

# National Strategic Plan for Ending TB 2020 - 2024



National Tuberculosis Control Programme  
Timor-Leste  
2020



World Health  
Organization  
Timor-Leste

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## ABBREVIATIONS

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BMI	: body mass index
CHC	: community health centre
CDC	: communicable disease control
DMC	: designated microscope centre
DOT	: direct observed treatment
DST	: drugs susceptibility testing
EQA	: ensure quality assurance
ERM	: external review mission
GDF	: global drugs facility
GLC	: green light committee
GYTS	: global youth tobacco survey
IOM	: International Organization for Migration
TPT	: Tuberculosis Preventive Therapy
KOICA	: Korean International Cooperation Agency
LFU	: lost to follow up
LPA	: line probes assay
MDR-TB	: multi drug resistance tuberculosis
M&E	: monitoring and evaluation
MHS	: municipality health services
MHO	: municipality health officer
MTB/RIF	: mycobacterial tuberculosis/rifampicin
MTC	: municipality TB coordinator
MTU	: municipality TB unit
NTP	: national tuberculosis programme
NTRL	: national tuberculosis reference laboratory
OSE	: onsite evaluation
PLHIV	: people living HIV
PSF	: Promotor Saude Familiar
RS	: regional supervisor
SAMES	: Servico Autonomo Medicamento Equipamento Saude
SISCa	: Servisu Integradu Saude Comunitaria
SLD	: second-line drugs
TB-CMU	: tuberculosis central management unit
UNHLM	: United Nations High Level Meeting

## 1 FOREWORD


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Tuberculosis is one of the major public health problem in Timor-Leste. To address this problem, the National Tuberculosis Control Program (NTP) was established in 2000 through an NGO, Caritas Dili, and then was handed over to the Ministry of Health under the Communicable Disease Control (CDC) department in early 2006.

The NTP is now fully integrated with in the Ministry of Health and works in collaboration with International Organizations, National and International NGOs. The NTP receives technical support from the World Health Organization (WHO). The program has been successful in adapting to the rapidly changing circumstances whilst following internationally recommended best practices and standards in tuberculosis control. The country is now moving forward from control to end TB by 2030, and therefore it is important for everyone to support this collective vision of ending TB by proper implementation of the national TB guidelines and strategies.

The fifth edition of the national strategy plan (NSP 2020-24) is revised in line with the WHO's End TB Strategy, recommendations of TB Mid-Term Review Mission 2019, and NSP workshop applying the people-centred framework for TB programme in planning and prioritization of essential interventions. The National Strategic Plan for TB for the next 5 years towards ending TB is robust, bold and ambitious. It is expected to improve remarkably TB and MDR-TB care, and prevention for people of Timor-Leste who are at risk or suffering from TB. We thank WHO for supporting development of fully costed and ambitious revised TB NSP 2020-24.

I endorse TB NSP 2020-24 as an official document of the Timor-Leste Government and recommend it to be used by all stakeholders, especially donors and implementers.



**Dr. Odete Maria Freitas Belo, MPH**  
Honorable Minister of Health,  
Democratic Republic of Timor -Leste  
Dili ,June 2020

## 2 FOREWORD (TETUN)

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Tuberkuloze nu'udar problema saude públiku signifikativu iha Timor-Leste. Atu rezolve problema ida ne'e, Programa Kontrola Tuberkuloze Nasional (NTP) estabesidu 2000 liu husi ONG ida naran Caritas Dili, depois entrega ba Ministeriu Saude hodi tutela ba Departamentu Kontrola Moras Komntajiozas (CDC) iha inísiu 2006.

Oras ne'e dadaun NTP integradu totalmente iha Ministeriu Saude no implementa iha kolaborasaun ho Organizasaun internacional, ONG Nasional no Internacional. NTP hetan suporta tékniku husi Organizasaun Mundial Saude (OMS). Programa ne'e hetan adaptasaun ho susesu ba mudansa sirkunstánsia ne'ebé lalais nune'e mós hatuir prátika no estandarte di'ak ne'ebé rekomenda internacionalmente iha kontrola tuberkuloze. Nasaun ne'e agora hakat dadaun husi kontrola atu hakotu TB iha 2030, tanba ne'e importante ba ema idaidak atu suporta vizaun kolektivu ida ne'e hodi hakotu TB ho implementasaun matadalan no estratejia TB nasional ho apropriadu.

Edisaun dalimak husi planu estratejia nasional (NSP 2020-24) hetan revizaun aliñadu ho OMS nia estratejia hakotu TB, rekomendasoens husi Misaun Revizaun TB Mediu Prazu 2019, no palestra NSP ne'ebé aplika enkuadramentu ho sentru ema ba programa TB iha planeamentu no prioritizasaun intervensaun esensial. Planu estratejiku Nasional TB ba tinan lima tuir mai iha direasaun hakotu TB ne'e forte, korajozu no ambisiozu tebes. Nia hetan expetasaun atu hadi'a ho rigorozu kuidadus TB no MDR-TB, no prevensaun ba timor oan ne'ebé iha risku atu sofre TB. Ami agradese ba OMS tanba suporta dezvoltamentu NSP TB- TB 2020-24 ne'ebé hetan suporta fundu tomak ba revizaun.

Ha'u aprova TB NSP 2020-24 nu'udar dokumentu oficial ba Governu Timor-Leste no rekomenda atu uza husi parte interesadu sira, liliu doador no implementador.



**Dr. Odete Maria Freitas Belo, MPH**  
Honorable Minister of Health,  
Democratic Republic of Timor -Leste

Dili ,June 2020

### 3 MESSAGE FROM THE WHO REPRESENTATIVE TO TIMOR-LESTE

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Countries have been developing National strategic plans (NSP) for TB for years, and they are known as the vision of the country in setting out the steps to end TB. NSP is also used to mobilize funds through donors, such as the Global Fund, and national governments to implement the plans. WHO is now embarking on a new way to develop national strategic plans and has developed the “people-centred framework for TB programme planning and prioritization”.

The framework facilitates an effort to consolidate all available national and sub-national data to inform prioritization and decision-making for national strategic and operational planning for TB. The revised TB National Strategic Plan (NSP) 2020-24 for Timor-Leste is developed applying this framework and through robust country dialogue process.

We thank the National TB programme of Timor-Leste for embarking on this journey in developing a **bold and ambitious** NSP for TB for the next 5 years for implementing the End TB Strategy, and the country is committed to end TB by 2030.

WHO is committed to support NTP/ MOH in all its efforts to end TB in the country and wishes good luck for the successful implementation of the revised TB NSP 2020-24 by all stakeholders



**Dr. Rajesh Pandav**

World Health Organization Representative to Timor-Leste  
Dili, June 2020



## 4 MESSAGE FROM THE WHO REPRESENTATIVE TO TIMOR-LESTE (TETUN)

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Nasaun barak dezenvolve ona Planu Estratejiku Nasional (NSP) ba TB tinan barak ona, no koñesidu hanesan nasaun nia vizaun iha estabesimentu pasus ba hakotu TB. NSP mós uza atu mobiliza fundus liu husi doadores, hanesan Fundu Global, no governu nasional hodi implementa planu hirak ne'e. Oras ne'e dadaun OMS iha hela dalan foun ida atu dezenvolve planu estratejiku nasional no dezenvolve ona enkuadramentu sentralizadu-ema ba planeamentu no prioritizasaun programa TB".

Enkuadramentu ne'e fasilita esforsu atu konsolida dadus nasional no internasional ne'ebe iha atu informa ba prioritizasaun no foti desizaun ba estratejia no planu operacional TB nian. Planu Estratejiku TB Nasional (NSP) 2020-24 ba Timor-Leste ne'ebé dezenvolidu tuir enkuadramentu ida ne'e Ho prosesu diálogo ne'bé rigorozu tebes.

Ami agradese ba Programa TB Nasional Timor-Leste atu hamotuk ho ami iha dalan foun ida ne'e hodi dezenvolve NSP ba TB ne'ebe rigorozu no ambisiozu ba tinan lima tuir mai atu implementa estratejia Hakotu TB, no nasaun kometidu atu hakotu TB iha tinan rihun rua tolunolu (2030).

OMS kometidu atu suporta NTP/ MOH iha sira nia esforsu tomak atu hakotu TB iha nasaun no espera sorte di'ak iha susesu implementasaun husi parte interesadu hotu ba NSP 2020-24 TB ne'ebé hetan revizaun.



**Dr. Rajesh Pandav**

World Health Organization Representative to Timor-Leste  
Dili, June 2020

## 5 INTRODUCTION

The National Strategic Plan (NSP) is a fundamental strategic document for management of TB programme, and constitutes the key instrument to efficiently implement the policies of TB prevention, care and control in Timor-Leste for 2020 to 2024. This is a guidance document to TB programme manager, programme partners and other stakeholders, including donors for planning, implementation and monitoring of strategic interventions and activities to reach the goal and objectives for ending TB in the country.

NSP, which covered the period 2015—2018, was used as the key background document for preparation of the Concept Note application of existing grant under the Global Fund's New Funding Model. The Global Fund provided substantial financial support for the implementation of the existing NSP. The same was updated for the period 2018--2022.

The Regional Meeting of National TB Control Programme Managers and Partners, New Delhi, 13--15 May 2019, advised to revise NSP for gaps in strategies and areas that will need focus on updating of 2022 targets in line with UN High-Level Meeting (UNHLM) targets. This is also much required for having an ambitious plan for accelerating the progress of ending TB in Timor-Leste.

### UNHLM:

The UNHLM Political Declaration on TB contained a number of global targets endorsed by Heads of States, including targets to treat 40 million people with TB between 2018 and 2022, 3.5 million children with TB, 1.5 million people with drug-resistant TB, and at-least 30 million put on TB Preventive Treatment.

In order to make these global targets relevant at country level, and with a view to drive country level political commitment, facilitate monitoring and accountability, the Stop TB Partnership has produced country breakdowns for these targets using the latest WHO data on incidence estimates and country notifications to WHO (<http://www.stoptb.org/resources/countrytargets/>). All projections were done using the TIME model implemented by Avenir Health. UNHLM targets and projected resource needs for Timor-Leste are as follows:

**Table 1.** UNHLM targets and resource needs projections (November 2019)

Particulars	2018	2019	2020	2021	2022	TOTAL
TB notification	3900	4300	4900	4800	4500	22 400
Child TB	300	400	500	500	500	2200
RR/MDR TB targets	12	32	105	164	178	491
Total preventive therapy (PT) targets	1600	2140	3540	5060	5870	18210

PT targets for under-5 child contacts	1190	1440	1770	1880	1900	8180
PT targets in contacts more than 5 years of age	411	705	1768	3176	3975	10 035
Resource needs for TB prevention and care (US\$) in million	6.236 563	7.782 083	11.38 014	13.66 008	14.1995	53.25 837

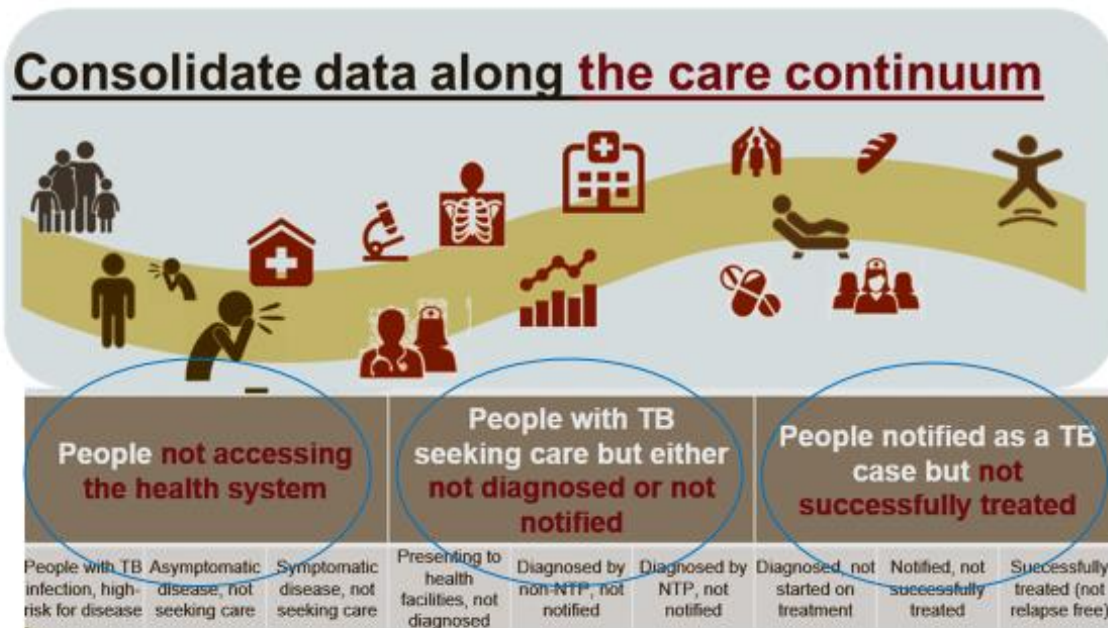
The revised NSP 2020--24 contains strategies and interventions based on the principles outlined in WHO's End TB Strategy. Building on the Strategy's three pillars *with* government stewardship and accountability and strong coalition with civil society organizations and communities, the proposed NSP 2020--2024 describes key interventions and activities that would enable the country to move towards achieving the End TB Strategy's *Milestones* for 2025, i.e., 75% reduction in TB deaths and 50% reduction in TB incidence rate) and *targets* for 2035, i.e., 95% reduction in TB deaths and 90% reduction in TB incidence rate.

The current Global Fund project will last until the end of 2020, and a programme continuation request will be submitted to the Global Fund in early 2020. Although the current NSP covers the period until 2022, the NTP has decided to prepare a new NSP covering the period 2020--2024, to provide strategic guidance during the grant negotiation process.

**Process of development of NSP:** NTP performed Mid-Term Review (MTR) in August--September 2019 to assess the current performance of the programme and provide guidance for the development of the next NSP. The National Strategic Plan 2020--2024 takes into account the recommendations made during this mission. This NSP was a country led process using the person-centred framework of TB programming with support from WHO HQ.



## People-Centred approach



NSP revision workshop using this approach was organized on 1--3 October 2019 at Dili with participation of various stakeholders including community representatives, national and international experts, WHO HQ, WHO SEARO and country office, national, district and sub-district representatives, NGO and civil society. The NSP has been costed based on the existing programme norms, incorporating the costs for newer activities. This document intends to be a guidance document for the country to move forward towards ending TB.

## 6 BACKGROUND INFORMATION

### 6.1 GENERAL COUNTRY BACKGROUND

The Democratic Republic of Timor-Leste (RDTL), also known as Timor-Leste, is a young lower middle-income country (LMIC), rising from a difficult past, having obtained its independence in May 2002 after voting to separate from Indonesia in 1999. The country is situated in the eastern end of the Indonesian archipelago with a population of nearly 1.3 million. Seventy percent of the population lives in rural areas in small, dispersed villages isolated by mountainous terrain with generally very poor, but improving roads and telecommunications. Poverty is high, with 41.8% of the population below the basic needs' poverty line, and over 30% below the international US\$ 1.90-a-day extreme poverty line.<sup>1</sup> In rural areas, only 62% of women are literate, compared to 72% of men. The country ranks 131 out of 189 countries with Human Development Index (HDI) value of 0.626 (2018).<sup>2</sup> Timor-Leste is administratively divided into 13 municipalities and 65 Posto Administrative, 442 Sucos (villages) and 2225 Aldeias (hamlets). The capital city of Dili has the highest population of about 316,727 (2015, Census) and is divided into six administrative areas.



Total health expenditure was 3.92% (USD\$ 115.8 million) of gross domestic product (GDP) in 2017. The current health expenditure (CHE) was 93% of total health expenditure out of which domestic general government health expenditure was US\$ 71.2 million (66%), voluntary health insurance US\$ 3.5 million (3.25%) and development partners contributed US\$ 24.1 million (22.36%). Household out-of-pocket expenditure (OOP) was US\$ 9 million (8.35%).<sup>3</sup> The TB patient cost survey conducted from October 2016 to March 2017 highlighted that 83% of TB patients experienced catastrophic costs related to their TB diagnosis and care, which is highest in the world. Income loss and nutritional supplementation accounted for 40.7% and 37.9% of these costs, respectively. Four of five TB patients in Timor-Leste experienced catastrophic costs related to TB diagnosis and care. Financial and social protections to mitigate these costs are urgently needed, in addition to universal health coverage.<sup>4</sup>

<sup>1</sup> Asian Development Bank – Basic statistics 2019.

<sup>2</sup> Human Development Report 2019 UNDP – Briefing note for countries on the 2019 Human Development Report – Timor-Leste.

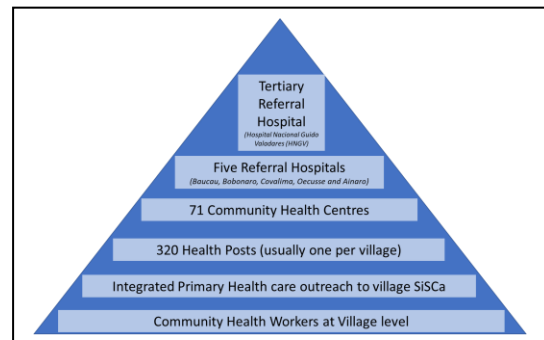
<sup>3</sup> World Bank data accessed at <https://databank.worldbank.org>

<sup>4</sup> [The International Journal of Tuberculosis and Lung Disease](#), 23 (11), 2019, pp. 1191--1197(7).

## 6.2 HEALTH SYSTEMS AND COMMUNITY SYSTEMS CONTEXT

### 6.2.1 Structure of the health care system

The Government of Timor-Leste aims to ensure the availability, accessibility, and affordability of health services for all Timorese people. It relies on two approaches: a comprehensive package of services through community health centres (CHCs), health posts, mobile clinics, and SISCa posts, as well as hospital service packages through national and referral hospitals in the country. Patient services are



delivered through a network of health care facilities. The country has 71 public CHCs, 7 private clinics under public private mix (PPM) initiative, and 320 health posts. The health post is usually for one village providing primary care services by a team of 3--4 health personnel, including a doctor. CHC provide primary plus service and has 2--10 health posts in its catchment area. For secondary health services, there are five referral hospitals located in the municipalities of Timor-Leste namely, Baucau, Bobonaro, Covalima, Oecusse and Ainaro. Dili has the National Hospital known as Hospital Nacional Guido Valadares (HNGV) which is the largest referral and tertiary care set up in the country.

Civil society, in the form of NGOs working on health, is very active in some parts of the country. The private sector (~54 private medical clinics formally reporting to health authority), is beginning to emerge in the capital city and some district towns.

The administration and management of health systems are centrally managed through the Ministry of Health (MoH) at Dili. The MoH is responsible for developing the policy, technical guidelines, and administration of complete health systems. Health services are based on delivery of a package of basic services that includes maternal, neonatal and child health, immunization programmes, TB, HIV and malaria services. The health system is primarily staffed by trained health staff. Many of the existing staff has been trained in Cuba, Indonesia or Australia. Nurses and doctors are now also trained at the University of Timor-Leste. In 2018, the doctor population ratio in the country was 8.9 per 10 000 population, higher than the median for other countries in WHO South-East Asia region of 5.9 per 10 000 population. Anti TB medicines are not available in the private market. Thus, all cases are referred to the NTP or partner NGOs for their treatment.

TB and HIV testing, care and treatment service are also included in basic service package. TB diagnostic and treatment services are fully integrated into the general MOH infrastructure, using common health facilities such as health posts and health centres as well as general health staff such as health workers, nurses and doctors at implementing facilities. Only managerial staff is programme-specific, which is common practice for all health programmes and is seen as an indispensable requirement for the effective functioning of the NTP.

