic Management of Drug-resistant TB

1. Expand implementation of essential services for PMDT to all districts and townships – ensuring appropriate and timely provision of care as close to patients' homes as possible.
2. Expand MDR-TB diagnostic capacity, decentralizing the availability of GeneXpert, DST and RR screening.
3. Improve treatment outcomes: bolstering patient and provider education and ensuring the consistent provision of a patient support package.
4. Update communications, diagnosis-to-treatment completion tracking, and recording and reporting systems.
5. Ensure full engagement of all providers.
6. Systematize contact tracing for all household contacts of MDR-TB patients.
7. Pilot and adopt new tools, including treatment regimens (e.g. PAS) and diagnostic tests.

1.2.3. Paediatric TB

1. Enhance the quality of diagnosis delivered by TB care providers, particularly in areas experiencing over-diagnosis.
2. Strengthen appropriate use of X-Ray as a diagnostic tool, introducing an EGA system for X-Ray, and increase the proportion of bacteriological confirmation of cases.
3. Intensify case finding in areas experiencing under-diagnosis; engaging all providers of paediatric services, partners, and schools; supporting contact tracing of all childhood contacts of TB patients.
4. Nurture centres of excellence for paediatric TB diagnosis and care to serve as trainers for other providers.
5. Enhance TB/HIV collaborative activities among children.
6. Accelerate preventive measures, including updating isoniazid therapy among child contacts of TB patients and expanding BCG coverage to at least 93% of population.

Full Narrative

Situational Analysis

1.2.1. Core DOTS

With over 200,000 new cases of TB in 2014, TB remains a major challenge for the health system in Myanmar. However, the success of the NTP is demonstrated by the declining TB incidence and prevalence, as illustrated by (Figure 10). Notably, TB prevalence declined from 894 per 100,000 population in 1990 to 457/100,000 in 2014. WHO estimated that 79% of all estimated new cases were detected in 2014. Figure 10 and 11 below show the wide variance in case notification rates between states and regions. Further variance exists between the districts and townships. It is not known if the variance reflects true epidemiological differences or programmatic challenges in some geographical areas.

The treatment success rate for new smear positive cases was 85% in 2013 cohort, with 4.6% of cases

Figure 10: TB incidence and prevalence (per 100,000) in Myanmar (1990-2014)

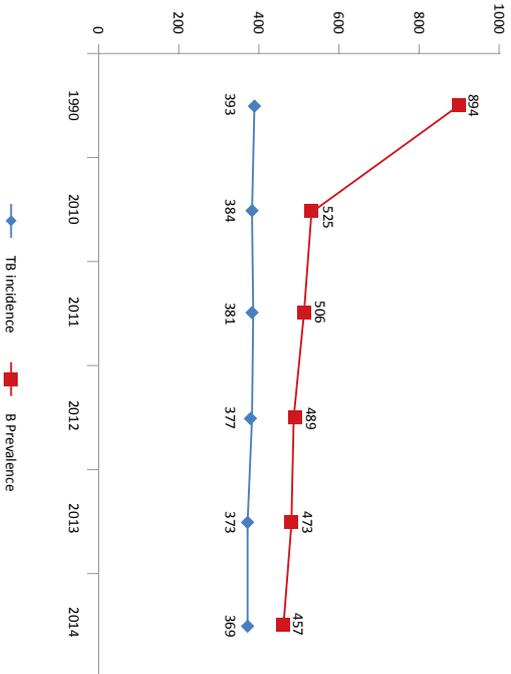
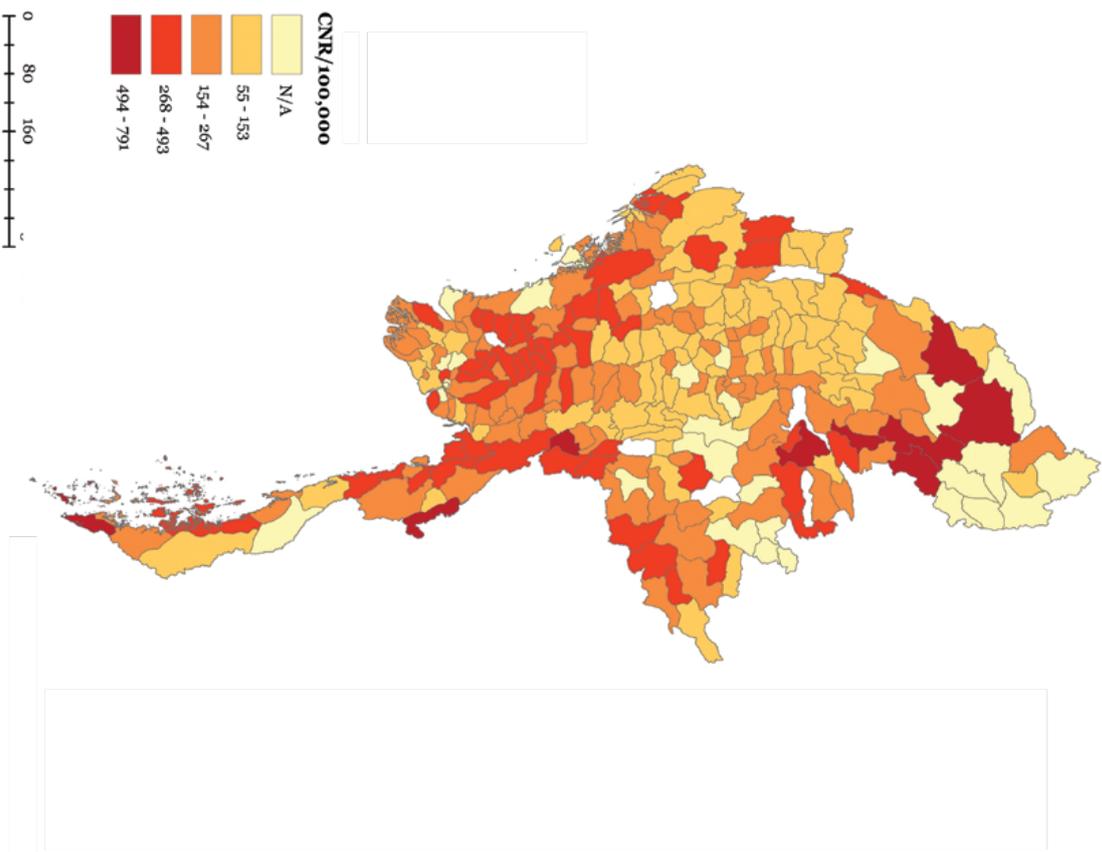


Figure 11: CNR (all cases) per 100,000 per Township in Myanmar, 2014



resulting in death, 4% in treatment failure, 5.2% lost to follow-up and 1.6% transferred out (Figure 12). Over the past decade, the NTP has successfully treated more than 1 million cases of TB. Figure 13 below shows the treatment success rates by states and regions, demonstrating that there remain areas of sub-optimal treatment outcomes.

Considering the well-documented relationship between poverty and TB, areas of low case detection and/or high rates of poverty may suggest a need for intensified case finding and targeted modalities of patient support (Figure 15).

The Joint Monitoring Mission noted that income was in fact a determinant of healthcare seeking with 67% of the poorest and 87% of the wealthiest doing so. The 2009-2010 prevalence survey results showed that the utilization of the public sector was different between urban and rural populations. While 62-77% of TB-symptomatic participants chose the public sector in rural areas, only 15-36%

of those in urban areas visited the public sector. In addition to some geographical areas, there are sub-populations that may be at higher risk for TB disease and poor treatment outcomes. Based on existing evidence from within Myanmar and other high TB burden countries, the following are considered high-risk populations for TB: a) factory workers, b) miners, c) health workers, d) people living with HIV, e) people living with diabetes, f) urban slum dwellers, g) migrants and h) the elderly (see section 1.4).

The NTP has established policies and guidelines in line with international norms and standards, and reflecting lessons learned from within Myanmar. The NTP is an important program within the disease control directorate and TB service delivery is fully integrated within primary health care through the Ministry of Health and Sports's network of facilities.

Figure 12: Trend of Case Detection Rate (CDR) & Treatment Success Rate (TSR) of New Sputum Smear (+) case at Country (1997-2014)

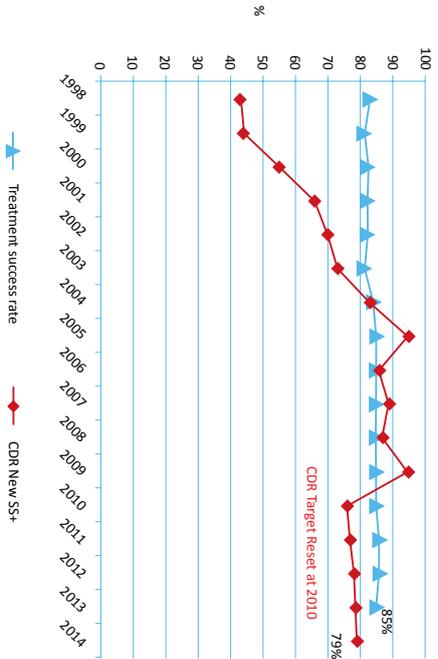


Figure 13: Treatment Success Rate (TSR) and case detection rate (new sputum smear positive) in 17 R/S in Myanmar (2013)

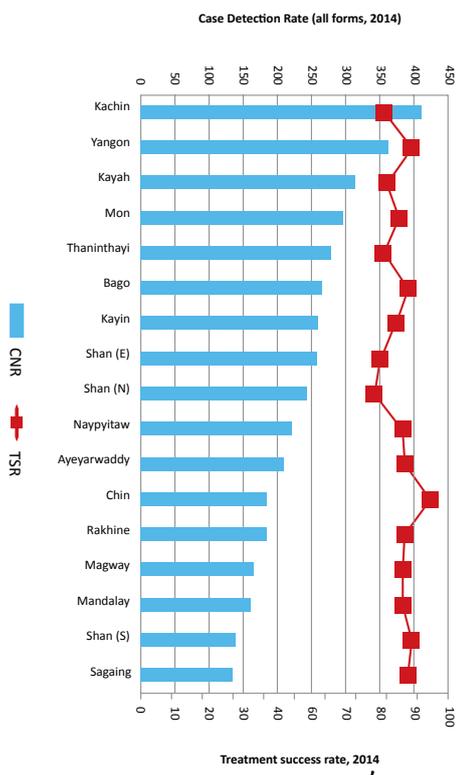
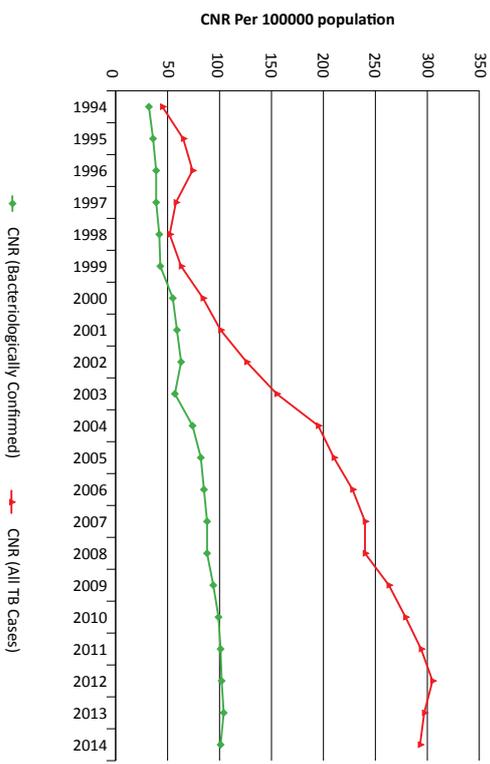


Figure 14: Trend of CNR (Bacteriologically Confirmed & All TB Cases) 1994-2014



Human resources dedicated to TB-related activities are employed at all levels of the health system to ensure disease-specific support with the context of integrated service delivery. A systematic case recording and reporting system, as well as standardized supervision and quality assurance enable programmatic monitoring at all levels.

1.2.2. Programmatic Management of Drug Resistant TB

Myanmar is one of 30 highest MDR-TB burden countries in the world. WHO estimated that approximately 9,000 cases of MDR-TB occurred in the country in 2014 and 5,500 cases were estimated by the NTP. Three national drug-resistance prevalence surveys show increasing prevalence of MDR-TB among new cases, currently estimated to be 5%, and among retreatment cases, currently estimated to be 27.1%.

Cases of extensively drug-resistant TB (XDR-TB) have been identified in Myanmar. The NTP estimates that 1% of drug resistant cases are XDR. A drug regimen for XDR-TB has been established and 7 patients were started on treatment in 2015. Under the UNITAID-funded programme (EndTB), MSF-Holland and the NTP are considering adding some of the newly WHO endorsed drugs to enable the treatment of 10 XDR-TB patients per year for 4 years.

The guidelines for PMDT were last updated in 2013, including revision of the diagnostic algorithms to optimize the use of GeneXpert. The algorithms are detailed in annex 1. The following structures ensure coordinated management of MDR-TB at different levels of care (Figure 17).

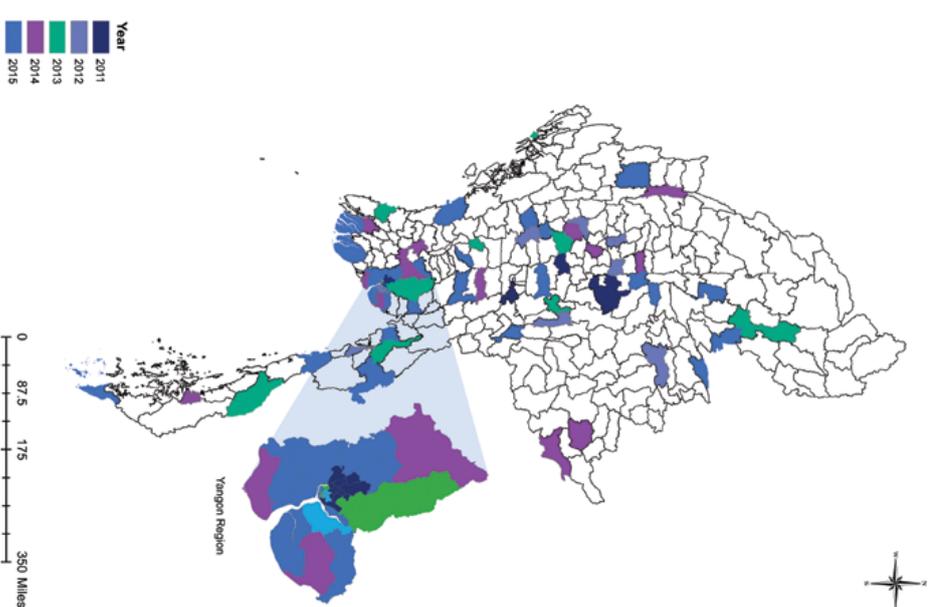
The NTP has been rapidly scaling up treatment since 2012 (Figures 16 and 18). By the end of October 2015, there were 108 MDR TB project townships. All 4 districts and 40 townships within Yangon region, except Kokogyun are covered, given the known high endemicity. MDR-TB centres have an GeneXpert machine, capacity to initiate MDR-TB treatment and manage adverse effects. Decentralized MDR-TB centres can give treatment, provide patient support, and manage minor adverse events. They refer any major adverse effects to higher-level MDR-TB centres. This plan is in line with WHO-GLC mission recommendations and borderless approach for patients to get MDR-TB treatment.

In most regions/states, treatment is provided on an ambulatory basis, with daily support for injections and treatment monitoring done by Basic Health Staff (BHS) and midwives. Going forward, the role of midwives may shift to enhance the focus on the MNCH aspects of their jobs. Public health staff working in communities will take up responsibility

Table 3: Summary of three national drug-resistance prevalence surveys

Survey years	MDR-TB among new cases	MDR-TB among retreatment cases
2002-2003	4.0% (95% CI: 2.7-5.7%)	15.5% (95% CI: 9.5-23.4%)
2007-2008	4.2% (95% CI: 3.1-5.6%)	10.0% (95% CI: 6.9-14%)
2012-2013	5.0% (95% CI: 3.1-5.6%)	27.1% (95% CI: 15.0-39.2%)

Figure 15: MDR-TB Township scaling up between 2013 and 2015



for public health and disease control activities, including TB control activities, in near future.

A standardized patient support package has been defined and is being implemented by the MOHS and partners. The package includes the equivalent of 30 USD per patient per month. For provider (BHS) support 30 USD / patient/month. The funds are designed to support additional nutritional needs and transport costs.

Among the cohort started on treatment in 2012, the treatment success rate for Programmatic Management of Drug-Resistant TB (PMDT) was 79% nationally with Mandalay reaching treatment success rates of 87%, Yangon reached 78%, and the rest of the country experienced considerably lower rates. The death rate on treatment remains high in some areas, possibly reflecting delays in treatment initiation or other challenges related to treatment.

By the end of 2015, the NTP had 49 GeneXpert machines in place, and partners had secured another 6 machines. Currently, there is one national TB reference laboratory (NTRL) in Yangon and one Regional reference laboratory in Mandalay, with capacity for culture and first-line and second line drug sensitivity testing. Sputum transport systems have been established in 330 townships to enable screening with GeneXpert and confirmatory testing by NTRL. This will be scaled up under the NSP.

A treatment regimen including PAS has been piloted. The pilot suggested the superiority of the

Figure 16: Coordinated management of XDR-TB at different levels of care

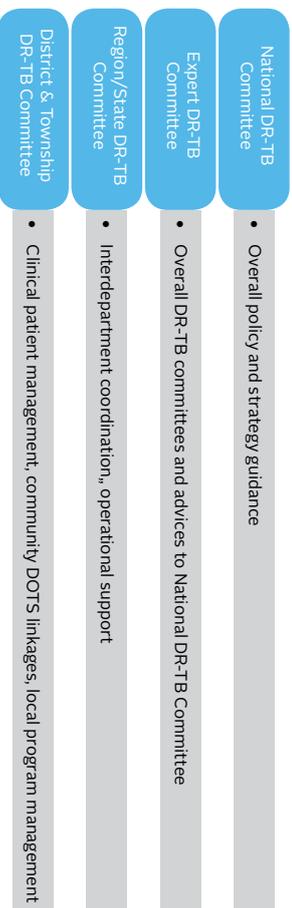
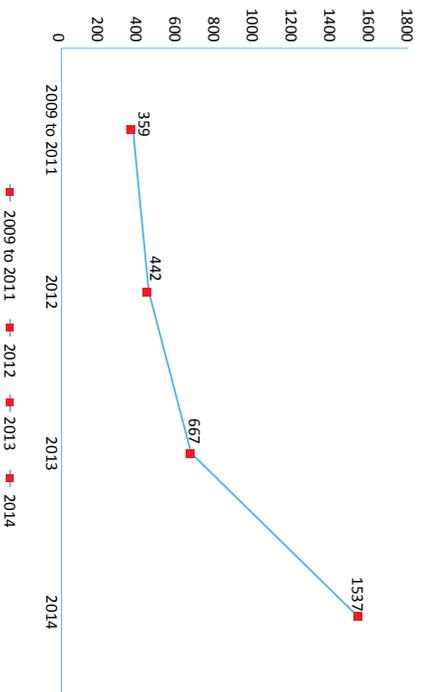


Figure 17: Enrolled MDR TB cases on second-line treatment



1.2.3. Paediatric TB

In 2014, over 36,000 cases of TB among children < 15 years of age were notified. This represented 26% of all notified cases. Case notification rates varied widely between states and regions, with rates as high as 142 / 100,000 population in Kayah to as low as 37 / 100,000 in Shan South (Figure 20). Since 2008, disaggregated data has been collected on TB in children < 15 years. The trends and types of tuberculosis in children are reflected in table 4, below.

Neonatal BCG coverage was estimated to be 93%. Treatment success for children < 15 years was high, at 85% in 2014.

Guidelines for the diagnosis and management of TB in children were developed in 2007 and revised in 2012. A diagnostic algorithm specific to children

is included in the guidelines. The evidence-based guidelines support symptom screening of all child TB cases, and isoniazid preventive treatment (IPT) is recommended for all contacts without symptoms of active disease. A register for IPT in children has been developed and disseminated. The recommended preventive regimen is daily isoniazid using 10 mg/kg. Isoniazid tablets of 100 mg are widely available for this purpose.

Management of childhood TB is taught as part of the pre-service curriculum for health staff. Current health worker training related to paediatric care is mainly conducted by senior paediatricians at provincial level, who provide training on diagnosing TB in children to the health staff in provinces and districts. There has been training in Yangon and Mandalay Regions to improve the quality of chest radiographs in 2014.

Figure 18: Percentage of all notified cases, 2014

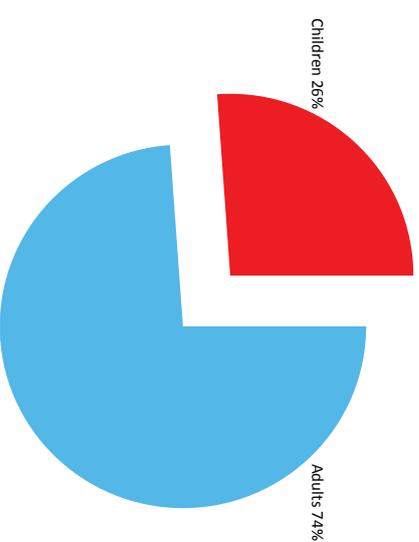


Figure 19: Paediatric cases notified 2007-2014

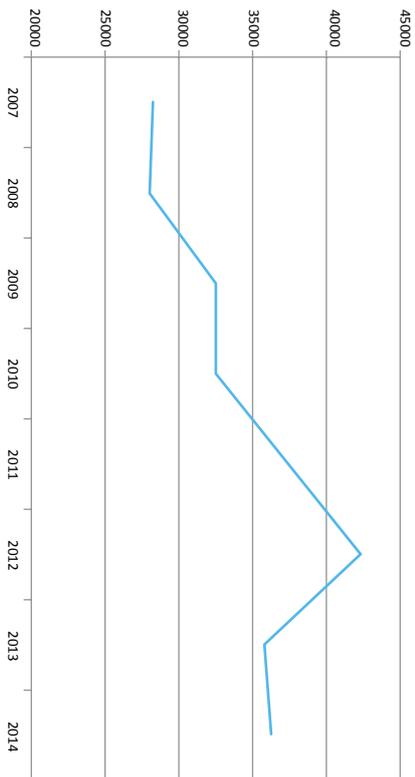


Figure 20: Case notification rate for paediatric TB by R/S

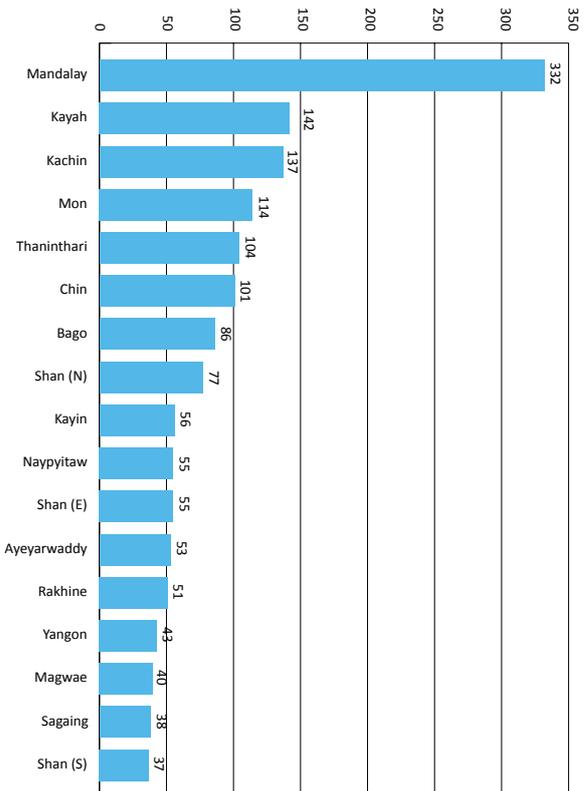


Figure 21: Percentage of childhood TB cases among all notified cases by state/region, 2014

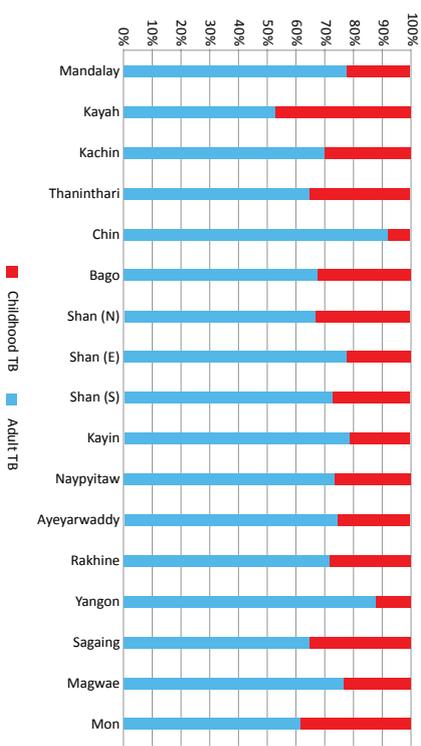


Table 4: 2014 Paediatric case notification (NTP and partners)

State / Region	Cases among 0-4 (all forms, 2014)	Cases among 5-14 (all forms, 2014)	Total <15 cases (2014)	0-15 / all cases (%)	Ratio of <5 : 5-14
Mandalay	1095	1526	2621	22%	1 : 1.39
Kayah	194	251	445	48%	1 : 1.29
Kachin	1223	1111	2334	31%	1 : 0.91
Thaninthari	720	775	1495	35%	1 : 1.08
Chin	303	289	592	56%	1 : 0.95
Bago	2018	2817	4835	32%	1 : 1.14
Shan (N)	827	1259	2086	33%	1 : 1.52
Shan (E)	184	234	418	22%	1 : 1.27
Shan (S)	351	475	826	27%	1 : 1.35
Kayin	532	682	1214	27%	1 : 1.28
Naypyitaw	345	337	682	25%	1 : 0.98
Ayeyarwaddy	1604	2322	3926	25%	1 : 1.45
Rakhine	682	1017	1699	27%	1 : 1.49
Yangon	1596	2930	4526	13%	1 : 1.84
Sagaing	1964	1575	3539	36%	1 : 0.8
Magwae	728	1047	1775	23%	1 : 1.44
Mon	1418	1883	3301	39%	1 : 1.33

Challenges

1.2.1. Core DOTS

Although the average treatment success rates are relatively high and stable, there is variability in programme performance across the country. Case notification rates at the township level range from 0 to nearly 850 per 100,000 population. In 2014, there were 7 States/Regions (Kachin, Kayah, Kayin, Shan (E), Shan (N), Thanintharyi and Ayeyarwaddy) with rates of lost-to-follow-up above 5%, with 2 of those (Shan East and North) having rates at or above 10%. Areas with high treatment success rates need to be able to sustain them, while expanding case detection. Areas with low treatment success will need to improve all aspects of case holding while further increasing case detection. Overall, the operations of the NTP will be adapting over the coming 5 years to the changing health systems context.

1.2.2. Programmatic Management of Drug Resistant TB

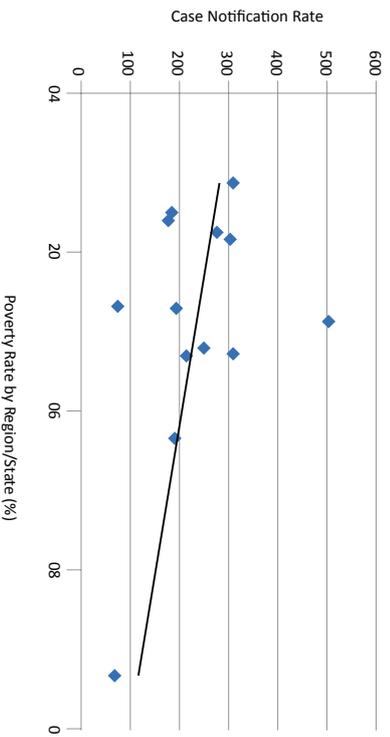
Resistant TB

Currently, the NTP cannot provide MDR-TB treatment to all diagnosed patients who reside outside the MDR project townships. As capacity for GeneXpert rolls out to all districts, an increasing number of drug-resistant cases will be identified. Scaling up treatment capacity commensurate with diagnosis, and ensuring the continued quality of care are priorities for this NSP. At the end of 2015, approximately 500 confirmed MDR-TB patients were waiting to initiate treatment. In 10 Regions and States, fewer than 67% of detected cases had initiated treatment in 2014. Infection control in laboratories and health facilities is not uniform.

1.2.3. Paediatric TB

Data on the number of children being treated for TB in Myanmar from 2008-2014 consistently reflect a larger than expected proportion of the total TB

Figure 22: Poverty Rate by Region/State (%)



burden among children (0-14 years). There is strong epidemiological and clinical evidence of over-diagnosis of TB based on incorrect chest X-Ray use and/or interpretation, and incorrect clinical and radiological assessment of lymphadenopathy. In 2013, WHO conducted a review of childhood TB in Myanmar and suggested that given the prevalence of TB in the general population, it is likely that prevalence among children is between 10-15% of total cases. The review found that chest X-Rays were being over-utilized, misused and were often being misinterpreted for diagnosis. It was concluded that incorrect X-Ray interpretation was a major reason for over-diagnosis. The largest groups of child TB represented are "primary complex disease" and "hilar lymphadenopathy" in the 5-14-year age group. This was far higher than expected as these presentations are usually more common in young children i.e. 0-4 years.

The proportion of cases that are TB meningitis or "other EPTB" was around 3.4%, which was much lower than expected. The proportion of EPTB cases in children is usually around 30% of total child TB burden with common types of EPTB being cervical TB adenitis, pleural effusion, spinal TB and miliary TB. Almost half of the TB meningitis cases were 5-14 years and yet TB meningitis is usually a disease of infants and young children. Since the review, National level advocacy meeting with senior paediatricians has been undertaken and the proportion of childhood TB to all cases has declined from 29% in 2012 to 26% in 2014.

Strategic Approaches

1.2.1. Core DOTS

It is expected that TB prevalence in Myanmar can decline at a rate of 3% per year over the period of the NSP, given the programmatic trends and existing programmatic base. This will require, however, that the country a) intensify case finding,

especially by targeting the hard-to-reach and most-at-risk populations; b) accelerate access to quality-assured diagnostic services (addressed in section 1.1); c) extend the 85% treatment success rate to all townships; d) expand contact investigations, infection control and the use of preventive chemotherapy (addressed in section 1.3); and e) further strengthen partner collaboration and involvement.

To this end, the NSP defines the essential services to be implemented nationwide, as well as differentiated approaches for intensified focus, based on the current programmatic performance and epidemiology of geographical areas. In section 1.4, differentiated approaches to target the most-at-risk sub-populations with these geographical areas are described. Well-performing areas, as defined by high presumptive TB examination rate, case notification among general and hard-to-reach populations, low rates of lost-to-follow-up and high treatment success, may serve as models for those needing to strengthen services, be empowered to mentor and train other sites.

1.2.2. Programmatic Management of Drug Resistant TB

Three States and Regions, namely Yangon, Mandalay and Ayeyarwaddy, have successfully scaled-up (or initiated scale-up) of PMDT, and include sites that will be designated as Centres of Excellence for the training, on-site mentoring and technical assistance for scale-up in other States and Regions. A mix of providers, including public hospitals, BHS and NGO partner sites that have successful treatment outcomes will be bolstered to provide assistance to like facilities. Essential PMDT services will be available in all PMDT townships and districts, with supplemental activities being targeted based on programmatic performance and gaps. The Guidelines for the management of MDR-TB will be updated in 2016.

1.2.3. Paediatric TB

The NSP aims to address the likely under-diagnosis of children < 5 years of age, and over-diagnosis particularly among children ages 5-14. The NSP aims to achieve the WHO suggested ratio of 1: 1.5-3.0 for those 5-14 years to children < 5 years diagnosed with TB. The overarching strategic directions aim to:

1. Enhance the quality of diagnosis delivered through the NTP network of TB care providers
2. Ensure integration of appropriate TB diagnosis and management by providers engaged through the child health programme of the Ministry
3. Nurture the adoption of the NTP guidelines for the diagnosis and management of TB in children by private sector providers and public hospitals; and
4. Accelerate the uptake of isoniazid preventive therapy among child contacts of TB patients.

The NSP recognizes that over- and under-diagnosis may be common to different degrees in different geographic areas. An initial assessment of current practices related to paediatric TB diagnosis and care will be conducted to determine the intensity with which one or both of these challenges must be addressed. Areas experiencing widespread under-diagnosis (especially in <5 years age group) will be supported to intensify case finding (interventions 2 and 3 below), while areas with suspected over-diagnosis of childhood TB (especially in 5-14 years age group) will be targeted to improve the quality of diagnosis (interventions 4 and 5 below).

Operations Research Priorities

A prospective audit of the clinical presentation and diagnostic practices of child TB suspects

Evaluate the yield of gastric aspirates compared to sputum in children under 8 years of age.

Evaluate and potentially revise the treatment regimen with FDCs for children

Descriptive study of cervical lymphadenopathy cases
Assessment of provider attitudes about the use of isoniazid for preventive therapy among childhood contacts of TB cases

Policy guidelines and tools

Fully disseminate and operationalize 2012 guidelines with SOPs and on-the-job aides
Develop and communicate clear guidance to support the use of the algorithms that are in the 2012 guidelines

Establish clear policy, guidelines and communication materials regarding the use of isoniazid for preventive therapy among child contacts of TB patients

Essential Interventions

1.2.1. Core DOTS

This NSP aims to reduce the disparities in case detection and treatment success across population groups and geographic areas, elevating and sustaining excellent programme performance within each township, district, state and region. Treatment success should reach 85% in most townships as case detection increases with intensified case finding and partnership activities. Specific activities are described below:

1. **Essential TB prevention, diagnosis and care services to be implemented nationwide include:**
 - a. Central unit with responsibility for setting policy, norms and standards, training, technical assistance, supervision, commodity management, and partner coordination (detailed in sections 2.2, 2.4, 2.5 and 3.2).
 - b. Human resource capacity with dedicated TB expertise at all levels of the health system (detailed in section 2.1 and 2.5), as part of the disease control or public health teams. Regular TB management trainings for BHS are provided, each region/state.
 - c. Diagnostic network (detailed in section 1.1): including microscopy centres in strategic or prioritized station health units (considering population coverage, accessibility to Township Diagnostic centre, assigned Station Health Doctor, Lab tech./trained microscopic and facility, GeneXpert capacity in all districts, radiology in all townships, sputum collection centres in communities and townships, functional EQA in all sputum microscopy laboratories and radiology units within the NTP network, uninterrupted supply of laboratory commodities, recording and reporting system linked to care providers.
 - d. Directly observed treatment as close to the patients home as possible, with support from community volunteers and health workers.
 - e. Supervision, and monitoring & evaluation (detailed in section 3.2): Routine supervision conducted through a cascade of TB-dedicated health staff and quarterly evaluation meetings/cohort reviews at township level. Standardized data recording and reporting, with analysis and use of data for decision-making. A move toward electronic data capture is envisioned.
 - f. Quality-assured supply of anti-TB medicines (detailed in section 2.4): Introduction of new systems for quantification, early warning and stock management are planned, as well as the integration of TB medicines into the essential medicines package.
 - g. Advocacy, communication and social mobilization (detailed in section 1.5): Promote information, education and communication activities to increase awareness, reduce stigma, address diverse populations, and accelerate care seeking, case finding and ensure treatment success.

The case for geographical targeting

1. 229 townships had a case notification rate of <293 / 100,000 (2014)
2. 9 States/Regions had a lost to follow-up rate of >5% (2014)

- h. Infection control (detailed in section 1.3): to be expanded to all diagnostic and care facilities, as well as at community level.
- i. Engagement of communities and all care providers (detailed in section 1.6 and 1.7): at all levels of the health system, with local coordination by township public health teams or disease control teams.
- j. Contact investigation (detailed in section 1.4)
- b. Centre(s) of Excellence will be identified to serve as the hubs for training activities, on-site mentorship, and technical assistance to other areas. In addition, they will contribute to national policy development based on lessons learned from their sites.

- c. Operations research: Given their human resource and infrastructure capacities, these Centres of Excellence will engage in selected operations research projects designed to stimulate further innovation for addressing barriers to TB care, to inform national policy and to pilot the introduction of new tools, including potential trials of future new drug regimens.

2. Intensified activities for areas with a TB case notification rate above the national average

There were four States/Regions with case notification rates above 293 / 100,000 in 2014. In addition, there are nearly 100 townships with high case notification rates. These States / Regions and townships host successful models of case finding and human resource expertise that will be shared with other areas. Activities designed to supplement the essential services in this group of geographical areas includes:

- a. Sustaining the gains: Disaggregated assessment of the facilities and townships within these States / Regions will be undertaken to determine if any areas should receive intensified support, as per packages 2 – 4. Sustaining the gains will require periodic refresher training for existing health staff, regular monitoring of performance and supportive supervision, intensive training of any new staff, training for the introduction of new policies, and maintenance of existing infrastructure and commodity supplies. In addition, identify the social determinants of TB especially in high burden areas and create the area specific initiatives to address the determinants. Provide the various kinds of supports such as nutritional, transportation

and psychosocial supports. Strengthen the patients' network and support groups.

Operations research: Given their human resource and infrastructure capacities, these Centres of Excellence will engage in selected operations research projects designed to stimulate further innovation for addressing barriers to TB care, to inform national policy and to pilot the introduction of new tools, including potential trials of future new drug regimens.

Research Findings

KAP (2009, KAP Survey)

- 9% of community member had high knowledge, 64% median knowledge and 27% low knowledge scores about TB
 - 65% of community knew anti-TB drugs were free of charge and 86.9% knew TB is curable
 - Radio broadcasting (in local language) was the most effective way to disseminate health messages, especially for ethnic groups in rural areas. High knowledge scores after broadcasting health messages on TB resulted ($p=0.001$)
- Treatment Seeking
- 49.9% sought care, 27.5% self-medicated and 22.6% took no action
 - 27.3% sought care from pharmacies, 25.2% from traditional, 18.8% from health centres and 16.7% from GPs. The majority (61%) sought care from untrained providers

3. Intensified activities for areas with TB case notification rate below the national average
- These areas will be prioritized for intensified technical assistance, training, mentorship, and supportive supervision. In these areas, support will be given to:
- f. Ensure the availability of referral networks for sputum samples, for basic diagnosis and DST, and patient care.

4. Intensified activities for areas with TB treatment success < 85%

Half of the States and Regions did not have TB treatment success rates above 85% in 2013. Intensified focus will be provided in these areas to:

- a. Understand patient, household and health system barriers to case notification with context specific assessments of knowledge, attitudes and practices, and develop locally-specific interventions to address them.
- b. Build capacity of community partners, health workers, radiographers, local health committees, and laboratory technicians to address the barriers to diagnosis, identify and diagnose TB; intensify technical assistance from partners and NTP-designated Centres of Excellence.
- c. Assess, adapt for local contexts and scale-up successful models of active case finding (ACF) including mobile teams.
- d. Strengthen implementation and monitoring of systematic TB screening at outpatient health facilities, in-patient hospitals, and at community level, with improved systems for documenting and tracking the progress of presumptive TB cases.
- a. Understand the barriers to treatment success, and develop locally specific, interventions to address them.
- b. Trace missed dose cases particularly ensuring that community volunteers have adequate access to communication and transport means to trace cases.
- c. Improve health education for patients, their families and community supporters. The NSP calls for consolidating and scaling-up the use of technology platforms developed by partners, and well received by patients, for the provision of health education. IEC messages will be developed and loaded into the mobile phones or tablet computers to be used by health staff when providing DOT.
- d. Build the capacity of basic health staff and community volunteers to provide treatment support
- e. Respond to social determinants of TB, ensuring that TB patients and their households benefit from social support mechanisms such as food supplementation, transport vouchers, and health insurance, that may offset the indirect costs of TB care
- e. Engage all care providers, particularly advocating for the use of updated symptom screening tools and diagnostic algorithms, ensuring availability of accessible referral networks and providing supportive supervision, training and/or technical assistance. These activities include support to local NGOs, local health committees, community organizations, and MNCH and HIV-specialty care provider.

- f. Strengthen referral networks to enable sputum transport for diagnosis, follow-up, and community-based care to ensure TB care is close to home
- ii. Central unit to develop a menu of options for GeneXpert data capture and communication to treatment sites, ensuring live national data aggregation and rapid communication of results to a treatment site. Each facility, such as BHS, and the district or hospital GeneXpert lab to select and introduce the most appropriate system for rapid communication of results from GeneXpert screening.

1.2.2. Programmatic Management of Drug Resistant TB

1. Essential PMDT services

- a. Systematized, rapid access to GeneXpert and DST:
 - i. Availability of GeneXpert at the district level (detailed in section 1.1).
 - ii. Community-to-district and township-to-district sputum transport systems designed and introduced to enable routine screening of all retreatment and HIV co-infected cases by GeneXpert. In urban settings, transport vouchers or reimbursement modalities to enable patient travel to GeneXpert sites. Once the scale-up of GeneXpert is sufficient to enable its use for initial diagnosis, the NTP will re-assess its diagnostic algorithm with an aim to providing drug-sensitivity testing for all TB patients.
 - iii. Design and introduce a standardized Registry of Patients Diagnosed with Drug-Resistant TB to track progress toward timely treatment initiation.
 - iv. Continue expansion of 30 MDR-TB centres/districts in year one (20 district + townships with 100 bedded hospital) to achieve nationwide coverage by 2016 including human resource development as detailed in section 2.5
- ii. All new cases to receive an initial home visit by community volunteers, in coordination with township health department.
- iii. Capacity for management of adverse events, including training of health workers and procurement of medicines, to be included as an integral component of all PMDT sites.
- iv. Community based treatment networks to be further strengthened to accommodate the planned scale-up of MDR-TB treatment. The NTP will collaborate with health facilities to

identify community volunteers, train them on DOT for PMDT, as well as on signs of side effects and MD referral.

- d. **Ensure uninterrupted supply of 2nd line anti-TB medicines and ancillary drugs:** Using quantification and supply chain management systems described in section 2.4, ensure quality-assured second-line medicines at township level.

PLH should be GeneXpert test. Expand the GeneXpert test algorithm to test non converter after intensive phase of initial regimen and retreatment regimen (all registered TB cases should be tested for GeneXpert in Yangon region only according to GLC recommendation) using sputum transport systems and transportation reimbursement to enable access to GeneXpert. Introduce the GeneXpert Ultra test beginning in 2016.

- e. **Patient support:** Ensure consistency in the provision of the standardized support package. The baseline standard package includes: US\$30 per month for both patients and their MDR-TB care provider, evening DOT for MDR-TB patients, nutritional support including rice and oil, personal infection control training and masks, health education and adherence counseling, household contact investigation and referral, and side effect monitoring & referral.

Expand capacity for first- and second-line DST: Establish 5 quality-assured first-line DST sites in Yangon, Mandalay, Taunggyi, Mawlamyay and Naypyidaw. Capacity for second-line DST will be built at the reference laboratories in Yangon and Mandalay.

3. Expand treatment

- a. **Patient and provider education:** Scaling up the use of video-based tools, using mobile technology, for refresher training of care providers and patient education

Borderless MDR-TB treatment: To enable treatment of MDR-TB cases from currently non-PMPT townships, new community-based / decentralized treatment sites will be established in end of 2015 and supported, with scale-up based on the detection of new cases. Once patients are stabilized and side effects managed, they can opt to return home and continue treatment through community based care with an established or newly trained DOT supporter and identified referral health facility.

- g. **Coordination:** Regional and State Committees for MDR-TB management to meet twice monthly to ensure timely enrollment of all diagnosed cases, and full engagement of all providers. Central level technical working group to meet quarterly.

2. Enhance diagnosis

- a. **Ensure the use of GeneXpert screening for RR among all retreatment cases and as the initial diagnostic test for all HIV-positive with presumptive TB cases.** For new registered TB cases with MDR-TB contact cases and

4. Pilot and adopt new tools
Standardize the use of PAS in MDR-TB treatment regimens for cases that have failed on Retreatment Regimen (category II).

- b. Assess and potentially revise the regulations regarding the use of linezolid, bedaquiline and delamanid to enable importation and introduction of these 3 drugs as per WHO indications.
- c. Adopt any shorter course regimens endorsed in future by WHO.
- d. Adopt WHO recommended new laboratory tests, e.g., molecular diagnosis of XDR/XDR-TB.
- e. Explore effective and less toxic regimens for treatment of MDR-TB patients without additional resistance to fluoroquinolones and second-line injectable.

1.2.3. Paediatric TB

1. Centres of excellence

Identify and nurture at least 4 centres of excellence, including in Yangon, Mandalay, Magwe and Traunggyi, for paediatric TB diagnosis and care to serve as trainers, on-site mentors and technical advisors for providers across the NTP and MNCH networks. The centres would be the conveners and hosts of periodic training and refresher sessions, enabling participants a hands-on training experience and an opportunity to witness best practice through models of service provision. The centres would have responsibility, in collaboration with the central NTP, for identifying and addressing trends in paediatric TB and programmatic challenges to the provision of quality diagnosis and care.

2. Intensify case finding

To address the likely under-diagnosis of childhood TB in some regions, states, and particularly among children < 5 years of age, activities to intensify case finding will be prioritized. An

evidence base of current provider practices will be developed through a prospective audit of the clinical presentation and diagnostic practices of presumptive childhood TB cases. Based on the results, the NTP will develop on-the-job tools for symptom screening, appropriate referral and diagnosis with differentiated targeting of the messages for an array of partners, such as pre-school providers, primary school teachers, community leaders, and paediatricians. These tools will accompany wider dissemination of the current guidelines and advocacy through professional associations and similar fora. Coordination with the MNCH programme and community-based organizations will be sought to ensure the full engagement and appropriate targeting of messages.

3. Contact tracing

Contact tracing of all childhood contacts of TB patients should be sustained by facilities engaged in the diagnosis of both drug-sensitive and drug-resistant TB diagnosis and treatment. The engagement of communities, as critical liaisons between patients and facilities, will be nurtured with adequate financial and logistical support for referrals and follow-up (described in section 1.3).

4. Strengthen the appropriate use of X-Ray as a diagnostic tool

Recognizing the complexities of diagnosing TB in children and the integral role of X-Ray in the diagnostic algorithm, the NTP will focus on introducing a comprehensive package of activities to train, mentor and assure the quality of X-Ray, especially for diagnosis of children. Specifically, the NTP plans to:

- a) Develop and pilot a routine external quality assurance (EQA) system, modelled after the

laboratory EQA system, for systematically reviewing the quality and interpretation of X-Rays. Future training and tools will be continually based on the findings of the quarterly EQA reviews.

- b) Develop and roll-out a technical refresher package targeting paediatricians and radiologists and focused on chest X-Ray interpretation related to diagnosing childhood TB. The package will include on-the-job tools, such as visual aids, to be rolled out with awareness raising about the over- and under-diagnosis of childhood TB in Myanmar.

- c) Intensify capacity building for chest X-Ray interpretation at the Township level. Anticipating improved access to chest X-Ray at the township level with MOHS investments in infrastructure and the NTP plans for expanding the availability of X-Ray (described in section 2.2), the NTP will introduce a cascade of training for township medical officer, radiologists, paediatricians and other providers engaged in TB diagnosis at township level.

5. Expand the use of Isoniazid Preventive Therapy for the childhood contacts of TB patients

All providers engaged in TB care will sustain the practice of conducting initial home visits to ensure the tracing of contacts for examination. An assessment of provider attitudes and practices related to the provision of isoniazid as preventive therapy for child contact of TB patients will be undertaken to form a foundation for the Technical Working Group to strengthen the NTP policy on IPT, and expand the systematic use of IPT in pilot areas.

6. Expand BCG coverage to at least 93% of the population

While Myanmar boasts high rates of BCG coverage, not all children are immunized at birth and remain at risk. In collaboration with the expanded programme for immunizations of the Ministry of Health and Sports and partners with hard-to-reach populations, the NTP will promote expanded use of BCG.

7. Enhance TB/HIV collaborative activities among children

Reach 60% of childhood TB cases tested for HIV and 80% of childhood HIV cases screened for TB by 2020.

1.3. Prevent transmission and the emergence of active TB

Summary

standard procedures, capacity building and activity plans of the TB control programme and other relevant health programmes, e.g. general infection prevention and control, occupational health and safety, infrastructure development, and prisons.

Programmatic Emphasis

1.3.2 Isoniazid Preventive Therapy (IPT)

1.3.1 Infection Prevention and Control
Conduct qualitative research to understand provider, patient and family concerns or barriers to the use of IPT. Addressing these barriers with IEC and training, scale-up of IPT with a focus to reach all eligible PLHIV and children exposed to an active TB case.

Accelerate the implementation and scale-up of TB IC measures, with a focus on implementation of the FAST strategy (Find cases Actively, Separate them safely, and Treat them effectively) and thereby prioritizing the most effective administrative controls. Streamline TB IC within policies, strategies,

Targets

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
Percentage of townships that comply with international TB IC quality standards and benchmarks to 50% of the facilities reaching a compliance score of 80% or higher	All townships	30%	35%	40%	45%	45%	50%
Number of children <5 in contact with TB patients who began IPT	Number	553	600	600	700	800	1000
Percentage of health workers undergoing symptomatic screening annually for TB		50%	60%	70%	80%	90%	100%

Summary of Approaches

1.3.1 Infection Prevention and Control

Situational Analysis

1. Engage township disease control teams as coordinators of the roll-out of IPC; specifically using a simplified assessment tool(s) and additional job aides.

1.3.1 Infection Prevention and Control

2. Introduce routine surveillance of TB disease among health workers in the recording and reporting system. Introduce a comprehensive package of prevention and care interventions for health workers, including personal protective equipment.

3. Incorporate TB IC in Occupational Health and Safety programmes including surveillance of active TB disease among workers at high-risk/high-volume work settings.

4. Develop and sustain TB IC interventions as an integral part of prison health programmes.

Transmission of TB in community, congregate and health care settings remains a major problem in Myanmar. It is estimated that one untreated infectious TB patient will infect 10-12 people each year. Most of the older health facilities in Myanmar were designed without specific attention to TB prevention. In the absence of national building norms and standards for the prevention of TB and other airborne diseases, recent architectural plans for hospitals do not comply with internationally recommended standards. Due to the natural population growth, the numbers of both inpatients and outpatients have increased considerably with overcrowding in wards and outpatient departments as a result. Thus, especially the high volume facilities have become a fertile setting for nosocomial transmission of TB and other airborne diseases.

1.3.2 Isoniazid Preventive Therapy (IPT)

1. Ensure INH and pyridoxine commodity security, including paediatric formulations.

2. Assess provider beliefs and willingness to provide IPT; revise communications and training materials to directly address misconceptions.

3. Train health care providers in TB screening and IPT provision.

4. Improve quality of recording of clients on IPT including initiation and discontinuation.

In 2014, the NTP developed a TB IC manual which has been distributed nationally. Facility managers and TB programme supervisors have been trained based on the guidelines and staff responsible for TB IC at each site have been assigned. The manual includes 8 Standard Operating Procedures and an extensive facility assessment tool that provides guidance for prioritizing interventions. However,

assessments have not yet been conducted and it has been suggested that the tool is overly complex and exhaustive. As such, there are not yet TB IC plans for all facilities; either stand-alone plans or (preferred) integrated facility IPC plans. A recent assessment suggested that MDR-TB sites are in compliance with TB IC policies (compliance score >75%). However, assessed general medical sites usually have much lower compliance scores (range 10-70%) suggesting inadequate implementation of TB-IC. The proper use of mechanical ventilation and upper-room UVGI systems from design and installation to maintenance needs strengthening through development of additional Standard Operating Procedures and stringent supervision. Also the proper use of N95 respirators needs strengthening. A revision of the TB IC manual has been recommended to improve facility level implementation and the periodic monitoring of its implementation.

1.3.2 Isoniazid Preventive Therapy (IPT)

National guidelines recommend routine screening for TB among PLHIV and placement on IPT for those asymptomatic for TB. Among 35 townships that reported in 2014, 17% (1,515/8781) of PLHIV were given IPT. Screening of children (<5 years) who are household contacts of patients with smear positive PTB and use of IPT for those who do not have active TB is national policy.

Challenges

1.3.1 Infection Prevention and control

While there are examples of facilities with excellent IC infrastructure and practices, such as the newly renovated DR-TB department of the Aung San TB hospital, many patients still encounter crowded indoor waiting spaces and general medical wards without adequate separation of infectious patients

from the general patient population. Few sites have a designated person to conduct triage of patients to enable the rapid separation of patients with cough or known infectious TB.

The evolution of policy guidance in Myanmar has been fast paced, resulting in some misalignment between operational manuals. The newly developed TB IC manual is not, for example, fully aligned with the national PMDT guidelines and is missing some standard procedures for example on the identification of patients with cough at entrance points, the installation and maintenance of UVGI fixtures and the proper use and disposal of N95 respirators. The facility assessment tool could be further simplified, based on international best practice, to enable facility self-assessment and IC plan development that prioritizes the immediate introduction of easily-managed administrative controls. Furthermore, job aides and increased use of signage (for staff) and IEC posters (for patients and visitors) are needed. Once plans are introduced, facilities will also need to initiate annual self-monitoring of compliance with internationally recommended standards and benchmarks.

More broadly, infection control for airborne infectious diseases, including TB, is not an integral part of IPC plans at facility level. IPC committees are functional in many places and could efficiently incorporate airborne diseases in their planning, checklists and monitoring of IPC practices. Efforts to better incorporate TB IC should be integrated within comprehensive IC for airborne infectious diseases, including considerations of air-change (ACH), maintenance of fans, and use of respirators.

1.3.2 Isoniazid Preventive Therapy (IPT)

The use of IPT in child contacts of TB patients is limited. Reporting on the use of IPT is also limited, making targeted approaches difficult to plan.

Strategic Approaches

1.3.1 Infection Prevention and control

Strategy 1: Accelerate the implementation and scale-up of TB IC measures, with a focus on implementation of the FAST strategy (Find cases actively, Separate them safely, and Treat them effectively) and thereby prioritizing the most effective administrative controls

Strategy 2: Streamline TB IC by integrating TB IC in policies, strategies, standard procedures, capacity building and activity plans of the TB control programme and other relevant health programmes, eg. general infection prevention and control, occupational health and safety, infrastructure development, and prisons.

1.3.2 Isoniazid Preventive Therapy (IPT)

Conduct qualitative research to understand provider, patient and family concerns or barriers to the use of IPT. Addressing these barriers with IEC and training, scale-up of IPT with a focus to reach all eligible PLHIV and children exposed to an active TB case.

Essential Interventions

1.3.1 Infection Prevention and control

a. Prioritize and accelerate the scale-up of TB-IC

The association of TB and HIV/AIDS, the lack of concern paid to TB transmission in health care and congregate settings, and the absence of a global TB infection control strategy have created a suitable environment for efficient transmission and spread of multidrug-resistant tuberculosis (MDR-TB) and extensively drug-resistant tuberculosis (XDR-TB), as well as drug-susceptible TB among patients, health-care workers, and the community. The potential impact of TB transmission in health-care and congregate settings on TB morbidity

and mortality has highlighted the urgent need to refocus attention toward TB infection control. TB infection control requires action at national and subnational level to provide managerial direction, and at health facility level to implement TB infection control measures. TB infection control requires and complements the implementation of core interventions in TB control, HIV control and strengthening of health systems. This set of strategic interventions builds on, strengthens and expands efforts to date.

Given the need to accelerate the uptake of IC measures across the country, the NSP refocuses the priority on administrative controls as proposed by the FAST strategy, i.e. conducting triage in facilities to identify patients with cough, separating them or fast-tracking them until the patient is put on treatment, ensuring effective treatment with regimens that are based on drug-sensitivity testing as per the national PMDT guidelines. Given this re-prioritization, the NSP calls for a revision of the IC manual, development of simplified assessment tool(s), introduction of a compliance monitoring tool(s) to be used by facilities annually and by supervisors during each visit, and creation of additional job aides, simple checklists and signage to remind the health workers to follow procedures. Specific guidance will detail the IC measures that could be considered in each facility setting, eg. outpatient departments, ART clinic, general ward, TB ward, laboratory, radiology department etc.

Routine surveillance of TB disease among health workers will be incorporated into the recording and reporting system. A comprehensive package of prevention and care interventions for health workers will be provided including personal protective equipment such as particulate respirators, HIV prevention education and commodities, antiretroviral therapy and isoniazid preventive therapy (IPT) or new preventive therapy regimens for HIV-positive health workers.

The introduction of the revised TB-IC manual and updated tools is planned through the active engagement of township disease control teams as coordinators of the roll-out of IPC. Formal on-site training of health staff and supervisors will be reinforced during supervisory visits. The NSP accelerates the development and operationalization of infection control plans, starting in high-volume facilities. Facilities will be supported to rethink the use of available spaces and consider renovation of existing facilities or construction of new ones to optimize implementation of controls. The NSP also plans for the use of upper room ultraviolet germicidal irradiation (UR-UVGI) systems, when adequate ventilation cannot be achieved in high volume facilities. Monitoring of the scale-up and effectiveness of the implementation of TB-IC in health care and congregate settings is planned.

- b. Fully integrate TB-specific IC priorities into the activities of the NTP and broader health sector policies, plans and activities
- i. Integrate up-to-date TB IC content into the national TB control policy, technical strategic groups, strategies, relevant guidelines and systems. Update recording and reporting forms to capture activities related to TB IC;
- ii. Ensure incorporation of TB IC into the national IPC policy, its strategies, guidelines, capacity building activities and facility level tools;
- iii. Develop building design standards for the prevention of transmission of airborne infectious diseases in health facilities;
- iv. Incorporate TB IC in Occupational Health and Safety programmes including surveillance of active TB disease among workers at high-risk/high-volume work settings;
- v. Develop and sustain TB IC interventions as an integral part of prison health programmes.

1.3.2 Isoniazid Preventive Therapy (IPT)

- a. Ensure INH commodity security, including paediatric formulations
- b. Assess provider beliefs and willingness to provide IPT; revise communications and training materials to directly address misconceptions
- c. Train health care providers in TB screening and IPT provision
- d. Quantification of pyridoxine procurement together with isoniazid (to be done by NAP)
- e. Distribution of isoniazid and pyridoxine (to be done by NAP)
- f. Improve quality of recording of clients on IPT including initiation and discontinuation (NAP)

1.4. Intensify targeted action(s) to reach marginalized and at-risk populations

Summary

Programmatic Emphasis

The NSP recognizes and addresses the disproportionate burden of TB among some high-risk populations, namely a) health care workers, b) elderly, c) prisoners, d) urban and rural poor, ethnic minorities, e) miners, f) migrants, g) drugs-users h) ethnic minorities i) pregnant and lactating mothers and under 5 children and people living with HIV or diabetes (detail in section 1.8). In addition to being high-risk, many of these populations are also hard-to-reach. As such, the NSP calls for intensified case finding through decentralization of services, targeted active case finding, and contact investigation.

- Summary of Approaches**
- 1.4.1. High-risk and Hard-to-reach Populations**
- Health-care workers
1. Expand annual TB screening to include all health care workers, especially those working in TB centres.
 2. Improve access to and use of personal protections.

Elderly

Expand active TB screening among elderly by outreach activity in collaboration with partners as well as by mobile clinics and elderly clinics.

Prisoners

Expand collaboration to all prisons: pre-entry screening of prisoners, regularly scheduled mobile

Targets

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
Treatment success rate among new drug-sensitive cases within high-risk populations	All new high-risk cases	85%	≥ 85%	≥ 85%	≥ 85%	≥ 85%	≥ 85%
No of TB cases (all forms) notified among key affected populations/high risk groups	Number	n/a	21,688	23,925	26,163	28,400	30,638
Percentage of notified MDR-TB patients, from sub-populations, started on treatment	All new high-risk cases	50%	65%	69%	69%	70%	70%
Treatment success rate among drug-resistant cases, within high-risk populations	All DR cases among high-risk pop.	n/a	81%	81%	≥ 82%	≥ 82%	≥ 82%

clinics to conduct ACF, identify and train work-site volunteers to support the prison population and camps; strengthen referral mechanism for care services post-release.

Urban and rural poor

1. Engage with community volunteers and TB SHG members to build networks for case referral in urban and rural poor areas, using differentiated approaches that respond to local context.
2. Strengthen mobile clinics to urban and rural poor areas, ensuring that the clinic open hours are accessible to those communities.

Miners

1. Enhance capacity of mine health clinics for TB care and regularly schedule mobile clinics to conduct active TB screening among miners and community. Strengthen referral mechanism for sputum transport and care services.

2. Engage other Ministries and the private sector to generate policies for worker self-protection, routine screening, job protection and supportive activities for TB cases. Migrants

Migrants

1. Initiate partnerships with IOM, SMRU and others who serve known migrant and internally displaced populations; establish a network of sputum collection, diagnostic and treatment services.

2. Develop "migrant friendly" approaches to be implemented by BHS and Voluntary Health Staff (VHS) as part of outreach in migrant communities. Strengthen the recording and reporting system to capture migrant status.

3. Expand ACF using mobile clinics to migrant hot-spot areas.

4. Develop a strategy to address cross-border TB.

Drug-users

1. Establish peer education and peer support groups, develop targeted information, education and communication materials for drug users.

2. Provide TB screening in all communities with known high drug usage, using linkages with local NTP providers; building the TB screening and care capacity of partners already working with the communities; or planning for ACF using mobile clinics.

3. Strengthen the referral network from harm reduction programmes to NTP sites, and train outreach workers to support TB treatment adherence in this group.

Ethnic minorities

1. Collaborate with ethnic health committees and NGO partners who serve ethnic minority populations to ensure a quality a network of sputum collection, diagnostic and treatment services.

2. Develop culturally-appropriate approaches to best serve these populations.

3. Strengthen the recording and reporting system to ensure case notifications to NTP.

4. Expand ACF using mobile clinics to underserved areas.

Pregnant and lactating mothers and under 5 children

Strengthen the collaboration with maternal and reproductive health department and child health department centrally, and service delivery points locally; appoint a focal point in NTP.

1.4.2. Active Case Finding

1. Conduct cost-effectiveness and impact evaluations of current mobile team approaches; select the most cost effective screening algorithms per risk group and setting for scale-up of mobile clinic activity.

2. Expand human resource capacity for case finding; engaging communities and general health services and HIV programme staff.

3. Strengthen the sputum-collection centres in hard-to-reach areas.

1.4.3. Contact Investigation

1. Roll-out structured contact investigation across the country, based on revised national guidelines that include paediatric index cases.