The government provided health system is also complemented by non-government health providers and faith-based (mostly affiliated to church) health service providers. The Bairo Pite Clinic has contributed to ~ 20% of case finding during the decade in Timor-Leste. HIV services are also provided by NGOs and community based organisations (CBOs) like Estrella Plus, Caritas Dili, Esperanza and others NGOs.

The relationships between the government and non-government sector appear to be good. TB services are delivered and reporting occurs based on agreed government protocols and systems. Clinical referral systems exist and are made between services in Dili and the municipality.

Malnutrition remains a significant public health problem in Timor-Leste, though there are indications the situation is improving. Significant proportion of children under-5 years of age were malnourished (45.5% of boys and 43.8% of girls), 58% stunted (60% of boys and 56% of girls) and 19% showed wasting (20% of boys and 17% of girls).<sup>5</sup> Rates of smoking are alarming with 52% men and 4% women smoke cigarettes,<sup>6</sup> and will require extensive health promotion and education efforts to prevent severe impacts on population health. In terms of hospital sector development, the main MOH strategy will be to develop human resource skills particularly in such areas as public health, health management and specialist medical and nursing skills. Structures and skills need to be developed for specialist areas including clinical care, nursing services, non-medical support, and finance and human resources management. There is significant variation in service access and coverage, indicating that more emphasis is required on more equitable patterns of human resources distribution and capacity building. Delayed budget and procurement, essential medicine and equipment supply stock outs all point to the need for improved reporting and request systems to ensure timely allocation of financial and material resources.

### **6.3 THE NATIONAL TB CONTROL PROGRAMME (NTP)**

#### **6.3.1 Structure of the NTP**

Oversight of TB control programme is implemented by National Tuberculosis Control Programme (NTP), which is organized in three layers. At the 13-municipality level, TB coordinator leads and coordinates the TB control programme in their municipality. Similarly, at district level the TB control programme is coordinated by 77 TB responsible, and the services are integrated in the general health services. The programme activities at village level are provided by health post staffs, and other villages which do not have health post including aldeia, Promotor Saude Familia (PSF) will do identification and referral of presumptive TB patients in community, treatment provision and providing TB information and education. At national level, NTP staff consists of one National TB Programme Manager, M&E officer, data entry clerk, and six regional officers.

*The Central Management Unit of Tuberculosis is responsible for formulation of technical and operational guidelines and policies, trainings, planning and overall implementation of programme activities in the country including procurement and supply of commodities for the NTP, coordination with all stakeholders, monitoring and evaluation of the programme. At the Municipality Level, the Municipality TB coordinator is specifically responsible for the organization of TB activities. CHC serves as the designated microscopy centre for smear microscopy. The municipality keeps sufficient stock of TB drugs and laboratory reagents. There is stock for 6 months (3 months stock + 3 months reserve) at municipality level. The senior laboratory technicians (SRTs) at the municipality level prepare and distribute laboratory reagents and ensure regular and adequate supply of reagents and sputum containers in health facilities. The SRTs also supervise all the laboratory activities in the municipality and facilitate quality assurance in sputum microscopy. At the Posto Administrative, the NTP is implemented*

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<sup>5</sup> Demographic and health survey 2009—2010.

<sup>6</sup> Demographic and health survey 2016.



through the Posto Administrative level CHCs or health posts. Each CHC has more than one doctor, and a team of 7--10 people, and at each health post primary care services are provided by a team of 3--4 health personnel including a doctor. CHCs, which serve as designated microscopy centres, have a laboratory technician. The functions of sub-municipality level are implementation, monitoring and supervision of TB control activities in its designated geographical areas. Delivery of health care for TB control is done by the primary health services, as per the policies stated in the NTP manual. Sub-municipality facilities keep a stock for two months (one-month stock + one-month reserve). Treatment supervision is provided by the health workers in the primary health care services (CHCs, health posts, etc.), NGOs, and community volunteers such as Promotor Saude Familia (PSF) who are engaged in the SISCa programme.

TB services are a part of the comprehensive service package and delivered through all levels of the health system. Both TB diagnostic and treatment services are fully integrated into the general MOH infrastructure, using common health facilities as well as general health staff as health workers, nurses and doctors at implementing facilities. Only managerial staff is programme specific, which is common practice for all health programmes and is seen as an indispensable requirement for the effective functioning of the NTP.

The mainstay of diagnosis is sputum microscopy. There are 76 TB laboratories including 69 in CHCs and seven in private clinics. There are eight GeneXpert® machines in the country -- two at NGOs: Klibur Domin and Bairo Pite; five at public health facilities: one each at Oecusse, Bobonaro and Ainaro referral hospitals, and one each at Viqueque and Covalima Municipalities; and one located at the National Tuberculosis Reference Laboratory (NTRL). Culture and drug sensitivity testing (DST) laboratory is at the NTRL, a BSL III laboratory set up by Korea International Cooperation Agency (KOICA) in 2016. X-ray facilities are available at referral hospitals and in a few private sector health facilities. The doctors and health personnel at the health posts and CHC level are responsible for patient referral and sputum transportation.

### **6.3.2 Technical and implementation support to NTP by partners**

The NTP is integrated within the structure of the MoH and follows its policies and principles. There are various directorates in the MoH including communicable disease control (CDC), finance and planning, human resource, pharmacy, procurement and logistics. Each of these directorates is headed by national directors. Each directorate then has departments with specific functions and lead by departmental heads. Thus, the hierarchy of MoH is well defined which assist in taking timely, well-coordinated management decisions and ensuring accountability. The NTP is supported on health promotion, HMIS, logistics, HR, financial, procurement and legal issues by concerned departments of the MoH as well as coordination support from the Directorate of Externally Funded Programmes. The NTP is also supported by the other arms of the MoH including the National Health Laboratory, national and referral hospitals, institute of health sciences and SAMES, which is an autonomous body supporting procurement and logistics management of health products.

Outside of the government, the major technical support for the NTP is from WHO. NTP has also received technical and commodity assistance from Global Drug Facility (GDF), UNITAID, Regional Green Light Committee (rGLC), KOICA, JICA, NIRT Chennai, and independent consultants. Several NGOs – Klibur Domin, and Caritas Dili, have also been engaged with the NTP for several years in providing services for TB. Currently NTP is engaging with new National and international organizations such as - International Organization for Migration (IOM), Maluk Timor, Alola Foundation, Bairo-Pite Clinic, Klibur-Domin, Catholic Relief Service (CRS)



etc. Some are active throughout the country, but most operate only at the local levels. There are few numbers of private or NGOs Clinic at peripheral level providing TB services.

### **6.3.3 Financing of NTP activities**

The NTP is funded by international donors and its domestic budget. The Global Fund has been a major donor of the national programme since 2005. This funding has helped set up the programme and supports all major activities. KOICA gave one-time support of US\$ 2.1 million to set up the NTRL, a BSL III laboratory to strengthen the MDR TB services by performing culture and DST, and capacity building of programme staff during 2012--17. Grants for operational research, community sensitizations and advocacy, programme support for module development, technical assistance, equipment and drugs have been given mainly by WHO, and other institutes like Burnet Institute, Australia National University, Menzies School of Health Research and others.

Currently most of the TB control activities are supported through the Global Fund grant. Domestic funding supports staff costs, infrastructure and basic resources. The resource need has increased from US\$ 5.37 million in 2018 to US\$ 7 million in 2020 in the existing NSP. However, there is a reduction in the donor funding which is reducing from US\$ 2.26 million (42% of the total requirement) in 2018 to US\$ 1.19 million in 2020 (17% of the total funding need). The domestic funding has also gone down considerably, from US\$ 1.02 million to US\$ 0.87 million in 2019. With the donor funding coming down and domestic funding not covering up, the funding gap is increasing over 50% in 2019 and 2020. The current GF grant with an allocation of US\$ 4.8 million over 3 years (2018--2020) ends in December 2020.

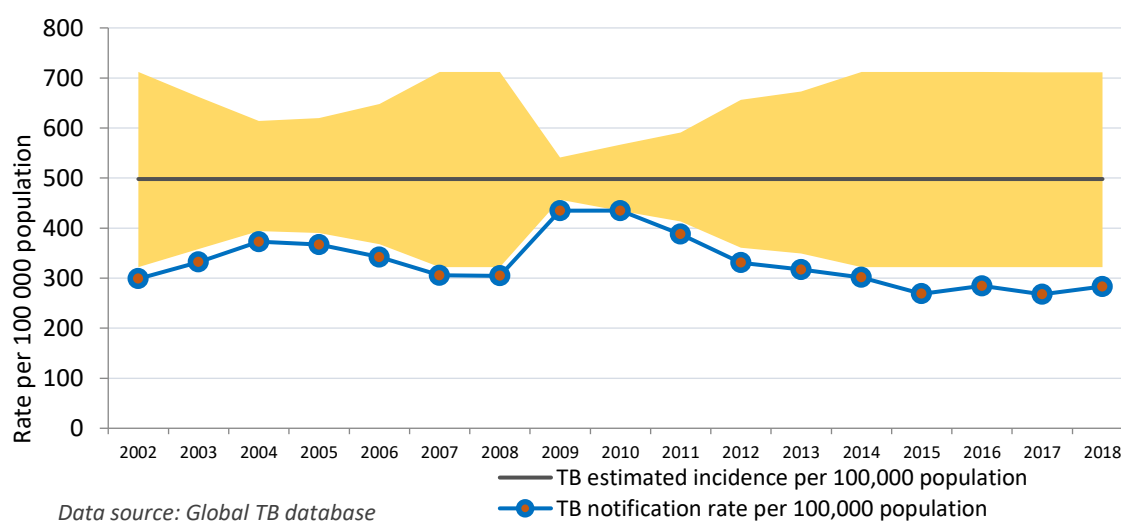
## 7 EPIDEMIOLOGY OF TB IN TIMOR-LESTE

### 7.1 WHO ESTIMATES ON TB BURDEN

#### TB incidence

Over the recent 15 years estimated TB incidence rate remained stable. In 2018 there were an estimated 6300 estimated incident cases of TB (range: 4100--9000) in Timor-Leste, equivalent to a rate of 498 (332-11) cases per 100 000 population.

**Figure 1:** Estimated TB incidence rate and notification of incident TB cases, per 100 000 population, 2002–2018

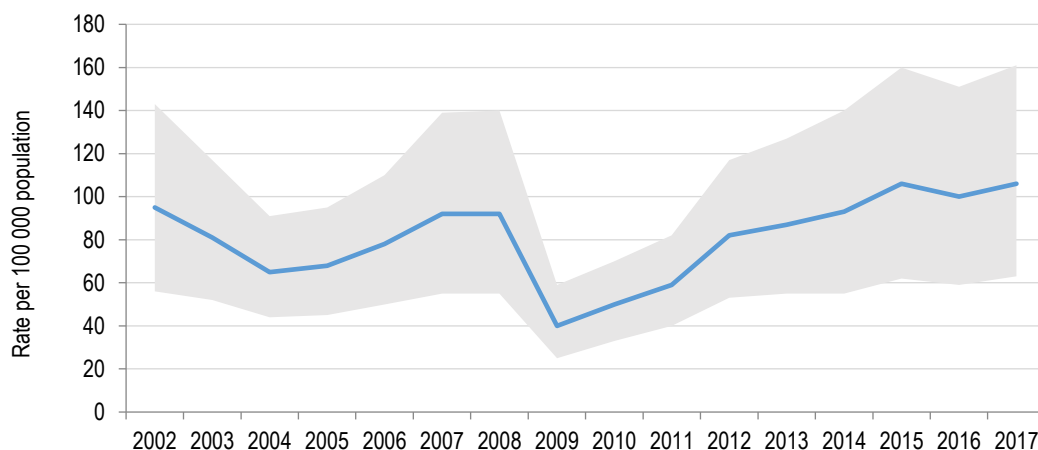


Note: Shaded area around lines indicates uncertainty range.

#### Analysis of the level and trend in TB mortality rate

In the absence of a vital registration system in Timor-Leste, TB mortality is measured indirectly by multiplying estimates of TB incidence by estimates of the case fatality rate (cf. Global TB Report 2018, WHO, technical appendix). As a result, these estimates lead large uncertainty. Thus, according to WHO estimates, in 2002 the TB mortality rate (excluding TB/HIV deaths) was estimated at 95 (range: 56--143) per 100 000 population. Mortality rate has declined with some fluctuation between 2002 and 2009. Then the trend of TB mortality changed the direction and up to 2017 increased about 12% annually. In recent three years, mortality rate had been stabilized. By the end of 2018, the estimated TB mortality rate in Timor-Leste was reported as 94 (range: 56--142) per 100 000 population, which is the second highest estimated TB mortality rate (all forms, excluding HIV) in the world.

**Figure 2:** Estimated TB mortality rate per 100 000 population, Timor-Leste 2002–2017



Data source: Global TB database

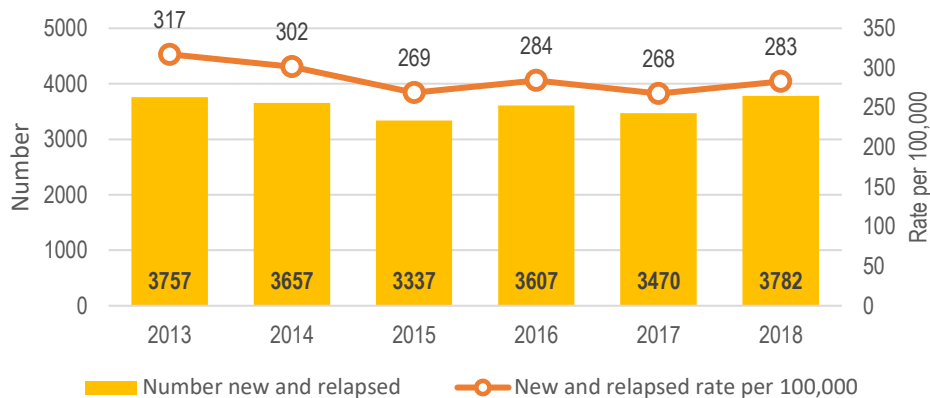
**Note:** Shaded area around lines indicates uncertainty range.

## 7.2 CASE NOTIFICATION

### 7.2.1 Case notification

The number of notified new and relapse TB cases in Timor-Leste slightly increased from 3757 cases in 2013 to 3782 in 2018, but TB notification rate declined from 317 to 283 per 100 000 because of rapid population growth.

**Figure 3:** Time-series trend of national TB notification, 2013--2018



Data source: Global TB database

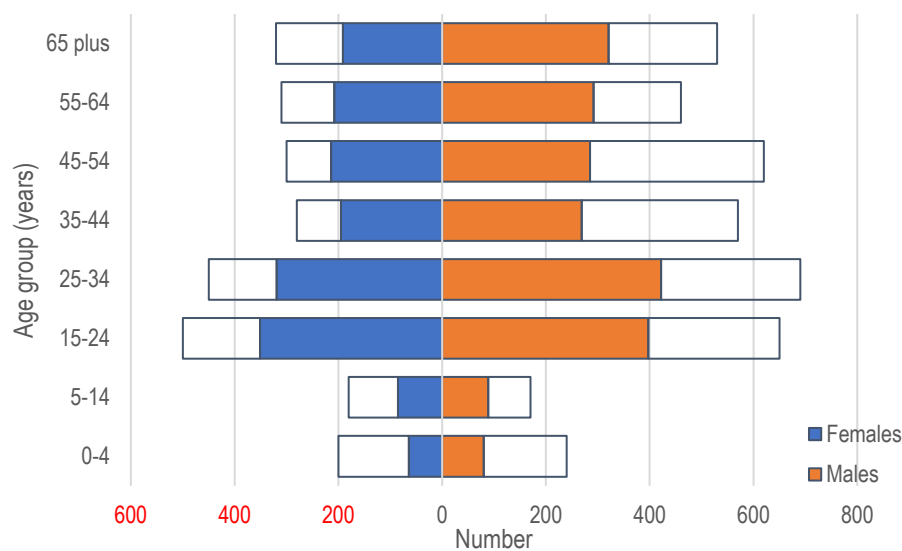
## 7.2.2 Case notification by age and sex

### 7.2.2.1 Case notification by age

#### Level and trend of TB in age-specific notification rates

Figure 4 shows notified number of new and relapse TB cases by sex and age groups in 2018 against estimated number of incident cases. TB is most frequently seen among those aged 15--34 years.

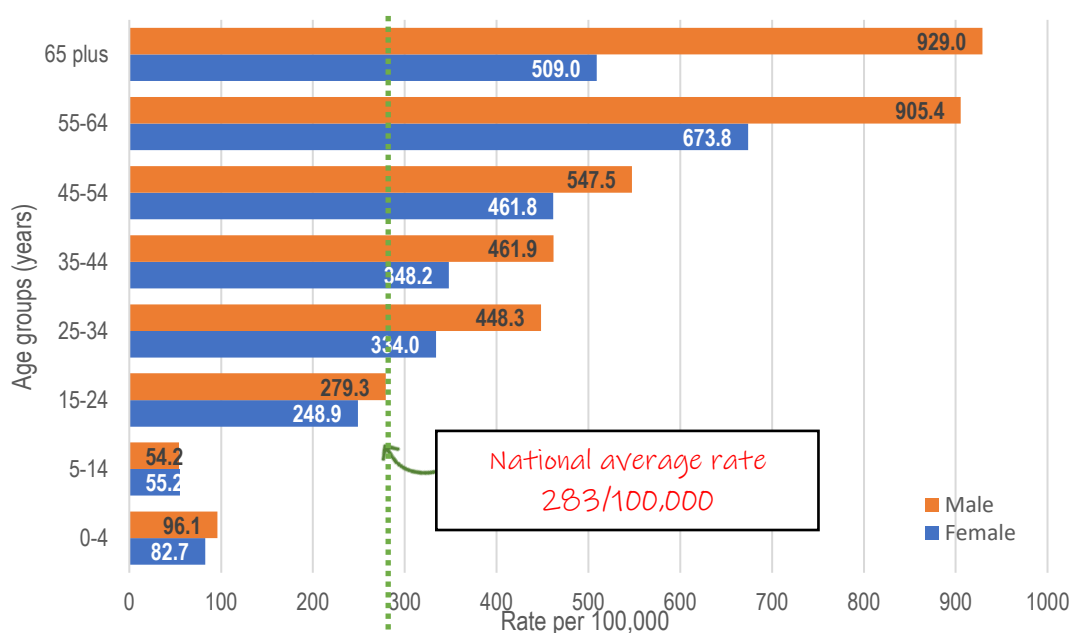
**Figure 4:** Estimated vs notified number TB cases by age and sex



Data source: Global TB database

While looking at age- and sex-specific notification rate, the TB notification increases with increase of age. Among the females the highest age-specific notification rate is observed among those aged 55--64 years, while among the males the highest age-specific notification rate is seen in those over 64 years. Age-specific notification rates always should be accounted in cases of calculation of the yield of ICF in specific group at risk population.

**Figure 5:** Age- and sex-specific notification rates of new and relapsed TB cases in 2018



Data source: Global TB database

TB notification rate starting from 2010 declined in average of 2.3% of annual percent of change, suggesting a decline in case detection and a growing gap between notifications and true incidence. In 2018 only 3782 incident TB cases were notified (283 cases per 100 000 population), which is only 57% of estimated number of cases occurring in Timor-Leste.

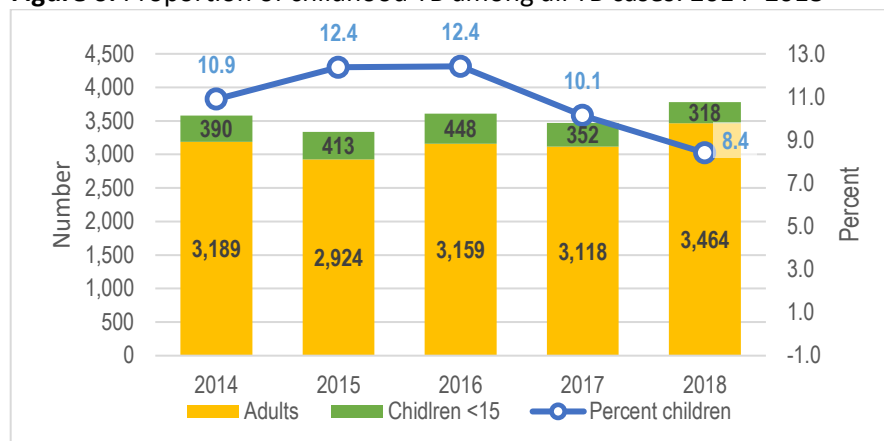
There was wide geographic variation of TB notification rates across the municipalities. It could be due to true difference in TB burden across the municipalities, as well as access of population to health care services and quality of services to detect and report TB cases. One of the reasons of high notification rate in Dili is that the TB patients referred from rural communities and with confirmation of TB diagnosed are notified in Dili. According to current surveillance system, it is not possible to identify true notification data from the catchment area true population.

There is a wide geographical variation in the proportion bacteriologically confirmed new and relapse PTB cases, ranging from 27.3% to 88.2% by municipality. The proportion of bacteriologically confirmed TB cases at national level increased from 48.5% in 2013 to 68.2% in 2017, but then sharply declined to 55.0% in 2018. TB is most frequently seen among those aged 15--34 years, while the age-specific notification rates increases with increase of age. The proportion of extra pulmonary cases among new TB cases gradually increased from 12.6% in 2013 to 19.7% in 2018 most likely indicating improved access of population to tertiary care. In the period 2013--2018 the percentage of retreated cases among all notified cases varied between 1.8 and 8.0% without any clear trend over the time. Over the recent five years the treatment success rate of new and relapse TB cases slightly increased from 83.9% in 2013 to 88.5% in 2017. While reported death rates and treatment failure rates are low, there is a concern about the very high proportion of cases that were not evaluated.

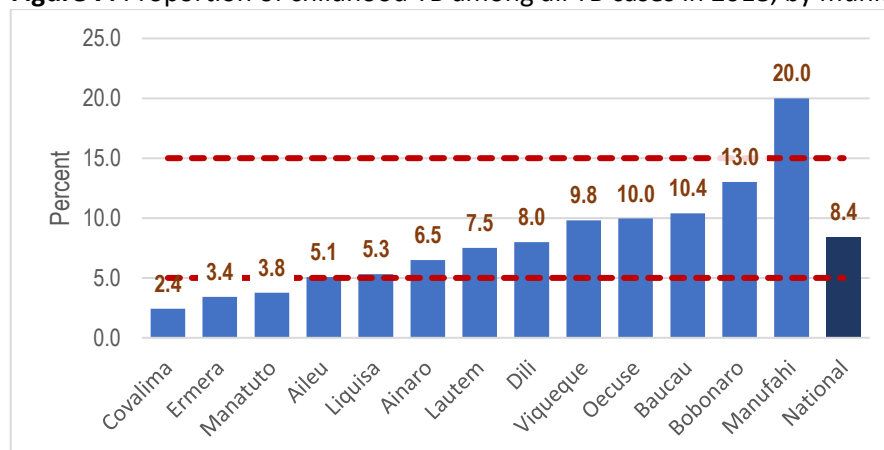
### 7.3 CHILDHOOD TB

In 2018, the number of TB cases (all forms) in children (aged 0--14 years) was 318, which accounted for 8.4% of all notified TB cases in the country. There has been an increasing trend of the case finding from 2014 to 2016, but started decreasing thereafter. The case finding has a wide variation between municipalities (range 2.4% to 20%) and is less than the target of 15% in almost all of the municipalities. This indicates under-diagnosis of child TB.

**Figure 6:** Proportion of childhood TB among all TB cases: 2014–2018

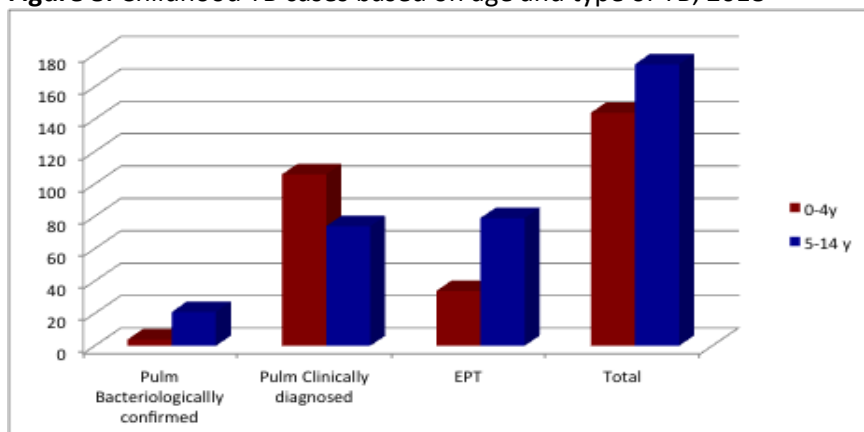


**Figure 7:** Proportion of childhood TB among all TB cases in 2018, by municipality



The most common forms of childhood TB being treated and reported by programme are sputum smear-negative and extra pulmonary TB. However, the cases are more common in 5--14 year age group than in 0--4 years for all disease categories. This indicates underdiagnosis of TB among young children. The global data suggest that the ratio of childhood TB in the age group 0--4 should be 1.5--3.0 higher than that of those aged 5--14. This assumption is based on the known increased susceptibility to infection, disease and disseminated disease (e.g., TB meningitis, miliary TB) in young children (< 4 years).

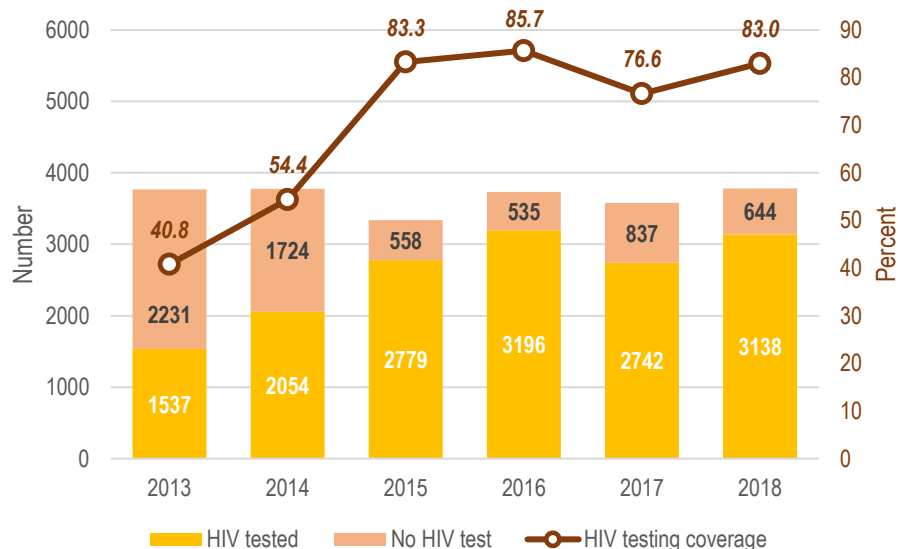
**Figure 8:** Childhood TB cases based on age and type of TB, 2018



### 7.4 TB AND CO-MORBIDITIES: HIV AND DIABETES

HIV prevalence in Timor-Leste is very low with a prevalence of less than 1% in the total population. The country has substantially expanded HIV testing among people diagnosed with TB over the past several years, with the proportion tested increasing from 40.8% in 2013 to 83.0% in 2018.

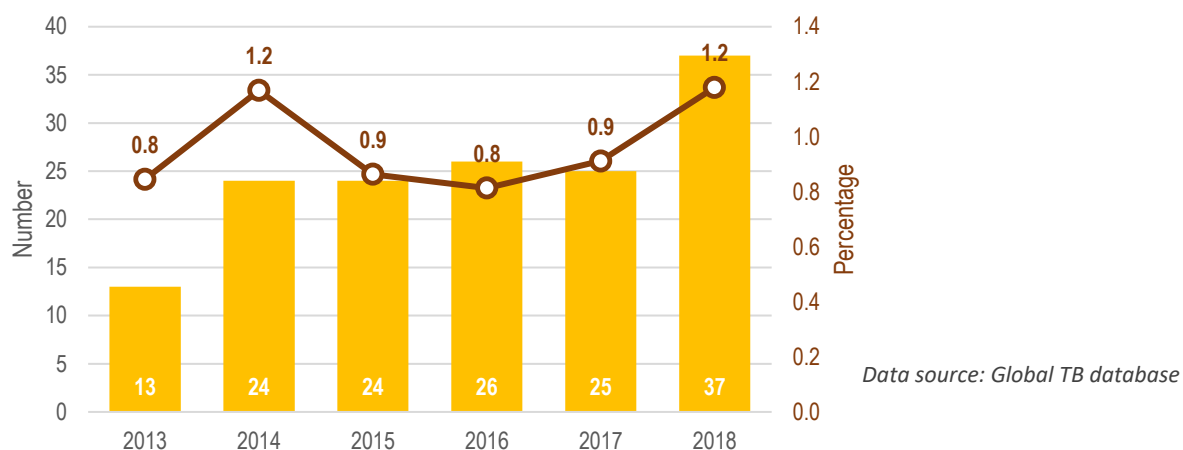
**Figure 9:** Trend in number and proportion of TB patients with known HIV status



Data source: Global TB database

Despite the impressive increase of HIV testing coverage, absolute number of TB/HIV coinfecting cases between 2014 and 2017 remained stable around 25 cases annually and increased to 37 cases in 2018 (48% of the estimated TB/HIV patients in 2018). The HIV prevalence among TB patients over the last six years ranged between 0.8% and 1.2%.

**Figure 10:** Number TB/HIV coinfecting patients and proportion of TB/HIV among tested



**Diabetes** is associated as a risk factor for active TB. Diabetic patients with TB may have worse treatment outcomes. Furthermore, the presence of diabetes may enhance adverse reactions to anti-TB drugs, particularly renal impairment and peripheral neuropathies. Diabetes should be closely monitored and treated throughout the duration of anti-TB treatment. A study in 2015<sup>7</sup> has estimated the prevalence of diabetes mellitus among adults in Timor to be ~15%. Diabetes has a strong association with TB and increases its risk by three times. TB patients with poor glycaemic control are at higher risk of unfavourable outcomes such as failure, relapse and amplification of resistance. The country currently does not have a formal non-communicable disease (NCD) programme, and there are no guidelines on prevention and care of diabetes. Therefore, it is essential to screen all TB patients for diabetes and manage them appropriately. Also, diabetes patients must be screened for TB regularly (Algorithms on TB-Diabetes bidirectional screening is attached). Testing for diabetes for all TB patients and ensuring adequate glycemic control by drugs and lifestyle modification. Provide treatment (drugs and life-style modification) and follow up facilities for diabetes patients.

Given the high prevalence of diabetes in the country compared to HIV, diabetes and TB are being prioritised.

<sup>7</sup> An estimation of the prevalence of diabetes mellitus and diabetic retinopathy in adults in Timor-Leste; Rosie Claire Hewitt Dawkins et al; BMC Research Notes volume 8, Article number: 249 (2015).



## 7.5 DRUG RESISTANT TB

A national drug resistance survey was conducted in Timor-Leste in 2019, and the final results are awaited. WHO estimates as per the 2018 GTB Report---3.1% (1.1--6.1%) of new TB cases and 15% (7.8--23%) of previously treated cases are estimated to have MDR/RR--TB.

The first MDR TB case was diagnosed in Timor-Leste in 2008, following cumbersome and lengthy process requiring samples to be shipped to Australia for testing. Since then, eight GeneXpert machines have been brought into the country. A TB culture laboratory established in Dili is anticipated to be accredited for TB culture and DST for a limited panel of both first- and second-line drugs in 2020.

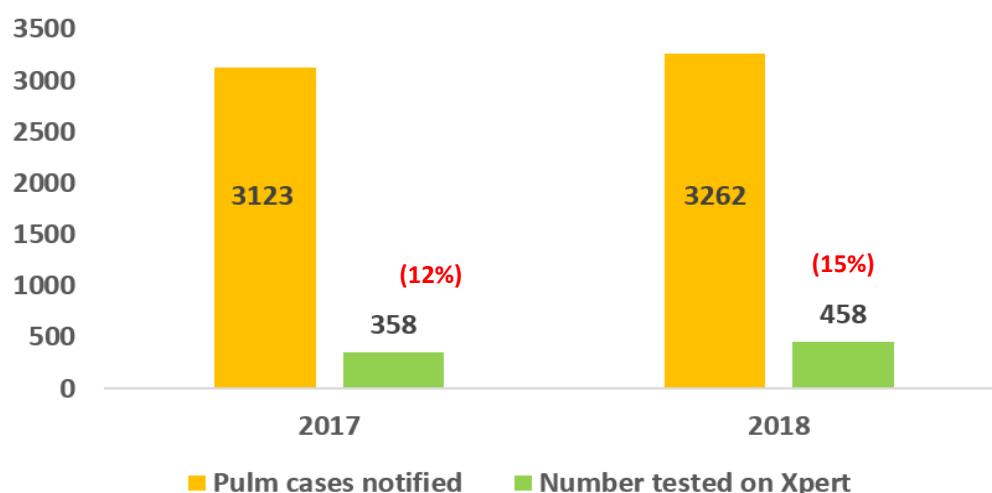
**Case finding strategy:** The current criteria for presumptive MDR/R-R TB patients include all retreatment TB cases, all new and retreatment cases who are smear positive on follow up, contacts of MDR/RR patients with symptoms of TB, PLHIV patients with symptoms of TB.

Number of presumptive MDR cases tested and diagnosed since 2014 is presented in Table 1. In 2017 and 2018 several presumptive TB patients have also been tested under the ongoing active case finding interventions using Xpert MTB/RIF. This has resulted in a significant increase in number of Xpert MTB/RIF tests, the number of TB and RR-TB cases diagnosed.

**Table 1: Presumptive MDR cases tested and diagnosed, 2014--2018**

Year	No. of presumptive TB patients tested on Xpert	No. diagnosed as TB	No. diagnosed as RR-TB	No. of presumptive MDR TB patients tested on Xpert	No. diagnosed as RR-TB	Total R-R diagnosed
2014	-	-	-	119	3	3
2015	-	-	-	181	4	4
2016	-	-	-	210	6	6
2017	1856	310	2	277	3	5
2018	3625	402	28	189	6	34

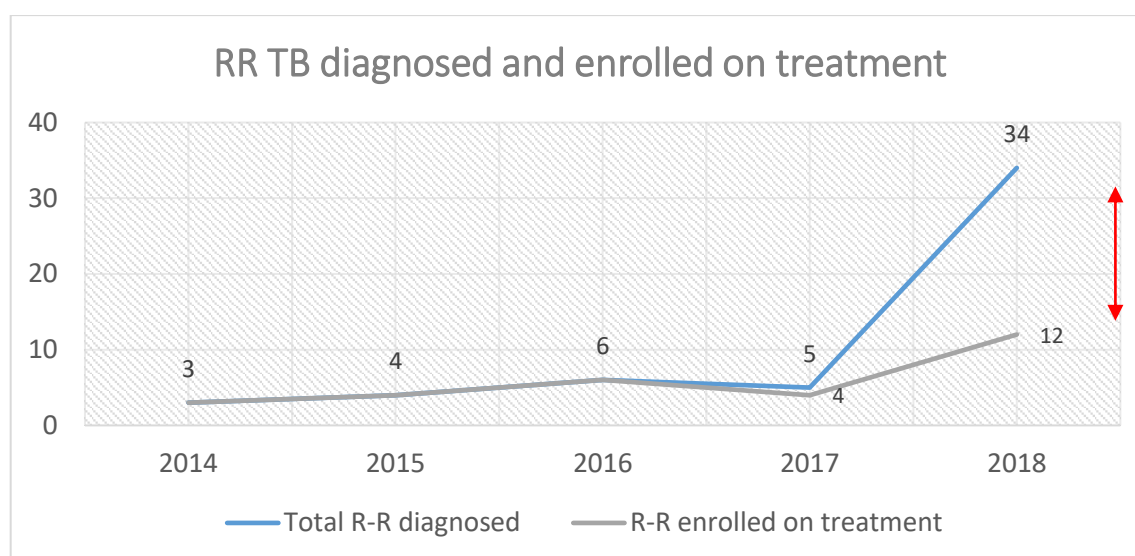
**Figure 11: TB cases – Proportion of notified pulmonary TB cases tested on Xpert**



**Patient enrolment:** The number of patients diagnosed has increased from three in 2014 to 34 in 2018 as shown in Figure 12. In 2018, with increased availability and use of Xpert MTB/RIF especially for active case finding interventions, there has been a sudden increase in the number of RR cases diagnosed (n=34).

In 2017 of the five RR patients diagnosed and four were enrolled on treatment. In 2018, of the 34 RR cases diagnosed only 12 (35%) were initiated on treatment. Programme noted that 22 RR cases were new and repeat Xpert MTB/RIFs were found to be negative, and hence not initiated on MDR/RR TB treatment. Mid-term review mission followed up on seven of these 22 patients. Of these five had prior history of TB and two had history of contact with MDR/RR patients within their family. Incomplete history of the patients has led to delayed treatment and continued transmission.

**Figure 12:** TB cases – Proportion of MDR/RR diagnosed enrolled on treatment



**Treatment regimen and model of care:** Treatment for MDR/RR-TB patients is initiated at Klibur Domin treatment centre in Liquica after a complete pre-treatment evaluation. The tests are conducted at the National Hospital. Standardized treatment with second-line drugs (including injectable) in accordance to WHO PMDT guidelines (2011) is being currently used (8 Cm Lfx Eto Cs E Z / 12 Cm Lfx Eto Cs E).

RR TB patients are hospitalized at the 14 bedded infection control compliant wards at the Klibur Domin DR-TB centre for the complete duration of intensive phase of treatment. While admitted, the patients are followed up clinically by a clinical specialist from the National Hospital who visits the facility daily. Severe complications/adverse reactions (ARs) are managed at the National Hospital at Dili in which a ward has been identified for admitting the MDR patients. Samples for second line DST sent to SNRL, Chennai, and results are not available prior to treatment initiation.

After the injectable phase the patients are referred to their respective districts where they continue ambulatory treatment and follow up smears are done. Directly observed treatment (DOT) is weak during the ambulatory phase with patients being handed over medicines for up to 4 weeks for self-administration.

Follow up cultures and other investigations are done regularly at the NTRL and National Hospital, respectively, while the patients are admitted at Klibur Domin. Audiometry is not available at the National Hospital, and hence there is no monitoring for ototoxicity. During the ambulatory phase, follow up cultures and investigations are done irregularly due to non-availability of necessary facilities for sputum transportation, blood investigations and X-ray at the peripheral health facilities.

During the injectable phase the ADRs and their management is recorded by the treating physicians and nursing staff in the patient case records but are not entered in the treatment card. During the ambulatory phase ADRs are not recorded at all.