2. Revise the recording and reporting system to monitor consistency and effectiveness of contact investigation.

Health-care worker

Transmission of TB is a recognized risk in health-care facilities. Health-care workers with symptoms of TB are screened annually for TB and provided care, free of charge. The Ministry of Social Welfare provides a package for government health workers. Social security covers the costs of diagnosis and treatment. Sick leave is provided for government health staff who develop TB. A recent study on TB infection control among health staff in Yangon noted that although aware of the high risk of TB transmission, health workers' self-protection measures were not proportional to the needs. According to the study findings, self-protection measures were particularly weak among technicians during sputum processing and examination. These results were echoed by a study on infection control practices in MMA PPM. This study found that among the interviewed GPs, 31.1% reported wearing a surgical mask, 11.2% an N95 and 29.1% other surgical masks. Early separation of TB patients is also scares with only 15.1% of GPs practicing it regularly.

Elderly

By 2020, the number of people aged 60 years and older will outnumber children younger than 5 years¹. Rapid demographic changes in Myanmar demand collaboration between NTP and the Department of Non-communicable Diseases (NCDs). There are an estimated 10.3 million people over the age of 50 (20% of the population in Myanmar) and TB rates among the elderly are much higher than among young adults, but there has been little consideration of how to address TB in this key affected population. During 2014, total 25,612 new TB cases, which is about 20% of all new cases, were notified among 55 and older age group.

Situational Analysis

Full Narrative

1.4.1. High-risk and hard-to-reach populations

In Myanmar, there exist sub-sets of the population who are at higher risk for TB given their occupational or socio-economic conditions. In addition, there are sub-populations who are particularly difficult to reach with services, due to geographical or social reasons. In Myanmar, the groups warranting special attention have been identified as the following table.

¹ <http://www.who.int/mediacentre/factsheets/fs404/en>

Prisoners

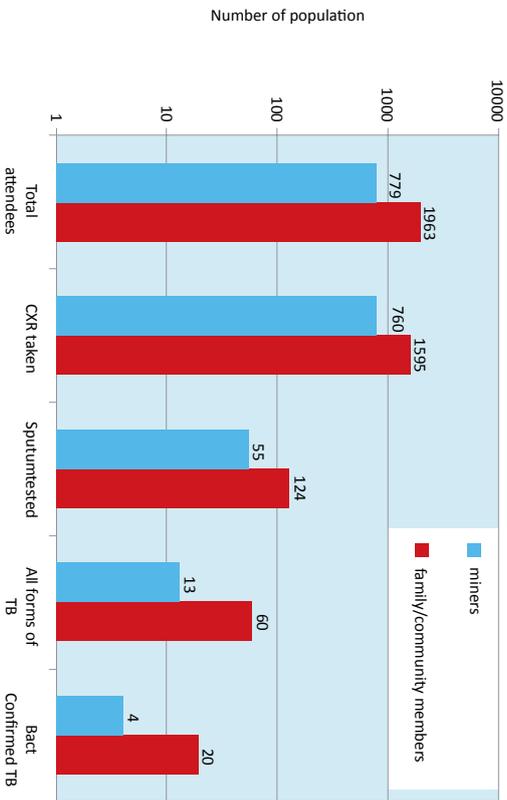
There are 45 prisons and 46 camps in Myanmar with an estimated 50-60,000 prisoners. The prison health services include one hospital in Insein Central Prison with 50 beds and two hospitals in Mandalay and Tharyarwaddy prisons with 25 beds each. Every prison or camp has an outpatient clinic, staffed in principle with 1 doctor, 1 health assistant, 2 nurses and 2 nurse aides. Prison services collaborate with the NTP, enabling TB treatment through collaboration with the township TB department. The townships provide all medicines and supplies for TB patients in prisons. In 2012, a TB and MDR TB Treatment Centre was established in Insein Central Prison Hospital. The TB mobile teams regularly visited 20 prisons in 2014 and 2015. For released TB patients, referral is arranged to the nearest TB Treatment Centre. In 2014, TB case finding in 20 prisons identified 6648 presumptive TB cases to be screened. Of those, 242 TB cases,

including 41 bacteriologically confirmed cases, were identified and initiated on treatment. The TB/HIV co-infection rate among TB patients was 11%.

Urban and rural poor

The urban poor live with many deprivations including limited access to adequate health care, education, employment and unhealthy environment. This community is one of the high risk populations for TB. According to the 2009-2010 National TB Prevalence Survey, TB prevalence in urban areas was higher than rural areas. With 3MDG support, TB mobile clinics go to urban poor and hard-to-reach areas. During the first two quarters of 2015, 26 mobile clinics were carried out in urban poor areas. From that, 612 TB cases were notified and started on treatment. The percent of all forms of TB among presumptive TB cases in urban poor areas was 5.6%.

Figure 23: TB prevalence five mining communities, Myanmar (Dec 2014-March 2015)



Miners

The prevalence of TB among miners has been documented to be as high as 1700/100,000 in some mines and upwards of 2700/100,000 in the mining community. In Myanmar, privatization of the mines started more than two decades ago. Most of the mines are now run by private companies, on a production sharing basis with government entities. During the transition from government to the private sector, some companies absorbed almost all of the former government miners while others did not. Mining areas are sometimes geographically hard-to-reach and accessibility to quality health services can be challenging for the miners.

As such, active case finding is conducted to reach miners using mobile teams. Between December 2014 and March 2015, mobile teams have visited Bawdwin (Nampitu), YadanaTheingi (NyaungCho), Bawesai (Kalaw), Heinda and Hermyingyi (Dawei) mines. In total, 2742 people including 779 miners attended the mobile clinics. Nearly 90% of miners did not know their HIV status. Thirty-seven miners (4.7%) had a history of TB treatment. Cough was the most common symptom among presumptive cases (41.8%). X-Ray was taken from 2355 individuals, including 760 miners. Of them, 1900 (81%) were considered normal, 52 (2.2%) had active TB, 91 (3.9%) showed healed lesions, 127 (5.4%) were presumed TB and 185 (7.9%) had other pulmonary disease. Sputum was examined from active and presumed TB (179 persons). Sputum was positive in 24 cases (13.5%). In total, 73 people (including 13 miners) were diagnosed with TB.

Migrants

Migration is an important phenomenon in Myanmar, with government estimates indicating that as many as 14 per 100 people move internally. The 2015 census data suggest that at least 2 million former Myanmar residents now live overseas, mostly in Thailand.

Specific information on tuberculosis in migrants in Myanmar is limited but evidence from a 2006 study suggests that nearly 58% of migrants delay care-seeking. Evidence from both high and low-income settings more broadly suggests migrants:

- May experience an increased likelihood of TB exposure, infection and transmission due to overcrowded living and working conditions, poverty and low levels of knowledge about TB. Pre-entry screening programmes in low incidence countries have found a high yield of TB cases when screening migrants from high prevalence countries;²
- Are likely to be diagnosed late and have high treatment default rates.³ Completion of DOTS was as low as 67.2% amongst migrant TB patients in Shandong province in China, while a study in refugee camps along the Thai-Burmese border found treatment default rates were higher amongst Burmese migrants compared to other vulnerable populations such as refugees.^{4,5}
- Reasons for delays in diagnosis and treatment default include: social, economic and legal barriers to accessing health care,

¹ Tomas B et al. Tuberculosis in Migrant Populations: A Systematic review of the qualitative literature. *PLoS One* 2013; 8(12):e82440

² Airdge R et al. Pre-entry screening programmes for tuberculosis in migrants to low-incidence countries: a systematic review and meta-analysis. *Lancet Infectious Diseases* 2014; 14:1240-49

³ Tomas B et al. Tuberculosis in Migrant Populations: A Systematic review of the qualitative literature. *PLoS One* 2013; 8(12):e82440

⁴ Toke RG et al. Factors affecting patient delay of diagnosis and completion of Directly Observed Therapy Short-Course (DOTS) among the migrant population in Shandong, China. *BioScience Trends* 2013; 7(1): 122-28

⁵ Minetti A et al. Tuberculosis treatment in a refugee and migrant population: 20 years of experience on the Thai-Burmese border. *International Journal of Tuberculosis and Lung Disease* 2010; 14(12): 1589-159

transportation difficulties and expenses, referred for TB testing, between 2013-2014, and incompatibility of clinic hours with working times, lack of TB-related education and self-supervision on treatment and high cost of healthcare. Higher treatment adherence is associated with social support and case management by family members or health care workers.^{1,2,3,4}

d. Can face substantial economic costs; with TB treatment for example reducing the level of remittances they are able to send back home.⁵

The NTP currently partners with organizations, such as IOM, that have expertise in working with migrant communities. IOM for example, provides tuberculosis services in 8 townships in Mon and Kayin State and has recently commenced active case finding activities in Yangon. With community outreach, IOM supported a 22% increase in the number of people referred for TB testing, between 2013-2014, and increased the number of bacteriologically confirmed patients identified by 13%.

Drug-users

There are 60-90 000 documented drug users and 40-80 000 female sex workers in Myanmar (5th JMM Report, Myanmar). The recent JMM identified effective programmes addressing the needs of marginalized groups which warrant expansion, e.g. the programme for female sex workers in Chanayetharzan urban centre/Mandalay; and the comprehensive programme for drug users implemented by AHRN which integrates HIV and TB services in Kachin and supports around 2,000 clients with harm reduction services. In close cooperation with the township hospital, this project provides substitution therapy with methadone, HIV and TB testing, and good reporting to NTP. During

Table 5: The IOM definitions for migrants:

Categories of migrants	Definition
Migrant	A person who lived away from their town or village of origin for continuously for more than 3 months
Internal/domestic migrant	A person who migrated to somewhere else within Myanmar
International migrant	A person who migrated to another country
Migrant workers	A person who regularly move around various locations within Myanmar and beyond in relatively shorter time-span . E.g. truck drivers, fishermen, railway staff, traders
Internally Displaced Persons	Persons who have been forced to flee their homes, in particular as a result of or in order to avoid armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters , and who have not crossed an internationally recognized State border <i>Note: IDPs cover persons who were displaced due to natural disasters</i>

1. Tomas B et al. Tuberculosis in Migrant Populations: A Systematic review of the qualitative literature. *PLoS One* 2013; 8(12):e8240
2. Zhou C et al. Adherence to tuberculosis treatment among migrant pulmonary tuberculosis patients in Shandong, China: A quantitative survey study. *PLoS ONE* 2012; 7(12):e52334
3. Kirwan et al. The social reality of migrant men with tuberculosis in Kathmandu: implications for DOT in practice. *Tropical Medicine and International Health* 2009; 14(12):1442-1447
4. Chen J. Which urban migrants default from tuberculosis treatment in Shanghai, China? *PLoS ONE* 2013; 8(11):e81351
5. Kirwan et al. The social reality of migrant men with tuberculosis in Kathmandu: implications for DOT in practice. *Tropical Medicine and International Health* 2009; 14(12):1442-1447

three quarters of 2014, the programme detected 174 cases among their clients, 78 of whom had HIV infection as well.

Ethnic minorities

Within the country, there are 135 recognized ethnic groups, speaking over 100 languages and dialects.

The ethnic minorities live primarily in the States and in autonomous regions.

Access to basic healthcare services is historically low in areas of the country where there has been a history of conflict and consequent population displacement. In areas with long standing conflict situations there has been very limited availability of health facilities and services. In Myanmar this impacts most upon populations in parts of Kachin, Kayah, Kayin, Mon, Shan, and Rakhine States. During the decades of active conflict in the ethnic states, official government health facilities and services were unavailable or inaccessible for the majority of ethnic populations in non-government controlled areas as a result of lack of provision of services as well as security factors, geographical access factors, and lack of freedom of movement/displacement.

As a result, many ethnic groups established their own community-based primary health care service provision structures. Their service delivery models include a 'package' of medical services comprising treatment of common diseases, war casualty management, reproductive and child health services, community health education, and water and sanitation programmes provided through a mix of mobile medical teams and stationary clinics. Many of these services however, have not previously been able to be covered by or linked with national.

Table 6: High-risk and hard-to-reach populations in Myanmar

High-risk and hard-to-reach populations	Evidence of need
1. Health workers ¹	Low utilization of self-protection measures among GPs (31.1% use of surgical masks) and low unrestricted ventilation (42.2%) ²
2. Elderly	About 20% of all new TB cases were notified among 55 and above age group during 2014 (2014 NTP Annual Report)
3. Prisoners	735 inmates with HIV positive, 174 (24%) were co-infected with TB. Of the 28 HIV + inmates that died, 15 (54%) were TB/HIV co-infected; ³
4. Urban and rural poor	TB prevalence in urban is higher than rural areas (2009 – 2010 prevalence survey). Rural populations face greater diagnostic and treatment delays. Malnourished and impoverished are at greater risk of disease.
5. Miners	Prevalence of up to 1700 / 100,000
6. Migrants	Migrants are not included in any health care registry, have limited access to health care services and are ineligible for referral support ⁴
8. Drug users	Estimates of 60-90,000 undocumented drug users (JMM)
7. Ethnic minorities	Active case finding among ethnic minorities yielded high rates of TB

1. TB infection control among health staff and MDR TB patients in Yangon, Myanmar. Yin Thi Nat Nu Oo & et al. 5th Asia Pacific Conference on Public Health, 10-11 April, Seoul, South Korea (No. 232 page 144 in TB Bibliography book and edition)
2. Tuberculosis Infection Control Practice of General Practitioners (GPs) in Myanmar. Medical Association Public Private Mix (MPM, PPM) Clinics in Myanmar: Provider Perspective.
3. MS Aung, Woodman M., Anterens, A., Sonko, C.-"Commencing Integrated HIV-TB Services in Myanmar" 43rd World Conference on Lung Health of the International Union Against Tuberculosis and Lung Disease (The Union), 13-17 November 2012, Kuala Lumpur, Malaysia, 2012
4. Access and utilization of maternal and child health care among migrants in Bogailey and Mawlamyethgun Townships, Myanmar (Wai Wai Han, Saw Saw, Thiengi Myint and et al., 2015)

1.4.2. Active case finding

Various programmes have been launched that use mobile teams to conduct active case finding at community level and in high-risk populations. Mobile teams are comprised of six people each (team coordinator, radiologist, X-Ray technician, data assistant, laboratory technician and driver/watchman). Mobile teams focus on urban slum areas, including those with industrial zones and large number of internal labour migrants, mine workers and their families. While the mobile teams are primarily supported by NGO partners, the teams are supervised by the respective Regional/State TB officer and collaborate with basic health staff in the particular township. The NTP provides training for all Regional/State TB officers and mobile team members on the standard operating procedures, including data management, for active case finding. The programme aims to increase awareness about TB in the community, stimulate early TB case finding, and increase overall case notifications. Active case finding using mobile

clinics was conducted in 113 high caseload, peri-urban and hard-to-reach townships in 2014. In addition, TB screening of prisoners using the mobile clinics is done in 20 prisons per year. These activities screened 57,905 presumptive TB cases with CXR and notified nearly 3,000 new TB cases including 660 bacteriologically confirmed cases in 2014. The contribution of mobile team activity to nationwide case detection was 2%.

There is limited evidence of the cost-effectiveness of the approaches for increasing case notification among different target groups. Several operations research studies are underway to assess the impact of the active case finding activities. Sputum collection centres, for example, seem to improve access to sputum smear investigation for women and the elderly, compared to the passive case finding approach. However, the limitation is that it mostly detects bacteriologically confirmed cases.

notifications. Active case finding using mobile

Figure 24: Achievement of ACF activities

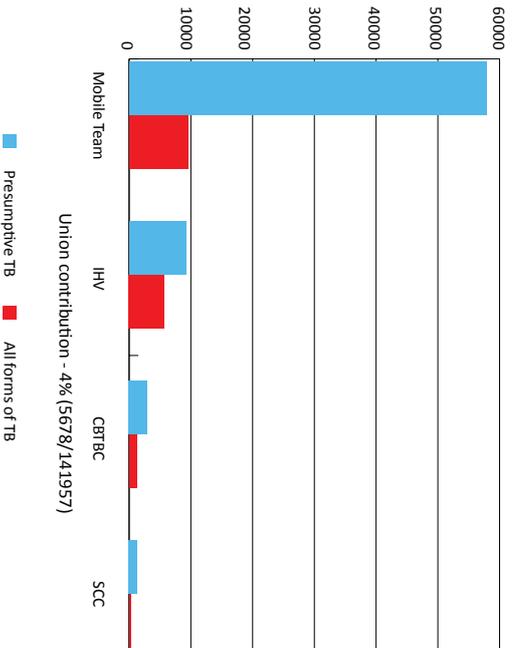
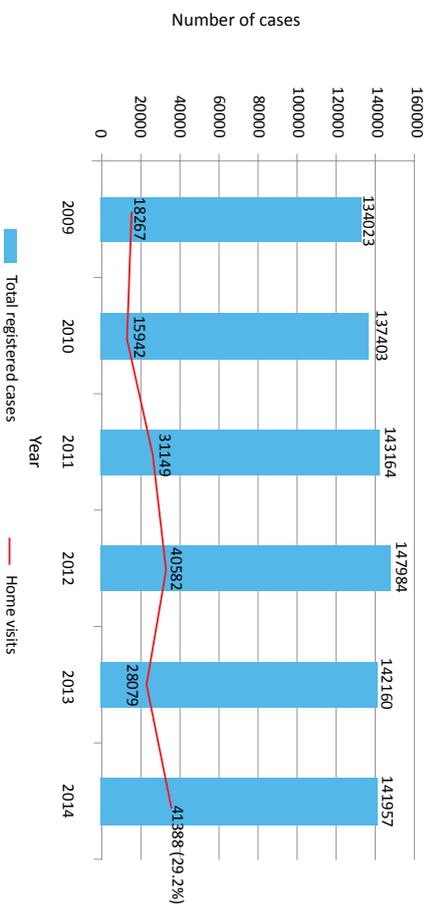


Figure 25: Proportion of index cases for whom contact investigation was done (2009 – 2014)



1.4.3. Contact investigation

The national TB guidelines recommend investigation and management of household contacts of all bacteriologically confirmed drug sensitive and DR TB cases. Contact investigation, conducted by basic health staff as part of the initial home visit, is recommended to occur within one week of treatment initiation. The family members, especially of bacteriologically confirmed cases, are investigated. All contacts with cough of more than two weeks' duration should be investigated with sputum smear microscopy and CXR if the smear is negative. In practice, contact investigation is done for a minority of index cases, a small proportion of household contacts are evaluated and investigated with smear microscopy. (Figure 25) In 2014, the contacts of nearly 30% of index cases were investigated. An additional 1,220 TB patients, including 458 bacteriologically confirmed cases, were identified and treated through this activity. While the guidelines do not currently include screening of the household contacts of paediatric index TB cases, new evidence recommends this additional activity.

Sputum Collection Centre

Sputum Collection Centres (SCC) are managed by rural health centres (RHCs) in each selected township. The Basic Health Staff (BHS) provide health information in the community, identify presumptive TB cases, conduct sputum collection from those presumptive cases, send specimens to the township TB laboratory, and provide anti-TB treatment prescribed by a TMO or TB team leader. This activity lasts for 2-3 weeks in each RHC, and then moves to another RHC within the selected township. In 2014, an additional 203 TB cases, including 193 bacteriologically confirmed cases, were detected. The sputum positivity rate was (3.4%).

Strategic Approaches

Given the strong foundation of the NTP network and numerous partners working with high-risk and hard-to-reach populations, this NSP calls for a systematic and coordinated scale up of intensified case finding, patient support and treatment to reach all known affected populations. The approach will

require the formation of additional partnerships to ensure TB awareness and treatment capacity, notably among ethnic health committees operating in independent zones.

system to monitor TB incidence among health workers.
Elderly

Strategy 1: Scaling up of high yield, cost effective ACF strategies targeting specific risk groups or populations in high-risk settings such as prisoners, miners and IDP camps, based on locally designed interventions and gathered evidence supporting the acceptability and effectiveness of the intervention.

1. Monitor trend of TB case notification, disaggregated by age and sex, to know the TB incidence among elderly.
2. Expand active TB screening among elderly by outreach activity in collaboration with partners as well as by mobile clinics and elderly clinics.

Strategy 2: Intensifying early case finding through structured contact investigation, including recording of activities and patient yield in the routine M&E system.

Prisoners
1. Expand collaboration to all prisons
2. Regularly scheduled mobile clinics to conduct ACF in all prisons

Essential Interventions

1.4.1. High-risk and hard-to-reach populations

To support the intensive needs for coordination of activities, and referral systems to enable hard-to-reach populations to access services, a national hotline and electronic system will be established to help communities/volunteers find services. This will require an elaborate mapping of service providers, public and private. The provision of patient support, including nutrition, transportation, financial subsidies and psychosocial support will be prioritized for these groups according to their needs.

Health-care workers

1. Development of policy and procedure for annual TB screening of health-care workers.
2. Annual TB screening for health care providers, prioritizing those working in TB centres.
3. Strengthen the recording and reporting

3. Identify and train work-site volunteers to support the prison population and camps
4. Engage other Ministries to generate policies and plans for infection control within prisons and screening / care of prison staff
5. Strengthen referral mechanism for care services, considering the transition from prison to community post-release
6. Improved data collection and reporting
7. Engage with Ministry of Home Affairs to do pre-entry screening of all prisoners

Urban and rural poor

1. Engage with community and TB SHG to strengthen referral in urban and rural poor areas
2. Capacity building to community volunteers and SHG members

3. Strengthen mobile clinics to urban poor areas, ensuring that the clinic open hours are accessible to those communities.

Miners

1. High level advocacy meeting with mining department, occupational health department and related departments.
2. Regularly scheduled mobile clinics to conduct active TB screening among miners and community

3. Identify and provide on the job training to volunteers to support the mining population

4. Engage other Ministries to generate policy for worker self-protection, routine screening, job protection and supportive activities for TB cases

5. Information, education and communication within community and surround health facilities

6. Strengthen referral mechanism for sputum transport and care services,

7. Improved data collection and reporting

Migrants

The NSP calls for a pro-active approach to identifying and serving migrant populations in collaboration with partners such as IOM and SMRFU. Outreach in migrant hot-spot areas, such as industrial zones, borders, will be systematized.

include non-state and non-health actors having gained the trust of the local communities, e.g. ethnic health committees, and faith-based organizations. Tap into partnership network used for malaria control, to expand capacity for TB. Aim for national coverage using a network of partners linked to the NTP

2. Expand the sites for regularly scheduled ACF using mobile clinics. Identify and prioritize townships not routinely reached by NTP, and where partners can support screening and treatment follow-up.

3. Develop a strategy to address cross-border TB, mapping partner engagement to ensure full coverage of the border populations and migrant workers. Conduct a study of care seeking among border populations to understand the complexities and needs for services.

4. Develop and implement an information, education and communication strategy to raise awareness among migrant communities, partners working with them, and surrounding health workers (public and private)

5. Develop "migrant friendly" approaches to be implemented by BHS, Voluntary Health Staff (VHS) including CHWs and Auxiliary Midwives (AMW) and CVS staff as part of outreach in migrant communities. Build awareness and knowledge of health staff regarding the care practices and needs of migrant communities.

1. Map partners / actors with access to known migrant populations, including internally displaced. Establish a plan to reach all migrant communities, including building capacity for TB screening and referral, and potentially treatment support, by partners. Partners will

6. Strengthen referral mechanisms between townships for migrants. Develop a mobile application / tool for supporting the transfer of migrant patients between care sites.
7. Strengthen the recording and reporting system to capture migrant status

Drug-users

1. Develop targeted information, education and communication materials for drug users, including injecting drug users
2. Establish peer education and peer support groups
3. Plan strategically for the provision of TB screening in all communities with known high drug usage. Options for each community include: a) strengthening the linkages with local NTP providers, b) building the TB screening and care capacity of partners already working with the communities, or c) planning for ACF using mobile clinics.
4. Enable referral among DIC / harm reduction partners
5. Involve communities in scaling up active case finding approaches
6. Improve policies and advocate for further integration of TB screening into General Health Services (e.g. OPD, DM clinics and MCH programmes)
7. Organize and implement TOT training to orient clinicians and nurses on TB to increase index of suspicion and take appropriate action
8. Improve quality of TB screening and diagnosis by care providers through regular supportive supervisions.

Ethnic minorities

1. Collaborate with ethnic health committees and NGO partners who serve ethnic minority populations to ensure a quality a network of sputum collection, diagnostic and treatment services
2. Develop culturally-appropriate approaches to best serve these populations
3. Strengthen the recording and reporting system to ensure case notifications to NTP
4. Expand ACF using mobile clinics to underserved areas.
9. Agree with NAP on targets for expected numbers of presumptive TB in HIV services
10. Strengthen the network of sputum-collection centres
11. Intensify sputum collection centre approach in hard-to-reach areas

1.4.3. Contact investigation

1. Establish and roll-out structured contact investigation across the country.

1.4.2. Active case finding

1. Conduct cost-effectiveness and impact evaluations of current mobile team approaches
2. Update the contact investigation component of the national guidelines to more fully detail which index cases require contact tracing and

including paediatric index cases, elaborate steps for conducting contact investigation, and revise the recording and reporting system to monitor consistency and effectiveness of contact investigation

1.5. Implement a robust communication strategy, extending from policy makers to patient education

Summary**Programmatic Emphasis**

3. Expand and intensify contact investigation to cover all household and other close contacts of patients with pulmonary bacteriologically confirmed TB, DR-TB, and paediatric index cases.
 4. Sustain intensified case finding and contact investigations efforts in HIV care and treatment settings, in collaboration with the National AIDS Programme
 5. Monitor the investigation of contacts, and disaggregate data to monitor the notification rate from contacts.
- The NSP recognizes that communications and advocacy efforts will contribute to the acceleration of case detection and increase of treatment success. The NSP defines the relevant information and targeted messages needed to reach those who can influence individual, community, provider, government or donor behavior. The NSP anticipates increased availability of electronic and mobile tools to enhance communications, particularly in hard-to-reach areas. Mobilization of political will and resources, financial and human, is a priority for advocacy-related activities.

Summary of Approaches

1.5.1 Build political will and mobilize resources at township and district level

1. Develop and implement township-specific advocacy and communications plans that take into account the local challenges and opportunities.
2. Establish township-level STOP TB Partnerships to coordinate communication and advocacy efforts.

1.5.2 Build political will and mobilize resources at national government level

Enhance communications and advocacy across the central government, broadening ownership of the NTP and integrating TB and MDR-TB issues

into plans for universal health coverage, social protection schemes and other health and non-health sector development.

1.5.3 Build political will and mobilize resources at donor level **1.5.5 Reduce stigma, accelerate care seeking, and enhance case holding through communities**

1. Nurture existing donor partnerships with regular programmatic updates. Target community-specific communications, including print, radio and mobile-phone based (depending on the local context) information.

2. National and township-level Stop TB Partnerships will be supported to engage new donors from the private and other non-state sectors, including businesses. **1.5.6 Increase awareness of symptoms and expectations during treatment by patients**
Former and current TB patients, especially youth, will be engaged in crafting patient-centred messages and promoting the best communications platforms.

1.5.4 Accelerate case detection and increase treatment success through all health providers

Ensure health providers have all relevant technical information: a) disseminate existing tools; b) develop new communication and advocacy materials targeting the specific needs of private sector GPs, hospitals, community-based

Targets

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
Percentage of BHSI and BHSII that have access to up-to-date technical guidance	All BHS	80%	85%	90%	95%	95%	100%
Percentage of districts that host a partner coordination meeting and have endorsed a local advocacy and communication plan	All districts	50%	60%	70%	80%	90%	100%

Full Narrative

Situational Analysis

Increasing government investments in TB, TB/HIV and MDR-TB will require political commitment and resource prioritization by not only the central government but by local governments. It will also require that the NTP realize efficiency gains through the integration of TB and MDR-TB control activities into other service delivery platforms (eg. MCH), financing modalities (eg. insurance schemes), policies (eg. workplace). The NTP will need the full engagement of the private sector, and will need to scale-up the most cost-effective interventions. Complementary and increased funding from donors and partners will be needed to sustain core activities and enable the roll-out of new innovations. In all cases, targeted communication and advocacy to the respective constituencies will need to be developed and delivered.

A Knowledge, Attitudes and Practice (KAP) study conducted in 2009 suggested that only 9% of community members had high knowledge of TB, while 64% had median knowledge and 27% had low knowledge scores. About 45.9% had heard about DOTS and 65% knew anti-TB drugs were free of charge, whereas 86.9% knew it was curable. According to 2013 results, nearly 69% of new patients had good knowledge about TB. Only 41% of DOT providers scored highly on TB knowledge, although those who attended training scored significantly higher (83%) than those who did not (25%). Among factory workers 95% perceived TB as curable and 68% were aware of free treatment. Among drug sellers, 46% had high knowledge of TB, 80% had low knowledge of symptoms, and 97.9% had low knowledge of treatment. Informal health care providers mostly had low knowledge of TB treatment.

Despite general knowledge, care seeking is commonly delayed. Studies suggest that 58.9% of patients delayed for more than 4 weeks, with an average delay of 30 days. This was longer for rural areas, patients with primary school level education, and lower monthly family income (<50000 Kyats) (2007). Patients also found it difficult to access THD in the rainy seasons. The KAP/ACSM research also found that FM radio broadcasting in the local language is the most practical way to disseminate health messages, particularly for ethnic groups in rural areas. High knowledge scores increased after broadcasting health messages from 18.4% to 26.4% (association between listening to FM radio and having high knowledge scores at p=0.001). Treatment seeking also improved.

Strategic Approaches

Communications and advocacy efforts will contribute to the acceleration of case detection and increase of treatment success by ensuring that relevant information and targeted messages reach those who can influence individual, community, provider, government or donor behavior. Mobilization of political will and resources, financial and human, is a priority for advocacy-related activities.

Essential Interventions

The proposed approaches outlined below respond to the recognition that different programmatic needs are best addressed by advocacy and communication activities that target different audiences. (Figure 26).

A foundational economic and social investment case for TB and MDR-TB will be developed, from which messaging for many of the constituencies highlighted below can be derived: i.e. framing the case for “why invest in TB and MDR-TB” at

all levels of the government, among the private sector and other partners, and in communities and households.

NSP supports the establishment of a STOP TB Partnership office to coordinate communication and advocacy efforts in every district.

Package 1: Build political will and mobilize resources at township and district level (1.5.1)

Some illustrative activities under this package include: a) identify TB champions for each township; b) organize local events to mark World TB Day (March 24); c) ensure a slot for "TB Talks" at regular intervals within the broadcasting schedule of local FM radios; d) organize health education activities in schools and other congregated settings about TB prevention and early diagnosis; e) produce simple, straightforward and clear messages about TB and disseminate them (in local language if needed) through posters, flyers and e-technology (mobile phones, popular websites, social networks); f) seek integration and coordination with other health programmes and initiatives by promoting and organizing joint events [e.g. TB and HIV talks during AIDS World Day (Dec. 1); TB and DM brief on World Diabetes Day (Nov. 14), etc.]; g) give voice to patients (current and former; DS as well as DR-TB) and families by promoting their

Building political will and mobilizing resources for TB and MDR-TB at the township and district level will require that the burden of these diseases be contextualized. Situational analyses that build on this NSP are planned for each state and region that should yield baseline information and propose district-specific targets to be monitored, including programme performance, partner engagement and resource use. These township-specific advocacy and communications plans will take into account the local challenges and opportunities described in the section on Core DOTS. Opportunities for resource mobilization in support of districts with limited local resources will be prioritized. Issues related to the control of TB and MDR-TB can be incorporated into township health fora. The

attendance to relevant meetings (review meeting, workshops, external missions, etc.); h) mass media campaign with Chit Thu Wai and Sai Sai Kham Hlaing, e.g. cough campaign; TB spot, public service announcements.