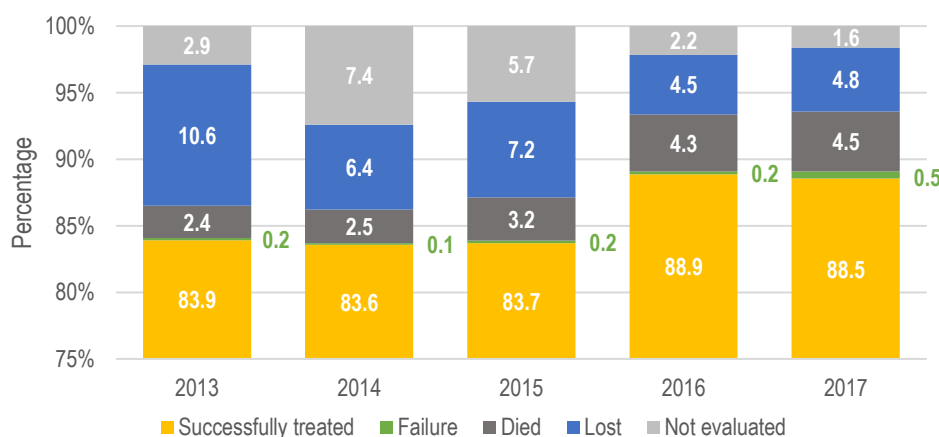
There is no standard regimen defined for treatment of H mono resistance and pre-XDR and XDR TB patients. Newer and repurposed drugs (Bdq, Dlm, Lzd, Cfz and Mfx) are not approved by the regulatory body and are not available in the country.

Treatment outcomes of the MDR/RR patients: The programme achieved 100% treatment success rate from 2011 to 2014. Since 2015 the outcomes have been ~50%--80% due to loss to follow up and deaths. There have been no formal death audits for ascertaining the reason for death. Since the number of patients enrolled on treatment between 2011 and 2017 ranged from 2 to 6 patients per year, interpreting percentages can be misleading.

## 7.6 TREATMENT OUTCOMES

TB treatment is one of the most effective interventions in TB control to reduce the prevalent cases in the population and reduce the transmission of infection. Over the recent five years the treatment, success rate of new and relapse TB cases slightly increased and in 2017 was reported 88.5%, which is marginally below End TB strategy target of 90%. The increase of treatment success rate was mainly due to decline of patients who were lost to follow up and not evaluated. While the proportion of those who died increased, the proportion of those with treatment failure remained overall stable below 1%.

**Figure 13.** Trends of treatment outcome of new and relapsed TB case in Timor-Leste 2013--2017



Data source: Global TB database

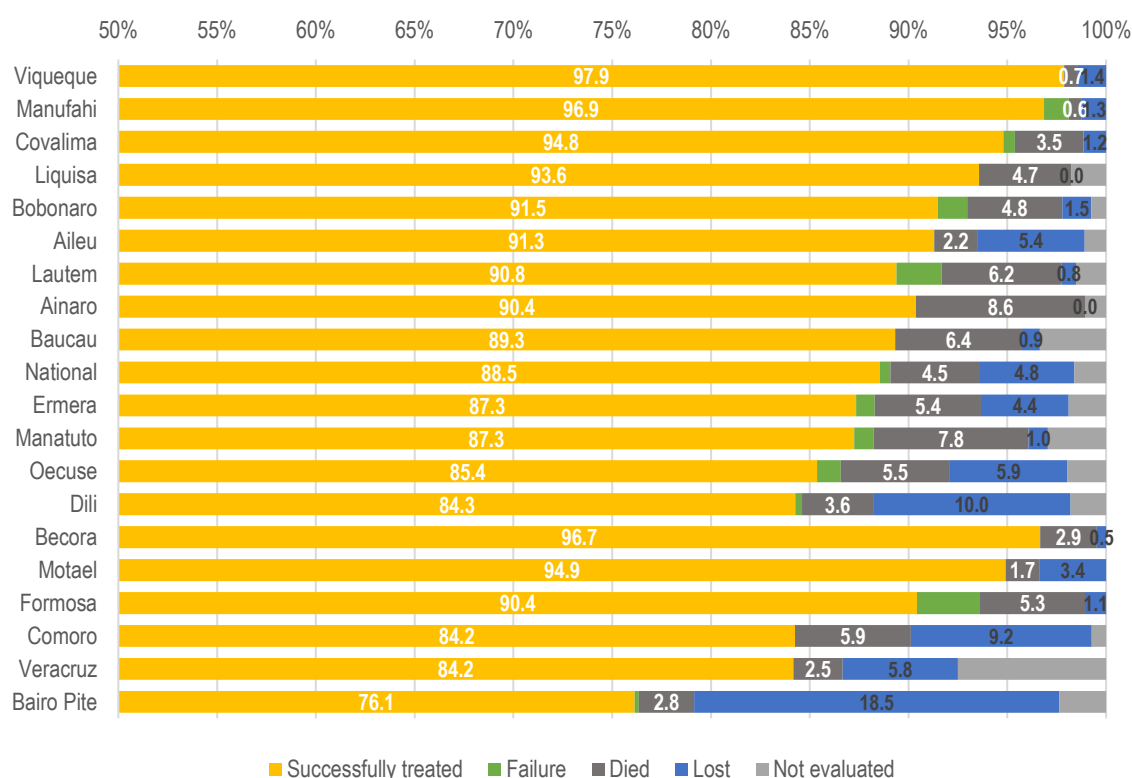
Dili has high rates of lost to follow up (LFU) mainly due to lack of mechanism of communication between tertiary clinics and peripheral health structures. The residents of other provinces who are initiated on treatment in the tertiary facilities in Dili continue their treatment in their local health facility. However, there is lack of standard mechanisms to ensure that the patients after discharge from the hospital actually continue the treatment

under the supervision of local health facility. Remarkably high death rate observed in several municipalities, such as Ainaro (8.6%), Manatuto (7.8%), Baucau (6.4%), Lautem (6.2%). High death rate indicates the delay in diagnosis and start of treatment as the patients are often identified only in advanced stage of disease. Therefore, the NSP proposed to undertake interventions aimed to increase population awareness on TB and scale-up of active case-finding among OPD patients and other identified population at risk in these municipalities.

The practice of excluding the patients identified with bacteriologically confirmed TB and initially LFU into cohort analysis leads to over-estimation of treatment outcome. Surveillance system reported treatment outcome of more patients than were originally registered. Some of these are attributable to transferred in cases and delay in case notifications. The challenge in data quality assurance is to be addressed.

The high level of treatment success is likely to contribute to reducing disease transmission and could be regarded as one of key factors to drive the TB epidemic downwards. However, the treatment success rate is likely to be over-estimated in the national data, as there is no routine recording of initial loss to follow up.

**Figure 14. Treatment outcomes of new and relapsed TB patients by reporting units, Timor-Leste, 2017**



The NTP policy of providing directly observed treatment (DOT) is not strictly enforced for those who seek treatment at health care facilities. Most commonly, patients are provided with drug supplies of several days up to two weeks during the intensive phase of treatment, and one-month drug supplies during the continuation phase. Drug intake is solely controlled on the basis of NTP drug blisters, which the patients are required to present to the treatment facilities before additional drugs are distributed. For those patients receiving treatment in the community from PSF, daily DOT is more feasible as access barriers are minimized.

## **7.7 DETERMINANTS OF TB**

### **7.7.1 Social determinants**

#### **Malnutrition**

Timor-Leste has one of the highest malnutrition rates in the world with children under 5 years of age have the highest levels of stunting, wasting and underweight at 46%, 24.0% and 46%, respectively. The prevalence of low birth weight is 10%.<sup>8</sup>

Malnutrition in women is also high with 27% of women age 15--49 are underweight, 24.8% women having a body mass index (BMI) less than 18.5.

#### **Smoke exposure**

According to Demography & Health Survey (DHS) 2016, exposure to smoke inside the home, either from cooking with solid fuels or from smoking tobacco, has potentially harmful health effects. Eighty-seven percent of households use solid fuels, consisting mostly of firewood, for cooking. Use of solid fuels for cooking is more common in rural areas (95%) than in urban areas (58%). Exposure to cooking smoke is greater when cooking takes place inside the house. In Timor-Leste, 62% of households cook outdoors under a cover, 14% cook outdoors, and 12% each cook in a separate building and inside the house.

Exposure to tobacco smoke is high in Timor-Leste. In 51% of households, someone smokes inside the house on a daily basis. Someone smokes in the house at least once a week in 15% of households, and at least once a month and less than once a month in 2% of households each. In 31% of households, no one ever smokes inside the house.

Tobacco smoking is also associated with an increased risk of latent TB infection (LTBI), clinical disease and TB mortality. Scientific data on adult tobacco use are scarce, but the findings from the Global Youth Tobacco Survey (GYTS) indicate that use of tobacco is much more common among men than women.

#### **Alcohol Consumption**

As per the DHS 2016 survey, 8% of women and 46% of men age 15--49 have ever drunk alcohol. The median age at having drunk alcohol is 20 for women and 18 for men. Among those who have ever had alcohol, 21% of women and 48% of men drink at least once a week. Among those who have ever drunk alcohol, the majority of women and men who report ever having been drunk also report having been drunk at least once in the past 3 months (31% and 25% of women, and 50% and 41% of men).

### **7.7.2 Developmental indicators**

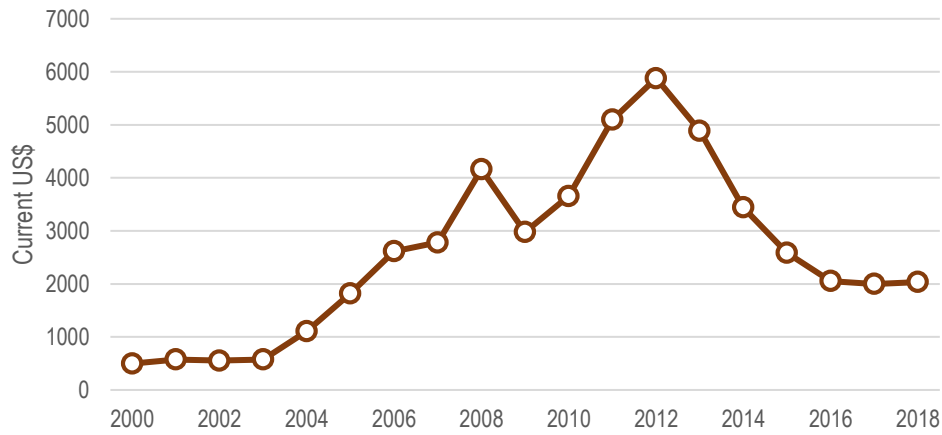
Economic growth has an important effect on many TB determinants including over-crowding, education, nutrition, and health care seeking behaviour. Consequently, economic growth can reduce both transmission of infection and the risk of progression to disease, as well as improving access to diagnosis and treatment. Figure 15 shows time changes in GDP per capita in Timor-Leste from 2000. Between 2000 and 2012 the GDP per capita in Timor-Leste

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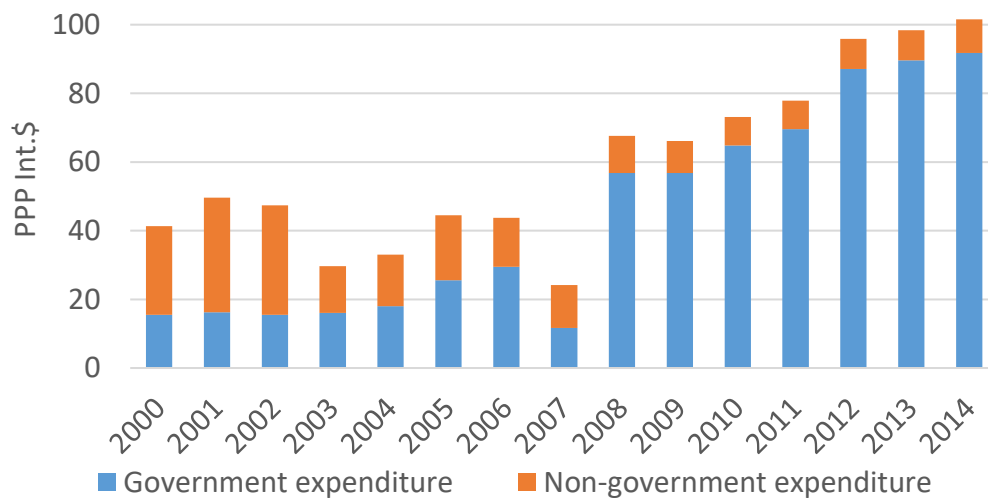
<sup>8</sup> Timor-Leste Demographic and Health Survey 2016 – General Directorate of Statistics, Ministry of Health & ICF 2018.

increased about 10 times. However, starting from 2012 the growth was reversed over the last five years the GDP per capita declined about three times compared to 2012 level. Currently Timor-Leste's GDP per capita remains low by international standards, which likely contributes to maintaining the TB epidemic.

**Figure 15:** GDP per capita (current US\$), Timor-Leste, 2000--2018



**Figure 16:** Per capita total expenditure on health, Timor-Leste, 2000--2014



## 8 ANALYSIS OF CURRENT GAPS IN NTP ACTIVITIES

The analysis of current gaps in NTP activities was done using the patient care continuum as a framework (PCF) to review in-country evidence, prioritise the issues, analyse their root causes and programmatic gaps to inform a set of priority interventions.

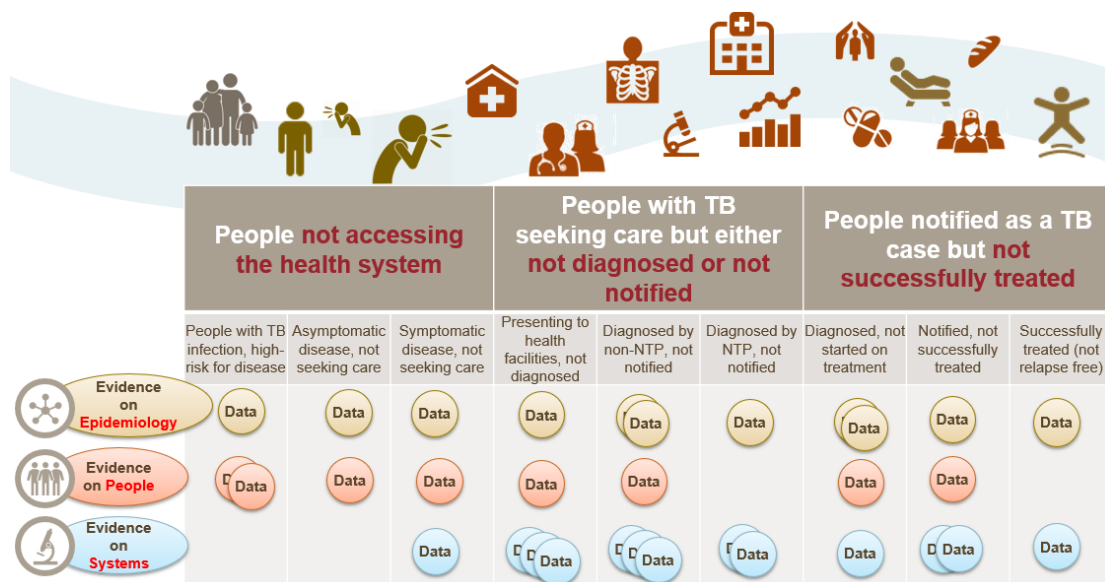


Figure 17: patient care continuum as a framework

It followed the three steps described below.

(1) **Problem Prioritization**

The magnitude of problems was assessed across the care continuum by mapping evidence on burden of disease, patient behaviour and health and social systems. Participatory discussions resulted in problem prioritization supported by evidence.

(2) **Root Cause Analysis**

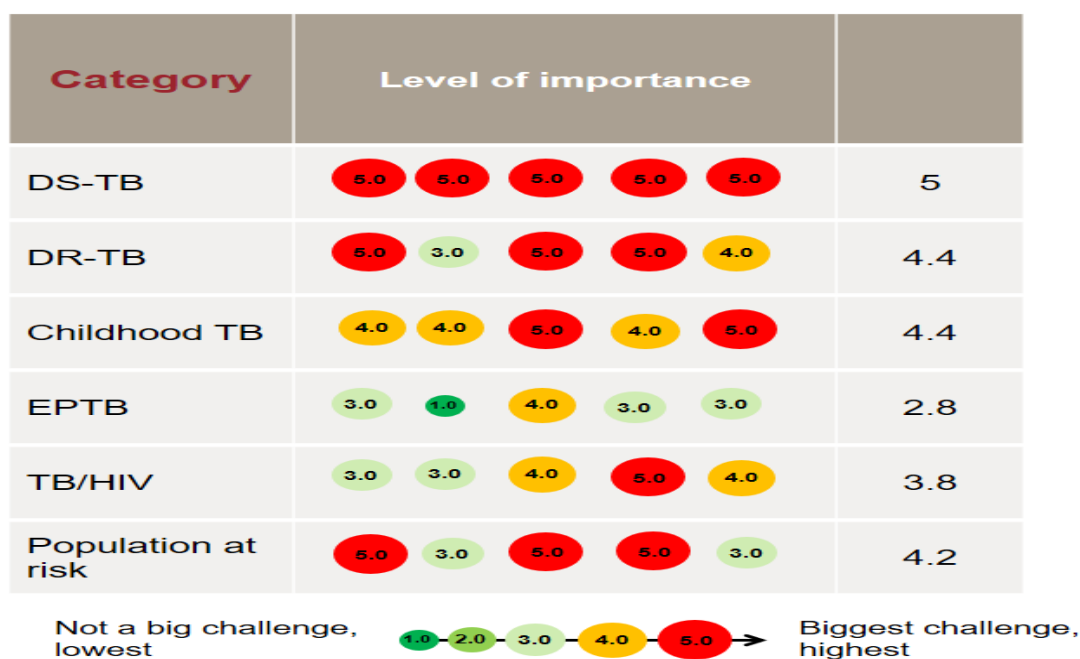
For priority issues identified in the step 1, their determinants, root causes and priority domains for action were identified.

(3) **Strategic Intervention Optimization**

Programmatic objectives were defined, and key interventions were identified for each of the priority domains identified in the step 2.