Package 2: Build political will and mobilize resources at national government level (1.5.2)

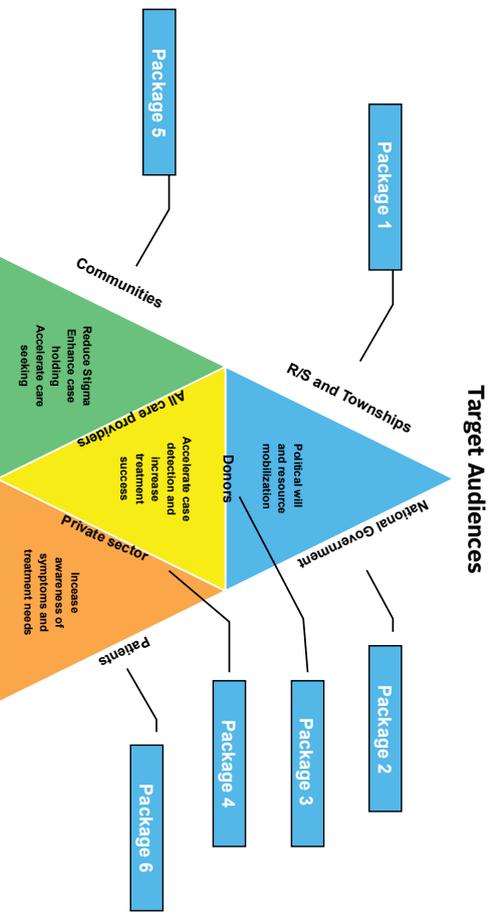
The NTP must enhance communications and advocacy across the central government, broadening ownership of the NTP and integrating TB and MDR-TB issues into plans for universal health coverage; social protection schemes and other health and non-health sector development plans. The NTP must concurrently facilitate access to information about the diseases and its programmes among the civil society and stakeholders. Finally, the central NTP must operationalize its increased communication and advocacy role vis-à-vis the township disease control teams. A national communications and advocacy strategy will be developed.

engaged in the evaluation of specific aspects of the programme, particularly if they have technical expertise on the ground.

Package 4: Accelerate case detection and increase treatment success through all health providers (1.5.4)

To ensure health providers have all relevant technical information, as well as the motivation to provide quality services, activities are planned to a) disseminate existing tools; b) develop new communication and advocacy materials targeting the specific needs of private sector GPs, hospitals, community-based organizations, and other NGOs, e.g. tools for adherence counseling and health education, fact sheets on IPT and contact tracing. Motivating health workers through professional development opportunities and performance-based recognition will form part of the advocacy strategy.

Figure 26: Various target audiences for advocacy and communication activities



Package 3: Build political will and mobilize resources at donor level (1.5.3)

The NSP has dual objectives of sustaining close collaboration with existing donors and nurturing new donor partnerships. National and township-level Stop TB Partnerships will be supported to engage new donors from the private and other non-state sectors, including businesses. The NTP and its partners will proactively and creatively mobilize new funds through events; e.g. runs, and innovative financing; e.g. charity pledges. A database of existing and potential donors will be established to better target resource mobilization where funding gaps remain. As a way of attracting their attention, donors may be invited to visit TB control activities in the field during programme reviews or ad-hoc missions. They may also be

The NTP will update pre-service and in-service medical training for all cadres of personnel to ensure that training is consistent with the norms and policies of the NTP. Key faculty will be engaged to design and deliver, potentially online, short courses or modules that communicate the components of NTP guidelines. These modules and courses will be promoted as integral components of pre-service training.

Package 5: Reduce stigma, accelerate care seeking, and enhance case holding through communities (1.5.5)

New communication materials and messages, including print, radio and mobile-phone based (depending on the local context), will be developed and translated for use at community level. Tools will be developed and activities supported to empower PHS2, CHWs, CHVs, CBOs, traditional

healers and other community leaders to inform, educate and support their patients, patient families and communities. TB and MDR-TB activities will be integrated into the training curriculum and terms of reference for midwives and PHs.

Similarly, it is envisaged to increase the level of community awareness for the early detection of patients with presumptive TB and to help the retrieval of patients who dropped treatment (pre-defaulting tracing). In selected areas, community involvement will also be harnessed to facilitate the operations of mobile outreach teams. Tools to engage informal providers such as drug sellers, and to engage workplaces in the referral of presumptive cases will also be developed. The NTP will incorporate TB, TB/HIV and MDR-TB messages into community health days / campaigns and other health-related platforms at community level.

A specific focus on gender-based differences in knowledge, care seeking and treatment adherence will render gender-specific activities. For example, male-specific clubs led by male, former TB patients / champions will focus on overcoming any gender-related causes of treatment delay and default among men.

Package 6: Increase awareness of symptoms and expectations during treatment by patients (1.5.6)

Communication efforts targeting patients aim to provide information and resources needed by patients to successfully complete treatment. Former and current TB patients, especially youth, will be engaged in crafting the messages and determining the best delivery platforms: e.g. web-based, social media, SMS, clinic based. The programme will consider how to best delivery information, based on known access to different forms of communication. Existing tools, such

as the Patient Charter, will be contextualized and made available to all DOT supporters. As internet and mobile phone coverage expand, e.g. by years 4-5, an interactive website and TB hotline will be considered to facilitate confidential communication channels for patients.

Patient-centred communication will be developed, in collaboration with the relevant partners, to inform eligible patients about the patient support package. Tools will also be developed to better inform and refer TB and MDR-TB patients to social protection schemes, social support systems, and income generation activities. This messaging will evolve as the NTP mobilizes support for the inclusion of TB patients in social protections. As the country is moving toward a community-based approach to MDR-TB management, it is essential to address the issue of infection control at home and in the workplace by developing suitable ACSM materials that aim to overcome fear and stigma associated with MDR-TB, as well as to avoid transmission of drug-resistant TB.

1.6 Engage all care providers,

including NGOs and the private sector, in appropriate TB diagnosis and care

TB through the private sector. This NSP aims to increase the proportion of TB cases detected and successfully treated by the private-sector and public hospital partners, by increasing the number of formalized and quality-assured PPM and PPP collaborators.

Summary

Programmatic Emphasis

With a growing private sector, the context is ripe for an enhanced focus on case detection and quality care for drug-sensitive and drug-resistant

The NSP includes targeted interventions to better engage: a) general practitioners; b) public and private hospitals; c) drug sellers and traditional

Targets

Standard Indicators	Denominator	Baseline	Targets				
		2015	2016	2017	2018	2019	2020
Percentage of notified TB cases (all forms) contributed by non-NTP providers - private facilities	All notified cases	17%	18%	19%	20%	21%	22%
Percentage of notified TB cases (all forms) contributed by non-NTP providers - public hospital sectors	All notified cases	4%	4.5%	5%	5.5%	6%	7%
Treatment success rate among PPM partners	All registered cases under PPM	85%	≥ 85%	≥ 85%	≥ 85%	≥ 85%	≥ 85%
Percentage of all new cases notified by PPM partners that are lost to follow-up	All registered cases under PPM	< 5%	≤ 5%	≤ 5%	≤ 5%	≤ 5%	≤ 5%
Number of registered GPs in PPM-DOTS (any scheme) (50% among 10,000 GPs in 2020)	All GPs (n=10000)	2443	2500	2700	2900	3100	3300
Number of public hospitals at R/S level in PPM (44% among 78 R/S hospitals in 2020)	All public hospitals (n=78)	24	26	28	30	32	34
Number of private hospitals in PPM (12% among 193 hospitals in 2020)	All private hospitals (n=193)	2	6	8	10	12	14

healers; d) corporate sector/large employers; e) community based organizations; f) partnership with related ministries. In addition, the NSP envisages pilot testing of novel approaches to engage traditional healers, corporate sector and community based organizations.

Full Narrative

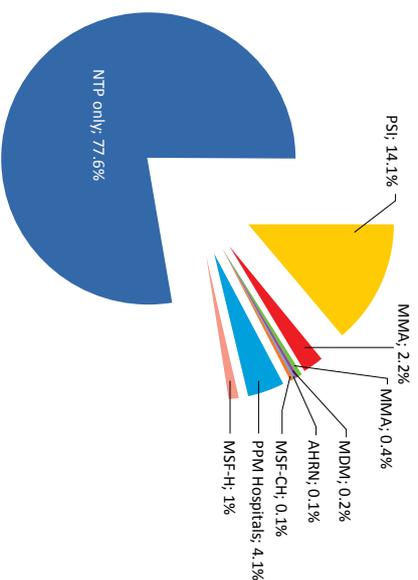
Situational Analysis

Myanmar is recognized globally as a pathfinder for the engagement of the private sector in TB control¹. Public-Private Mix DOTS (PPM-DOTS) was first introduced in Myanmar in 1998 by the NTP in collaboration with MMA and was launched as a formal strategy of the MOHS in 2003.² In 2014, more than 20% of notified cases came from PPM partners, see graph. International NGOs have introduced various PPM models in support of expanded TB control, from running clinics and treating patients, e.g. MSF-H, to filling small gaps in the TB control to

strengthen case finding and treatment outcomes, e.g. the Union. Partners' contributions to case detection are significant, especially in hard-to-reach populations which otherwise might not have access to services such as migrants, those living in post-conflict areas, the urban poor and other vulnerable populations. Partners were especially strong in addressing Active Case Finding (ACF) using various modalities. Table 7 below highlights the NGOs currently engaged in TB control. In all scenarios, collaboration with the NTP has enabled a cohesive national response to TB.

Public hospitals engaged in PPM increased from 9 in 2011 to 24 in 2014. This represents 2.2% of all public hospitals in the country. In 2014, the PPM hospitals notified 4.1% of all TB cases (all forms). In addition, they also referred TB cases for registration and notification in their townships. The first private hospital to engage in PPM was formally linked to the NTP in 2014. 2 private hospitals are engaged in PPM by MMA in 2015. There are 191 licensed private hospitals not yet engaged in PPM.

Figure 27. Proportion TB cases contributed by NTP & other partners (2014)



¹ JMM
² Appraising PPM Report

The involvement of GPs is crucial for effective TB control. Research in Myanmar has suggested that most TB patients (73.3%) first seek care at GP clinics. Many patients (38.8%) shopped around to more than 2 GP clinics before seeking care in the public sector. However, the practices of GPs are not always in line with NTP guidelines. MDR rates were significantly higher in patients who sought care at GP clinics before seeking care at the public sector.

Myanmar is engaging private-sector general practitioners (GPs) through three schemes. Scheme 1 focuses on health education and suspect

referral. Scheme 2 includes health education, suspect referral and DOTS provision. Scheme 3 comprises referral, diagnosis, treatment and DOTS. The number of private GPs involved in PPM, supported by MMA and PSI, increased to 2316 by the end of 2014. It is estimated that approximately 23% of GPs were engaged with the NTP and partners by the end of 2015. In a pilot site in Kyaukse Township, a collaboration between MMA and NTP has achieved private GPs contributions of 44% of new smear positive cases registered within two years. The treatment success rate for new smear-positive cases treated by GPs was 90%.

Figure 28. Concentration of TB Partner Organizations in Myanmar, 2015

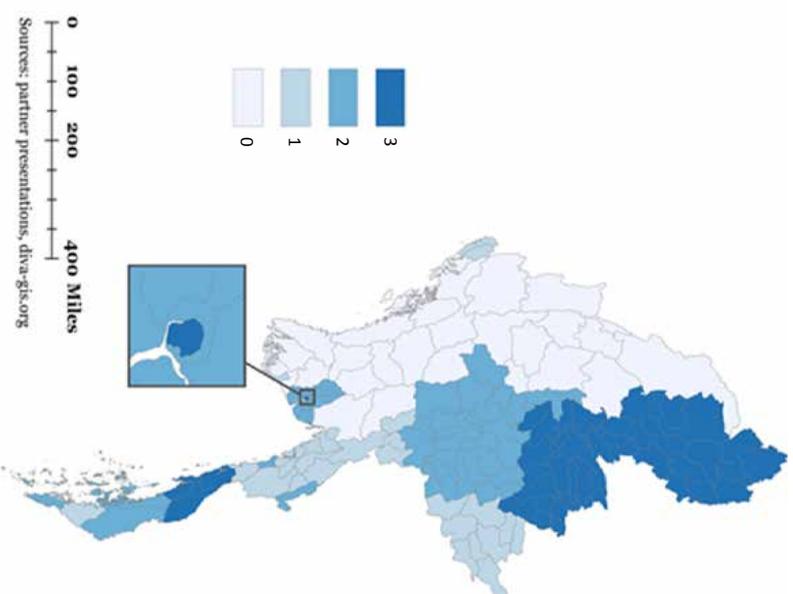


Figure 29. Location of TB Partner Organizations in Myanmar, 2015

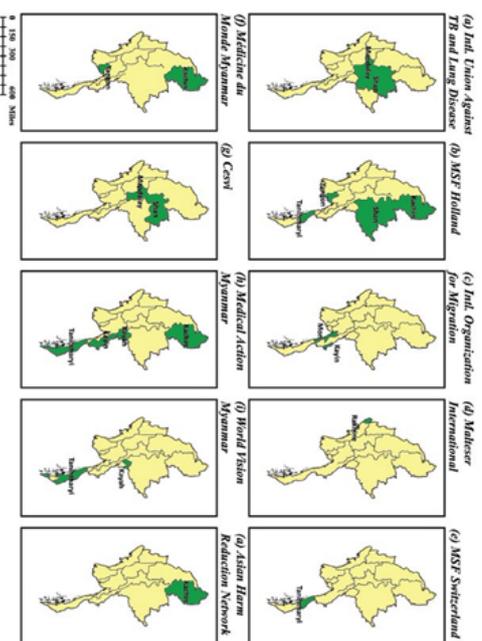


Table 7. Partners contributing to case finding, by state or region

State or region	Partners
Mandalay	MMA, PSI, Union
Magway	MMA, PSI
Chin (South)	PSI
Mon	MMA, PSI, IOM
Shan (South)	MMA, PSI
Yangon	MMA, PSI, MSF-H, MDM, MAM
Shan (North)	MMA, PSI, MSF-H, AHRN
Shan (East)	PSI
Ayeyarwaddy	MMA, PSI,
Rakhine	MMA, MSF-H, Malteser, PSI
Chin (North)	PSI
Sagaing	MMA, PSI
Kachin	MMA, PSI, MSH-H, MDM, AHRN
Taintharyi	PSI, MSF-S, MMA
Kayah	PSI, World Vision
Bago	MMA, PSI
Kayin	MMA, PSI
Naypyitaw	MMA, PSI

Challenges

The 2014 JMM found that the network of PPM collaborations was wide but fragmented, with geographical gaps in the nationwide coverage of PPM. In some places the JMM observed that the quality of care, including diagnostic procedures, use of chest X-Ray, and sputum examination that was provided by partners was not quality ensured since the NTP had limited capacity to do so.

Only a minority of private GPs are linked with the NTP for referral or treatment of patients; traditional healers are not involved; only one private hospital and very few drug sellers are engaged in a PPM model. There is also scope for expansion of public partnership with other organizations. Links with the corporate sector have yet to be developed.

NGO models include different elements and different ways of involving communities. There is wide variation in the types of activities, incentives, operations and coverage among different NGOs, between NGOs and government, and even within a single NGO, with multiple and overlapping versions of approaches. Reporting between some INGOs and NTP is not always adequate. The project sites of many NGOs are scattered across the country in areas far from each other that require complex and costly coordination and monitoring. Cost-effectiveness analysis of the various approaches has not been done, particularly considering the yield of case detection or improvement in case holding for each model. The choice of operating model is therefore not yet fully evidence-based.

Strategic Approaches

With a growing private sector, the context is ripe for an enhanced focus on case detection and quality care for drug-sensitive and drug-resistant TB through the private sector. Many of the recent political and economic changes are paving the way

for further engagement, including the introduction of an open market economy; increased demand by the general public for quality services; health sector reform; limited resources in the public sector or the government; an increased proportion of public staff working also in the private sector; the development and the increased involvement of non-government organizations (NGOs) in health care services; urbanization and diversity of health care providers in peri-urban and slum areas; and poor or sub-standard practices in private sector.¹

Engaging General Practitioners

Summary of findings from the Appraising PPM Report

1. ~70% of GPs were not participating in PPM in 2014
2. GPs in PPM network requested guidelines on TB (80%), CME on side effects of anti-TB drugs (73%) and info on referral process (60.9%).
3. Challenges were the high turnover rate of GPs, attitude and motivation of public staff and funding support to organize regular meetings with GPs at township level.

Engaging drug sellers

Summary of research (2013)

1. 60% of drug shops had 1st line drugs
2. 97.9% had low knowledge on anti-TB treatment
3. 21.6% of drug sellers said they referred TB suspect cases
4. 98% had positive attitude towards referral.
5. Referred cases by drug sellers accounted for 11.9% of smear positive pulmonary TB and 9.6% of all forms of TB (2012).
6. Smear positive case detection was 1.2 times higher after training.
7. Referral practice was significantly positively associated with TB training.

¹ Appraising PPM Report

This NSP aims to increase the proportion of TB cases detected and successfully treated by the private-sector and public hospital partners, by increasing the number of formalized and quality-assured PPM and PPP collaborations. As such, the NSP includes interventions to better engage:

- general practitioners;
- public and private hospitals;
- drug sellers and traditional healers;
- community corporate sector/large employers;
- community based organizations;
- partnership with related ministries.

In addition, the NSP envisages pilot testing of novel approaches to engage traditional healers, corporate sector and community based organizations.

Essential Interventions

- Develop an evidence base to inform scale-up of the most effective models of PPM. Specifically, the NSP calls for the completion of cost-effectiveness analyses for various PPM models.
- Update national guidelines for PPM to reflect:
 - evidence from cost-effectiveness and partner assessments, highlighting best practice for the Myanmar context, including standardized patient support packages;
 - new diagnostic algorithms;
 - updated referral mapping based on increased NTP diagnostic capacities and drug distribution points; and
 - revised M&E tools for PPM partners.
- Update and document the referral network inventory to capture centres of excellence, new diagnostic capacity, and sites implementing "best practice".
- Refresh training curriculum in schools of medicine, nursing, microbiology, etc. to ensure alignment with NTP guidelines.

- Enhance capacity of all PPM partners.
- Update the International Standards of TB Care for use by the private sector, and update the national guidelines for PPM. Develop companion materials targeting each level of PPM partner, such as job aides, e.g. posters of Standard Operating Procedures and diagnostic algorithms.
- Develop training / orientation computer-based seminar(s) for use on individual tablets or computers and train private providers using updated training materials and guidelines.
- Design supervision structure and network, using established PPM sites and partners to ensure routine supervision and quality assurance.
- Update, annually, the inventory and referral network including all PPM and NTP partners providing quality TB care. Disseminate contact information for referral partners, potentially in an electronic format, through township disease control teams. Create forum for better coordination between the NTP and partners, especially at the field level.

Target 1: General practitioners

- Map registered GPs, considering capacity for TB detection and care: Identify GPs with capacity or potential to engage in TB care. Establish priorities, by year, for franchising of new GPs into the PPM network, based on current gaps in geographic coverage, areas of low case detection or treatment success, and GPs serving at-risk populations.

- Advocacy and start up package:

Target 2: Public and private hospitals

- Develop and implement an awareness raising campaign targeting GPs, including the production and dissemination of advocacy materials. Conduct an initial assessment of GP knowledge, attitudes and practice about TB to provide an evidence-base for the advocacy messaging.
 - Refresh capacity of technical staff in "DOTS corners".
 - Strengthen laboratory and X-Ray capacity within hospitals.
 - Systematize routine supervision and quality assurance from Centres of Excellence (other hospitals) and NTP central or R/S staff. Regular coordination meetings with other hospitals are also planned, to address technical and managerial challenges.
 - Range of TB care activities under each PPM referral networks, MOU with NTP partner site for supervision and quality assurance support.

Target 3: Drug sellers and traditional healers

- Franchise GPs, using all government schemes, into PPM network, including inclusion in the referral networks, MOU with NTP partner site for supervision and quality assurance support.
- Social support for poor patients: ensure the availability of the standardized package of patient support to eligible patients undergoing treatment with GPs
- Provider support: Organize coordination meeting among NTP and partners for development of standardized provider support package.
- Review evidence from pilot projects engaging drug sellers and traditional healers, and determine best practice. Develop a standardized package for drug sellers and traditional healers, including documentation of referral and treatment norms, job aides such as syndromic / symptom-based diagnostic

Table 8: range of TB care activities under each PPM hospital option

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

algorithms, referral and reporting forms, and capacity building opportunities. Consider incentive structures to motivate referral, compensating for potential lost income.

manner. Innovative models that bring TB symptom screening and DOT into workplace settings may be piloted. Worker rights to sick leave, time to undertake treatment and sustained employment will be at the core of this strategy.

2. Prioritize districts or cities where drug sellers and traditional healers have an important market, especially where they serve the hard-to-reach. Priority will also be given to scaling up involvement of drug sellers and traditional healers in areas where patients are coming late for care, and evidence suggests delays due to continued reliance on drug sellers or traditional healers.

Target 5: Community-based organizations

1. Map CBOs, considering their capacity and potential for community TB care, based on the national programme's needs.
2. Develop advocacy start up package.
3. Develop standardize training package, job aids and IEC for CBO in line with WHO & National guidelines.
4. Develop standardize incentive schemes for CBOs.
5. Provide monitoring and supervision support

3. Pilot the implementation of the standard package with selected drug sellers and traditional healers in year 2, and scale-up if proven effective.

Target 4: Corporate sector/Large employers

1. In collaboration with the Ministry of Labour, identify the leading employers in the formal for-profit sector. Prioritize engagement with employers with the potential for high rates of TB due to crowded working conditions, underlying poverty among workers, exposure to environmental hazards that may impair lung function, e.g. mining sector, manufacturing.

Target 6: Partnership with related ministries

1. For advocacy purpose, organize stakeholder meeting and workshop with related ministries.
2. Update training package, job aids & IEC for them in line with WHO & National Guidelines.
3. Conduct training according to the needs of related ministries.
4. Provide monitoring and supervision support.

2. Awareness raising and advocacy: develop and disseminate targeted awareness raising and advocacy activities to promote an understanding of the curable nature of TB, worker rights, and the availability of NTP services for workers.

Establish MOU with each employer, defining rights and responsibilities of workers, employers, and the NTP in terms of the prevention, detection and treatment of TB in a timely and quality-assured

1.7 Promote and strengthen community engagement

Summary

Programmatic Emphasis

With ambitious plans to increase case notifications of bacteriologically confirmed TB cases 3% per year, the NSP call for the active engagement of communities for timely detection and supported care of all TB patients. Implementation of this NSP will establish an integrated and seamless network of patient support and service delivery that reaches people where they live and extends to the high-level diagnostic and care capacity of the health facilities.

Summary of Approaches

1. With support from midwives, community volunteers will be engaged in active case finding, contact tracing, income generation activities, peer support, sputum collection, default tracing, and DOT.
2. Establish village-based support groups and other self-help groups (SHG) that are supported by volunteers, BHS and the NTP.

Targets

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
Percentage of notified TB cases (all forms) contributed by non-NTP providers - community referral	All notified cases	12%	13%	14%	15%	16%	17%

Full Narrative

Situational Analysis

Community volunteers are increasingly involved in TB care provision. Following the recommendations of the 2013 Annual Evaluation Meeting, community involvement in TB care and support has expanded, (Figure 30). In 2013, 8,692 presumptive TB cases in 166 townships were referred by volunteers trained by four local NGOs (MMCWA, MRCs, MHAA, MWAF) and 1605 cases were detected and treated. The 2014 Joint Monitoring Mission for TB Care and Prevention in Myanmar observed a number of good practices in community-based programmes by different agencies. Activities included volunteer engagement in ACF, contact tracing, income generation activities, peer support, sputum collection, default tracing, and DOT. World Vision has been instrumental in developing community support models through creation of self-help groups of current or former TB patients.

While models of NGO involvement exist (see section 1.6), particularly managed by international NGOs, few CBOs are currently engaged in such work. If there were significant expansion of such civil society engagement, through systematic inclusion of CBOs and NGOs in TB activities (or in broader disease control) there could be rich dividends by

way of significantly improved public health. The current models of community-based care are mostly supply-side and driven from health facilities. International or national NGOs often appoint new community health volunteers (CHVs) to conduct general or TB-specific tasks such as screening, referral and DOTS support. In some places, NGO-supported volunteers link presumptive TB cases to private practitioners who diagnose and treat drug-

sensitive TB and refer MDR-TB to government facilities. Community-based volunteers reach remote areas and marginalized segments. They support them as they link up with health facilities. They assist in screening and referral, in sputum collection and transport, in accompanying presumptive TB cases for diagnosis and in follow-up treatment support, particularly through home-based DOTS.

Figure 30. Community-Based TB Care Townships (GF)

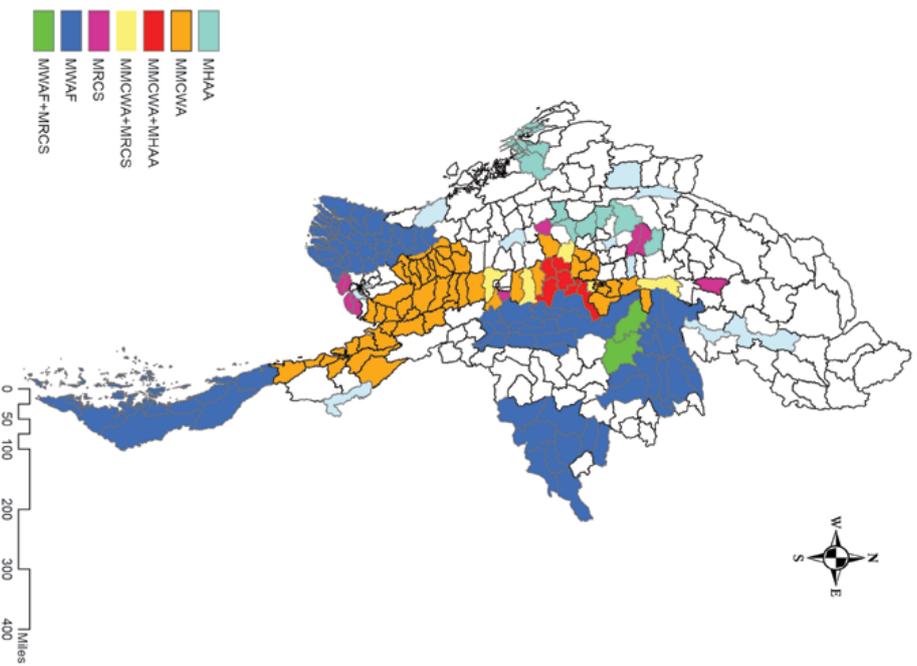
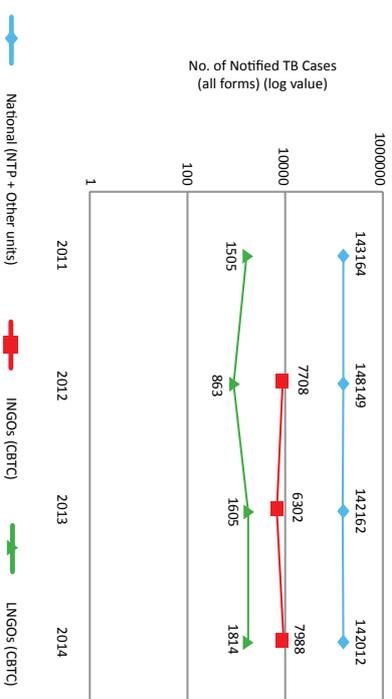


Figure 31. All Forms of Notified TB Cases of Country and Community Partners, 2011-2014



These volunteers are usually selected in collaboration with the BHS and the Township Medical Officer and work cooperatively with BHS. Such INGO-appointed volunteers are provided financial rewards by way of transport allowances and/or incentive payments for specific results (referrals, notifications, treatment success). In addition, they attend regular meetings and receive focused training, which contributes to their overall motivation and ability to contribute effectively. In some townships, MWAF volunteers are involved in TB care and prevention with a reported contribution of 3-5% (presumptive TB referral and DOT). In other townships Red Cross volunteers are involved in similar tasks. There is strong evidence to show that such volunteer models work effectively and contribute to case notification and treatment success.

Challenges

Communities still lack funding to ensure their stability as organizations, technical support, capacity building and partnerships. Although community-based care is cheaper and more cost-effective than hospital-based care, new resources are often required for successful implementation. Regular investment is required to

conduct initial training and refresher trainings for health staff and community volunteers to strengthen health delivery systems such as laboratory and drug supply; and to ensure proper and regular support and supervision of activities of both health staff and of community volunteers.

Effective community contribution to TB care requires strong referral, recording and reporting systems, easy access to laboratory services and a secure drug supply; close collaboration with the NTP to provide technical and other support to community initiatives and ensure high-quality services; and context specific motivation by community care providers and ongoing motivation to sustain their activities.

If more CBOs and NGOs engaged in TB activities, there would likely be increased demand for quality services. However, there are too many different models, particularly for patient-support and volunteer rewards, sometimes even within the same organization. There is insufficient recording or monitoring of contributions by community volunteers to TB services, which underestimates their contribution.

Strategic Approaches

1. Strengthening the collaboration between midwives and volunteers
2. Establish village-based support groups similar to village member working group (VMWG),
3. Develop self-help groups (SHG), working together with volunteers, BHS and NTP. Establish a network of TB SHGs to enhance leverage, expanding TB SHGs to attract more TB patients, their family, and other community members
4. Establish additional village support groups. Currently there are 69 support groups in villages. The NSP calls for expansion to 5 new groups per year. Training and refresher training for volunteers are planned. Community volunteers from village support group facilitate sputum transportation, referral of presumptive TB cases and DOT provision.

4. Promote multi-sectoral collaboration at the community level, with an emphasis on integration with the livelihood sector, and strengthening institutional capacity of SHGs, particularly for monitoring and evaluation, financial management and resource utilization.
5. Establish additional self-help groups working together with volunteers, BHS, and the NTP. There are currently 17 self-help groups. The NSP called for expansion with 2 new groups per year and a total 10 new groups by 2020. They work together and support BHS in facilitation of sputum transportation, presumptive TB referral and provision of DOT.

Essential Interventions

1. Expand and strengthen Community Based TB Care activities by defining clear roles and responsibilities. CBTBC activities are implemented in 221 townships by INGOs and NGOs, contributing 7% of all new TB cases. New CBTBC townships will be added, at a rate of 5 townships per year (20 new townships by 2020). To build the capacity of volunteers, training for new townships and refresher trainings for existing townships are also planned each year. Community health volunteers will engage in TB control activities by doing health education, facilitating sputum transportation, referral of presumptive TB cases, home visit, and DOT provision. Their activities will be monitored by supervisors and during evaluation meetings.
2. Strengthening recording and reporting. Training, including on-job training of volunteers, and printing of adequate registers and forms are planned.

3. Ensure adequate funding and refresher training. Due to volunteer attrition and motivation, refresher trainings are necessary every year.

- Proper recording combined with timely and regular reporting is crucial for monitoring and evaluation of community based TB care activities. Regular supervision by community based TB care officers to volunteers is planned to proactively address challenges identified during quarterly evaluation meeting of volunteers. Additionally, it also leads to more collaboration with BHS and volunteers. An annual evaluation at central level is planned for evaluation of community based TB care activities which might need to coordinate with implementing partners, including INGOs, local NGOs involved in community based TB care.

1.8 Joint TB and HIV programming

to enable decentralized and integrated services for TB and HIV

Summary

Programmatic Emphasis

This NSP prioritize scale-up of TB/HIV collaborative activities to the entire country. Targeted operations research to further inform scale-up. The NSP also calls for the introduction of collaborative activities, modelled on the TB/HIV approach, for TB screening among people living with diabetes.