Prior to the NSP workshop applying PCF, M&E team had consolidated data points from WHO Global TB Report, patient pathway analysis, epidemiological review, TB inventory study, and other national surveys such as Demographic Health Surveys and TB catastrophic cost survey and utilization survey. Data points were mapped to the care continuum. The resulting evidence summary sheets were distributed to all participants. After plenary presentations on key findings from major surveys and studies, the workshop was divided into groups to identify systems and epidemiological gaps across the patient care continuum, assess progress in these areas, and assign a priority level to the issues. The groups scored, on a scale of 1-5 (1=low, 5=high) the 1) magnitude of the problem within the country; 2) extent to which progress is being / has been made

against the problem; and 3) priority to be given to mounting a greater response to the problem. The intent of this step was to have stakeholders think about the epidemic holistically and to set priorities based on a desire to optimize the impact of resource allocations, human and financial. Following are the output of the group work exercise on problem prioritization –



### Along continuum of care

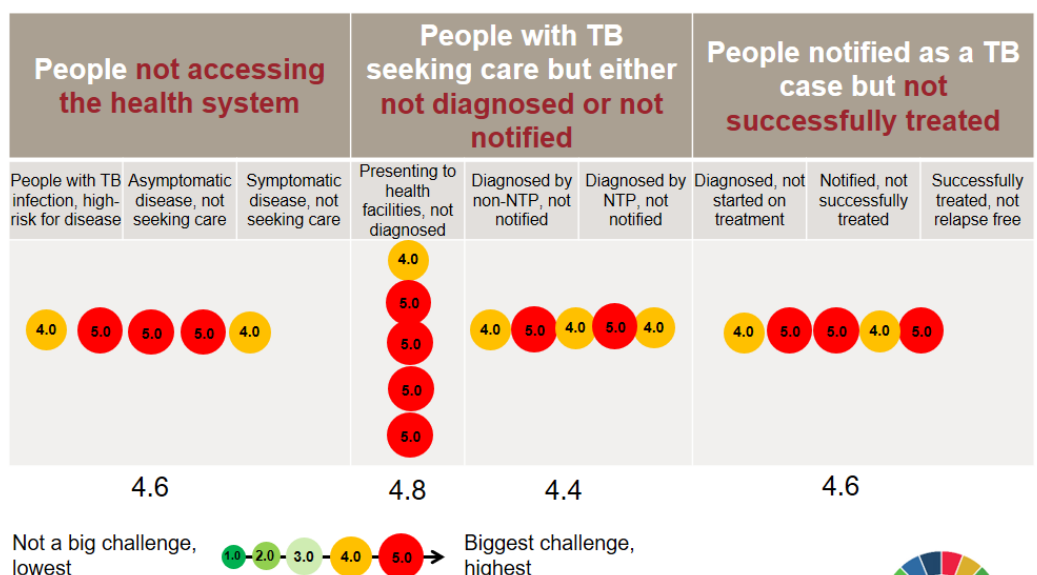


Figure 18: Problem prioritization output from the country dialogue on NSP Revision



Based on the gap analysis describing current gaps in NTP performance for key programmatic areas, key interventions were identified that will most likely contribute to an improved performance of the NTP. The analysis drew on the results of the Mid Term Review Mission that was completed in September 2019. The achievements and deficiencies in key programmatic areas were discussed in the stakeholder’s workshop using **People-Centered Framework for TB programme planning and prioritization** is presented as follows:

People not accessing the health system			People with TB seeking care but either not diagnosed or not notified			People notified as a TB case but not successfully treated			
People with TB infection, high-risk for disease	Asymptomatic disease, not seeking care	Symptomatic disease, not seeking care	Presenting to health facilities, not diagnosed	Diagnosed by non-NTP, not notified	Diagnosed by NTP, not notified	Diagnosed, not started on treatment	Notified, not successfully treated	Successfully treated, not relapse free	
Gap in overall case detection (57% case detection rate), low case detection of DR-TB (5%), low case detection of TB/HIV (48%), decreased proportion of children among notified new and relapse cases from 12.4% in 2016 to 8.4% in 2018)									
<ul style="list-style-type: none"> <li>• Low coverage of TPT among children and HIV patients</li> <li>• Low coverage of contact investigation</li> <li>• High smoking prevalence</li> <li>• Increasing trends of diabetes</li> <li>• High prevalence of undernourishment</li> <li>• Unidentified high-risk population group</li> <li>• Low BCG coverage in some municipalities</li> </ul>	<ul style="list-style-type: none"> <li>• Low community awareness – lack of information</li> <li>• Community has no active role against TB</li> <li>• Traditional belief</li> <li>• Stigma and discrimination</li> <li>• Different health seeking behaviour between male and female</li> <li>• Lack of money for transport to the health system</li> </ul>		<ul style="list-style-type: none"> <li>• Missed opportunity for TB diagnoses among patients in the health facilities</li> <li>• Insufficient capacity to diagnose and manage DR-TB cases</li> <li>• Limited access to technology (molecular diagnosis)</li> <li>• Suboptimal use of Xpert</li> <li>• Unreliable diagnosis for EPTB</li> <li>• Lack of logistical support for sputum transportation</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal collaboration with private sectors</li> <li>• No formal PPM policy</li> </ul>	<ul style="list-style-type: none"> <li>• Weak surveillance system</li> <li>• Paper-based surveillance system</li> <li>• Lack of review meetings and internal evaluation visits</li> <li>• Lack of communication between referral hospital and health facilities</li> <li>• Lack of access to supply chain data</li> </ul>	<ul style="list-style-type: none"> <li>• Not all DR-TB patients put on treatment</li> <li>• Insufficient adverse drug reaction monitoring</li> <li>• 83% of TB patients know their HIV status</li> </ul>	<ul style="list-style-type: none"> <li>• High TB mortality rate</li> <li>• Treatment success rate for DS-TB cases &lt;90%</li> <li>• Treatment success rate for DR-TB cases 83%</li> <li>• Treatment success rate for TB/HIV cases is very low 28%</li> <li>• 83% TB patients facing catastrophic total costs. Income loss and nutritional supplementation accounted for 40.7% and 37.9% of these costs, respectively</li> <li>• Lack of financial protection</li> <li>• Lack of social support for patients</li> <li>• Limited follow-up with patients</li> <li>• Stigma</li> </ul>		
Lack of collaboration between programmes and multi-sectoral approach. Heavy reliance on donor funding.									

**Figure 19:** Deficiencies in key programmatic areas using People-Centered Framework for TB programme planning and prioritization

The findings of this exercise were considered in light of the following programmatic areas for identifying the strategic interventions and activities:

- Case detection
- Laboratory Services and Diagnosis (including new diagnostic tools)
- Childhood TB
- Treatment
- Recording / reporting
- Programmatic Management of Drug-resistant TB
- TB-HIV
- Community engagement
- Partnerships
- Procurement and Supply Chain Management (PSM)
- Programme management

## **8.1 GAPS RELATED TO CASE DETECTION**

### **Case detection ratio**

TB notification rate sharply increased in 2009 and started declining from 2010 by an average of 2.3% annually, suggesting a decline in case detection and a growing gap between notifications and true incidence. In 2018, only 3782 incident TB cases were notified, which was only 57% of the estimated number of cases occurring in Timor-Leste. Factors are of particular importance for the limited access to NTP services: the geographically difficult terrain in many parts of the country, and the severely limited transportation facilities for many parts of the population and low awareness and engagement of community in TB care and control.

### **Access to NTP services**

The NTP has made an attempt towards improving access by officially incorporating the most peripheral level of the health care system, i.e., health posts, into the NTP structure. However, the access to TB diagnostic and treatment services at the health post level are not yet well-structured. A routine system for sputum sample transport has been established in Dili Municipality, but such a system has not yet been functional fully in more remote, geographically challenging areas.

### **Active case finding activities**

Under the Global Fund, several partners have been implementing ACF activities for people living in “hot spot” areas, household contacts of TB patients, congregate settings of Dili and remote rural areas. The strategies for the ACF include door-to-door screening for cough  $\geq 2$  weeks, enhancing the capacity of PSFs in home visits/sputum collection, community mobilization, as well as active identification of close household TB contacts. According to routine project data from eight districts in 2018 and during the first two quarters in 2019, 35 882 people from different risk groups were screened for TB, 7484 (21%) were identified as presumptive cases. Of them 188 (2.5%) were diagnosed with the TB by X-ray and/or GeneXpert examination.

The yield of TB is low against the expected higher yield of TB cases through ACF as it targets adult high-risk groups. Possible reason for comparatively low case detection might be selection bias (missing the most vulnerable during screening as they are hard to reach), low sensitivity of screening tools and diagnostic algorithm. Symptom check as a screening tool has been proven as not efficient in one of recent meta-analysis of TB prevalence surveys implemented in Asia, showing that 40–79% of confirmed TB cases did not report TB symptoms and were only detected due to chest X-ray screening of all survey participants. Vulnerability mapping systematically and then screening and follow up of this population can improve the yield efficiently. Proactive involvement of health facilities and community can also improve the yield.

### **TB services at large hospitals**

Active case finding (ACF), initiated since 2017, has failed to increase case finding in spite of the huge number of missed cases. In the last 18 months, ACF has notified about 3% of the cases. There is strong evidence that presumed cases are being missed at outpatient departments (OPD) of health facilities.

A large number of presumptive TB cases and TB cases are seen in the country's large hospitals. However, standard NTP diagnostic algorithms are frequently not followed stringently by these hospitals. This is evident from the fact that the presumptive TB examined in the laboratory in these facilities is way below 1% of the out-patient department (OPD) attendance. There is also no standardized system for collaboration between the hospitals and peripheral health care units for the management of cases newly diagnosed at hospital OPDs and referred to respective health units for continuation of treatment. A focused and designated HR in high load hospitals is missing for coordinating these activities.

### **Coverage of at-risk population**

Persons with diabetes, HIV and malnourishment are at higher risk of TB and need to be covered. Systematic coverage of these groups is yet to be done under the programme. Collaboration with respective programmes to systematically screen eligible population periodically is not happening.

### **Diagnosis of smear-negative cases**

There are substantial variations in the proportion of smear-negative cases, both between municipalities as well as between various types of health facilities in the country. In general, there is an overreliance on diagnosis by X-ray exclusively at all hospitals. On the other hand, facilities without regular access to chest X-ray frequently do not attempt to make a diagnosis of smear-negative TB at all.

### **Diagnosis of extra-pulmonary cases**

The diagnosis of extra-pulmonary TB is currently made on the basis of clinical criteria in majority of the cases. As a result, extra-pulmonary TB remains largely undetected in most health facilities, while a few facilities report very high case numbers. A reliable diagnosis of extra-pulmonary TB using the national guidelines for the use of GeneXpert needs to be implemented to improve the diagnosis of extra-pulmonary TB.

### **Involvement of the private sector**

While management of TB in the private sector was previously considered a negligible issue in Timor-Leste, during recent years, at least at some clinics in Dili, a large proportion of presumptive TB were referred by private practitioners. There is no formal "Public- Private Mix" policy for private sector engagement. Similarly, the Church clinics and NGO health facilities need to be formally engaged for better involvement in an accountable way with the programme.

### **Information and education activities**

Contributing to a limited level of case detection, there is a general lack of IEC material providing information about TB and NTP activities for TB presumptive, TB cases and the general population. The NTP has developed a patient brochure and a movie about TB detection and treatment and need to be used across the country.

### **Key Programmatic Issues:**

- Many cases are still not detected due to lack of access to services
- Key problems are the geographically difficult terrain and the limited availability of sputum sample transport

- Active case finding activities initiated with several partners and urgently need to be evaluated with respect to a potential scale-up with a focus on high risk population instead of general population
- Large hospitals have a huge patient load and great opportunity to screen and test presumptive TB, but lack of compliance with National TB Guidelines and insufficient collaboration with peripheral health care centres
- The NTP has developed effective policies for the detection and management of smear-negative and extrapulmonary cases, but these policies have not yet been implemented countrywide
- The private sector has a potential role for case detection and management in urban centres like Dili and there is a need for the development of standardized public--private mix policies.

## **8.2 GAPS RELATED TO LABORATORY SERVICES AND DIAGNOSIS (INCLUDING NEW DIAGNOSTIC TOOLS)**

National TB Reference Laboratory located in Dili is having a TB containment facility (BSL III) with a full set of equipment for performing solid culture and DST funded by KOICA. This laboratory was performing solid culture and drug susceptibility (DST) for the first-line and select second-line drugs. Since February 2018, the Biosafety Level 3 (BSL 3) facility has stopped functioning in want of repair of the Air Handling Unit and replacement of HEPA filters. In the absence of local agencies providing preventive maintenance and breakdown services for equipment, there is an ongoing risk of laboratory work getting stalled if any of the equipment breaks down.

Universal DST requires offering DST for all TB patients for Rif, INH and second line drugs (FQs and SLIs) as per the recent WHO guidelines. While DST for Rif is being offered by GeneXpert MTB/RIF, the DST for other drugs planned to be done at NTRL by phenotypic method following accreditation, which will take time. Phenotypic DST has a long TAT and can impact clinical management of the patients resulting in unfavorable outcomes. Rapid molecular technique like LPA is required to provide the DST results rapidly for appropriate patient management.

There are eight GeneXpert equipment's (4 modules) in the country with less than sub-optimal utilization of 44%. GeneXpert is being primarily used for rapid detection of RRTB and is expected to be used for diagnosis of TB among PLHIV, contacts and active case finding. However, this is not uniformly being implemented as only less 15% of bacteriologically confirmed cases have GeneXpert testing. GeneXpert EQA has not yet been introduced.

External quality assurance mechanism is sub-optimally working for smear microscopy and improvement is supervisory visits of 13 Senior LTs to 76 DMCs needs to be introduced with stringent monitoring and adequate resources for travel. Key reason identified has been lack of transport facilities and funds for the visits.

The GeneXpert testing facilities are still only minimally utilized due to issues related transport of specimens from the municipalities due to poor road connectivity. However, the patients in and around Dili are being served well with many of the eligible patients getting a test for detection of RRTB.

Key programmatic issues:

- Sub-optimal use of the GeneXpert
- Lack of logistical support for sputum/specimen transportation
- Limited access to molecular diagnostics
- Insufficient capacity to diagnose and manage DRTB cases
- Not all DRTB patients are put on treatment.

### **8.3 GAPS RELATED TO CHILDHOOD TB**

While childhood TB cases make up to 8.4% of all cases at national level, this proportion varies widely between municipalities, ranging from 2.4 % to 20% across municipalities. Over the past 3 years, there was a decline in proportion of children---from 12.4% in 2016 to 8.4% in 2018. This indicates under-diagnosis of TB in children. Symptom-based screening of children who are household contacts of infectious TB patients is recommended. Children less than 5 years, without active TB disease are to receive Tuberculosis Preventive Treatment (TPT). This recommendation is not followed routinely, and if done, lacks systematic recording.

Key programmatic issues:

- Low coverage of contact investigations
- Low coverage of PT among child contacts
- Lack of formal inter-sectoral coordination with Nutrition programme for systematic screening of malnourished children

### **8.4 GAPS RELATED TO TB TREATMENT**

The NTP has reported high treatment success rates during recent years, regularly exceeding 85%, but is still below End TB strategy target of >90%. However, the NTP policy of providing DOT is rarely strictly enforced. Most commonly, patients are provided with drug supplies of several days up to two weeks during the intensive phase of treatment, and one-month drug supplies during the continuation phase. Drug intake is solely controlled on the basis of NTP drug blisters, which the patients are required to present to the treatment facilities before additional drugs are distributed. Community DOT is done through the PSF, especially in rural and remote areas.

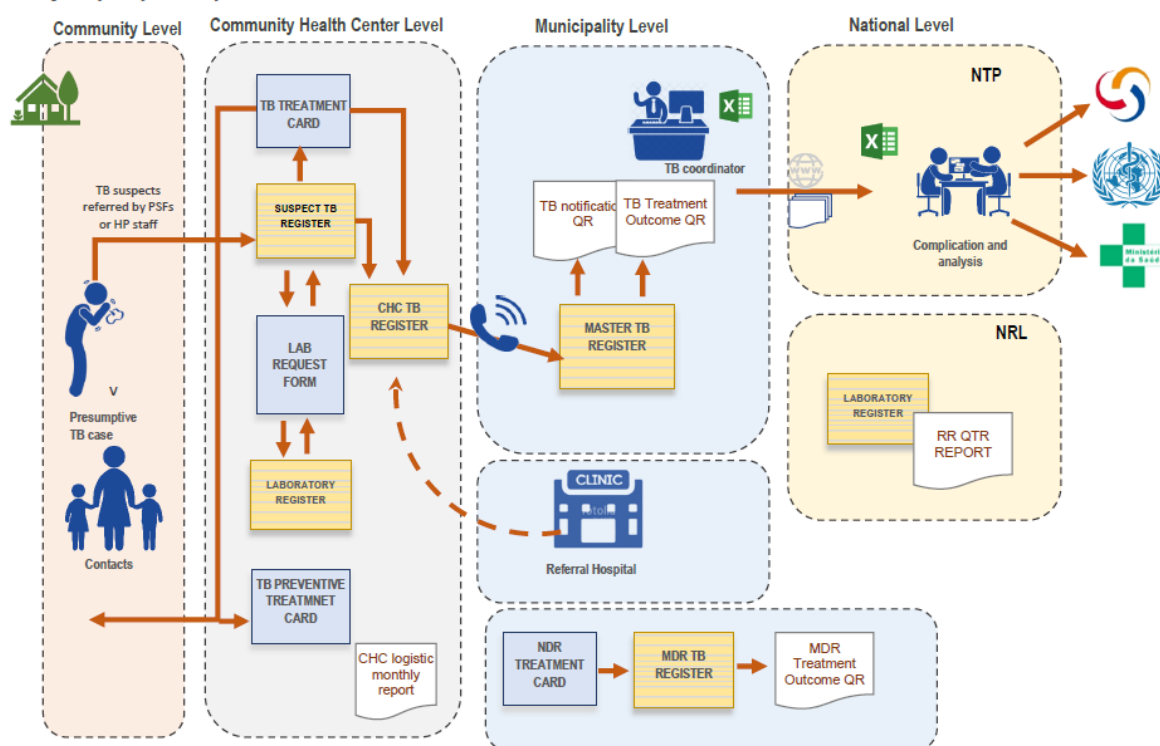
Key programmatic issues:

- Patient supported and patient friendly mechanisms of DOT are not yet attempted; Use of information technology, family DOT (especially in children), community-based DOT has not yet been attempted
- There is limited ADR management, as ancillary drugs are frequently not available and staff training on ADR management is insufficient.

## 8.5 GAPS RELATED TO RECORDING AND REPORTING

The TB recording and reporting tools were revised in 2015 to align with the new recommendations from WHO. These R&R tools have been distributed and are in use at the health facilities and municipality. Recording and reporting tools are available at all facilities and are mostly accurately completed. Data from the health facilities are aggregated at the municipality level by the DHO and submitted quarterly to the central level using hard copies. Data verification meetings are conducted quarterly to clean up the data. The data are entered manually at central level into an excel-based data collection tool for further analysis. The MoH is in the process of establishing an integrated health management information system (HMIS). In early 2017, the MoH agreed to incorporate all the data elements as reported by the TB programme into the HMIS; however, the detailed process for data transmission has not yet been developed.

Diagram of TB information flow



NTP is currently in the process of developing a case-based TB district health information system (DHIS), and plans to transit from paper-based recording to case-based digital recording. Earlier experience in establishing case-based digital drug resistance survey (DRS) database (<http://tb.ms.gov.tl/>) is being used.

Key programmatic issues:

- Paper-based reporting, electronic format only for compilation
- Currently there is no register for presumptive MDR-TB patients
- Forms for R/R in contact investigation are not always available at facility level
- No data on TB screening or TPT uptake among PLHIV newly enrolled in care
- Weak monitoring and evaluation of TB/HIV collaboration activities

- No system to trace initial LFU
- No follow up of transferred patients from Dili
- Weak documentation TB/HIV collaborative activities in the field
- Electronic data are in excel format and unprotected files
- No single data repository for historical data
- No annual surveillance report produced and disseminated.

## **8.6 GAPS RELATED TO PROGRAMMATIC MANAGEMENT OF DRUG-RESISTANT TB**

The NTP has accelerated efforts for setting up a robust service delivery system to test and treat drug resistant TB cases across the country, based on recommendations by experts during the reviews. MDR–TB levels are currently estimated to be 2.2% (1.9--2.6) among new cases and 16% (14--17) in retreatment cases (WHO GTB 2019 Report). Programmatic Management of Drug Resistant TB was initiated in 2008, after Green Light Committee endorsement. Mechanisms for sputum sample transportation have been set up across the country and eight GeneXpert machines are functional for the growing need for diagnosis of presumptive TB and MDR--TB patients. TB culture facilities are now available in the National TB Reference Laboratory. DST is expected to start once the accreditation is complete.

MDR--TB patients are hospitalized and managed at the premises of the NTP's NGO partner, the Chester Ryder foundation at Klibur Domin during the intensive phase of the treatment. DOT is a challenging issue during the continuation phase of both TB and MDR--TB.

**Centralization of GeneXpert machines:** Timor-Leste currently has eight GeneXpert machines in 13 municipalities. This makes it difficult for people to access these services from other parts of the country.

There are currently no systems in place for regular sputum collection and transportation. The health system currently relies on an adhoc mechanism of health personnel bringing the sputum samples to the NTRL and other GeneXpert facilities for testing resulting poor utilization of the existing GeneXpert machines.

Testing of all presumptive MDR/RR TB patients needs to improve as mid-term review reveals that nearly 30% of the retreatment patients and almost all patients who are smear positive on follow up did not get GeneXpert MTB/RIF test. The proportion of all notified TB cases tested on Xpert MTB/RIF was only 12% in 2017 and 15% in 2018.

Of the 34 RR TB patients diagnosed in 2018, only 12 (35%) were initiated on treatment as programme documented 22 RR cases as new and repeat Xpert MTB/RIF was found to be negative. The mid-term review mission followed up on seven of these 22 patients and found that five of them had prior history of TB and two had history of contact with MDR/RR patients within their family. Incomplete history of the patients has led to delayed treatment and continued transmission.

Challenges related to care of DR-TB patients include dependence on one expert to manage MDR/RR patients throughout the country which causes delays in treatment initiation; use of injectable-based longer treatment regimen (8 Cm Lfx Eto Cs E Z / 12 Cm Lfx Eto Cs E) in the absence of audiometry test and insufficient adverse drug reaction monitoring; and a

centralised model of care that involves hospitalization for the entire 8 months intensive phase of treatment.

**Key programmatic issues:**

- Centralized management of DRTB – diagnosis and treatment
- All presumptive MDR/RR TB patients are not tested for R-resistance
- All diagnosed MDR/RR TB patients not initiated on treatment
- Newer regimen not yet introduced
- Newer drugs not yet registered and licenced for use in the country.

## **8.7 GAPS RELATED TO TB/HIV**

Timor-Leste has the highest TB rates in South East Asian region, but fortunately the HIV prevalence rates remain low. In 2010, a nationwide survey based on representative samples of TB patients showed 1.13% of TB HIV coinfection. Data from sentinel sites for surveillance of HIV in TB patients showed similar results (1.0%). In 2011, 6% of all TB patients were tested for HIV and 1.4% of them were found positive. The HIV sentinel surveillance 2013 shows prevalence of HIV in antenatal attendees as 0.04% and prevalence of HIV among TB clinic attendees (with 95% CI) -- 0.38%.

Currently, the chances of HIV fuelling TB epidemic is low, but this could reverse in no time with a marginal increase in HIV morbidity rates. TB HIV collaboration has been progressive in Timor-Leste. Joint coordination meetings have helped. Further, introducing routine provider-initiated HIV testing for TB (PITC) has helped to identify many HIV positive and more importantly has increased the quantum of HIV testing among TB patients. Conversely, screening for TB has improved and has become almost universal in every visit to ART centre for HIV infected. Antiretroviral therapy (ART) and CPT are available for all PLHIVs and are being monitored through the HIV programme. The coordination between both the programmes has increased and has resulted in better management of coinfecting patients.

As per policy all PLHIVs should be screened for TB using GeneXpert and be offered TPT if they are TB negative. ART and CPT are being provided as per the national guidelines and there is no stock out of any drugs (both ARV, Co-trimoxazole and INH).

**Key programmatic issues:**

- Testing for TB among the PLHIV is still low with many of them not being offered GeneXpert as per policy after symptom screening. This has resulted in a low detection of TB/HIV patients (48% in 2018)
- Implementation of TPT among PLHIV has been limited.

## **8.8 GAPS RELATED TO COMMUNITY ENGAGEMENT**

Community engagement for service delivery and case detection has remained limited and provides extra-ordinary prospect to encash available untapped resources to achieve the targets to move towards ending TB. The activity is being driven through the NGOs/sub-recipients of grants and appears to be limited to PSF and project staff. Involvement of the community chief, leaders, faith-based institutions and churches for their engagement in TB programme is required.



Proactive systematic engagement of community volunteers like PSF (Promotor Saude Familia), who already participates in the SISCa (Servisu Integradu da Saude Comunitaria) programme can increase the number of presumptive TB and patients significantly. The benefit of mobilizing PSF as community volunteers for TB is that they often already have status within the community as trusted sources of information and have built strong relationships with community leaders and CHC staff. PSF play a major role by identifying TB symptomatic from the community, ensuring DOT for all patients at the community level and as well retrieving patients who stop TB treatment.

**Key programmatic issues:**

- Community engagement is not yet systematic and structured
- Lack of monitoring indicators for community engagement
- Lack of capacity building efforts.

### **8.9 GAPS RELATED TO PARTNERSHIPS**

The NTP Timor-Leste has good partnerships with several private and NGO health care providers. There are several national NGOs, Caritas Dili, and Klibur Domin. Caritas Dili is the SR for Global Fund grant (6 Church Clinic) and training community volunteers in 3 municipalities (Dili, Ainaro and Lautem) and Church clinics (Bobonaro, Bebonuk, SSPS Becora, Maubara, Santo Joaquim Maubisse, Imanuel Lospalos). Klibur Domin: C-DOTS in Liquica Municipality. Church clinics under MoH (Santo Antonio Motael, Sao Paul and Maria Auxiladora Venilale), and Clinic Café Timor only in Coffee plant Municipality (Ainaro, Ermera, Manufahi and Aileu).

NTP Timor-Leste has added International Organization of Migration (IOM) in the list of partnerships recently. In collaboration with NTP, IOM has been conducting active case finding in bordering municipalities among high risk group, prison, army and congregate settings. IOM covered Bobonoro, Covalima, Ermera and Dili Municipalities.

**Key programmatic issues:**

- Limited availability of IEC materials in all level of the health services, No public display of IEC materials, Patient awareness on TB and TB services are not adequate.
  - Inadequate involvement of civil society partners in promoting TB control. Potential for utilizing NGOs for outreach activities not fully utilized
  - The expansion of successful NGO models on detection and treatment has been limited.

### **8.10 GAPS RELATED TO DRUG PROCUREMENT AND LOGISTICS**

All anti-TB medicines are procured through the Global Drug Facility (GDF) from WHO pre-qualified manufacturers. Hence, the quality of medicines is assured. However, there are no means of conducting quality test in the country and post-marketing surveillance also is not carried out.

Products are stored and maintained at three levels, which include, the central warehouse, known as SAMES, the Municipality warehouse and the health facility level. There are mechanisms for transportation of products from the central warehouse to health facilities. Laboratory reagents are prepared by the central laboratory and distributed to the laboratories through the municipality.

The municipality level sends request for orders quarterly to the central level using morbidity data (number of patients registered in last quarter). No reports were generated at the health facility; instead request for medicines and other products are made through informal methods such as phone calls, text messages, etc.

Based on the recommendations made during the JMM 2019, the country is planning to introduce the 9-11 months shorter treatment regimen. The establishment of an active Drug Safety Monitoring system is a requirement for the introduction of STR month's regimen which is not yet in place.

**Key programmatic issues:**

- The design of the logistics system doesn't provide for recording and reporting of logistics data at the health facilities. Inventory Control Cards (ICS)/Stock cards are not maintained at the health facility level, and therefore, the actual consumption data could not be captured
- Quality assurance testing for medicines cannot be conducted because there is no functional laboratory within the country to carry out this test on receipt of medicines and after distribution. Currently, only physical inspections are carried out.

### **8.11 GAPS RELATED TO PROGRAMME MANAGEMENT**

The NTP is funded by international donors and supported by domestic budgets also. The Global Fund has been a major donor of the national programme since 2005. This funding has helped set up the programme and supports all major activities. South Korea through its donor agency KOICA gave one-time support of US\$ 2.1 million to set up the NTRL, a BSL III laboratory functioning since 1st April 2016, to strengthen the MDR TB services by performing culture and DST. Small grants for operational research, community sensitizations and advocacy, programme support for module development, equipment and drugs have been given by WHO, Burnet Institute, Australia National University, Menzies School of Health Research and others. Government co-financing amounts to 40% of the total requirements of the NTP. This includes salaries of NTP staff, running costs for the NTRL, advocacy and communication efforts, buying and maintaining of equipment. This support amounted to USD \$ 850,000 for the period 2016–17.

In 2013, the NTP has developed two comprehensive sets of training modules covering the revised NTP policies outlined in the new NTP manual. One set of the manuals targets treatment providers at peripheral levels of the health care system (CHCs and health posts), such as doctors, nurses or health workers. A second set of modules targets NTP staff performing managerial functions, such as regional- or Municipality TB officers. The INS is the department of the MOH specifically charged with conducting routine training activities for MOH staff and intensive training activities based on the new training material have been carried out.

The NTP has developed a formal supervision structure requiring regular supervision from the central to the municipality levels, as well as from municipality to peripheral health facilities. However, the current system is not yet effectively implemented, and the frequency and quality of supervision remains insufficient at many facilities.

**Key programmatic issues:**

- Dangers to the future sustainability of the programme resulting from the heavy reliance on GFATM funding
- Newer initiatives in TB programme increasing the managerial load on the limited staff in NTP
- Key technical assistance to NTP/MOH is provided by WHO. However, TGF has withdrawn the current funding support for long term TA, which is much needed considering the country is moving from controlling TB to ending TB by 2030.

**8.11.1 Common health system gaps**

There are major institutional challenges with translating policy, leadership and partnerships into operational systems and practices for municipality health systems and health facilities (Referral hospitals, CHCs and health posts). This is related to constraints in scaling up management systems such as planning, budgeting, financial management, transport, quality and M&E for MHS and facilities. Health facility utilization rates have remained unchanged in the last two years, though there has been a recent placement of over 872 doctors at the primary level of care in the same time period.

Concerns regarding quality of health care services and demand for these services will require more in-depth health systems and social research to uncover reasons for limited utilization of the formal health care system. Despite positive trends nationally in utilization of facilities for maternal health services, there is a wide variety in utilization by location. Delivery by skilled birth attendant ranges from 79% in Dili to less than 20% in some rural and remote municipality.


**Key programmatic issues:**

- Low utilization of the public sector health facilities
- Lack of formal communication mechanism between referral hospitals and peripheral health units.

## 9 NTP GOALS AND OBJECTIVES

### 9.1 ALIGNMENT WITH WHO'S END TB STRATEGY

NTP policies and strategies to date have been informed by international standards formulated by WHO, such as the directly observed treatment, short course (DOTS) strategy launched in 1993, and the Stop TB Strategy that underpinned the Global Plan to Stop TB 2006–2015. New multi-sectoral strategic approaches and new international targets for the post-2015 period have been approved by the Sixty-seventh World Health Assembly in May 2014. In developing the NTP's National Strategic Plan 2015--2020, it was ensured that the NTP's strategy takes full account of WHO's End TB Strategy. However, it was noted that the targets of the post-2015 strategy concern long-term goals for incidence rate and mortality to be achieved by 2025 and 2035. Specifically the reduction of TB incidence rates requires a long time frame due to the prolonged presence of previously acquired infections in a population, which will not be affected immediately by an improvement of TB control activities. The use of TB prevalence was deemed more appropriate to define a short-term goal for the period until 2024 covered by the NSP, as this epidemiological marker rapidly indicates changes in case finding activities and treatment effectiveness. A summary of WHO's post-2015 strategy is given below.

		TARGETS			
		MILESTONES		SDG*	END TB
		2020	2025	2030	2035
 <p><b>Vision:</b></p> <p><b>A country free of TB</b></p> <p><i>Zero TB deaths, Zero TB disease, and Zero TB suffering</i></p> <p><b>Goal:</b></p> <p><b>End TB epidemic in country</b></p>	<p><b>Reduction in number of TB deaths</b> compared with 2015 (%)</p>	35%	75%	<b>90%</b>	<b>95%</b>
	<p><b>Reduction in TB incidence rate</b> compared with 2015 (%)</p>	20%	50%	<b>80%</b>	<b>90%</b>
	<p><b>TB-affected families facing catastrophic costs due to TB (%)</b> Baseline – 83% (2016)</p>	0%	0%	<b>0%</b>	<b>0%</b>

Translating the targets into country specific numbers as follows:

Indicator	Baseline	Milestone		Targets	
				SDG	END TB
	2015	2020	2025	2030	2035
Reduction in number of TB deaths	1400	910	350	140	70
Reduction in TB incidence rate	498	398	249	100	50
TB affected families facing catastrophic costs due to TB (%)	83% (in 2016)	0%	0%	0%	0%

## 9.2 DEFINITION OF NTP GOALS AND OBJECTIVES FOR 2020--2024

The objectives for the NSP 2020--2024 have been developed to cover the three pillars of the End TB strategy, and to specifically address the deficiencies identified in the gap analysis described in section 4 of this NSP. This is in alignment with the End TB strategy and UNHLM targets.

**Vision: TB-free Timor-Leste with zero deaths, disease and catastrophic cost due to TB**

### 9.2.1 Goal of the National Strategic Plan 2020--2024

- To achieve a rapid decline in incidence, mortality and morbidity due to TB while moving on path of ending TB to achieve reduction in the incidence of TB (all forms) by 50% by 2025 and 90% by 2035 (from 2015 baseline figure)

The NSP intends to achieve the following core impact, outcome and output indicators and targets.

Figure 20: Result Framework

Results Framework (Impact, Outcome and output indicators and targets)							
	Indicator	Baseline (2018)	Target (2024)	Frequency	Data source	Layers of analysis	Level of indicator
<b>IMPACT INDICATORS:</b>							
1	To reduce estimated TB Incidence rate (per 100,000 population)	498 (322-711)	325	Annually	Global TB report	National	Impact
2	To reduce estimated mortality due to TB (per 100,000 population)	94 (56-142)	38	Annually	Global TB report	National	Impact
3	To ensure no family should suffer catastrophic cost due to TB	83% (in 2016)	0%	End of plan	Follow-up survey	National	Impact
<b>OUTCOME AND OUTPUT INDICATORS:</b>							
<b>1. INTEGRATED PATIENT-CENTRED CARE AND PREVENTION</b>							
<b>1.1. Active case finding at high load health facilities</b>							
1.1.1.	Notification rate of new and relapse TB cases per 100,000 population	283	292	Annually	Routine TB notification quarterly reports	National	Outcome
1.1.2.	Coverage of population at risk with systematic screening for TB (Diabetes, PLHIV, malnourished children)	N/A	85%	Bi-annually	Survey among risk population	National Municipality	Output
1.1.3.	Proportion of presumptive TB cases among adult OPD visitor	1.6%	4.0%	Quarterly	Routine facility report & Routine TB notification quarterly reports	National Municipality	Output
<b>1.2. Active case finding among vulnerable population – for TB, for LTBI</b>							
1.2.1.	Contact investigation coverage	N/A	100%	Quarterly	Routine quarterly report (to be introduced)	National Municipality	Output
1.2.2.	LTBI treatment coverage among the household contacts of bacteriologically confirmed TB cases under 5 years of age	100%	100%	Quarterly	Routine quarterly report (to be introduced)	National Municipality	Output
<b>1.3. Implementation of revised diagnostic algorithm</b>							
1.3.1.	Percentage of notified new and relapse TB patients who were successfully treated	88.5%	>90%	Quarterly	Routine treatment outcome reporting	National Municipality	Outcome
1.3.2.	Percentage of newly notified TB patients tested using WHO-recommended rapid tests	15.0%	>90%	Annually	Routine TB notification quarterly reports	National	Output
<b>2. BOLD POLICIES AND SUPPORTIVE SYSTEMS</b>							
2.1.	DST coverage for TB patients	22.0%	>90%	Annually	Routine reporting	National	Output
2.2.	Percentage of RR- TB patients who were successfully treated	50.0%	>85%	Annually	Routine reporting	National	Outcome
2.3.	RR-TB treatment coverage	35.0%	100.0%	Annually	Routine reporting	National	Output
2.4.	Documentation of HIV status among TB patients	83.0%	>90%	Quarterly	Routine reporting	National Municipality	Output
<b>3. INTENSIFIED RESEARCH AND INNOVATION</b>							
<b>3.1. Ensure adequate support for operational research to foster innovation</b>							
	Number of operational researches conducted	N/A	>5	Annually	NTP annual report	National	Outcome

## 9.2.2 Objectives of the National Strategic Plan 2020--2024

### PILLAR 1: INTEGRATED, PATIENT-CENTRED CARE AND PREVENTION

#### Objective 1:

**Detect at least 85% of incident TB cases (all forms) by 2021 and at least 90% of incident cases by 2022**

- Indicator: Notification rate of new and relapse TB cases per 100 000 population

Numerator: Number of notified new and relapse TB cases available from the NTP's routine recording and reporting system. Denominator: Estimates of the underlying case incidence published annually in WHO's Global TB Report.

#### Objective 2:

**Ensure successful treatment for at least 90% of the enrolled patients (all forms) by 2021, and more than 90% thereafter and improve management of MDR-TB cases through country-wide implementation of the shorter MDR-TB treatment regimen**

- Indicator: Treatment success rate

The treatment success rate is available from the NTP's routine recording and reporting system. The rate has been regularly exceeding 85% during previous years, thus meeting WHO target levels. The objective of the NTP will be to make every effort to further improve treatment success rates to at least 90%.

### PILLAR 2: BOLD POLICIES AND SUPPORTIVE SYSTEMS

#### Objective 3:

- **Provide MDR/RR TB diagnostic services for 75% of the estimated persons with presumptive MDR TB by 2021 and 100% by 2022; successfully treat at least 85 % of the diagnosed MDR patients**

- Indicator:

The NTP recording and reporting system will capture information on presumptive MDRTB and tested for MDR/RR TB in the laboratory, and will be possible to define the proportion of cases with risk factors that received DST for at least Rifampicin. The treatment success rate will be available from the NTP's routine recording and reporting system for MDR--TB cases.

#### Objective 4:

- **Ensure timely and accurate recording and reporting from all (100%) of reporting centres by 2020**

- Indicator:

The NTP to use DHIS2/similar HMIS system to capture relevant data from each reporting centre, preferably real time. Case based data available in electronic format with generation of routine programme reports at National, District and sub-district levels. The NTP will coordinate with the MOH data management section to ensure regular and smooth entry of TB data into HMIS/DHIS2.

**Objective 5:**

**Ensure availability of quality TB services, in line with current international standards and provided by qualified and trained personnel at 90% of all facilities by 2021 and 100% of the facilities by 2022**

- Indicator:

Number of health facilities with at-least one qualified and trained personnel who is managing the TB patients.

**Objective 6:**

**Scale up patient support system to all TB patients including DSTB with an intent to reduce catastrophic cost at least by 80% by 2023**

Indicator:

Proportion of TB patients receiving the eligible support system. Information to be documented and derived from programme recording and reporting system. NTP to conduct follow up patient cost survey to access the catastrophic cost for TB patients.

**Pillar 3: INTENSIFIED RESEARCH AND INNOVATION**

**Objective 7:**

**Ensure adequate support for operational research to foster innovation**

- Indicator:

The NTP will develop an operational research plan specifying priority research areas. Particular emphasis will be given to operational research to assess the efficacy and cost implications of new active case finding activities.



## **10 STRATEGIC INTERVENTIONS FOR SPECIFIC OBJECTIVES**

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Strategic interventions have been developed to address the specific NTP deficiencies outlined in the gap analysis described above. The listing of strategic interventions below provides a brief explanation of the rationale for including each intervention in the NSP.