Summary of Approaches

1. Essential TB/HIV services to be implemented nationwide and at all levels of the health system; establishing functional TB/HIV
2. Strengthening TB/HIV collaborative activities to the entire country. Targeted operations research to further inform scale-up. The NSP also calls for the introduction of collaborative activities, modelled on the TB/HIV approach, for TB screening among people living with diabetes.
3. Conduct TB symptom screening during the initial and follow up visits, as an integral part of chronic care of PLHIV.
4. Provide HIV testing, counseling, and prevention services to all patients with presumptive and diagnosed TB.
5. Initiate early ART for all TB patients with HIV infection.

coordinating bodies at national, R/S, district, township, and in all hospitals caring for both TB and HIV patients.

2. Ensure human resource capacity for TB/HIV collaborative activities with regular training of new staff at all levels, quarterly supportive supervision and annual refresher training of existing staff, nationwide dissemination of guidelines and development of supportive, on-the-job tools.

Targets

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
HIV prevalence among TB patients	All registered TB cases	8.3%	8%	7.8%	7.5%	7.4%	7.3%
Percentage of registered TB cases tested for HIV (recorded in the register)	All registered TB cases	63.5%	65%	70%	75%	80%	85%
Percentage of HIV+ registered TB patients given anti-retroviral therapy during TB treatment	HIV+ registered TB cases	38%	65%	70%	75%	80%	85%
Percentage of TB/HIV cases receiving CPT	HIV+ registered TB cases	72%	75%	80%	85%	90%	95%
Number of districts with pilot TB / DM collaborative activities	Number	2	5	10	10	20	30

6. Provide isoniazid preventive therapy to all PLHIV who do not have active TB disease.
7. Provide co-trimoxazole preventive therapy for TB patients living with HIV.
8. Link data systems to enable monitoring of care and treatment for patients with TB and HIV.
9. Test a model for TB/DM collaborative activities in selected States/Regions, including screening for diabetes among TB patients, and establishment of a referral network for patient care.

Full Narrative

Situational Analysis

1.8.1 TB and HIV

Myanmar has a concentrated HIV epidemic, with a low prevalence of HIV in the general adult population, i.e. 0.54%¹. However, Myanmar is one of the 41 highest TB/HIV burden countries in the world, with TB being a leading opportunistic infection for people living with HIV (PLHIV). The NTP estimates that 8.5% of TB patients were HIV-infected in 2014. Annual sentinel surveys show a steady, albeit gradual, decrease in co-infection rates, (Figure 32).

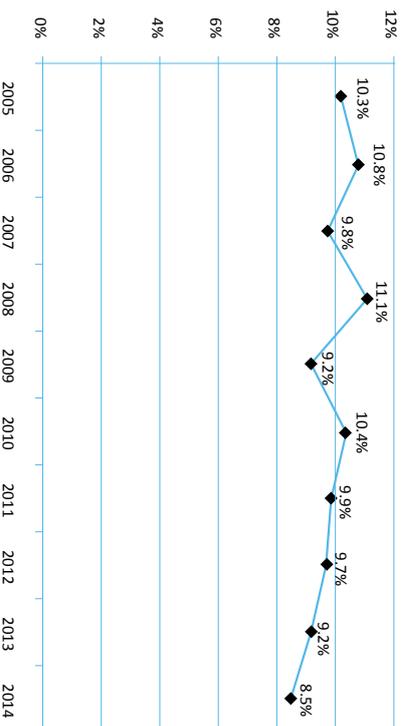
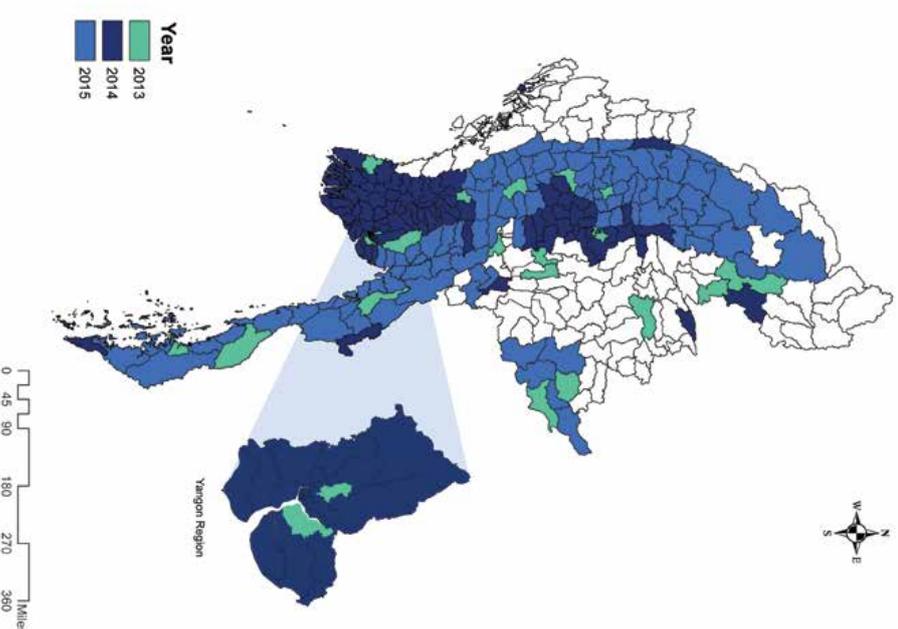


Figure 32. Trend of HIV prevalence among New TB Patients HSS 2005-2014

¹ projection from Asia Epidemic Model (2014)

Figure 33. Township with TB/HIV Collaborated activities (2015)



TB registration and outcome quarterly reports (TB 07 and 08). However, only 35 out of 136 townships

provided quarterly report including the use of IPT among HIV-infected people. A total of 10,345 PLHIV were enrolled under the care of the NAP in these townships, out of which, 85% (8781/10345) of patients received TB screening and 17% (1,515/8781) of PLHIV were given IPT. States and Regional level TB/HIV workshops were conducted in 2015 to strengthen the existing TB/HIV activities including recording and reporting of TB/HIV data.

1.8.2 TB and Diabetes Mellitus

A growing body of evidence supports the role of type 2 diabetes as an individual-level risk factor for TB. In lower income countries, studies have suggested that individuals with diabetes are more likely than non-diabetics to have TB [univariable odds ratio (OR): 2.39; 95% confidence interval (CI): 1.84-3.10; multivariable OR: 1.81; 95% CI: 1.37-2.39]. Increases in TB prevalence and incidence over time were more likely to occur when diabetes

prevalence also increased (OR: 4.7; 95% CI: 1.0–22.5; OR: 8.6; 95% CI: 1.9–40.4).

Myanmar is facing a double burden of disease with a rise in non-communicable diseases due to the demographic and socio-economic transition. The 2014 national survey of diabetes mellitus found 10.5% [95% CI: 8.3-13.1] for both sex; 9.1% [95% CI: 6.9-11.8] for men; 11.8% [95% CI: 9.6-14.6] for women prevalence of DM among 25-64 years age group.² In Yangon, the overall prevalence of adult onset diabetes in 2003-2004 was 11.8% (urban prevalence was 13.9% and rural prevalence was 7.3%).

Endocrinologists, as well as general physicians or internists, and general practitioners at the primary health-care levels take part in treating diabetes patients. An endocrinology and diabetes department was established in the University of Medicine 2 in 2012 and as a result, there is an expansion of diabetes care as well as research. Since 1991, the World Health Organization (WHO) has supported a diabetes project for the prevention of diabetes and improvement of diabetes care. In

2008, the Myanmar Society of Endocrinology and Metabolism was established under the Myanmar Medical Association. Through this society, many Continuing Medical Education (CME) activities are provided to clinicians to update their knowledge of diabetes care. In 2013, the Myanmar Diabetes Association was founded.

1.8.3 TB and Hepatitis

A cross sectional analysis was completed of 11,032 HIV-infected patients enrolled in the Integrated HIV Care Programme from May 2005 to April 2012 to determine the serological prevalence of chronic hepatitis B and hepatitis C. The mean age of patients was 36 years (adult cohort) and 7 years (paediatric cohort). The sero-prevalence of hepatitis B surface antigen, hepatitis C (anti HCV antibodies) and triple infection were 8.7%, 5.3% and 0.35%, respectively. Men who have sex with men were at the highest risk of being co-infected with hepatitis B while intravenous drug users were at the highest risk of being co-infected with hepatitis C.³

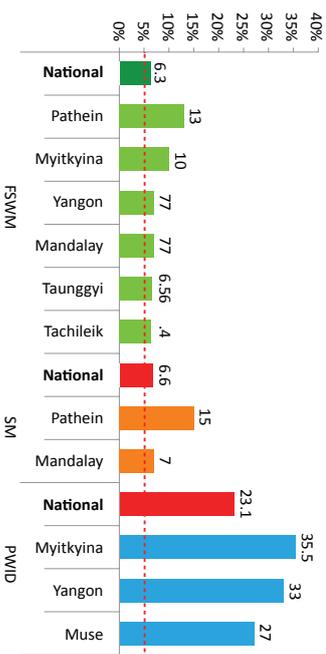


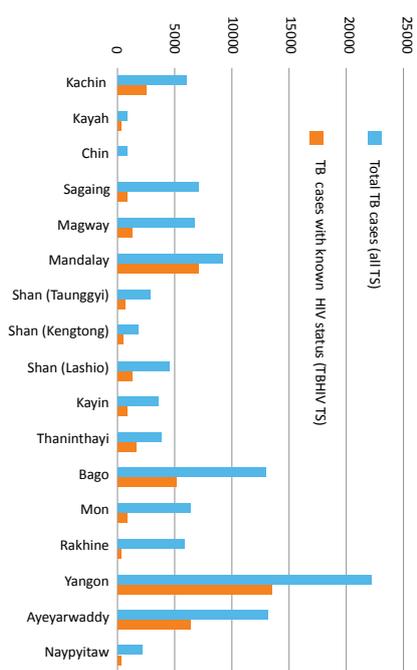
Figure 34. HIV prevalence among key populations, 2014

1. Jeremy D Goldhaber-Fiebert, Christie Y Jeon, Ted Cohen, Megan B Murray. "Diabetes Mellitus and Tuberculosis in Countries with High Tuberculosis Burden: Individual Risks and Social Determinants". *Int J Epidemiol*. 2011;40(2):417-428

2. Ministry of Health (2015). Report on National Survey of Diabetes Mellitus and Risk Factors for Non-communicable Diseases in Myanmar (2014). Ministry of Health (2015)

3. Sai Ko Ko Zaw, Sai Thein Than Tun, Aye Thida, Thet Ko Aung, Win Maung, Myint Shwe, Mar Mar Aye and Philippe Clevenbergh. Prevalence of hepatitis C and B virus among patients infected with HIV: a cross-sectional analysis of a large HIV care programme in Myanmar. *Tropical Doctor* 43(3) 113-115 (2013)

Figure 35. Total TB cases (NTP) and TB cases with known and recorded HIV status in States and Regions (2014)



Nationwide Hepatitis prevalence survey has been started and results will be available by the end of 2016. National guidelines for hepatitis control are currently being developed and will incorporate adequate guidance for the co-infection with TB.

Challenges

1.8.1 TB and HIV

The estimated HIV prevalence among newly diagnosed TB patients was 8.5% in 2014, as calculated through sentinel sites surveys conducted every second year by the National AIDS Programme. Since the sites surveyed are representative of the whole country, the estimated prevalence is lower than that reported by the 136 TB/HIV townships through routine surveillance (11.4%). Sixty percent (56,133/93,963) had recorded HIV status among registered TB patients (TB/HIV townships) and 36% (2,319/6,412) percent were recorded as patients on ART among recorded HIV positive TB patients (TB/HIV townships) in 2014 (NTP and partners). Therefore not only geographical expansion but also improving HIV testing, referral and feedback system are the challenges of TB/HIV collaborative

activities. Given the high rate of TB/HIV co-infection, HIV testing for all TB patients followed by appropriate case management (CPT, ART and DST) for co-infected patients will mitigate the failure, relapse and mortality rate of TB/HIV patients and will permit the sustainability of the existing Treatment Success Rate of National TB Programme. While HIV testing among TB patients has been scaling up rapidly, slower progress has been made with the introduction of TB screening among PLHIV. It was estimated that approximately 85% of people with known HIV were screened for TB in 2014 in 35 townships.

While access to integrated TB/HIV services is improving, access to ART remains limited. Around 36% of HIV-infected TB patients accessed ART in 2014. Provision of isoniazid preventive therapy (IPT) remains low.

The magnitude of challenges and support needed to implement standard TB/HIV collaborative activities are not the same for all states and regions. A good example will be the Mandalay Region that has conducted TB/HIV activities for 10 years while Chin state has not started yet.

Figure 36. Proportion of Known HIV status among registered TB patients in TB/HIV townships of States and Regions (2014)

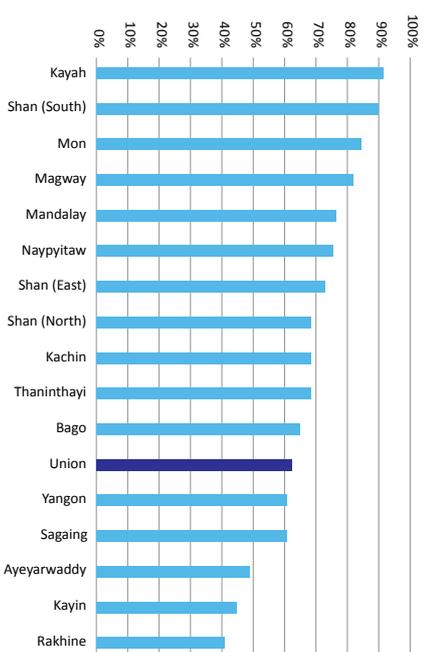


Figure 37. HIV testing and care among TB patients, 2014

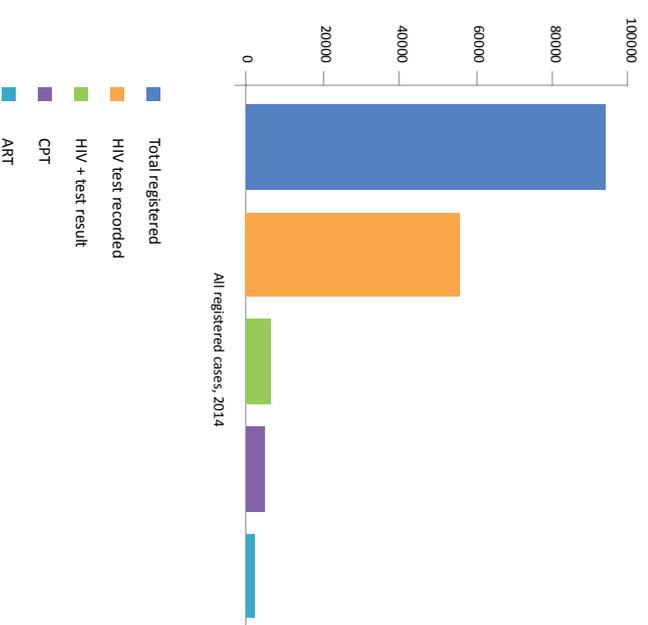


Table 9: TB/HIV collaborative activities in 2014 from 136 implementing townships

State / Region	Registered TB patients (2014)	Patients with recorded HIV test results (2014)	Patients with documented HIV+ results	HIV+ patients with CPT treatment	HIV+ patients with ART treatment	Total No. of Implementing Townships (2014)
Mandalay	9193	7006	937	704	315	28
Sagaing	1621	980	136	122	56	3
Magway	1510	1227	104	79	28	2
Shan (North)	1701	1171	228	204	96	2
Shan (South)	783	702	99	85	56	2
Kachin	3777	2595	711	582	372	3
Ayeyarwaddy	13100	6366	419	290	65	26
Yangon	22109	13408	780	454	147	43
Rakhine	577	256	15	6	7	1
Shan (East)	755	552	63	41	34	2
Mon	1020	866	140	65	8	1
Kayin	2013	822	59	26	16	2
Taninthayi	2372	1621	155	111	26	3
Bago	7837	5109	349	190	79	16
Naypyitaw	514	389	47	43	12	1
Kayah	359	329	9	8	4	1

Contributing to the geographic variance in the prevalence of TB/HIV is the variable distribution of HIV itself, and its high rates among some hard-to-reach populations. (Figure 36). (Source: Prepared by www.aidsdatahub.org based on National AIDS Programme, Department of Health, Ministry of Health and Sports and World Health Organization (2015). Results of HIV Sentinel Sero-surveillance 2014). Several key interventions for TB/HIV, such as infection control and isoniazid preventive therapy have not yet been introduced on a wide scale.

1.8.2 TB and Diabetes Mellitus

Rapid demographic change in Myanmar demand collaboration between NTP and the Department of Non-communicable Diseases (NCDs). Nationally, the prevalence of diabetes mellitus is estimated about 10%¹. It has likely increased over the past ten years. Since 2015, two tertiary hospitals (in Mandalay and Yangon) have been screened for TB in diabetes clinics.

While the evidence base regarding the prevalence of and risk factors for DM expanded greatly with the 2013 prevalence survey, and important steps have been taken to coordinate a public health response to DM, the coverage of diagnosis and care remains limited. Close collaboration between the NTP and these new entities, will be required to design, pilot and introduce collaborative activities as have been done for TB/HIV.

1.8.3 TB and Hepatitis

Very little is known about the magnitude of TB and hepatitis co-infection, nor the benefit of collaborative approaches for the care of dually infected patients.

Strategic Approaches

1.8.1 TB and HIV

Though gains have been made in the introduction and implementation of TB/HIV collaborative activities, nationwide coverage has not been reached. The interventions will prioritize scale-up to achieve universal coverage of all the TB/HIV collaborative activities while drawing on targeted operations research to further inform scale-up.

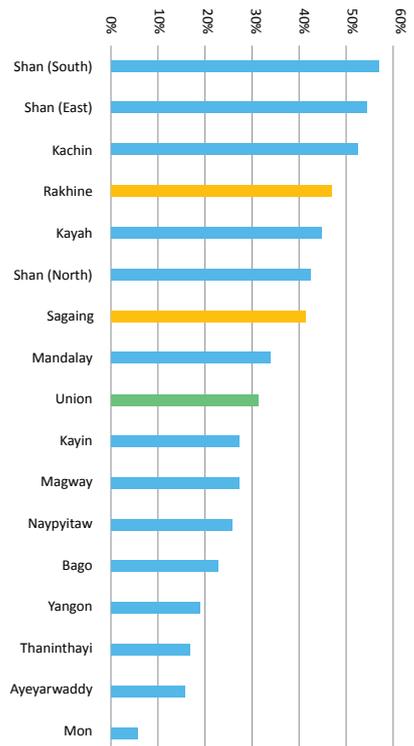


Figure 38. Proportion of patients on ART among HIV positive registered TB patients in TB/HIV townships of States and Regions (2014)

¹ Non-communicable Disease Risk Factor Survey, Yangon Division 2003-2004, MOH, Myanmar, 2009

1.8.2 TB and Diabetes Mellitus

Using the models and lessons learned from the roll-out of TB/HIV collaborative activities, the NTP will collaborate closely with the Myanmar Society of Endocrinology and Metabolism, and the Myanmar Diabetes Association, to design, pilot and scale-up a package of collaborative activities. The aim of this collaboration is to intensify TB case finding among people living with DM, and to prevent and treat TB among diabetics.

1.8.3 TB and Hepatitis

During the timeframe of the NSP, the NTP will collaborate with NAP to fully assess the burden and interactions between TB, Hepatitis and HIV.

Essential Interventions

1.8.1 TB and HIV

1. Essential TB/HIV services to be implemented nationwide and at all levels of the health system:

- The NSP aims to scale up the standard package of collaborative TB/HIV activities in all 319 townships by 2016, and further intensify activities according to level of performance at township level.
 - Systematic coordination: In keeping with WHO's recommendations on TB/HIV collaborative activities, there is need to establish functional TB/HIV coordinating bodies at several levels, i.e. national, R/S, district, township, and in all hospitals caring for both TB and HIV patients. Leveraging the ongoing devolution of some responsibilities will enable local oversight of the implementation of TB/HIV collaborative activities with a focus on the local epidemiological context. There
 - Human resources for health: Ensure human resource capacity for TB/HIV collaborative activities with regular training of new staff at all levels, quarterly supportive supervision and annual refresher training of existing staff, nationwide dissemination of guidelines and development of supportive, on-the-job tools. Innovative and sustainable approaches for conducting in-service staff training will include self-taught modules, including digital or tablet-loaded learning modules.
 - Conduct TB symptom screening during the initial and follow up visits, as an integral part of chronic care of PLHIV. All HIV testing and care sites to have on-the-job tools for TB symptom screening, receive quarterly supervision from focal person from the district disease control team, and receive refresher training as part of supervisory visits at least annually. An updated register for symptom screening in HIV care facilities.
 - Initiate early ART for all TB patients with HIV infection. Data systems will be linked to enable monitoring of care and treatment for patients with TB and HIV.
 - Initiate TB prevention among PLHIV by

- providing isoniazid preventive therapy to all PLHIV who do not have active TB disease
- f. Provide HIV testing, counseling, and prevention services to patients with presumptive and diagnosed TB
 - a. on-site mentoring, and provision of technical assistance to lower performing sites and geographical areas. Exchanges of health staff between high- and low-performing sites will be planned.
 - b. Prioritize introduction of TB infection control (IC) measures in all health-care facilities treating patients with TB or PLHIV, and congregate settings. The scale up and institutionalization of TB IC activities at facility and community levels will be achieved through revision and dissemination of TB IC, continuous capacity building of TB managers, health facility managers and health workers. In addition, health facility infrastructural improvements will be rolled out in a prioritized manner, according to the magnitude of TB/HIV burden of each facility. Scale-up nationwide by the conclusion of the NSP is anticipated.
 - g. Provide co-trimoxazole preventive therapy for TB patients living with HIV
 - a. Ensure monitoring and evaluation of TB/HIV collaborative activities. Establishment of a monitoring and evaluation systems that comprehensively addresses all TB/HIV collaborative activities. This will be achieved through the development of a comprehensive TB/HIV M&E framework that integrates relevant data capture into the NTP and NAP existing recording and reporting tools. Annual TB/HIV evaluation central level meetings will be organized once a year.
 - b. Contribute to evidence generation, including a study on the acceptance and barriers to utilization of IPT by providers and patients
 - c. Intensified efforts in townships with limited performance;
 - a. below Union achievement for both HIV testing and/or initiation of ART
 - b. Regular supportive supervision and on job trainings will be provided to the disease control team of townships by District Focal person.
 - h. Ensure monitoring and evaluation of TB/HIV collaborative activities. Establishment of a monitoring and evaluation systems that comprehensively addresses all TB/HIV collaborative activities. This will be achieved through the development of a comprehensive TB/HIV M&E framework that integrates relevant data capture into the NTP and NAP existing recording and reporting tools. Annual TB/HIV evaluation central level meetings will be organized once a year.
 - a. Plotting on TB/HIV pre-entry screening programme in Yangan and Mandalay (Central Prisons: preparation will be started in 2016 in coordination with prison department. Implementation will be initiated in 2017.
 - b. Contribute to evidence generation, including a study on the acceptance and barriers to utilization of IPT by providers and patients
 - c. Intensified efforts in townships with limited performance;
 - a. below Union achievement for both HIV testing and/or initiation of ART
 - b. Regular supportive supervision and on job trainings will be provided to the disease control team of townships by District Focal person.
 - i. Accelerated action by townships with satisfactory performance;
 - a. above Union achievement for both HIV testing and initiation of ART
 - b. Centres of Excellence: Centres of excellence are envisioned to create hubs for more decentralized capacity building and mentorship. Facilities at varying levels of the health system, and including private, public and non-governmental, will be considered for inclusion as models of successful TB/HIV collaboration. Centres of Excellence will be designated and supported to conduct training.
 - c. Set up a strong referral/special and feedback system for the townships that are far away from ART centres

1.8.2 TB and Diabetes Mellitus

1. Establish the policy and strategy framework. In collaboration with the Ministry's Department of Medical Services and Department of non-communicable diseases, develop a sub-strategy for introducing collaborative TB / diabetes prevention, screening and care modelled after the TB/HIV collaborative activities. High level advocacy meeting and advocacy meetings at States and Regions will be conducted.
2. Test a model for collaboration in selected States / Regions. The model may include:
 - a. Screening for diabetes among TB patients. TB focal person screens verbally for DM using standard tool (history taking for risk factors of DM such as family history of DM, old age > 65 years, non-healing ulcer) for all registered TB cases.
 - b. Screening for TB among diabetes patients, using existing symptom screening tools
 - c. Establishment of a referral network for patient care. For example, when a TB patient becomes a probable DM case, will be referred for blood testing either same health facility or higher level. When patient is diagnosed as DM, TB case will be monitored by a medical doctor.
3. Conduct trainings for TBDM activities in pilot districts, with possible expansion based on results.

Research-driven evidence

1. Among TB patients offered Voluntary Counseling and Confidential Testing (VCCT), 91.2% of TB patients accepted to be tested (2007). A high knowledge score made patients 4 times more likely to accept VCCT. If there were no other persons in the room during VCCT treatment, patients were 89 times more likely to accept it. They were 3 times more likely to accept VCCT if the HIV test result was confidential and 47 times more likely if the results were given immediately.
2. Amongst the barriers to Providers Initiated Testing and Counseling (PITC) was general practitioners' unwillingness to test people they consider to be at low risk of HIV, fear of positive results from TB patients and self-perception of being at low or no risk.

STRATEGIC DIRECTION II: BOLD POLICIES AND SUPPORTIVE SYSTEMS

2.1 Secure financial resources for implementation of NSP

Summary

Summary of Approaches

Programmatic Emphasis

This NSP aims to ensure enough financial resources to implement the NSP activities. The NTP will continue to promote efficient use of government resources and systematic inclusion of TB activities under all UHC financing schemes. Government will function as one of the PRs for the Global Fund support for the key activities and PR transition management will be handled by NTP for TB-related activities. Internal auditing system will be strengthened during this NSP period as well.

1. Ensuring the financing for TB operational budget, including drugs, and human resource issues from the government.
2. Inclusion of TB services in national health insurance policy.
3. Global Fund grants PR to be shifted to government.
4. Nurture existing donor relationships, beyond Global Funds, e.g. USAID and 3MDG; and leverage non-TB-specific donor funding for health where appropriate; e.g. World Bank.
5. Communication with and support to NGOs and INGOs for mobilization of own resources.
6. Development of internal auditing system.

Targets

Standard Indicators	Denominator	Baseline	Targets				
		2015	2016	2017	2018	2019	2020
Government contribution to TB as a percentage of the total expenditure on TB	Total spending on TB		20%	25%	25%	30%	30%
Proportion of approved posts filled	Total number of approved posts	70%	70%	75%	80%	85%	90%
Percentage of total TB budget requirements not filled (financing gap as percentage of total costed budget)	Total NSP budget	5%	<10%	<10%	<10%	<10%	<10%

Full Narrative

Situational Analysis

Over the past four years, Myanmar entered a new phase in its economic development. The gross domestic product is growing swiftly and external investment has increased, shifting from humanitarian assistance, largely supporting marginalized populations and responding to natural disasters, to development assistance aligned with increased Government investments in the social sectors. Government expenditures on health have increased from US\$ 1 per capita as recently as 2009-2010 to US\$ 11 per capita in 2013-2014. WHO recommends that per capita spending reach between US\$ 12-34. For fiscal year 2014-2015, the MOH budget was US\$ 650 million. This represents a quadrupling of the budget since 2013-2014. Health insurance for TB has not yet been established. However, government civil service staffs are now able to claim health expenditures in the public hospitals from the government budget. Since 2011, external partners to the health sector have committed over US\$ 1 billion especially for

health systems strengthening, primarily through 3MDG, Global Fund, GAVI HSS, JICA and the World Bank. These investments, while not TB-specific, stand to benefit the implementation capacity and accessibility of the entire health system and therefore, be of benefit TB care and prevention. The World Bank credit of US\$ 100 million over five years was signed in January 2015 and has the potential to support pivotal change in the flow of financing through the health system. Where there is currently a cash-based system with limited direct spending at decentralized levels, the World Bank investments aim to bring health financing closer to the frontline with formalized and accountable systems (e.g. bank accounts). Like GAVI HSS, the World Bank credit also emphasizes increasing service delivery for Maternal, Neonatal and Child Health (MNCH).

With the exception of USAID's support, the project-based external funding for TB prevalent in the mid 2000's has been mostly replaced by the larger funds of the Global Fund and 3MDG which, in turn, support a number of implementing agencies. While limited funds flow directly to Government,

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 spending in TB control hugely increased in 2014, largely for second-line drugs, infrastructure and human resources. Of the operational budget for TB control activities, 10% was contributed from government in 2015. The MOH pays for only a small fraction of first-line TB drugs. Recent policy made all other essential drugs available free-of-charge to patients through public facilities. This has helped to reduce the contribution of out-of-pocket payments from approximately 90% of health spending (prior to 2013) to an estimated 60% today. 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 the presumptive cases that may be among those accessing care.

Most drug-sensitive patients do not receive support, beyond informal support to defray transport costs, health workers or CBOs, but in some places some do receive nutritional support, but these types of support are done by some partner organizations. Some progress has been made in setting standards of packages of support for MDR-TB patients. The NTP is promoting a standard of 25,000 Kyat for support (in form of cash or food), and 5000 Kyat for transport per patient/month – with most funding now coming from GF and 3MDG. However, the JNM observed variation in the level of patient support by location and by INGO and this creates inequities. Nor would it be sustainable by NTP alone. While the 2014/15 support from the World Food Programme (WFP) (monthly food packages for MDR-TB patients) covers all diagnosed MDR-TB patients during treatment, it is not yet clear how its support would be secured for more than the initial year.

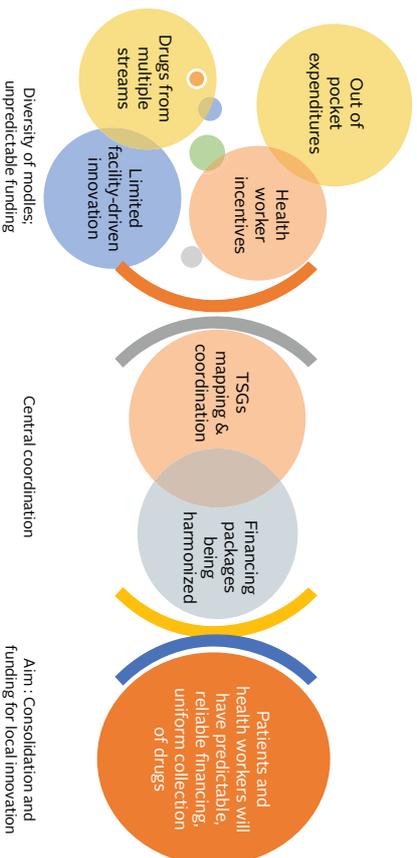
Challenges

In spite of huge recent increases, Myanmar's national expenditures on health, at 2.4% of its gross domestic product, are still the lowest among the ASEAN countries. Based on the costing of this National Strategic Plan and the operational budgets available from the listed sources, it is estimated that the NTP will face a budget shortfall of approximately US\$ 200 million for the period 2016-2020. With 37.5% of the population defined as poor, ensuring that funding benefits the poorest is desirable. A study on care-seeking found that when ill, 67% of the poorest (lowest wealth quintile) sought care while 87% of the wealthiest did so. Public hospitals were primarily accessed by the wealthier sub-populations, while services delivered at lower levels of ambulatory care were strongly pro-poor (concentration index of -.012). TB care and prevention activities delivered through the NTP and NGO partners are highly decentralized, suggesting they focus well on the most at-need populations. The challenge will be to maintain this focus as government health spending increases.

There is an increasing burden on township medical officers to complete donor-specific planning, costing and budget reporting. Yet, the capacity for strategic planning and budgeting is insufficient at these decentralized levels, and the requirement for multiple plans and parallel financial accounting systems is inefficient.

Strong MOHS leadership will be required to harmonize the donor and Government financing, and to direct the use of funds. Strong NTP leadership will also be required to protect the interests of the TB programme. The schematic shown below (Figure 39) illustrates the transition that is currently taking place.

Figure 39: Schematic illustrating the transition underway in funding of TB care and control



Strategic Approaches

1. Ensuring the financing for TB operational budget (including drugs) and human resource issues
 2. Inclusion of TB services in national health insurance policy
 3. Global Fund grants PR to be shifted to government
 4. Communication with other NGOs for mobilization of own resources
 5. Development of internal auditing system
- Essential Interventions**
1. Government commitment through full financing and staffing of TB operations
 - a. Increasing government allocation
 - i. Operational budget; including drugs
 - ii. Salaries and filling all vacant posts
 - b. Stewardship of donor investments to fill gaps, ensuring the inclusion of TB in other donor interests (e.g. World Bank, DFID)
 - c. Government to become PR for Global Fund grants
 - d. Support to NGOs to mobilize their own resources
 2. Increasing government commitment through full financing and staffing of TB operations

Government budget allocation should be raised for TB control activities, increasing by 30% by 2020. Consideration should be emphasized on operational budget including drugs, infrastructure, lab supplies and equipment. There is also a need of consideration for staff salaries and filling all vacant posts. There was a change in the setup of Ministry of Health and Sports lately and were some posts arising due to the split of previous Department of Health to Department of Public Health and Department of Medical Care. NTP will try to assess the gap in human resource and propose the required amount of staffs to narrow down the known gap.
 3. MOHS will become PR for GF grant by 2017. During PR transition plan, programmatic management, M&E, PSM and financing portions will be handed over to NTP as a part of transition. The activities will be handled by PR transition unit in NTP (3 Assistant Directors from 3 national programmes) by coordinating

and collaborating with UNOPS and Save the Children so that NTP would be government PR beyond 2016. At the same time, NTP will propose budget for TB control to MOHS so that government contribution to TB would be increased by 30% by 2020.

4. Myanmar government already has its auditing system and, internal auditing system is to be established. For the purpose of the treatment success in MDR-TB treatment, incentives will be supported to every patient on MDR-TB treatment.

2.2 Promote a coordinated and multi-sectoral response and policy development

Summary

Programmatic Emphasis

This NSP aims to have inter- and intra-sectoral collaboration to implement the activities and meet the objectives of NSP. During the period of this NSP, NTP will establish an expanded TSG to include stakeholders engaged in health and community engagement, beyond traditional TB partners. NTP staff will participate in non-TB health and donor planning meetings, as appropriate to ensure full inclusion of the TB control agenda. Finally, the NTP will engage with the corporate sector in Myanmar, in collaboration with the Ministry of Labour, to promote workplace-based policies and activities that promote early TB case detection and treatment completion within their workforces.

This NSP identifies and plans for the updating of various national guidelines, and dissemination through the public, private and NGO sectors.

Summary of Approaches

1. Stewardship of multi-sectoral approach.
2. Engagement and coordination of partners in civil society and NGOs.
3. Full alignment of TB activities within restructured MOHS.
4. Engagement of the corporate sector in TB control among the workforce.
5. National TB spending assessment.
6. Normative guidelines and policies.

Full Narrative

Situational Analysis

The NTP has taken a pro-active approach to partnership development and collaboration. Since 2011, the NTP has made efforts to collaborate with other disease programmes, particularly HIV and MCH) and other MOHS units, divisions and departments and with other ministries, e.g. the Ministry of Home Affairs for TB control in prisons. Within MHSCC, there are Technical and Strategic Groups (TSGs) on HIV and TB, with regular meetings of NTP and NAP. At the regional/state level, a quarterly TB/HIV meeting is held.

With an estimated 1 million pregnancies and 800,000 live births annually, TB-MCH collaboration presents many opportunities in the Myanmar context, where the burden of TB among children and young women is high. With improving coverage of ANC services and increased utilisation by the population, there are more opportunities for active TB case finding in MCH services. National level policy discussions have been ongoing between

Targets

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
Number of NTP guidelines updated	Number	n/a	3	3	3	3	3

the Divisions of Disease Control and Public Health, which have defined critical elements of the collaboration operationally, and a standard operating procedure (SOP) to support rollout has been developed by the NTP. The Maternal and Child Health Handbook distributed to all ANC attendees mentions TB screening in the pre- and post-partum period but does not provide guidance on how to do it. There are now seven indicators for monitoring TB screening in ANC and under-5 Child Clinics and to measure progress of collaboration.

Challenges

Intra-ministerial collaboration of the NTP occurs primarily with HIV and MCH. Engagement within the MOHS for broader health system issues (e.g. social security, UHC, health promotion, occupational health, human resource planning, and medical research) can be strengthened.

Essential Interventions

1. Stewardship of a multi-sectoral approach
 - a. Engage other ministries
 - i. Ministry of Labour (for workplace-based DOTS, social security board, etc.)
 - ii. Ministry of Home Affairs
 - iii. Ministry of Education (for pre-service training and school-based awareness raising)
 - iv. Ministry of Mining
 - v. Ministry of Transport
 - vi. Ministry of Railway Transport
 2. Nurturing of existing donors (e.g. Global fund, 3MDFG, USAID, etc.) will be properly conducted through MHSCC, technically working together with seven TSGs, including the TB TSG. NTP will also have some other activities to ensure the inclusion of TB in other donor interests (e.g. World Bank, DFID, ADB, etc.) These activities will be done through partner coordination (private sectors, civil societies, development partners and implementing partners (INGO)) and support to NGOs to mobilize their own resources.

3. Engagement and coordination of partners in civil society and NGOs
 - a. Active engagement of partners to extend the reach of government services
 - b. Ensure consistency in quality and approach across partners
 - c. Engage partners to pilot new approaches, build evidence; ensure an evidence-to-policy pipeline that involves partners
 4. Full alignment of TB activities within UHC and the restructured MOHS
 - a. TB in health insurance and other UHC schemes
 5. After the development of NSP, NTP will do costing of the NSP using WHO budgeting tool so that overall budget needs for NSP can be finalized. There will be assessment of national TB spending in Myanmar (2012-2013), ie, national health account for TB, after which it will be published. Normative guidelines and policies
 - a. The NTP plans to establish a technical committee to update NTP guidelines. The committee will review and revise the existing guidelines. After being updated, guidelines will be distributed to all states/regions and partners. Dissemination workshop for the updates of the guidelines will be conducted at national and state/regional levels. Guidelines to be updated, translated and disseminated include:

Table 10: List of guidelines to be updated/developed, translated and disseminated

Guideline	
Update / Develop	<ol style="list-style-type: none"> 1. Infection control guidelines 2. MDR-TB treatment guidelines (with policy updates regarding medicines) 3. Human resource development plan 4. Monitoring and evaluation plan 5. PPM guidelines (for public and private providers) 6. SOPs for X-Ray 7. EGA guidelines for X-Ray
Translate	<ol style="list-style-type: none"> 1. BHS manual 2. NTP manual 3. Paediatric TB care guidelines 4. SOPs for GeneXpert
Disseminate	<ol style="list-style-type: none"> 1. Logistics management information system 2. Laboratory SOPs for FM, solid and liquid culture, LPA 3. Community-based TB care guidelines 4. TB/HIV care guidelines 5. Laboratory EGA guidelines 6. Drug seller guidelines 7. Sputum collection centre guidelines

2.3 Ensure inclusion of TB in UHC and wider economic development plans and activities

Full Narrative

Situational Analysis

Summary

Programmatic Emphasis

This NSP aims to have TB activities included in all existing and emerging UHC schemes. The NTP will review and revise, where necessary, its service delivery and policy guidelines to reflect UHC structures and systems. Among the UHC priorities, the NTP will engage actively with the development of patient support and social protection policies and packages to promote access by households affected by TB.

Summary of Approaches

The NTP will coordinate regular meetings with the focal points for UHC to ensure the proactive engagement of TB actors. The NTP will ensure full inclusion of TB service and control activities as an integral part of the essential health package at all levels. The NTP will participate in planning of the health sector policy for integrated drug

policy and rational use of TB medicines to have TB appropriately included in integrated drug supply policy. Realignment of NTP activities within UHC and restructured MOHS framework is also a part of this activity.

In 2014, WHO's Global TB Programme pursued a systematic review of published literature on the nature of the economic burden of TB and associated medical, non-medical costs (eg. transport) and income loss before and during

In 2014, the Ministry of Health and Sports adopted its vision for achieving UHC "to end poverty, improve human capital and lay the foundation for preventing impoverishing and catastrophic health expenditures". The plan includes nine strategic areas for UHC (Figure 40). All nine are pertinent to the needs of NTP in increasing the capacity of the health system to provide TB services, to expand the range of TB services provided in an integrated fashion, to extend the free coverage of services to all those populations most affected by TB, and reduce the associated costs.

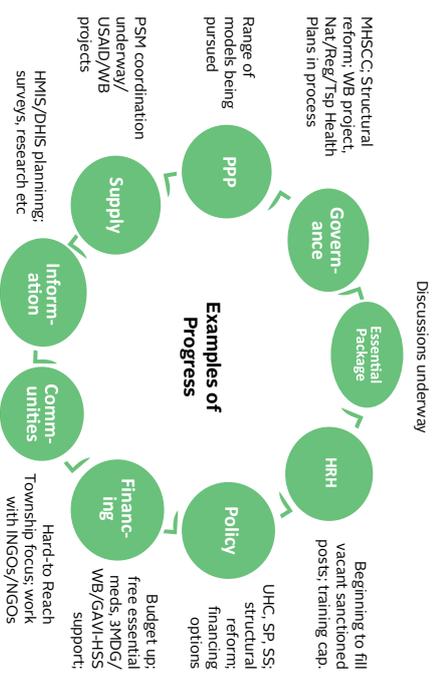
A central principle of UHC is that no person should experience financial hardship, or "catastrophic expenditures" as a result of care seeking. While the magnitude of direct and indirect expenditures during care seeking and treatment is not well understood, a TB-specific catastrophic cost survey is underway to establish the baseline.

Challenges

In 2014, WHO's Global TB Programme pursued a systematic review of published literature on the nature of the economic burden of TB and associated medical, non-medical costs (eg. transport) and income loss before and during

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
TB Included in updated Health Sector Policy in order to have Universal Health Coverage	Yes/No		N/A				

Figure 40: 9 Strategic Areas for UHC in Myanmar



treatment for TB patients and/or households. Among the studies examined was a small patient costs survey conducted in Myanmar 2004/2005 linked to the piloting of PSI's private sector franchising of TB care. The mean costs for TB care and treatment in Myanmar, as a percentage of annual individual income, were 56% (and 68% for lower patients with lower socio-economic status). Other research in Myanmar showed that 67% of the poorest quintile of the population sought health care when ill, whereas 87% of the richest sought care. Fear of catastrophic costs can be a major factor for poor people, who are most at risk of TB, not seeking care, or seeking care late.

Strategic Approaches

While Myanmar is moving towards the establishment of universal health coverage by updating its health sector policy, the NTP will work to incorporate TB service and control activities as an integral part of the essential health package at all levels. The NTP will participate in planning of the health sector policy for integrated drug policy and

rational use of TB medicines to have TB appropriately included in integrated drug supply policy.

Essential Interventions

The approaches highlighted below aim to ensure the availability of universal health coverage. It comprises sessions related to health policy, governance and finance.

1. Health Policy Development

During the development process of national health policy, NTP will participate in reviewing/ revising 15 national health policies reflecting UHC. There might be diagnosing MDR/XDR-TB and provision of treatment outside of the public health service. Mandatory reporting on MDR/XDR-TB as a notifiable disease will be inclusive in planning of health sector policy. NTP will also have an emphasis on inclusion of TB service and control activities as a part of essential health packages at all levels of health care in Myanmar. The important areas in TB, such as case

notification, vital registration, quality and rational use of medicines and infection control, should have a proper regulatory framework. NTP will try to develop such a framework in Myanmar.

Nationwide TB-related catastrophic survey will be conducted. Based on the results of survey, patient support and social protection policy will be set up.

It should be considered to have health care workers screened for TB disease. Recording and reporting system should be designed to have health care workers' TB disease screening. Comprehensive package of prevention and care interventions for health care workers will be provided, such as personal protective equipment, education on TB and HIV infection prevention and control procedures, antiretroviral therapy and isoniazid preventive therapy for HIV-positive health care workers.

2. Full alignment of TB activities within UHC and the restructured MOHS

Myanmar is now on the way towards universal health coverage inclusive of health insurance system. TB should be incorporated in universal health coverage plan and in health insurance plan, as well. Essential health packages will be organised so that it must include TB control activities at all levels.

2.4 Ensure a stable and quality-assured supply of drugs, diagnostic tests and commodities

Summary

Programmatic Emphasis

This NSP establishes an integrated supply chain system that ensures the availability of high quality, efficacious TB medicines and related medical supplies to all levels, and is aligned with the broader National Health Supply Chain Strategy for Medicines, Medical Supplies and Equipment 2015-2020 (National Supply Chain Strategy) of the MOHS. The NSP aims to strengthen the forecasting of TB medicines, laboratory products and other TB related commodities at the national level. Stock monitoring and Early Warning Systems to detect and respond to impending shortages and/or excess stocks are included, to ensure the medicines and commodities are available all the time.

Summary of Approaches

1. Establish standard forecasting methods and tools for quantification of TB medicines and related commodities, including laboratory products, for the NTP
2. Ensure that NTP is actively involved in the overall Logistic Management Information System (LMIS) design, which intends to eliminate parallel logistics data reporting systems.
3. Establish a dynamic Procurement System which can respond to an Early Warning System of TB medicines.

Targets

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
Percentage of reporting units (townships) reporting no stock-outs of anti-TB drugs	Total no of reporting units (n=330)	100%	100%	100%	100%	100%	100%

4. Improve storage and distribution practices of TB commodities.

5. Build HR capacity across the NTP Supply Chain.

Full Narrative

Situational Analysis

The Ministry of Health and Sports is moving toward establishing an efficient, cost-effective, transparent health supply chain that ensures availability of quality, efficacious medicines, medical supplies, and equipment at all levels to improve health outcomes. Multiple development partners in Myanmar are currently working with the MOHS to strengthen all aspects of the supply chain.

The MOHS currently finances only a small fraction of first-line TB drugs, relying on complementary funding from development partners for the remainder. The MOHS finances a greater proportion of second-line TB drugs. Forecasting and quantification is done nationally by the NTP in collaboration with its technical partners. A national procurement plan is developed and reviewed annually. UNOPS, the principle recipient of the Global Fund, coordinates a centralized and competitive procurement process according to the national procurement plan.

A software tool for inventory management of both TB medicines and laboratory commodities, mSupply, has been implemented and is under expansion phase. However, facilities complete paper based quarterly reporting forms; maintain daily patient registers, dispensing registers and stock cards. An Early Warning System for TB medicines by QuantB was just established at central level but there is still need to expand this system at each level of the supply chain. Post-market surveillance is conducted on an annual basis by UNOPS to evaluate the quality of TB medicines used by patients on the ground.

NTP would like to keep 6 months of buffer stock for all TB medicines and diagnostics at the national warehouse for both first and second line medicines. Restricted funding support is making it challenging for NTP to keep a 6-month buffer for second line TB medicines in stock centrally.

Strategic Approaches

NTP is moving toward the establishment of an integrated supply chain system that ensures the availability of high quality, efficacious TB medicines and related medical supplies to all levels, which aligns with the broader National Health Supply Chain Strategy for Medicines, Medical Supplies and Equipment 2015-2020 (National Supply Chain

Strategy) of the MOHS. Throughout the National Supply Chain Strategy is an emphasis on harmonizing systems (from warehousing to logistics information systems), rationalizing parallel distribution channels, and optimizing storage facilities.

The NSP aims to support a seamless TB drug and commodity supply chain system to ensure that no drug shortages occur, at any level of the health system. In order to ensure that medicines and commodities are always available for end-users, NTP wants to strengthen the forecasting of TB medicines, laboratory products and other TB related commodities at the national level. Stock monitoring and Early Warning Systems to detect and respond to impending shortages and/or excess stocks are also crucial to ensure the medicines and commodities are available all the time.

Multiple partners are supporting Supply Chain System of NTP and NTP is coordinating those organizations to promote a more cohesive approach that leverages their strengths and expertise. The following diagram shows current and ongoing supply chain support planned with NTP.

The priorities for the period of this NSP are:

a) Establish standard forecasting methods and tools for quantification of TB medicines and related commodities including laboratory products for NTP.

b) Ensure that NTP is actively involved in the overall Logistic Management Information System (LIMS) design, which intends to eliminate parallel logistics data reporting systems.

c) Establish a dynamic Procurement System which can respond to an Early Warning System of TB medicines.

d) Improve storage and distribution practices of TB commodities

e) Build HR capacity across the NTP Supply Chain

Essential Intervention

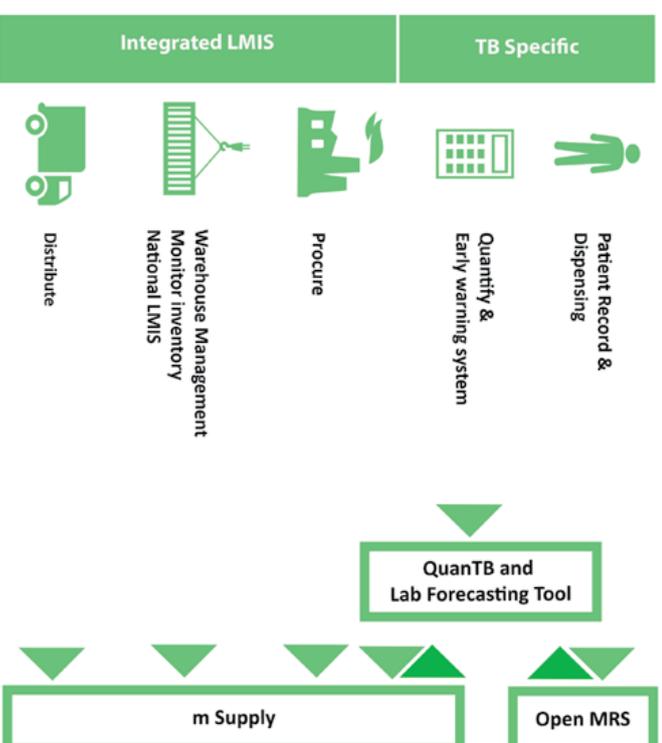
The approaches highlighted below aim to ensure the availability of quality assured anti-TB drugs and other commodities related to the diagnosis and treatment of TB, MDR-TB and XDR-TB. These approaches also aim to ensure the availability of laboratory, radiographic, other diagnostic and infection control commodities and ancillary drugs to treat the side effects of TB medicines. The specific approaches under each strategic direction are:

Establish standard forecasting methods and tools for quantification of TB medicines and related commodities including laboratory products for NTP

QuantTB, a forecasting tool, for quantification of TB medicines was introduced to NTP beginning in January 2015. Approximately 20 persons from NTP and other implementation partners have been trained since the introduction of the tool. A national NTP quantification exercise for 2016 has already been conducted once using QuantTB. NTP staffs from upper and lower Myanmar were trained for forecasting and early warning of TB medicines by SIAPS and SCMS. But a more systematic setup for TB quantification and stock monitoring is needed, such as the development of standard operating procedures (SOPs) and guidelines for Forecasting and Supply Planning specific to NTP. Refresher trainings, coordination of forecasting technical support partners and ongoing support are also needed to ensure the sustainability of high quality forecasting and monitoring efforts.

Forecasting of NTP laboratory products requires different expertise and therefore a specific set of

Figure 41: Current and ongoing supply chain support planned with NTP



SOPs and tools is needed from focal forecasting partners.

Ensure that NTP is actively involved in the overall Logistic Management Information System (LIMS) design, which intends to eliminate parallel logistics data reporting systems

As part of its National Supply Chain Strategy, the MOHS is working on designing an integrated LIMS to accommodate the logistics data and reporting needs of all programme areas. The long-term vision is for the LIMS to converge into an integrated electronic system. Currently, LIMS of NTP is paper base system. A software tool for supply chain management developed by the company Sustainable Solutions and called mSupply has

been installed and is operating in several of NTPs central and regional sites. As currently configured at these sites, mSupply is being used for inventory management of TB medicines and commodities. Further collaboration among the NTP technical support partners is needed to explore the development and deployment of a functioning LIMS which will support the management of TB medicines and commodities across all levels of the Myanmar health system.

Establishment of a dynamic Procurement System which is responsive to EWS

TB medicines and commodities are currently procured by UNOPS and 3MDGS. The MOHS current procurement system is fixed to a 12-month

procurement period with commodities ordered for delivery under two separate shipments with fixed schedules; a dynamic that makes it challenging for NTP sites to maintain the proper balance of TB commodities. NTP has set up QuantB for use as an Early Warning System of TB drugs stocks status at each of upper and lower Myanmar warehouses.

QuantB is planned to be run quarterly at upper and lower Myanmar store level. In order to take action on the findings from EWS, the current procurement system needs to be flexible in planning quantities and shipment dates. This point suggests that a dynamic procurement system in the future will be needed in order to adjust orders to maintain the TB commodities in optimum levels at central, upper and lower Myanmar TB stores. Other challenge in procurement that should be improved is; prolong clearance time. MOHS should negotiate with Ministry Of Finance for quick custom clearance time and to shorten the lead time.

Improve Storage practices and Distributions of TB commodities

TB medicines and commodities are kept in separate stores at central, upper and lower Myanmar at present. As part of its National Supply Chain Strategy, the MOHS is evaluating the establishment of integrated warehouses at three locations across Myanmar that would warehouse and distribute commodities for all programmes, not just those currently managed by the MOHS. The establishment of an integrated warehouse management and distribution system is a long-term activity for the MOHS. In the near-term, NTP needs to introduce modern warehousing practices, including SOPs for storage, inventory management and stock control as well as training of staff for technical and operational management of warehouses and stores. Distribution of NTP commodities should also be integrated with other health programmes in the near-term as this

will result in greater levels of efficiency overall. Alternative options for distribution should also be explored by NTP, such as outsourcing distribution services in some circumstances.

Management Support: HR development in NTP Supply Chain

One of the major challenges in NTP Supply Chain management is the absence of human resources trained in supply chain management. NTP needs to assign staffs to take on supply chain management responsibilities and to have these responsibilities incorporated into their official job descriptions. Capacity building of the staff at various levels should be done on a continuous cycle. Recruitment of pharmacists up to Regional and State levels and filling up of the vacant positions are recommended. Regular supervisory visits that deliberately focus on commodities management, on the job training and coaching will be carried out as part of the capacity building plan.

2.5 Human resources for health

Summary

Human resources for health is fundamentally important to implement Five Years TB NSP (2016-2020) effectively. However, the listed six key strategic approaches and interventions go beyond the role and responsibilities of NTP, necessitating close collaboration and coordination with other stakeholders and other overall strategic interventions on human resources for health (HRH) in developing the overall health workforce in Myanmar. Overall health workforce development are also necessary to ensure a competent, responsive and productive health workforce mainly in quantity, quality, distribution and motivation to achieve UHC in general and TB related targets for End TB Strategy.

Programmatic Emphasis

The NSP prioritizes the filling of vacancies during years one and two, giving priority to TB team leaders, medical officers, health assistants, laboratory microbiologists and technologists and nurses. With existing and new health staff, the NSP prioritizes a multi-pronged capacity building strategy that ensures efficiency in the delivery of training, and the introduction of systems for

sustaining capacity through self-directed courses, job aides and shadowing of other practitioners in Centres of Excellence.

Summary of Approaches

1. Contribute to overall Health workforce planning, policy development and leadership and advocacy for filling of authorized new sanctioned positions and establishment of ATM integrated disease control teams in all townships.

2. Strengthen pre-service training and organize on-going in-service training session will roll-out through a cascade system with central NTP maintaining its normative roles for the development of training materials and R/S maintaining responsibility for prioritizing and disseminating new technical norms through training to implement TB control activities (TB NSP) by existing Central, R/S training teams and created Centres of Excellence (COE). (COE will start on diagnosis and management of MDR-TB)

3. E-based and on-the-job learning: The NSP envisages the use of novel training and capacity building techniques that may reduce costs and enable ad hoc refresher training as needed.

Targets

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
Percentage of townships with BHSI and BHS II trained in the last year	All townships	60%	70%	80%	90%	90%	100%
Number of centres of excellence designated and operational	NA	3	5	10	12	15	17

4. Engage in strategic partnerships for health workforce development for comprehensive TB control.
5. Contribute to integrated personnel management system to foster adequate workforce planning, recruitment, hiring, deployment and retention.
6. Monitor and supervise the health worker performance.

Full Narrative

Situational Analysis

The persistent shortage of human resources for health is one of the leading challenges for expanding TB prevention, detection and treatment. At the end of 2015, approximately 72% of the sanctioned posts that support TB activities were occupied. The total health workforce in Myanmar increased by 20% between 2010 and 2015. The health care professional both in Public and Private (doctors, nurses, and midwives) per 1000 population increased from 1.25 (2010) to 1.6 (2015) (Population, 52 Millions, Doctors, 31,040 + Nurses 26,770 + Midwives 22,544). But it is still below the 2.28 benchmark proposed by WHO. Furthermore, there remains important geographical variance in terms of the availability of needed health staff, with rural areas facing disproportionately high shortages of staff. The Human Resource Development for health depends upon Ministry of Health and Sports budget allotment and also based on prioritization of human resources needed.

notified TB patients registered at these facilities. Often, midwives visit patients' homes to provide contact tracing, treatment support, including DOT, and counseling. The role of midwives is, therefore, central to TB care and support in Myanmar. The plan to strengthen this level of care by inducting over 10,000 PHS-II over the next two to three years will add to this capacity and should make a significant difference to the availability and quality of services provided to patients. PHS-II/HA-4 will be the main cadre responsible for disease control activities - including TB care and prevention - at health facilities, 8,122 PHS II have been posted as of March 2016, enabling midwives to focus on provision of MNCH services.

In Myanmar, there are 330 townships and before March 2016, 101 townships have specialized TB teams. Each team includes 2 lab technicians that are under the responsibility of the Department of Public Health. Other sputum microscopy services at township level are provided by general hospital lab technicians, who are under the responsibility of the Department of Medical Services. TB control activities are conducted by TB coordinator (general health staff) who is assigned by TMO in townships without TB team.

There are about 1,190 Government hospitals in Myanmar, with more than 90% under the Ministry of Health and Sports (as of June 2015). Hospitals are classified based on disease specialties and the number of hospital beds. There are two TB hospitals; one 300-bed hospital in Yangon (Aung San) and one 200-bed hospital in Mandalay (Pathengyi). One general physician is posted to the district level, 100 bedded and above hospitals, and can initiate ART and MDR-TB treatment.

The Ministry of Health and Sports divided the Department of Health into the Department of Medical Services and Department of Public Health

Table 10: Total sanctioned, appointed and vacant posts in NTP, Myanmar

SR.	Post	Central			17 Region & States	74 District	330 Township	Total Sanctioned	Appointed	vacant	Remark
		NPT	LM	UM							
1	Deputy Director	1	2	1			4	4			
2	Assistant Director (TB)	4	1	1			6	6			
3	AD (Microbiologist)		4	1			5	5			
4	AD (TB/Leop)				17		17	8	9		
5	Medical Officer (TB)		8	6	5	17	110	39	71		
6	DV T/S PHO						330 (TB 13%)				
7	T/S Team Leader MO						330 (TB 20%)				
8	MO (Microbiologist)		8	5			13	5	8		
9	AO (Lab)		6	4			10		10		
10	AE (Bio)		1	1			2		2		
11	Nurse (1) DHN		1	1			3	3	0		
12	Nurse (2) THN			2			2	2	0		
13	Sr. Statistician		2				2	2	0		
14	Branch Clerk (BC)		2	1	1		4	4	0		
15	Med Social Worker		1	1	17		19	2	17		
16	Med Tech 2 (Drug)		2	2			4	4	0		
17	Med Tech 2 (Lab)		12	6	17		35	18	17		
18	Med Tech 2 (X-Ray)		5	2	17		24	11	13		
19	Health Assistant		4	2	2		8	69	PM61		
20	Nurse 3 (B/S or SN)		2	2	17		21	2	19		
21	Nurse 3 (TN)		7	7	17	74	330	435	99	336	
22	Nurse 2 (LHV)		5	2			7	6	1		
23	Med Tech 3 (X-Ray)		3	3			6	9	Plus 3		
24	Med Tech 3 (lab)		16	10	17		43	21	22		
25	Statistician		1	1			2	3	Plus 1		
26	Upper Division Clerk		5	2	3		10	11	Plus 1		
27	Med Tech 4 (X-Ray)		2	4	17		23	???	23		
28	Med Tech 4 (Lab)		22	12	17		330	381	139	242	
29	Med Tech 4 (Drug)		2	2			4	3	1		
30	Lower Division Clerk		6	10	7	74	114	10	104		
31	Surgeon Dy Assistant Supervisor		1	1			2	0	2		
32	HA 4 (JTW/PHS-2)		5	5			10	74	64		
33	Junior Statistician		2	1			330	333	65	268	
34	Driver		7	7	5		19	10	9		

SR.	Post	Central			17 Region & States	74 District	330 Township	Total Sanctioned	Appointed	vacant	Remark
		NPT	LM	UM							
35	Worker (Lab)		9	6			15	5	10		
36	Worker (X-Ray Car)		1	1			2	1	1		
37	Worker (CXR Room)		2	2			4	2	2		
38	Worker (General)		11	6	17		40	24	16		
39	Office Assistant	3	1	1	17	74	96	4	92		
40	Guard		8	6			14	5	9		
	Total	51	170	121	221	222	990	1849	675	1368	

(DOPH) in April 2015 and new Set-up of DOPH including NTP was approved with Budget allotment and established on 7-3-16. The sanctioned posts of the new set up of NTP are 342 at central (NTP Nay Pyi Taw, Lower Myanmar TBC- Yangon and Upper Myanmar TBC-Mandalay) level, 13 at each and every Region and State (17 R/S), 4 at District (74 Districts) and 3 at Township (330 Townships) level altogether 1,849 Vertical TB Health Staff.

Community volunteers, including the CHW and AMW, DOPH-appointed cadres, are engaged in TB activities. The cadre of CHWs dates back over thirty years and many are no longer particularly active in community-based health care, besides mobilizing people occasionally for events such as the arrival of mobile clinics or immunization campaigns. Large numbers of CHWs have dropped out and now, the DOPH undergoing a process to replace them. It is unlikely that this cadre will be able to make a significant contribution to TB services given the lack of connection with the BHS. The AMWs work directly with midwives. They focus on community-based MNCH activities, particularly assisting in childbirth, for which they receive a fee for service in cash or in kind. They have no specific training in TB.

Apart from TB staff and BHS, there were additional helping hands recruited by SRs through WHO and IPS. Their contribution are crucial for TB control activities to meet targets and objectives. (see table-12)

Where international or national NGOs have community based programmes, they often appoint new community health volunteers (CHVs) to conduct general or TB-specific tasks such as screening, referral and DOT support. In some places, NGO-supported volunteers link presumptive TB cases to private practitioners who diagnose and treat those with drug-sensitive TB and refer those with MDR-TB to public facilities. Community-based volunteers reach people in remote areas and from marginalized segments. They encourage and support them as they link up with health facilities. They assist in screening and referral, in sputum collection and transport, in accompanying presumptive TB cases for diagnosis and in follow-up treatment support, particularly through home-based DOT. Evidence suggests that volunteer models work effectively and contribute to case notification and treatment success.