### **10.1 STRATEGIC INTERVENTIONS FOR OBJECTIVE 1**

#### **Detect at least 80% of incident TB cases (all forms) by 2021 and >90% of incident cases by 2022**

##### **10.1.1 Intensified case finding at high load health facilities**

Intensified case finding to be done among the patients who are attending the health facilities. The existing presumptive TB examination rate is low in many health facilities indicating the missing opportunity to diagnose the TB patients. All the health facilities will be arranged sequentially in relation to high OPD/patient load and top 26 health facilities will be selected for this intervention. It will cover one national hospital, five referral hospitals and 20 high-load CHCs. Considering the patient load, two human resources will be deputed at one national hospital and one human resource will be deputed at five referral hospitals to coordinate these activities. The 20 high-load CHCs will be covered with TB volunteer (part-time) during OPD hours through the NGOs/community organization. As a part of the package, single window scheme (DOTS corner) will be established in these health facilities. All the health staff will be sensitized and appropriately trained. Presumptive TB patients to be identified by each of the department (OPD, IPD, diagnostic centre, pharmacy, nursing, etc.) and to be referred to single window system for further confirmation/guidance for testing and treatment under the programme. The activity will be documented and monitored for improvement in the presumptive TB examination rate. Appropriate diagnostic testing facilities will be organized to ensure examination of each presumptive TB patient. Diagnosed TB patients will also be referred for counselling and further referral to patient convenient health facility for treatment. It is intended to increase presumptive TB examination in these health facilities to at least 3% of the OPD by 2021. All these 26 health facilities are to be involved in phase wise manner by end of 2021 with priority to national and referral hospitals.

##### **10.1.2 Vulnerability mapping, screening and monitoring**

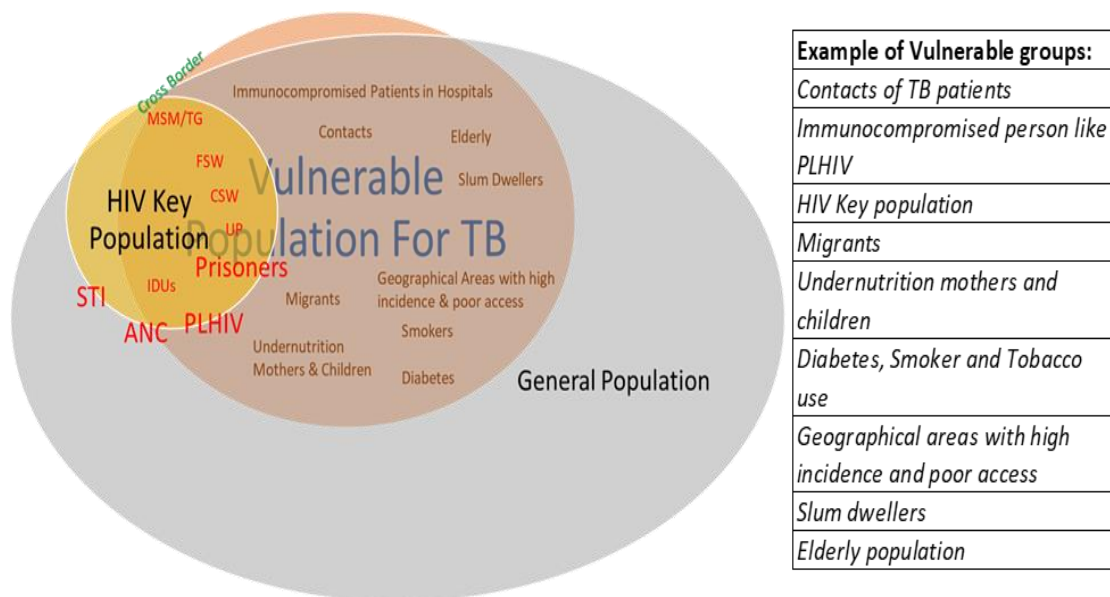
Active case finding activity implemented in last two years does not have significant yield and has not improved the case detection in the areas of intervention. Hence targeting the activity in at-risk/vulnerable population group has been identified as one of the strategies. Systematic mapping of the vulnerable population using standardized vulnerability assessment tool is an important step. The mapping will be done in identified geographical area with information available in electronic format for its efficient use for action. The protocol for vulnerability mapping will be developed and used across the country for uniformity. Vulnerability groups in priority to include:

- a) PLHIV, household contacts of TB cases: This activity will be done across the country as the information is readily available with NTP for all TB cases. The health system staff including PSF will be pro-actively involved with support extended through NGOs/civil society/community groups. The mapping will be done in the first year of the NSP for all PLHIVs and for household of TB patients notified in at least previous three years. This will

cover ~430 PLHIV and ~ 12000 TB patients' households covering a population of around 50 000 to 60 000. Information will be updated progressively as new eligible patient information is available with the programme.

- b) Malnourished population will be included on priority in phase wise manner to cover the country by end of 2022 as per the plan.
- c) Congregate settings like prison, hostels, community homes, at risk workplaces with over-crowding will be prioritized in development of the protocol. Identified places will be covered on priority across the country.
- d) House to house survey information available in health system will be used for visiting the houses using the vulnerability assessment tool. Identified vulnerable population will be mapped using electronic system. The information will be available health post wise, and preferably hamlet wise for planned interaction. This activity will be covered in phase-wise manner. Protocol will consider the suggested plan to cover all 13 municipalities in three years.

The first year will focus on finalization of the vulnerability assessment protocol after testing it in a small geography area. The same will be planned with adequate resources. The 2nd, 3rd and 4th year of the NSP plans to implement it to reach across the country.



	2021			2022			2023			3-Years	
	Municipality	Number of Private households	Population	Municipality	Number of Private households	Population	Municipality	Number of Private households	Population	Number of Private households	Population
				AILEU	7598	48,837				7598	48837
							AINARO	10601	63,136	10601	63136
				BAUCAU	22976	1,23,203				22976	123203
				BOBONARO	17635	97,762				17635	97762
							COVALIMA	12564	65,301	12564	65301
	DILI	42485	277,279							42485	277279
	ERMERA	20671	125,702							20671	125702
				LAUTÉM	12050	65,240				12050	65240
							LIQUIÇA	11885	71,927	11885	71927
							MANATUTO	7467	46,619	7467	46619
							MANUFAHI	9023	53,691	9023	53691
	SAR OECUSSE	14,345	68,913							14345	68913
				VIQUEQUE	15297	76,033				15297	76033
<b>Total</b>	<b>3</b>	<b>77501</b>	<b>471894</b>	<b>5</b>	<b>75556</b>	<b>411075</b>	<b>5</b>	<b>51540</b>	<b>300674</b>	<b>204597</b>	<b>1183643</b>
<b>% coverage during the year</b>	<b>23%</b>	<b>26%</b>	<b>40%</b>	<b>38%</b>	<b>25%</b>	<b>35%</b>	<b>38%</b>	<b>17%</b>	<b>25%</b>		

Note:

1. Population and Number of private households are as per census 2015.

**Vulnerability mapping, assessment and screening activity scale-up plan:**

During the mapping of the vulnerable population, each member from vulnerable population will be screened and evaluated, if required, for TB/LTBI. A portable digital X-ray machine fitted to an all-terrain vehicle, converting it into a mobile TB screening service to be used. The mobile van will travel to all target municipalities to the community levels as far as possible depending on suitable road communication. The identified vulnerable population will be offered chest X-ray at the mobile van. A software called computer aided detection for TB (CAD4TB), which analyses digital X-rays giving a probability percentage of normal versus abnormal consistent with TB detection markers will be used for primary detection of TB cases. Mobile vans will also link the testing for GeneXpert for diagnosis of TB. This activity will be planned within a week's time of completing the house visits in hamlet/village so that all the eligible beneficiaries are covered for evaluation. The local health system doctors, staff and PSF will be pro-actively

involved for completing this exercise. The same population will be re-visited/re-evaluated at a definite time interval, at least annually. The patients eligible for TB treatment or LTBI treatment as per country's protocol will be provided and followed-up for treatment adherence.

Cross-border movements of the patients will also be targeted through annual meetings with the program managers of the neighbouring country. Information exchange and joint program activities will be planned to ensure that all such patients are reached with provision of the quality diagnostic and treatment services. Information will be included in the vulnerability mapping for continuous follow-up. Internal migration will also be dealt with inclusion in the vulnerability assessment.

The activity will be done by NTP through NGOs/agencies with similar experience with adequate capacity under the leadership and oversight of NTP. Standardized uniform protocol will be used, and the activity will be monitored stringently by NTP. Activity is envisaged to be implemented by health system staff/PSF so that health system is engaged for sustainability and annual/bi-annual/quarterly follow up of the population. The population data will be stored within the health system cloud/storage systems and will be available to NTP for public health actions.

#### **10.1.3 Implementation of revised diagnostic algorithm and treatment guidelines**

The revised diagnostic algorithm and treatment guidelines finalized by the NTP will be implemented across the country. Dissemination, sensitization and training will be coordinated across the country in a campaign mode to create enabling environment and ensure that information is available to every corner of the health system. Social media and electronic platforms will be used for quick dissemination and access to all stakeholders. Patient education and awareness will also be included to create demand generation. The activity will be monitored and implemented through the project staff, and NGOs/agencies will be appropriately involved in these activities.

#### **10.1.4 Strengthen involvement of the private sector**

Private sector market is emerging in the country and health sector is not untouched. With improvement in the economic conditions of the population, the private sector will also increase to meet the demands of the population. Although the anti-TB drugs are not available in the private market in the country, the first contact of patient with private sector specially in urban areas is not low. While management of TB in the private sector was previously considered a negligible issue in Timor-Leste, at least at some clinics in Dili a large proportion of presumptive TB can be referred by private practitioners. The NTP will initiate contacts with private practitioners and will result in the improving referrals. Formal "Public- Private Mix" policy, guidelines and tools will be developed after PPM assessment. Under this strategy, the NTP will develop and implement a comprehensive "Public-Private Mix" policy for the engagement of private practitioners in the detection and management of TB cases.

#### **10.1.5 Intensify advocacy and communication about TB for the general population**

A large-scale massive advocacy required for ending TB is proposed to be channelized with engagement of the highest level political and administrative commitment.

**TB National Task Force (NTF)** is proposed to be established under the Chairmanship of Honourable Prime Minister of Timor-Leste with Vice-Health Minister and Acting Minister of

Health as convener of NTF. The highest political and administrative commitment drives the Ending TB initiative in the country. Targeting the economic-social determinants of TB (Malnutrition, Poverty, Tobacco & Alcohol use, HIV, DM, and Hepatitis) is essential through multi-sectoral coordination. NTF has its members Honourable Minister for Social Solidarity and Inclusion, Finance, Estatal, Agriculture & Fisheries and Commerce & Industry. It also has representatives from the community leaders, village chief and bishops. NTF will be secretariat at HOD, Communicable & Non-communicable disease, MOH, NTP Manager and WHO Representative to Timor-Leste (invited member) for steering the technical guidance for ending TB. NTF is a high-level national mechanism to direct implementation of the NSP for TB in country. It mobilizes the inter-sectoral collaboration with direct coordination with relevant ministries for TB as part of bigger public health and social agendas. It takes policy decision on strategy, operations, resources and timelines for ending TB in Timor-Leste. It takes the decisions on recommendation from the National Technical Working Group (NTWG) for TB. It advocates and seeks resources beyond the budgeted resources in programme implementation plan to fast-track the activities. NTF reviews and monitors the progress of End TB strategy in country.

**Municipality Task Force (MTF):** Similar structure at municipality level is proposed under the chairmanship of President of Municipality with Director of Municipality as Vice-Chair and convener of MTF. Other members of MTF being Administrator (Postu Administrative), Representatives from Agriculture, Education, Social Solidarity, Infrastructure, Church Leaders, Representative from the Village Chief (3) and Aldea Chief (3). The implementation of the programme towards Ending TB in the municipality area will be reviewed and monitored by the MTF. MTF will have secretariat as Coordinator TB, HIV, DPHO-CDC.

The general lack of information about TB and NTP activities has been described as a key factor contributing to low case detection levels during the recent joint monitoring mission. Under this strategy, the NTP will significantly enhance its advocacy and communication activities through the implementation of a comprehensive TB information and education package including billboards, posters, pamphlets and stickers on public transport facilities. The strategy will also include community-based activities, such as the screening of newly developed movies about TB at village congregations. An important component of this strategy will be the involvement of previously cured TB patients, who will be used in community-based activities to provide information about TB and NTP services. Intensify Social Mobilization and Partnership Activities on TB. Recent initiatives of "Walk-the-Talk" to target various health issues including TB to be used and widely publicized. Use of social-media platforms has wider reach and is a low-cost intervention.

The NTP has already established several successful collaborative activities with CSOs engaged in TB control. Under this strategy, these activities will be further enhanced in line with WHO's recently developed "Engage TB Strategy". The strategy will also target opinion leaders at the village level through regular meetings focusing on TB control activities, in order to achieve further social mobilization against TB.

#### **10.1.6 Build HW capacity at CHC and health posts for identification of presumptive TB patients**

A high sensitivity for signs and symptoms of TB by health workers at the primary care level is a key requirement for the achievement of high case detection levels. Under this strategy, the NTP will ensure that health workers at all CHCs and health posts will receive intensive training in the detection of signs and symptoms of TB, as well as the use of appropriate diagnostic

techniques. The training will be conducted as part of a comprehensive training course using the newly developed TB training modules.

### 10.1.7 Ensure screening of case contacts

Contacts of active TB cases have a high risk for contracting an infection and subsequently developing active disease. Under this strategy, the NTP will ensure that health workers will visit the homes of all active cases registered at peripheral health care facilities. All family members will be interviewed about signs and symptoms of TB, and sputum samples will be collected from any symptomatic. This activity will be appropriately documented in the recording and reporting system for adequate monitoring.

### 10.1.8 Ensure implementation of all components of WHO's TB/HIV policy

Timor-Leste has the highest TB rates in South East Asian region and fortunately the HIV prevalence rates remain low. Currently, the chances of HIV fueling TB epidemic is low, but this could reverse in no time with a marginal increase in HIV morbidity rates. Both HIV and TB NSP have accorded very high priority to TB--HIV coordination. Further, introducing routine HIV testing for TB patients has helped to identify many HIV positive and more importantly has increased the quantum of HIV testing among TB patients. NSP proposes to strengthen TBHIV collaborative activities as follows as recommended by the recent Mid-term review. Particularly the set of activities will be prioritized to reduce the burden of TB among PLHIV, the so-called 3Is – Intensified TB case finding among PLHIV, TB preventive treatment and early ART, and TB Infection Control in health care and congregate setting.

Implementation of the four pronged strategy on TB-HIV Collaboration in Timor-Leste	
<p style="text-align: center;"><b>Prevention</b></p> <p><b>1. TB Preventive Therapy</b> Status: Patchy implementation, % of PLHIV newly enrolled in HIV care receiving IPT is unknown and not reported to WHO</p> <p><b>2. Air-borne Infection Control:</b> Status: Fast tracking of chest symptomatic is reported to be ongoing in all the referral hospitals, MTR team could not observe the same</p> <p><b>3. Awareness generation</b> Status: Weak counselling and awareness generation related activities</p>	<p style="text-align: center;"><b>Early Detection of TB / HIV</b></p> <p><b>1. 100% coverage of PITC in TB patients</b> Status: 80% of TB patients tested for HIV in 2018</p> <p><b>2. PITC in Presumptive TB cases</b> Status: Not initiated</p> <p><b>3. Rapid diagnostics for detecting TB &amp; DR-TB in PLHIV</b> Status: Patchy implementation, not properly documented</p> <p><b>4. ICF activities at all HIV settings - ICTC, ART</b> Status: 4 symptom screening ongoing but not documented)</p>
<p style="text-align: center;"><b>Prompt Treatment of TB / HIV</b></p> <p><b>1. Prompt initiation of TB Treatment</b> Status: Ongoing</p> <p><b>2. Early Initiation of ART:</b> Status: Not known: within 8 weeks?</p>	<p style="text-align: center;"><b>Management of special TB / HIV cases</b></p> <p><b>1. TB / HIV in children (Not reported)</b></p> <p><b>2. TB / HIV in pregnant women (Not reported)</b></p> <p><b>3. Drug Resistant TB / HIV (Not reported)</b></p> <p><b>4. TB / HIV patients on PI-based ART (Not reported)</b></p>

HIV--TB coordination will be strengthened with regular meetings and joint monitoring of TB-HIV collaborative activities. Documentation of TB--HIV collaborative activities will be strengthened. HIV test kits projections and supplies will include requirements of the TB patients. Universal testing of all TB patients for HIV, maintaining a line listing of TB-HIV patients referred to the HIV programme for ART, cotrimoxazole prevention treatment and other services will be key activities under this strategy.

TB screening of HIV positive patients will be documented at the ART centres and a line list made for all referrals to TB programme to facilitate follow up. The issue of screening PLHIV for latent TB infection and provision of INH preventive therapy will be jointly discussed by

both programmes, and implementation monitored on a monthly basis so as to ensure that all PLHIVs are covered with PT at the earliest within next 3 years.

#### **10.1.9 Strengthening quality diagnosis: microscopy**

The updated WHO EQA for smear microscopy has been implemented since 2014 with objective of improvement in quality. All components of EQA namely random blinded rechecking (RBRC), centralized at NTRL, on-site evaluation (OSE) and panel testing (PT) are being implemented by the NRL. In addition, the NRL is also participating in annual panel testing exercise with the SRL Chennai with a proficiency of 100% for the past two rounds. Laboratory performance reports are being compiled every quarter with a RBRC exercise which is coordinated by the NRL. RBRC is centralized to the NRL where all the slides from the laboratories are coded blinded and read by Senior Laboratory under the supervision of the NRL staff. Under this strategy, the NTP will ensure regular training activities (both induction and refresher). The training programmes will include basic microscopy, EQA for smear microscopy and use of GeneXpert. The protocol for EQA for GeneXpert is planned to be included in the lab quality assurance protocol and will be covered during the EQA visits. The Senior LTs visit will be ensured to cover all the laboratories performing the sputum microscopy so that regular supervision is done. The required support for the visit will be planned in this NSP.

#### **10.1.10 Ensure access to Xpert MTB/RIF for presumptive MDR-TB and presumptive TB patients among at risk population (PLHIV, Paediatric, DM, contacts, etc)**

The new NTP manual specifies the GeneXpert technology as the primary diagnostic tool for the diagnosis of TB in any persons with presumptive MDR TB and PLHIV. The technology will also be employed for the diagnosis of smear negative TB in areas without regular access to chest X-ray facilities. Under this strategy, the NTP will ensure the countrywide access from all health care facilities to the gene Xpert technology. This will require the procurement of additional Gene Xpert machines and the establishment of a reliable sputum sample transport mechanism from all health facilities.