Volunteers are usually selected in collaboration with township and village authority, the BHS and the Township Medical Officer and work cooperatively with BHS. INGO-appointed volunteers are usually provided financial rewards by way of transport allowances and/or incentive payments for specific results (referrals, notifications, treatment success). In addition, they attend regular meetings and receive focused training, which contributes to their overall motivation and ability to contribute effectively. There is strong evidence to show that such volunteer

Table 12: Additional Staff made available through external funding as of 12.10.2015 updated

Sr.	Type of Staff	Sanctioned	Occupied	Vacant	Funding Re-source
1	International MO/TB (TB)	2	1	1	GF, USAID
2	NTO (WHO Country Office)	4	4	0	GF
3	NTO (HRD, M&E, PSM, ACF, OR)	6	6	0	3M/DG
4	NTO (TB)	17	13	4	GF
5	NTO (MDR)	2	2	0	USAID
6	Microbiologist	2	2	0	GF
7	Senior TB Lab Supervisor	8	3	5	GF
8	Laboratory Technician	12	5	7	GF
9	Electronic Engineer	1	1	0	USAID
10	Data Assistant	16	15	1	GF
11	Data Assistant (MDR-TB)	2	2	0	USAID
12	Data Assistant (ACF)	2	0	2	3M/DG
13	Data Assistant (Nutrition)	2	0	2	3M/DG
14	Office Assistant	4	4	0	GF
15	Community based care officer	4	3	1	GF
16	WCO Admin Support TB Unit	5	5	0	GF, USAID, 3M/DG
17	WCO Admin Support General	3*33%	3*33%	0	GF
18	Laboratory Technician (MMA)	10	10	0	GF
19	8-member mobile team (9 teams, INGOs)	72	40	32	3M/DG
	Total	171	118	53	

*Please note that Lab Technician (MMA) & mobile team are not WHO contracted staff

models work effectively and contribute to case notification and treatment success.

Challenges

The WHO Joint Monitoring Mission found that, in sites visited where all sanctioned positions were filled, and management at RHC was good, TB care and prevention services were functioning well, regardless of whether a TB team was there or not. In townships without a TB team, focal points for TB were designated and were well trained.

There are 5 main challenges related to human resources that must be addressed by this NSP: 1) filling of vacant positions; 2) ensuring adequate staffing and referral mechanisms to support hard-to-reach and marginalized populations; 3) retention of trained and well-performing staff; 4) training of new staff and continuing education of existing staff; and 5) supportive supervision and on-site mentoring of staff.

Strategic Approaches

1. Contribute to overall workforce policy development, planning, production and leadership.

TB Officers mentored in health related training schools throughout the country. Region and State training team gave the on-going in-service training, TB R/Os and District TB Team Leader are trainers.

3. E-based and on-the-job learning:

The NSP envisages the use of novel training and capacity building techniques that may reduce costs and enable ad hoc refresher training as needed. NTP will start on MDR-TB diagnosis and management and then expand in other area.

4. Engage in strategic partnerships for health workforce development for comprehensive TB control.

NTP developed training guidebooks gave concerned trainings in closed collaboration with responsible personnel, from Maternal Child Health, NAP, PPM, Prison, Ips, TB/HIV joint training workshops and TB-MNCH trainings were conducted in all R/S within 2014,2015 and 1st Quarter 2016.

5. Contribute to integrated personnel management system to foster adequate workforce planning, recruitment, hiring, deployment and retention.

In collaboration with WHO, GF-UNOPS and 3MDG Fund-UNOPS, NTP recruited additional helping hands to foster workforce development and retention.

6. Monitor and supervise the health worker performance.

NTP personnel and WHO-NTOs, STLS conduct supportive monitoring and supervision for TB control performance and give necessary on-job trainings according to workplans.

Responsible personnel from Department of Public Health involve in curriculum development including TB control in pre-service training Universities and schools. NTP central and R/S

2. Centres of Excellence (COE)

Strengthen pre-service training and organize on-going in-service training session will roll-out through a cascade system with central NTP maintaining its normative roles for the development of training materials and R/S maintaining responsibility for prioritizing and disseminating new technical norms through training to implement TB control activities (TB NSP) by existing Central, R/S training teams and created Centres of Excellence (COE). (COE will start on diagnosis and management of MDR-TB).

In response to the challenges, the NSP prioritizes the appointment of new sanctioned posts during years one and two, giving priority to: TB R/S Officer, TB medical officer, microbiologists and technologists of Lab and X-Ray, TB nurses, and other health staff.

With existing and new health staff, the NSP prioritizes a multi-pronged capacity building strategy that ensures efficiency in the delivery of training, and the introduction of systems for sustaining capacity through self-directed courses, job aides and shadowing of other practitioners.

Essential Interventions

A detailed human resource development strategy will be developed in year one to elaborate on the following interventions:

1. Centres of Excellence

The NSP will capitalize on well-performing sites at each level of the health system and in the private sector to establish operational centres of excellence. The multiple centres of excellence will effectively decentralize the availability of on-site mentoring, training and supervision across the country. Centres of excellence will be bolstered to conduct period training workshops, host bi-annual refresher training with participants shadowing the best practice of the centres, host ad hoc "shadowing" sessions for new staff, and be incentivized to provide technical support directly to other integrated disease control teams. In each township, it is envisaged that there would be at least one centre of excellence representing BHS, GPs, hospitals, microscopy laboratories, and X-Ray facility.

2. Formal training

sessions will roll-out through a cascade system with the central NTP maintaining its normative roles for the development of training materials and the R/S maintaining responsibility for prioritizing and disseminating new technical norms through training. The central NTP trains R/S level staff, who in turn train township level personnel. The townships provide training to all BHS in their area. The number of formal training sessions will be conservative, recognizing that there are commonly more efficient ways to build and sustain technical capacity. However, formal training will be aligned with the hiring of new human resource and any revisions to the national guidelines or technical standards.

3. E-based and on-the-job learning

The NSP envisages the use of novel training and capacity building techniques that may reduce costs and enable ad hoc refresher training as needed. In addition to the use of centres of excellence to offer on-the-job training through shadowing of other skilled practitioners, the NSP plans for the development of electronic self-directed courses. Acknowledging the absence of internet connectivity in all sites, training seminars will be developed and pre-loaded onto tablets that can be shown /used by public and private sector providers, based on their individual learning needs. In years 4 and 5, these may migrate to a web-based platform. Job aides and other on-the-job learning tools will be developed and deployed. Supportive supervision and referral networks will be updated, formalized and systematized as a means of sustaining staff capacity.

Table 13: Human resource development tactics required for the strategic approaches of each thematic group.

Group	Human resource development
1- Basic DOTS	<ul style="list-style-type: none"> - Recruit with full section - Trainings - BHS + volunteers - Fill the vacant post including Lab tech - Refresher training, supervision and on job training
2- PMDT	<ul style="list-style-type: none"> - Recruitment of biomedical Engineers, lab tech, microbiologist, lab officer, MO in line with GeneXpert rolling out plan - Provide standard training package - Recruitment of health care providers, counselors and CHW in line with expansion plan - Appropriate training to all laboratory personnel, BHS and CHW
3- Childhood	<ul style="list-style-type: none"> - Training including sample collection especially for the gastric aspirates (Health staff) - Refresher training MNCH and School health team - Have to be established - SDCU team - NTP, NAP
4- Concomitant disease TB/HIV, TB-DM, TB-Hepatitis	<ul style="list-style-type: none"> - Additional staff for social support, IPT,CPT and ART - Recruit training for NTP/NAP staff and refresher training coordination with NAP - To put TB/HIV treatment guidelines (CPT,ART and IPT) as part of curriculum in all schools of health care providers - Cross visits between high performance and low performance townships - To develop appropriate supervision checklist for TB/HIV collaborative activities and improve regular joint supervision - 5 engineers for installation of GeneXpert, monitoring, supervision and maintenance - Training package (including computer training) for GeneXpert to all lab technicians in GeneXpert sites - To put algorithms for GeneXpert testing as part of curriculum in all schools of health care providers - All sanctioned and vacant microbiologists are to be filled up for regular monitoring and supervision - Training on NTP/NAP staff training including counseling and LMIS - Regular monitoring and supervision at all level.
5- High risk	<ul style="list-style-type: none"> - Prioritize staff needs - Training needs (In-service) - Revision of pre-service training - Mentorship from another area (exchange visit) - Supervision requirements - Recruit and train Mobile Team Members (MO, X-Ray, Lab Tech etc); Provide trainings (X-Ray reading for TMOs, partners); Joint M&S, on-site training, staff exchange programme among partners - Refresher training to BHS and PHS2, field supervisors of partner organizations for DOTS, TB/HIV and PMDT - Train local volunteers (sustainability) - Train health care providers working in DICs - Training for health staffs including lab tech - Train new comers in TB control

Group	Human resource development
6- Diagnostics	<ul style="list-style-type: none"> - To fill up vacant lab personnel - Recruitment of Bio-engineer and necessary staff, radiographers - Capacity building by necessary training including EGA, M supply - Volunteer recruitment and training and refresher training for existing volunteer - Capacity building (sample collection, package and cold chain)
7- PPM	<ul style="list-style-type: none"> - Prioritize staff needs - Training needs (In-service) - Revision of pre-service training - Mentorship from another area (exchange visit) - Supervision requirements and joint monitoring and supervision - Capacity building - R&R and eR&R (for public) - Mobile application - Standardized poor patient support package - Equipment and reagent - EGA for both public and private - Coordination
8- Community engagement	<ul style="list-style-type: none"> - Technical assistance from experts - Capacity building for community advocates - Capacity building of recruited community volunteers - Services TB/HIV/chronic care/PMPT and DOTS - Capacity building for recruited public health clinicians who providers - Training of Community Volunteer supervisor
9- Monitoring & Evaluation and Operations Research	<ul style="list-style-type: none"> - Assigned focal persons for M&E at central, R/S, District and Townships - Assigned focal persons for OR at central and R/S level - Revised national M&E plan for TB control (2016-2020)
10- UHC	<ul style="list-style-type: none"> - Prioritize staff needs - Training needs (In-service) - Revision of pre-service training - Mentorship from another area (exchange visit) - Supervision requirements - Concern Technical Group/Coordinating Body - Recruit additional HR

STRATEGIC DIRECTION III: INTENSIFIED RESEARCH AND INNOVATION

3.1 Implement the prioritized research agenda

Summary

Programmatic Emphasis

Implementation of this NSP will strengthen the evidence base for future policy and practice through operations research. Capacity building will be prioritized to enable the use of programmatic data and operations research for decision-making.

Summary of Approaches

1. NTP and implementing partners in collaboration with DMR will design, training and conduct workshops to build capacity among NTP staff for operations research using programme data, and facilitate an evidence-to-policy/ practice continuum.
2. Promote impact assessments and prioritize research, including completion of 20 prioritized operations research studies, that will address programme challenges.
3. Systematically evaluate, through pilot projects and TSG review, the appropriateness of new technologies and tools for adoption and implementation in Myanmar.
4. To conduct periodic survey, such as Prevalence Survey (2017), Feasibility Assessment of Short Course MDR-TB Regimen (2017), DR-TB Survey (2018) and Mortality Survey (2020).

Targets

Standard Indicators	Denominator	Baseline 2015	Targets				
			2016	2017	2018	2019	2020
3.1 Implement the prioritized research agenda							
Percentage of R/S that have at least one NTP staff trained in operations research	N=15 staff	10%	25%	50%	75%	100%	100%

Full Narrative

Situational Analysis

To address specific knowledge gaps, Myanmar has a rich history of employing operations research. In 2015, a published annotated bibliography featured 242 TB-related operations research projects completed in Myanmar between 2007-2014. Capacity for undertaking operations research exists most notably within the Department of Medical Research (DMR) and the universities of medicine and university of public health. The NTP closely collaborates with DMR for operations research, as well as DMR support for data analysis and programme evaluations. The NTP, in turn, reviews research proposals / protocols coming from the DMR and graduate schools, and engages to ensure programmatic relevance of the research and uptake of the results into policy and practice. In 2014, the NTP in collaboration with the Department of Medical Research and partners developed a prioritized TB research agenda. The agenda includes 20 operations research topics across 5 domains: a) diagnosis, screening and active case finding; b) treatment and prevention; c) TB in special groups; d) community-based TB and engaging all care providers; and e) epidemiology and social determinants of tuberculosis. Coordination of research is led by the NTP, using the TSG as a venue for discussion of partner engagement in research and discussion of new priorities. The DMR offers training,

mentorship and other forms of capacity building for NTP and other health staff.

Challenges

One of the primary challenges for the research agenda is ensuring formalized coordination of priority operations research. The NSP call for continuation of the current leadership by the NTP for setting the operations research agenda and approving studies. Collaboration with the DMR and University of public health and Universities of Medicine will be sustained. Furthermore, the TSG is an appropriate forum for discussion of research priorities, and coordination of research implementation. An on-going inventory of research will be made possible by requiring all IPs, medical units and academic institutions to submit their TB-related research plans quarterly to the NTP research and M&E focal point and DMR. With the increased attention to health and TB control in the country, the NTP is increasingly stretched. Formal coordination mechanisms to ensure continued NTP leadership, in the most efficient manner, are needed.

Strategic Approaches

Implementation of this NSP will strengthen the evidence base for future policy and practice through operations research. Capacity building will be prioritized to enable the use of programmatic data and operations research for decision-making.

Essential Interventions

Improve the systematic use of strategic information

- NTP in collaboration with DMR will establish and strengthen research capacity including design and training on analytical protocols for use by decentralized levels/townships, on themes of broad importance; e.g. how to assess loss-to-follow-up of presumptive cases who fail to reach a diagnostic facility. These analytical protocols can later form the basis for automated analysis within an electronic system.
 - In 2014-2015 in collaboration with WHO/ TDR and the Union, which yielded 5 directed operations research studies under the NTP. The cohort has completed 2 workshops and will participate in workshop 3 and inter-workshop mentoring over the course of one year to take a research project from proposal writing to publication of a research paper.
 - In alternative years, it will offer a short-course on TB operations research for a wider audience.
 - Annually, the DMR, Department of Public Health and partners will convene a one-day workshop on translating research into policy and practice
 - Promote impact assessments and prioritize research, including operations research, that will address programme challenges
- The DMR will design, training and conduct workshops to build capacity among NTP staff for operations research using programme data, and facilitate an evidence-to-policy/practice continuum. The NTP will identify OR trainees who are well positioned to conduct and apply research; and build them for capacity for conducting impact assessments and operations research. They will be enabled to serve as future trainers and mentors. The DMR will offer the following capacity building opportunities:
 - DMR to coordinate OR training for selected staff of the NTP. In addition, NTP staff may join the DMR-organized annual basic research methodology course.
 - Provide intensive training and mentor, every other year together with first cohort of NTP staff trained in SORT-IT, for a small cohort of NTP staff on the design and implementation of operations research using routine programme data. The structure will be based on the successful Structured Operations Research and Training Initiative (SORT-IT) model piloted

Table 14. Operations research priorities

No.	Operations Research Priorities
1	Integrated approaches for utilization of community volunteers in TB, HIV and MNCH
2	Effectiveness of community-based MDR-TB care by community supporters and BHS
3	Health-seeking behavior and patients' barriers to diagnosis and treatment of MDR-TB
4	Cost-effectiveness of active case finding for tuberculosis
5	Assessment of patient satisfaction in community-based TB care
6	Factors for sustainability of community volunteers for TB control
7	Economic analysis of community-based MDR-TB programmes
8	Establishment of screening for tuberculosis in cross border areas
9	Role and effectiveness of voluntary health workers in community-based TB care
10	Barriers for accessing TB screening and diagnosis
11	Role of community involvement in treatment adherence of TB patients
12	Causes of compliance in standard MDR-TB regimens
13	Accessibility to services related to diagnosis and treatment of tuberculosis
14	Effective ways of communication to improve TB knowledge among community
15	Social determinants of TB transmission among people living in hilly regions
16	Factors influencing treatment of tuberculosis among migrant populations
17	Factors influencing delays in treatment of MDR-TB
18	Prevalence and resistance patterns of MDR-TB among migrant populations
19	TB treatment outcomes among diabetic patients
20	Risk factors for DR-TB: with special emphasis on MDR among new patients

In process

1. Assessment of patient satisfaction in community-based TB care
2. Factors for sustainability of community volunteers for TB control
3. Nationwide TB related costs survey in Myanmar
4. Factors influencing ART coverage among TB/HIV patients
5. Accelerated case findings through mobile teams and community involvement: A process evaluation

Planned for 2016 – 2017

1. TB prevalence survey (planned for 2017)
2. National KAP survey (planned for 2016)
3. Integrated approaches for utilization of community volunteers in TB, HIV and MNCH (planned for 2016-2017)
4. Barriers for health seeking and adherence of TB treatment among migrants at border township, Myawady (2016)

Systematically evaluate the appropriateness of new technologies and tools for adoption and implementation in Myanmar

3.2 Enhance evidence-based programme monitoring and implementation

Summary

Programmatic Emphasis

1. TSG to review any new policy guidance issued by WHO and relating to the global endorsement of new medicines, diagnostics, vaccines or other tools, and to advise the NTP on the potential relevance for uptake in Myanmar

For the period of this NSP, the NTP will focus on a) a shift to electronic data capture and management systems, including the use of GIS technologies;

2. NTP and DMR to collaborate in the design of pilot and evaluation projects to assess new tools in local contexts and to adapt global policy recommendations for the Myanmar context
3. NTP and TSG to review evidence from pilot evaluations and to update technical policies

b) integration of TB into the emerging DHIS and LMIS systems; c) strengthening of vital registration for more consistent recording of TB-related deaths; d) decentralization of data analysis skills; and e) enhanced evidence base for future policy and practice through operations research. Capacity building will be prioritized to enable the use of programmatic data and operations research for decision-making.

Summary of Approaches

1. Evaluate electronic data capture systems already being used in Myanmar and other countries to identify the best platform for the NTP. Design, piloting and eventual roll-out of an electronic system will occur during the span of the NSP.
2. Revise TB M&E plan with core TB indicators for inclusion in the national guidelines.
3. Systematize linkages between with the emerging Logistics Management Information System (LMIS), DHIS-2, and laboratory monitoring system. Also ensure linkages, using unique identifiers, to data systems for HIV and diabetes patients and beneficiaries of any social support platforms.

Targets

Standard Indicators	Denominator	Baseline		Targets				
		2015	2016	2017	2018	2019	2020	
Intervention 3.2: Enhance evidence-based program monitoring and implementation								
Percentage of districts using an electronic data management system	All districts (n=74)	n/a	3%	20%	30%	40%	50%	
Percentage of districts having completed a data quality assessment in the last quarter	All districts (n=74)	7%	10%	20%	50%	75%	100%	
Percentage of HIMS or other routine reporting units submitting timely reports according to national guidelines	All townships (n=330)	97%	97%	97%	97%	98%	100%	

- Conduct routine and systematic data quality assessments (DQAs) at township, district and national level to improve data completeness, consistency and accuracy.
- NTP in collaboration with DMR will establish and strengthen research capacity including design and training on analytical protocols for use by decentralized levels/townships.
- Maintain a designated focal point for M&E and Research at central level to oversee all aspects of data management.

Full Narrative

Situational analysis

A robust and responsive surveillance, monitoring and evaluation (M&E) system is important for ensuring evidence-based planning, implementation of quality TB control activities and tracking progress towards achieving NSP goals. The NTP utilizes the internationally recommended TB recording and reporting system, with paper-based data collection at facility-level and electronic management of

aggregated data at State/Regional and Central level. NTP staff from all Regions and States meet on an annual basis to review progress, and discuss challenges and emerging best practice as evidence by the data.

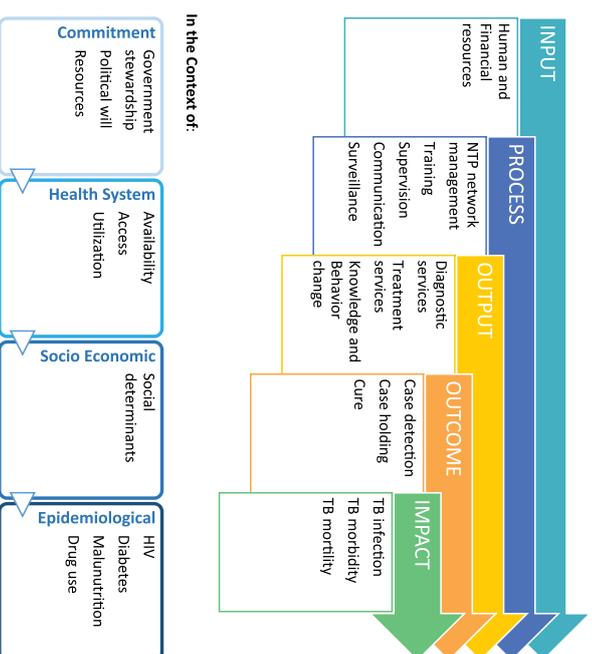
Changes to the monitoring and evaluation system are on the horizon. Innovations in electronic data capture, such as with mobile phones and tablet computers, have been piloted by some of the NGOs working in the country. Exploration of electronic data base systems has been initiated by the NTP. An integrated health information system, DHS-2, is being introduced by the Ministry of Health and Sports and vital registration is prioritized for strengthening. An integrated Logistics Management Information System (LMIS) is also under development. TB-related data will need to both be integrated into and efficiently use all systems in a complementary, non-duplicative, manner.

Periodic surveys complement routine surveillance, providing a longer term view of programmatic impact. A national drug resistance survey was completed in 2012-2013, a Knowledge, Attitudes and Practice (KAP) survey is planned for 2016, and

a national prevalence survey is planned for 2017. The NTP also benefits from evidence generated by wider health sector surveys where they inform the NTP about the health services and patient demand context in the country. For example, a Service Availability Readiness Assessment (SARA) was recently completed in 2015 and a Demographic and Health Survey (DHS) is currently being designed. Other disease-specific prevalence surveys, such as for HIV ie. IBBS (Integrated Bio-behavioural Survey) for Key Affected populations (MSM, FSW, PWID) conducted in 2014-2015 and diabetes (National Survey of DM and Risk Factors for NCD in Myanmar (2014), guide the prioritization of collaborative activities.

Given these streams of programme monitoring and evaluation, the NTP is able to track its inputs, activities, outputs, and outcomes according to the M&E framework (fig. 42) which is outlined in the M&E plan for the NSP.

Figure 42: M&E framework as outlined in M&E plan for the NSP



Challenges

There are increased demands for TB-related data to be linked to other systems and to more comprehensively monitor all aspects of patient care seeking, diagnosis, treatment and ACSM. Some of the challenges relate, for example, to linking the laboratory M & E system for drug sensitive TB, with quarterly report by TB 07. For DRTB, culture and sensitivity testing results are sent to the central NTP from two National Reference Laboratories on a quarterly basis. Electronic reporting of Xpert (GxAlert system) is used in 43 of the 49 sites which have a GeneXpert machine. EQA slides are sent monthly from township to State/Region and EQA reports from State/Region are sent to central EQA unit quarterly. As

such, a number of challenges will need to be addressed, including:

1. **Lack of an electronic, case-based patient recording and reporting system:** Given the lack of an electronic case-based data system and the complexities of manually compiling data for analysis, the use of data for decision making at decentralized levels is limited. It is not possible to assess, in real time, the effectiveness of newly implemented interventions or quickly identify changes in programme performance.

levels is done for reporting purposes but is not yet fully utilized to guide programme decisions. Increased capacity building to nurture an evidence-to-practice continuum will be needed. The DMR has identified a need to build its own capacity for health economics, meta-analysis and the translation of research findings into policy.

5. **Weak data and reporting to NTP from security compromised townships:** This could be addressed when security situation improves. Then M&E system in those areas could be strengthened in collaboration with other implementing partners. It is important to note that these areas do not accept all health services, including TB.

Strategic Approaches

2. **Insufficient patient data** routinely captured to guide all programme decisions: Updates to the recording and reporting system will be required to capture information such as: a) all presumptive cases with their diagnostic results, b) contact investigations, c) TB cases among health workers, d) HIV status, e) diabetes, f) proxy for catastrophic costs or wealth status, g) community-based care / referrals, and h) active case finding.

For the period of this NSP, the NTP will focus on a) a shift to electronic data capture and management systems, including the use of GIS technologies; b) integration of TB into the emerging DHIS and LMIS systems; c) strengthening of vital registration for more consistent recording of TB-related deaths; and d) decentralization of data analysis skills. Capacity building will be prioritized to enable the use of programmatic data and operations research for decision-making.

Essential Interventions

Enable electronic data capture and electronic case-based data management:

4. **Capacity for data analysis and use of data:** The NTP has compiled extensive databases based on routine reporting and operations research. Its ability, both due to time constraints and a shortage of internal capacity for data analysis, to make full use of the data is limited. In particular, the analysis of data at decentralized

The NTP and partners will evaluate systems from other countries, as well as the piloted, electronic data capture systems already being used in Myanmar to identify the best platform for the NTP. Design, piloting and eventual roll-out of an electronic system will occur during the span of the NSP.

The aim is to maintain electronic records of all patients, enabling real-time evaluation of programme performance at all States/Regions. Data aggregation can happen at any level, including nationally. A fully electronic system will yield a robust database with comprehensive patient parameters. Some features will include:

1. Electronic data capture of patient-based information in a phase manner depending on the internet accessibility and strengthen capacity of BHS on mobile technology
2. GIS parameters to enable identification of geographic variance in programme performance
3. Data transfer in (near) real time to the central unit
4. Ability to generate real-time reports at any level
5. Identification of duplicate patient entries
6. Automated analytic functions, with key performance indicators, to aid in utilization of the data.

Strengthen integration of TB data with other surveillance platforms

1. Adopt unique identifiers for use in all TB-linked M&E systems, in collaboration with the Inspection Division focal point within the Department of Public Health
2. Systematize linkages between with the emerging Logistics Management Information System (LMIS), DHIS-2, and laboratory monitoring system. Also ensure linkages, using unique identifiers, to data systems for HIV and diabetes patients and beneficiaries of any social support platforms (e.g. food support, subsidies).
3. Improve the vital registration system to better capture TB deaths.

Continuously improve monitoring and evaluation capacities at all levels

Improve the quality and systematic use of strategic information

1. Revise TB M&E plan including agreeing on core TB indicators for inclusion in the national guidelines.
1. Conduct quarterly, systematic data quality assessments (DQAs) at township and district level to improve data completeness,

consistency and accuracy. The national and R/S levels will be assessed annually. DQA will be incorporated into the cascade of supportive supervision. Conduct data validation meetings and quarterly data review meetings at district level.

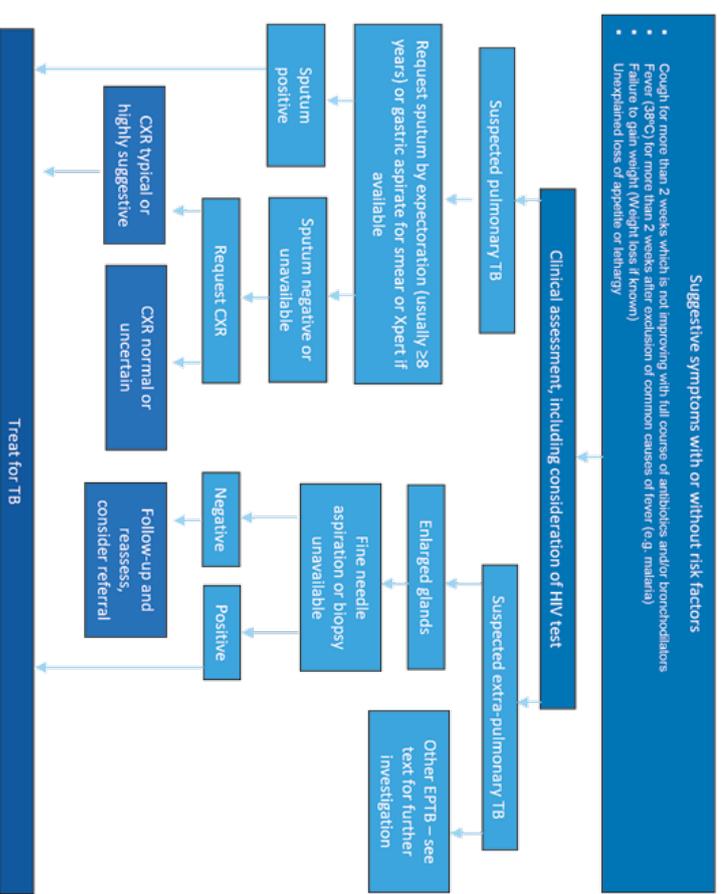
Ensure availability of a support systems for MSE

1. Maintain a designated focal point for MSE and Research at central level to oversee all aspects of data management; include coordination of operations research in his/her scope of work
2. Designate time within each quarterly TSG meeting to discuss evolutions in MSE and operations research.
3. Provide tablets and computers, where needed, for data capture and management

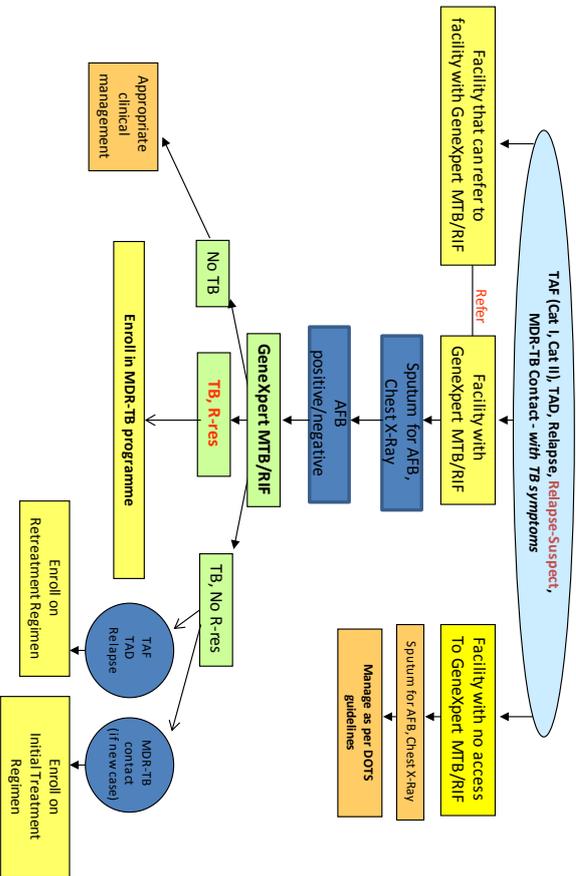
ANNEXES

Annex 1: GeneXpert Diagnostic Algorithm

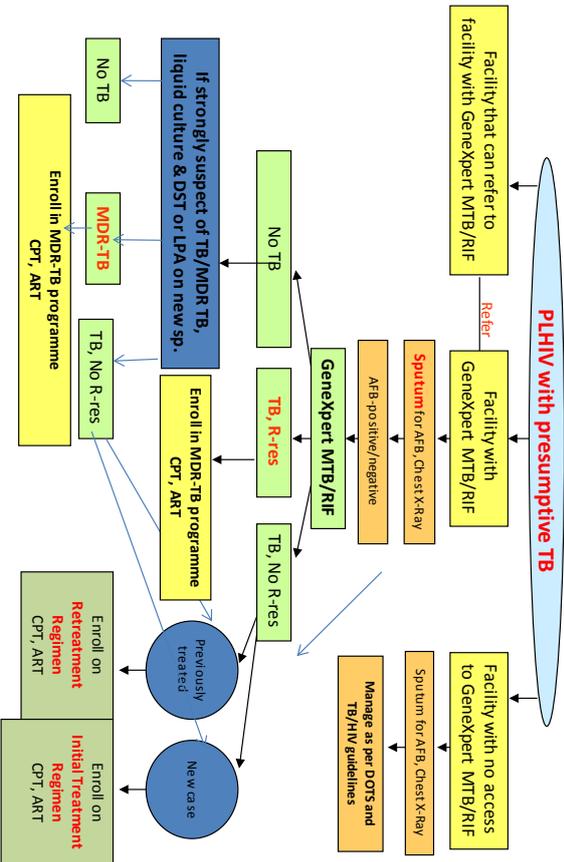
General approach to diagnosis of TB in Children



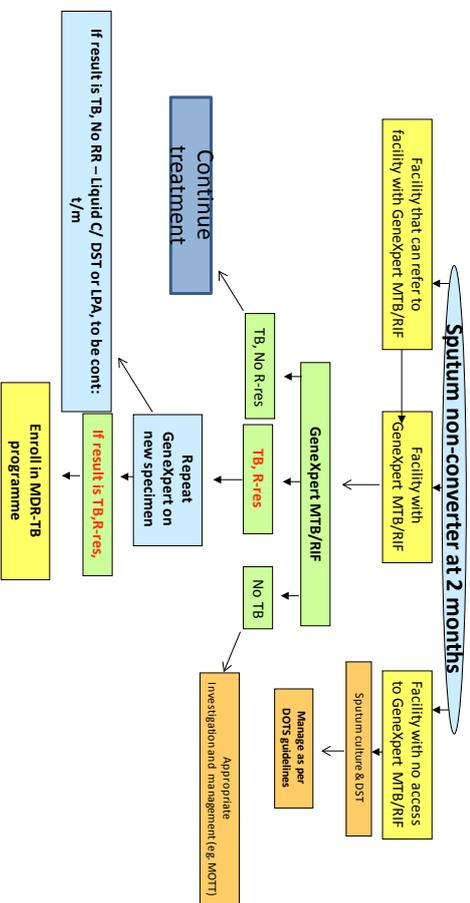
Diagnosis of MDR-TB in patients with risk factor for resistance



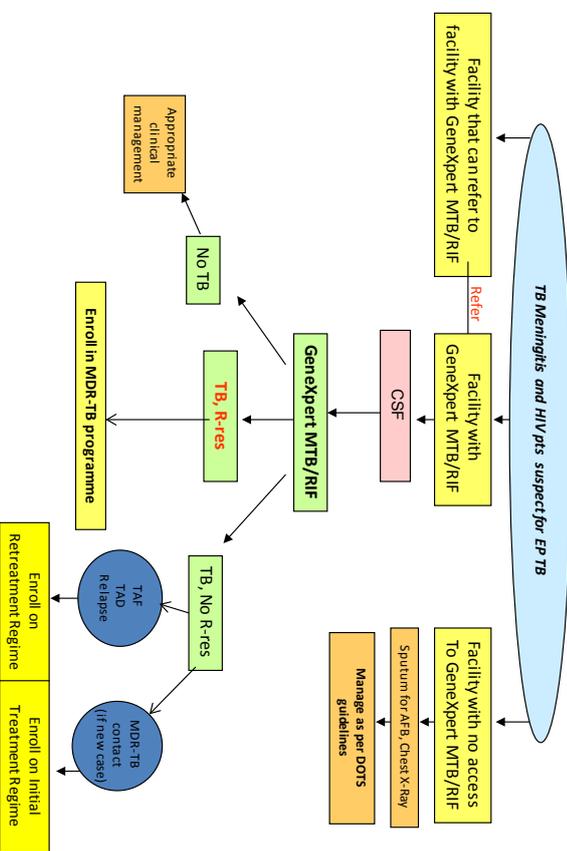
Diagnosis of TB/MDR-TB in HIV-positive patients



Diagnosis of MDR-TB in HIV (-) non-convertor new patients with (S+ at 2months) no significant risk for MDR-TB



Diagnosis of MDR-TB in EP spec. (CSF) in patients with risk factor for MDR-TB



Annex 2: Executive Summary of PMDT Monitoring Report

Findings/Observation

Much progress has been made since the 2014 monitoring mission. The main financial partners are the Global Fund, USAID and the 3MDG Fund, with MSF-H, FH360, the UNION and WHO as the major technical partners. There is substantial secured support for the PMDT activities of the NTP and partners, from both domestic (Government of Myanmar; USD \$2.8m in 2014) and external (3MDG Fund; USD \$20m for MDR-TB activities, Global Fund; almost USD \$82m for overall TB activities, and USAID/PEPFAR; almost USD \$2.9m for overall TB activities) sources. The 2013 "Guidelines for the management of MDR-TB" have been revised based on the experience and previous mission recommendations. Updates include: revision of the diagnostic algorithms, including removal of the requirement for confirmatory testing for cases diagnosed by GeneXpert; widened eligibility criteria for DST, including testing all registered TB cases in the Yangon Region; PAS not included in the MDR-TB treatment regimen for all MDR-TB cases; treatment duration now 20 months; and an XDR-TB regimen has been agreed upon.

Starting in late 2011, laboratory capacity via GeneXpert has now expanded with 39 GeneXpert machines in place under the NTP (plus 6 more in other sectors). Another 7 machines will be introduced during 2015. Although there is a target of having one national TB reference laboratory (NTRL) and four Regional Reference Laboratories (RRLs) able to perform culture and DST, only the NTRL in Yangon and the RRL in Mandalay are able to support MDR-TB diagnosis. A third laboratory at Taunggyi can undertake treatment monitoring in addition to these two laboratories. The NTRL in Yangon has now started doing second-line (SL) drug susceptibility testing (DST) by solid culture. PMDT activities have been expanded from 68 townships in 2014, and are planned to be in 108 townships by the end of 2015. From mid-2009 to end 2014, a cumulative total of 3,005 MDR-TB patients have been enrolled in MDR-TB treatment. In 2014, 1,337 patients were enrolled on treatment (c.f. 667 in 2013) – out of which 65% were enrolled in the Yangon region alone. Another 493 patients were enrolled on treatment in Q1 2015. The "Waiting list" for second-line drug (SLD) treatment is now much reduced. Treatment outcomes remain high – the 2012 cohort report for 443 patients shows 71% cure and 8% completed i.e. 79% treatment success rate (c.f. global average of around 50%). The doctors, health care staff and community volunteers continue to gain experience and confidence in treating MDR-TB cases, and remain enthusiastic to care for the MDR-TB patients.

Experience is gaining in the use of treatment regimens without PAS included, and outcome data is now available for patient cohorts treated both with and without PAS. The documentation and management of the adverse drug reactions generally appears to be adequate. Expansion of strong ambulatory community based care, with the Basic Health Staff (BHS) still at the core of the care, continues. The bulk of cases in most Regions / States are now treated fully on an ambulatory basis. Support packages to both patients and care providers continue, and the provision of food packages to patients is now expanded both within and outside of the Yangon Region. However almost all of the 24,000 Kyat per patient per month incentive provided to the BHS, is spent on buying fuel. Hence it is more of a fuel allowance than a pure incentive. Basic infection control measures are being considered in most health facilities, including the provision of personal protection equipment for staff. Some of the recommendations, but not all, from the 2014 mission

visit have been followed.

Sections A to O of the report provide a detailed description of the mission findings and new recommendations. **Annex A** describes the progress made on last year's monitoring missions recommendations. While there has been substantial progress in many areas, there remain considerable challenges and a number of last year's recommendations have not been followed through on. The terms of reference for this visit are described in **Annex B** and the visit agenda and places visited are described in **Annex C**. Patient interviews, as well as interviews with the BHS providing DOT, were conducted at all MDR-TB treatment sites. The respective centre/department staff in the visited hospitals, laboratories, and townships provided programmatic data, which were accurate and up to date. **Annex D** provides the list of key persons met during the visit.

Main challenges identified by the mission, include:

1. The implementation of the "Guidelines for the management of MDR-TB", especially in relation to the diagnostic algorithms, needs to be reviewed, and the guidelines revised if required. For example, only 76% (4,035/5,332) of registered TB cases in Yangon tested with GeneXpert in Q1 2015; although the data on the outcomes of patients treated with and without PAS is available, it is not yet fully analysed.
2. The GeneXpert capacity is being used for multiple purposes and appears overall under-utilised. As a result of the removal of the requirement for confirmatory testing, the need of line probe assay (LPA) for first-line (FL) DST in the NTRL is now much reduced
3. Only the NTRL is doing SL DST (on solid culture) and has not yet been shown to be proficient for this.
4. There are long delays from time of diagnosis of R-resistance (RR) to treatment initiation for a proportion of cases, with significant loss of patients including deaths (e.g. from HIV co-infection), incorrect address (especially amongst migrants) and also subsequent refusal to take treatment.
5. "Delays" in SLD procurement persist, with the NTP constantly playing "catch up" in relation to placing the detected cases on to treatment depending on availability of the SLDs.
6. The death rate on treatment remains high at 16–18%. In Mandalay, from death audits, this appeared to be linked with high levels of co-morbidities (e.g. HIV infection, Diabetes Mellitus, Hepatitis B & C, etc).
7. Although community volunteers are now being used as DOT providers, this is only done in certain areas.
8. The food support from the World Food Programme is not universal across all MDR-TB patients and is confirmed only for one year.
9. Infection control measures are not uniformly applied across all health facilities.
10. The information system remains paper and manually based.
11. Waste management practices were observed to be poor in many health facilities.
12. The implications of the ongoing separation of the Ministry of Health and Sports into Departments of Clinical Care and Public Health for the NTP, is as yet unclear.
13. Amongst the notified TB cases, there are a very large percentage of "clinically confirmed" TB cases. Is there over-diagnosis happening, which could have implications for the estimated number of MDR-TB cases?

14. There is an ambitious target for enrolment of MDR-TB cases for 2015 and 2016. The achievement of these targets will require focused efforts.
15. Sufficient funding to sustain and expand the existing PMDT services is secured up to end of 2016 when both GF and 3MDG Fund support planned to end. However the sustainability of the services afterwards is as yet uncertain.

The matter of the proposed pilot of a shorter regimen for MDR-TB patients in Myanmar, on which much time was spent during the 2014 mission, was further discussed at the National DR-TB Expert Committee meeting in Yangon on 19 May 2015. The consensus of the meeting was that unless the Government of Myanmar itself decides to fund the proposed pilot (which is unlikely considering the many other priority activities that require funding), this matter can now be considered closed. It needs to be noted that the funds previously allocated by the 3MDG Fund to supporting the conducting of said pilot, are still available to the NTP, and hence need to be reprogrammed for activities upon agreement of the NTP and the 3MDG Fund. Also at the meeting on 19 May, the representative from MSF-H introduced the UNITAID-supported END TB Project and the proposal that Myanmar be included in the initial phase of the project.

By far, the biggest challenge the programme in Myanmar faces in the next two years related to PMDT is achievement of the ambitious targets for enrolment of MDR-TB cases. In addition, although much reduced, the "waiting lists" of diagnosed MDR-TB cases continue. The National DR-TB Registry of all detected MDR-TB cases, as recommended by the 2014 mission, is not yet established. There is a high attrition rate from the waiting list (i.e. the fate of only around 300 of the 700 patients on the waiting list at the end of 2014 are known). Also there is the continued major issue surrounding those patients detected with MDR-TB who come from non-project townships, who comprise a significant proportion of the detected cases on the "waiting lists".

Finally there is the matter of financial sustainability of the PMDT services after the end of 2016 when the current funding from the GF and the 3MDG Fund are planned currently to end.

1. Design and implement a national system for keeping track of all diagnosed DR-TB cases. [Q3 2015] To date, this has been referred to as the "waiting list". In future, it should now be called the "Registry of Patients Diagnosed with Drug-Resistant TB". This list should include ALL patients diagnosed with rifampicin resistance from GeneXpert and/or MDR-TB from any other source (such as MGIT, LJ, or HAIN testing) irrespective of the patients' place of residence. Without an improved system and with so many GeneXpert machines now online, it is unlikely that the country will be able to keep an accurate list of DR-TB patients. The registry should be updated and reviewed on a monthly basis. Note that the Form 02 MDR-TB Register should be referred to as "Form 02 MDR-TB Treatment Register".

For suggestions of what data should be collected in the "Registry of Patients Diagnosed with Drug-Resistant TB", please refer to the 2014 PMDT Monitoring Mission report.

2. Implement multiple strategies to meet targets for enrolment of RR-/MDR-TB patients in 2015 /16

Key recommendations

Summary of key recommendations	Responsible agency/person	Time frame
1. Design and implement a national system for keeping track of all diagnosed DR-TB cases	NTP / WHO Country Office (WCO)	By Q3 2015
2. Implement multiple strategies to meet the targets for enrolment of RR-/MDR-TB patients in 2015 / 2016	MOHS / NTP / WCO / In-country partners (Technical and funding agencies)	By Q4 2015
3. Develop post-2016 National TB Strategic Plan, updated PMDT Expansion Plan (including laboratory expansion and HRD plans) and PMDT Operational Plan	MOHS / NTP / WCO / In-country partners and external consultants	By Q4 2015 / Q1 2016
4. Continue to strengthen laboratory capacity, including culture capacity and in-country SL DST capacity	NTP / WCO, Regional Office and HQ / In-country partners and external consultants	On-going
5. Improve the management of MDR-TB cases	MOHS / NTP / WCO, Regional Office and HQ / In-country partners and external consultants	By Q1 2016

- a) Eliminate the "waiting list" of diagnosed MDR-TB patients awaiting treatment:
 - i. Speed up geographical expansion. [On-going]
 - ii. Consider mobilising the current SLD stocks to treat "waiting list" cases according to stock levels, patient numbers and anticipated arrival dates of the next SLD supplies. [Q3 2015]
 - iii. Assure timely delivery of on-going SLD orders for 2,160 patient courses in the coming month.
 - iv. Review and revise future SLD orders according to planned enrolment and reduction of the waiting list. [Q3 2015]
 - v. Have the Regional/State Committee for MDR-TB Management meet more often than once a month to ensure timely enrolment of the diagnosed cases (enrolment will average >150 patients per month). [On-going]
- b) Improve the processes for "borderless" MDR-TB treatment so that cases diagnosed from the non-project townships can be treated in their own townships. [Q4 2015] Suggested possible improved strategies for patients who do not live in townships with an MDR-TB treatment centres include:
 - i. For bordering townships, train a BHS (on a one to one basis as patients are diagnosed) in the bordering township to deliver DOT for the patient, update TMO on the management of an MDR-TB patient, and have the patient travel once a month to the township with an MDR-TB Treatment centre for their clinical follow up. Review the patient support package to cover any resultant increase in travel costs for the patient.
 - ii. Provide an enhanced living allowance for patients coming from different townships (for example instead of 28,000 Kyat provide 60,000 Kyat) to allow the patient to rent living accommodation in the

- township with an MDR-TB Treatment centre and hence allow the patient to receive their treatment in a township in which they are non-resident.
- iii. Where appropriate, consider increasing the use of non-health care workers in the provision of DOT for MDR-TB patients, particularly of the continuation phase, with appropriate incentives being in place.
- c) Develop a plan for optimal utilization of the existing and additional GeneXpert machines (currently under-utilized) which will include:

- i. Expanding the eligibility criteria for DST to other regions besides Yangon based on the number of notified TB cases.
- ii. Strengthening sputum collection and transportation mechanisms.
- iii. Establishing an efficient system for timely communication of results (using GxAlert or other systems).

3. Following the results of the recommended analyses, develop as soon as possible the 2016-2020 National TB Strategic Plan, updated PMDT expansion plan (including laboratory expansion and HRD plans) and PMDT Operational Plan, including budgetary requirements, in order to sustain the achievements of the expanded PMDT service coverage. Subsequently proposals for external donors to be developed and submitted in order to support NTP activities, including PMDT, in 2017 onwards [Q4 2015/Q1 2016].

Plans will need to incorporate implications of all health system and recommended policy changes. For example:

- a) Widening of eligibility for GeneXpert testing for RR-/MDR-TB. Hence the requirements of GeneXpert MTB/RIF test machines and cartridges, culture laboratory capacity for patient monitoring, and the “downstream” SLD requirements, will need to be reviewed and revised accordingly:
 - b) In country second-line drug resistance testing.
 - c) Pre-XDR and XDR-TB regimens.
 - d) Added patient socio-economic support for patients coming from townships without MDR-TB treatment centres.
 - e) Strengthened pharmacovigilance systems wherever SLDs are being used.
 - f) Strengthened infection control measures applied in all health facilities, policy guidance developed and implemented.
 - g) Human resources needs, including optimal utilization of the newly recruited Public Health Supervisors (II) for NTP activities.
 - h) Impact on NTP of the ongoing division of the Ministry of Health and Sports into separate Departments of Clinical Care and Public Health
4. Continue to strengthen laboratory capacity, including culture capacity and in-country SL DST capacity [On-going]:

- a) Update diagnostic algorithms.

- b) Urgently have the Yangon NTRL accredited as proficient for SL DST (using LJ) by a SNRL;
- c) Expand SL DST to the Mandalay RRL.
- d) Introduce the use of molecular testing for SLD using HAIN, MTBDRsl assays in the Yangon and Mandalay laboratories.
- e) Perform DST for at least the fluoroquinolones and the second line injectable agents on all diagnosed MDR-TB patients at initiation of treatment.
- f) Establish a timeline for the accreditation as proficient for culture testing of the RRLs in Mawlamyine and Nyi Pyi Taw by the NTRL.
- g) Ensure annual maintenance contracts are in place for the current culture and DST laboratories, and continue to train the laboratory staff of the 3 laboratories on basic maintenance and troubleshooting of the key pieces of equipment in their laboratories.
- h) Strengthen the transportation networks for sputa samples established to ensure timely movement of samples to the current GeneXpert test sites, with systems in place for rapid communication of test results to the appropriate persons.

5. To improve the management of MDR-TB cases:

- a) Implement an integrated comprehensive electronic information system that links laboratories, clinicians, and programme officers. [Q1 2016]
- b) Ensure that all patients who are eligible for GeneXpert testing for RR-/MDR-TB, are actually tested. Include non-convertors at the end of intensive phase in the eligibility criteria. [On-going]
- c) Undertake a series of data analyses including: outcomes of the various GeneXpert initiatives to guide future policy [Q3 2015]; why only 76% of the registered TB cases in the Yangon Region were tested with GeneXpert in Q1 2015, and devise interventions accordingly [Q3 2015]; and treatment outcome data to determine whether any or no patient requires PAS routinely in their MDR-TB treatment regimen. [Q3 2015]
- d) Review on a regular basis the vacancies of key human resources, and advocate to the relevant authorities for the timely filling of the vacancies. [On-going]
- e) Review and update the 2013 “Guidelines for the management of MDR-TB”, including Paediatric cases with MDR-TB, as required. [Q1 2016]
- f) Consider joining the END TB Project consortium – the proposed expanded access programme initiative to bedaquiline as presented to the National DR-TB Expert Committee on 19 May 2015. [Q3 2015]
- g) Further develop short refresher trainings for MDR-TB DOT Providers.
- h) Continue to investigate the regulations regarding the use of linezolid, bedaquiline and delamanid, and seeking permission for importation and use of these 3 drugs as per WHO indications.
- i) The engagement of partners in delivery of PMDT services and ensuring treatment adherence is currently sub-optimal and needs to be strengthened. They should be entrusted to create community support groups to empower and support the affected community and develop and implement communication strategies to create awareness about TB and DR-TB, treatment adherence, infection control etc.

Annex 3: Executive Summary of JMM

The national context

Myanmar has adopted a bold new vision for providing better health to its people and moving towards Universal Health Coverage (UHC). The Government of the Republic of the Union of Myanmar has committed to provide free essential drugs and X-rays, and this has already led to many more people attending health facilities than previously.

The burden of tuberculosis (TB) in Myanmar is heavy: 200 000 new cases of TB and over 9 000 cases of multidrug-resistant tuberculosis (MDR-TB) occur each year and 26 000 people die. However, TB control in Myanmar has good foundations: the National Tuberculosis Programme (NTP) is highly regarded nationally and internationally. It is rightly praised for its innovation and successful engagement of all types of care providers including the private sector. Collaborations involving hospitals, general practitioners (GPs) and community volunteers are bearing fruit. The NTP has raised significant governmental and international financial resources and treated successfully over 1.1 million people in the past ten years. The results are that the Millennium Development Goals' (MDG) target of incidence and the Stop TB Partnership's target of mortality are already achieved, and the prevalence target is just on track.

As a follow up to the MDGs, the World Health Assembly has set ambitious End TB targets of a 95% decline in TB deaths and 90% decline in TB incidence by 2035. WHO's End TB strategy also calls for zero catastrophic costs for families affected by TB by 2020. Myanmar now needs to accelerate to thoroughly address the determinants of TB, achieve universal access and meet the End TB targets.

The monitoring mission

A team of national and international experts visited numerous sites in the country with detailed terms of reference addressing the strategic issues currently confronting TB care and prevention in Myanmar.

The challenges

The following main challenges were identified by the team:

1. There are gaps in the numbers and capacity of staff working on TB, particularly in basic health services and the fields of monitoring and evaluation, laboratory, and programme management at central and state/regional levels.
2. Capacity at district and township levels is still insufficient for the programme expansion that is needed and the additional demands created by adding new fields such as childhood TB, MDR-TB, budgeting/ planning etc.
3. The current health sector reform and the proposed split of medical care and public health are already changing the health environment. It is not clear how TB will be mainstreamed within emerging structures.
4. Current case detection is missing around 30% of the estimated TB cases, especially those in vulnerable

5. groups, including the elderly and children under five years.
6. Only a minority of TB and HIV co-infected patients currently accesses appropriate services, especially antiretroviral treatment (ART).
7. There are insufficient drugs, and capacity, to treat all the MDR-TB cases in Myanmar, in spite of recent increases in availability due to additional funding from the Three Millennium Development Goals Fund (3MDG) and the Global Fund.
8. Future expansion of MDR-TB diagnosis and treatment may place too heavy a burden on peripheral health services.
9. The rapid expansion of the private health care sector and the multiplicity of partners and nongovernmental organizations (NGOs) in Myanmar emphasize the need for NTP to exercise leadership and for all the partners to collaborate and coordinate with each other.

Recommendations

The JMM team made the following recommendations, grouped in three broad areas:

1. The JMM recommends firstly, that the NTP and partners strengthen their capacity to carry out basic TB control functions and improve the quality of care. They need to capture the demand created by more people using government and private health facilities while maintaining the quality of services. The JMM recognises a) the Government's increased expenditures on health; b) the financial implications of strengthening and expanding TB services; and c) the desirability of sustainable government financing even in the context of growing international investment. The JMM recommends continued and increasing government investment in TB control and specifically.
 1. recommends that the Ministry of Health and Sports (MOHS) urgently fill vacant posts in the medical services, laboratories, and public health services at all levels, especially at primary health care (PHC) level. In addition, the JMM urges MOHS to invest further in human resources by sanctioning additional posts, particularly at district and township level, to enable further expansion of disease control and maternal and child health activities;
 2. supports the establishment of Disease Control Teams at township level. These teams should include and, at the same time, strengthen all critical TB control functions that are currently under the TB teams. In particular, any split of medical service and public health provision must ensure that the NTP has full access to the laboratory network.
 3. recommends that MOHS continues to increase its contribution to TB control and allocates funds for first-line drugs from the government budget.
2. NTP and partners need to expand their work to cover the gap between the most peripheral health facilities, and people in the communities, and to provide more treatment for MDR-TB and for those with both TB and HIV infection. Marginalised groups must gain better access to care and treatment for TB. Specifically the JMM recommends that:
 1. the NTP intensifies work with community-based organizations and community volunteers, as well as

- the private sector, to reach out to vulnerable groups. These include children and the elderly, those displaced by civil unrest, prisoners, the rural and peri-urban poor, migrants, substance users and other marginalised and hard-to-reach people across the entire country.
2. the NTP builds on the progress made in 2014 in making treatment available to more MDR-TB cases and ensures that it deploys the additional funds for MDR-TB treatment from the Global Fund, 3MDG and the United States Agency for International Development (USAID) swiftly and efficiently, so there is no slowing down in GeneXpert® MTB/RIF testing or increase in the time between diagnosis and treatment;
3. the NTP and the National AIDS Programme (NAP) collaborate to ensure ART is available for 100% of HIV-infected TB patients by the end of 2015. This will require greater decentralisation of HIV services by NAP and an improved referral system that links all those who are tested into care and treatment.
4. the NTP analyses the enablers and incentives given to patients, community health volunteers and health workers, including support for sputum transportation, and identifies and extends successful models that accelerate access to prompt diagnosis. Any such support should be standardised and aligned with overall MOHS incentive structures (yet adapted to place, such as isolated rural areas), and have a goal of eventual sustainability. The aim is to remove financial barriers to diagnosis and completion of treatment for TB and MDR-TB, particularly for the poor, without distorting health worker priorities.
5. the NTP builds up its capacity to analyse data and ensure that any policies or guidelines are evidence based. This includes the investments specified in the epidemiological analysis namely improvements to database capacity, enhancements of the skills of staff responsible for monitoring and evaluation at state/regional and township levels, an electronic case-based, web-based recording and reporting system, data quality monitoring and support to the vital registration system.
- C. Thirdly, better TB control needs greater coordination between NTP and other directorates and MOHS departments, as well as non-health sectors. NTP, other government departments, national NGOs, the private sector and external partners should collaborate more fully with each other to take full advantage of the skills and opportunities they each offer. In addition to the considerable cooperation already in place, the Department of Disease Control and NTP should:
 1. enhance intra- and inter-ministerial collaboration, to optimize the capacity of the Government to meet the needs of communities for TB prevention and care, by using the specific policies, service and outreach platforms of counterparts, e.g. in Planning, Medical Sciences, Maternal and Child Health (MCH), Nutrition, Occupational Health, Health Promotion, School Health and Medical Research, Food and Drug Administration, Social Security and Social Welfare.
 2. conduct or update more detailed mapping of partners to fill critical gaps, to ensure best use of available capacity and resources, to improve consistency in approaches, and to avoid duplication (e.g. by geographical, thematic and population coverage).
 3. review all public-private mix (PPM) and active case finding (ACF) activities, including their cost-effectiveness, and develop a PPM expansion plan that takes full advantage of best practices and addresses engagement of all care providers, including both formal and informal providers within communities.

Annex 4: Summary of Paediatric Mission

There has been a fall in child TB diagnoses and in the proportion of all TB that is in children (from around 30% to 25%) since the recognition of a particular challenge of over-diagnosis of pulmonary TB ('primary complex disease') particularly in primary school-aged children (5-9 years). This has been a result of targeted training, guidelines update (2014), advocacy and engagement of the radiologists, paediatricians and international NGOs by National and State TB Programmes. However, more needs to be done as the largest group of children diagnosed with TB in Myanmar continue to be 5-9 year olds, normally a low-risk group, and it is difficult to estimate whether there is under-detection of TB in young children (0-4 years), a more at-risk and vulnerable group.

The guidelines for child TB management published in 2014 need some updating – however, the main challenge is for practitioners to adhere to the guidelines for diagnosis. Contact screening and preventive therapy are included in guidelines but rarely implemented and this is an area that the NTP would like to move forward. There is a need for more experience and training for paediatricians in the management of MDR TB in children.

An opportunity to address a number of issues (diagnosis, treatment and prevention) is provided by the procurement later in 2016 of the new child-friendly fixed-dose combination for the treatment of drug-susceptible TB.

Recommendations

1. Revise and update 2014 guidelines where necessary – new dosage tables for treatment with FDC, diagnostic approach and GeneXpert, MDR TB management – and get consensus for updates. To be led by SG with input from NTP and paediatricians before end April 2016.
2. Develop tools for training and management of child TB in Myanmar: adapt WHO training modules for Myanmar setting that include recent global evidence; develop a Deskguide or job aide for use by health workers at district and township levels that are consistent with updated guidelines; develop IEC material for implementation of child TB contact screening and prevention; develop key messages for mass media to inform community and health staff; and develop SOPs for implementation of community-based contact screening and management. To be drafted by SG before end May 2016.
3. One day workshop between NTP and leading paediatricians to get final feedback and consensus on all material – June 2016.
4. Training of trainers of state level NTP officers and paediatricians (child TB working groups) that will include presentation of updated guidelines, training modules, implementation tools – during Q3 2016 facilitated by SG.
5. At the ToT, state level child TB working groups will develop action plans to end 2017.

Annex 5: Summary Budget of National TB Strategic Plan (2016-2020)

TOTAL COST FOR NSP						
	2016	2017	2018	2019	2020	TOTAL
Strategic Direction I: Integrated, patient-centred care and prevention						
1.1 Accelerate the appropriate diagnosis of TB	41,498,000	40,393,003	39,188,386	40,396,657	40,891,572	202,367,618
1.2 Identify and treat all forms of TB, among all ages and including drug-resistant and drug-sensitive	5,955,462	6,500,587	5,404,399	5,583,134	5,051,317	28,494,899
1.3 Prevent transmission and the emergence of active TB	25,402,353	23,131,679	23,435,242	24,297,806	25,098,469	121,365,549
1.4 Intensify targeted action(s) to reach marginalized and at-risk populations	1,605,910	2,036,970	1,612,970	1,610,470	1,607,970	8,474,290
1.5 Implement a robust communication strategy, extending from policy makers to patient education	2,317,907	2,808,104	2,885,804	2,998,804	3,116,004	14,126,623
1.6 Engage all care providers, including NGOs and the private sector, in appropriate TB diagnosis and care	1,554,570	1,345,446	1,315,060	1,311,400	1,311,400	6,837,876
1.7 Promote and strengthen community engagement	721,708	485,892	499,127	459,921	482,586	2,649,234
1.8 Joint TB and HIV programming to enable decentralized and integrated services for TB and HIV	2,025,456	1,962,872	2,026,956	2,077,640	2,133,704	10,226,628
	1,914,634	2,121,453	2,008,828	2,057,482	2,090,123	10,192,520
Strategic Direction II: Bold policies and supportive systems						
2.1 Secure financial resources for implementation of the NSP	23,321,264	32,085,095	33,615,889	33,121,649	35,418,838	157,562,736
2.2 Promote a coordinated and multi-sectoral response and policy development	11,129,271	20,376,678	21,200,319	22,639,225	22,961,329	98,306,823
2.3 Ensure inclusion of TB in UHC and wider economic development plans and activities	1,247,438	862,127	1,291,648	859,607	1,264,608	5,525,428
2.4 Ensure a stable and quality-assured supply of drugs, diagnostic tests and commodities	5,596,094	5,455,213	5,511,538	5,469,052	5,473,277	27,505,174
2.5 Human resources for health	256,941	1,313,315	296,455	81,355	295,015	2,243,081
	5,091,521	4,077,762	5,315,929	4,072,410	5,424,609	23,982,230
Strategic Direction III: Intensified research and innovation						
3.1 Implement the prioritized research agenda	3,235,243	5,586,674	2,948,922	2,894,430	3,071,433	17,736,702
3.2 Enhance evidence-based programme monitoring and implementation	623,503	2,156,984	534,812	342,940	637,313	4,295,552
	2,611,740	3,429,690	2,414,110	2,551,490	2,434,120	13,441,150