#### **10.1.11 Introduction of a new diagnostic algorithm**

Following the advent of new diagnostic technologies such as Gene Xpert (nucleic acid amplification for rapid and simultaneous detection of tuberculosis and rifampicin resistance), WHO has been actively promoting the use of revised screening algorithms to increase TB case detection. More recently, WHO also confirmed the routine use of chest X-rays for screening and diagnosis as a means for increasing case detection. Additionally, WHO recommendations also specify that universal testing with GeneXpert as the initial diagnostic test is recommended if the financial capacity exists and universal access to this technology can be established. Accordingly, the NTP plans to initially use the following diagnostic algorithm in all areas in which access to GeneXpert has been established:

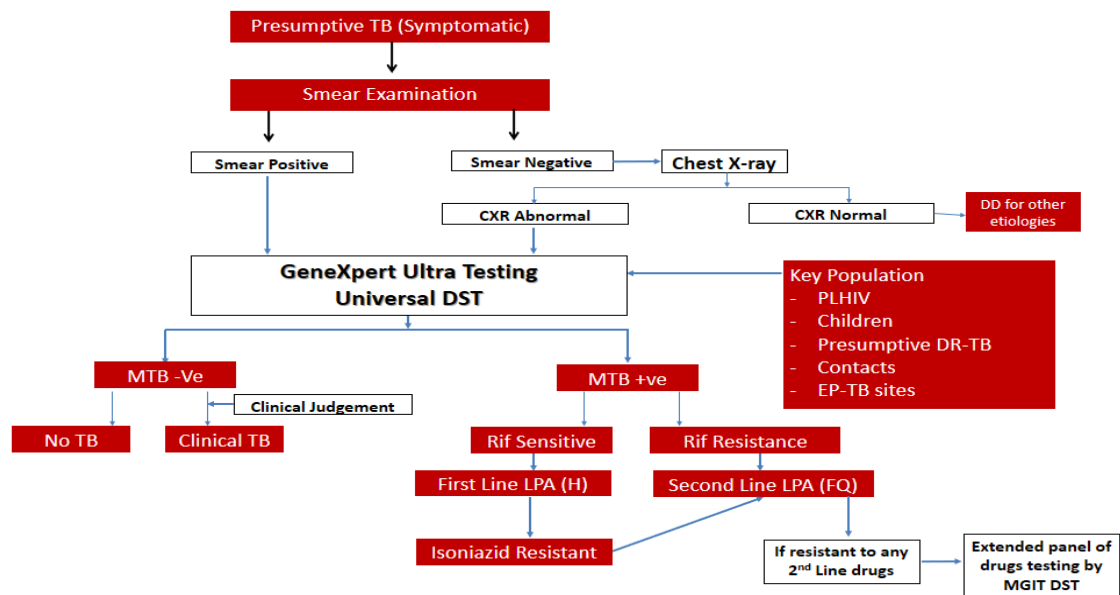
##### **Revised NTP diagnostic algorithm**

For sites that do not have GeneXpert and X-rays during the phased implementation of the new algorithm, the current diagnostic algorithm based on smear-microscopy will be continued.

Depending on the availability of adequate financing, the NTP plans to gradually introduce a second algorithm based on testing all TB symptomatic with GeneXpert as the diagnostic test.

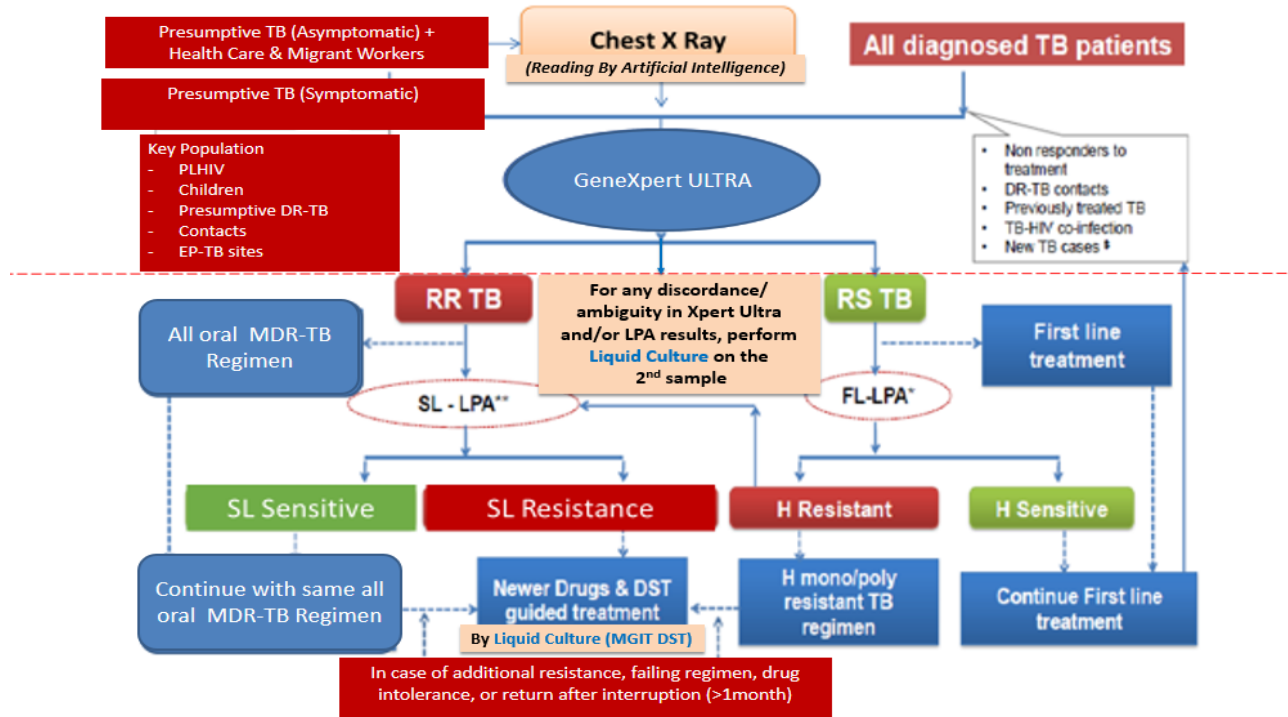
The respective algorithm is shown in Figure 18.

Figure 21: Diagnostic algorithm on Universal DST of all TB cases



As the country moves forward, the programme will take decision to move towards Universal DST for all presumptive TB cases using the following algorithm:

**Diagnostic algorithm in areas with universal Xpert MTB/RIF access**

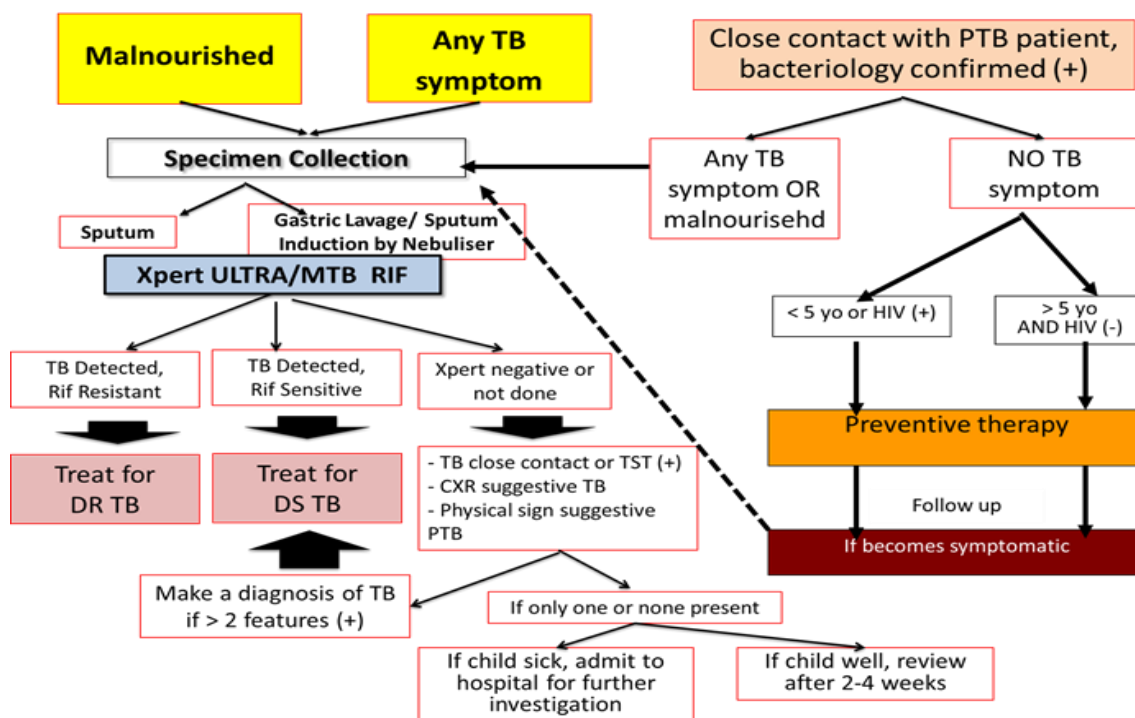




### 10.1.12 Ensure quality diagnosis: children

Programme data indicate that TB in children is currently severely under-diagnosed. A new paediatric guideline has been developed and is currently under approval process. This guideline introduces diagnostic algorithm in line with WHO protocols. The guideline developed by eminent national and international pediatricians includes use of diagnostic tools such as the GeneXpert® and X-ray.

#### Algorithm for child TB diagnosis and preventive treatment:

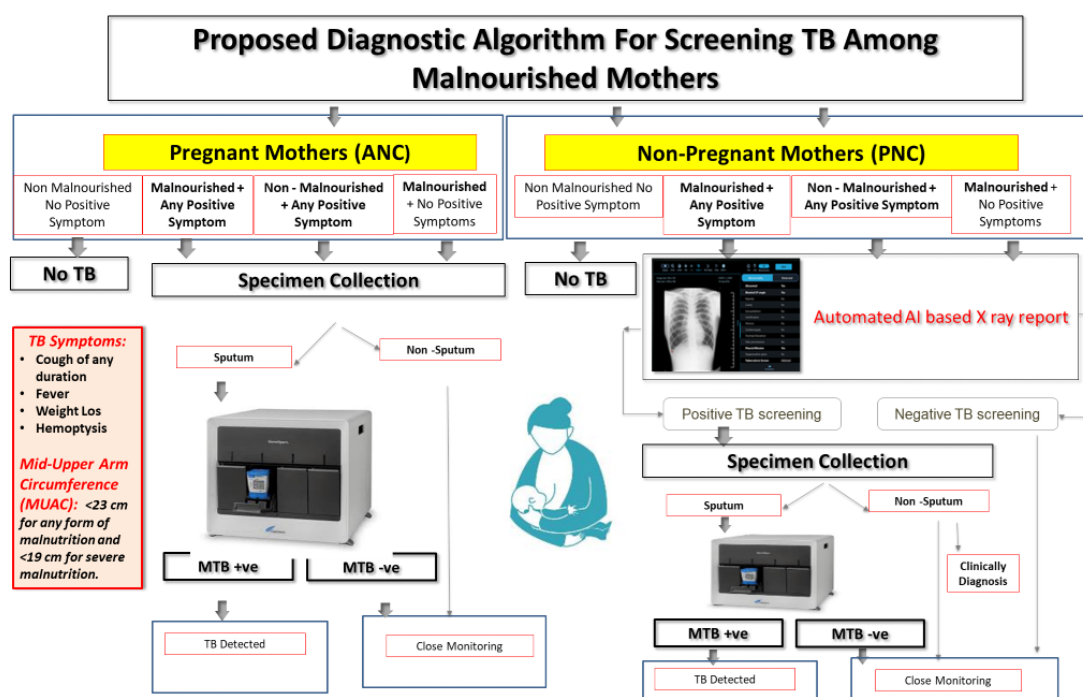


The NTP envisages training all doctors in the new guidelines once approved by 2021. The training will be done through a cascade-mechanism. The first lot of doctors and nurses will be sent to a high burden country to practically learn to diagnose paediatric cases and collect samples from children, especially the 0–4 year olds, under senior paediatrician (consultant). They will be identified as trainers. The consultant will be invited to teach the first 2–3 batches of doctors and nurses in country, and the trainers will co-teach. The subsequent training will be conducted by the trainers on a regular basis until all relevant doctors and nurses in the country are covered. The NTP will also build capacity of doctors and nurses for gastric aspirate collection at municipality hospitals. All children suspected of having TB will be completely evaluated with all diagnostic tools (Chest X-ray, GeneXpert, etc) according to the new Childhood TB guidelines. The NTP will specifically target pediatricians at referral hospitals for training activities to facilitate the diagnosis of more complicated cases in children. Staff at peripheral health care facilities will be informed about the possibility of referring children for diagnosis of TB to pediatricians at referral hospitals. The NTP will ensure the integration of TB-specific components in MCH and IMCI training materials; this will be affected through discussions with WHO country office, which oversees developing the MCH and IMCI training materials.

### 10.1.13 Strengthen collaboration between the NTP and the RMNCH programme

Globally, TB is one of the main causes of mortality in women of reproductive age group. Pregnant women are susceptible to develop active TB during pregnancy or soon after delivery,

making TB a leading cause of death during pregnancy and delivery, and thereafter. Undiagnosed TB in pregnancy also puts the newborn at risk for TB. Increasingly, researchers have noted the emergence of perinatal TB in locations most affected by the HIV epidemic. Some studies suggest that TB in pregnant women with HIV more than doubles the risk of in-utero transmission of HIV. When combined with the high burden of undiagnosed active TB among pregnant women in areas with high HIV prevalence rates, these data indicate a need for routine TB screening and prevention in antenatal clinics. Given that women are mostly primary care givers, young children under their care are also at risk of developing TB disease.<sup>9</sup>



The NTP R&R reveals that the male--female ratio in accessing services for TB treatment was 1.22:1 over time and 1.21: 1 in 2016. There was a slight decline of diagnosis in women of reproductive age group and geriatric age group in 2016. Although these are within acceptable limits the NTP plans to ensure that gender issues are adequately addressed in case finding and treatment activities. Given the alarming rates of under--nutrition among women and under 5 children and high maternal and under 5 mortality rates due to 'other' causes, programme plans to set up mechanisms for collaboration between the two national programmes. This will also optimize utilization of human resources present across national programmes. The RMNCH staff currently have greater reach at community level and so integrating TB screening, diagnostic and management services with maternal and child services becomes paramount importance.<sup>10</sup> The strategy proposes for routine TB screening of women and children at each visit for RMNCH services in every health facility including visits to every village outreach (such as SISCA and mobile clinics). Contact tracing, especially among household and close contacts, of bacteriologically confirmed cases will be undertaken. Diagnosed TB patients among women

<sup>9</sup> WHO. Strengthening the inclusion of RMNCH health in concept notes to the Global Fund.

<sup>10</sup> As noted and in line with WHO: Strengthening the inclusion of RMNCH health in concept notes to the Global Fund.

and children will be tracked to ensure early initiation of treatment by prompt notification and prioritized tracking by the field worker. Patient-friendly DOT will be organized to ensure adherence among this group of patients. Preventive treatment will be provided to all the eligible patients.

**10.1.14 Strengthen collaboration with the national nutrition programme and non-communicable disease (NCD) program to address malnutrition and diabetes and tobacco use in TB patients**

Timor-Leste has the highest level of malnutrition among countries in the Asia-Pacific region. Almost 50% of Timorese under 5 years age children are stunted, 38% are underweight and 11% have moderate to severe acute undernutrition. The highest stunting prevalence was found in Ermera (65%), highest wasting prevalence in Covalima (17.4%) and highest underweight prevalence in Oecusse (50.3%). TLFNS 2013 also reported that 24.8% women of reproductive age had a BMI of less than 18.5, which is higher than WHO benchmark of 20% and a serious public health problem. Ermera Municipality has the highest percentage of undernourished women (39.8%) compared with Baucau Municipality, which has the lowest (18%).

Higher prevalence of stunting was evident among poorer households (59.3%) as compared to the richer households (39.1%) leading to a national economic loss of US\$ 41 million annually. Increased susceptibility to infections including TB and 34% of U5 mortality has been attributed to malnutrition.

Diabetes is an emerging problem in Timor-Leste and at the present times, nearly 3.2% of females and 4.2% males are affected by diabetes.

The strategy proposes to have inter-departmental coordination with other programmes to prioritize identification and screening of the at-risk population for TB and provide prompt diagnostic services to all the eligible patients. The routine screening of undernourished individuals especially children at each visit to the health facility and outreach will be promoted with engagement of the staff from those programmes. Immediate referral and tracking will be done for treatment of malnourished individuals diagnosed with TB and ensuring DOTs.

- Testing all TB patients for Diabetes and all diabetes patients screening for TB symptoms.

**10.1.15 Strengthen community engagement utilizing an integrated approach through government health system and implementing partners**

The NTP envisages covering a wide range of community-based TB activities contributing to prevention, diagnosis and improved treatment adherence that will positively influence outcomes of drug-sensitive, drug-resistant and HIV-associated TB while reducing stigma. It will draw its strength from effectively integrating with the general health system and optimally utilization of its implementing partners to mobilize communities to generate greater demand for TB prevention, diagnosis, treatment and care services. These services will be integrated with other community-based activities supporting primary health care services, including those for HIV infection, maternal and child health and NCDs to improve synergy and impact. It will utilize existing mechanisms through which community members, CBOs and groups interact, coordinate and deliver their responses to the challenges and needs affecting their communities. The following activities are included in this strategy:

- Joint planning and revision of the NSP for inclusion of TB screening in communities using new government platforms such as SISCA, Saude na Familia and others as they are defined. The resource need has increased from US\$ 5.37 million in 2018 to to US\$ 7 million in 2020 in the existing NSP.
- Inclusion of key TB screening questions in the existing tool of the Health System screening tool including KSP/Saude na Familia, SISCA among others
- Capacity building of the community members and volunteers
- Printing of IEC materials for the relevant target audience – advocacy materials for leaders, behaviour change communication material for communities, pamphlets and flow charts for health personnel and patients
- Screening of TB film, spots and jingles
- Collaborating with RMNCH, nutrition, NCD and HIV programmes to strengthen community engagement
- Community awareness meetings, formation of TB forums, involvement of former patients and TB patient support groups in sucos, ‘know your micro – foes’ in schools, colleges and universities
- Monitoring and supervision of community engagement with inclusion of related indicators on referrals from community volunteers.

#### **10.1.16 Address social protection and poverty alleviation issues, as well as other TB determinants**

The TB patient cost survey conducted from October 2016 to March 2017 highlighted that 83% of TB patients experienced catastrophic costs related to their TB diagnosis and care, which is highest in the world. Income loss and nutritional supplementation accounted for 40.7% and 37.9% of these costs, respectively. WHO's End TB strategy specifically lists social protection and poverty alleviation issues as essential components of NTP activities. The NTP will engage in regular advocacy activities with high level policymakers to alert them about the importance of social determinants for the TB epidemic. Another component of this strategy will be the provision of financial support for all TB patients to alleviate the financial burden associated with frequent visits to the health care facilities required for drug collection and follow up examinations during treatment.

The financial assistance (TB pension) will be provided to all the TB patients including the DSTB patients. NSP stakeholder workshop proposed financial support of US\$ 150 per month to TB patient. The list of the eligible patients will be shared by the NTP to Ministry of Solidarity. Eligible beneficiaries to be provided the TB pension through the municipality, as is done by the department for other ministries. SUCO, DTC and programme to coordinate, monitor and facilitate. Electronic system for notification will help for easy transmitting the data and monitoring the patients with transparency.

TB patients to be provided with food basket (rice, pulses, oil, milk and eggs) on monthly basis. This is to be implemented through Ministry of Estate/SUCO Chief. The BMI of TB patients to be monitored for impact assessment and revision of the food package scheme.

DSTB patients visits for treatment, follow-up and clinical monitoring to be provided with a travel support of US \$30 for the complete course of treatment supporting for 6 visits to be provided in three installments at treatment initiation, end of IP and end of treatment.

TB patients and their families to be counselled and provided the required support at all levels. Patients must be provided the complete information to take a conscious decision on TB

treatment to improve adherence. Also this will empower the patient and reduce the stigma. Capacity building and linkage to PSF will further enhance the handholding of the patient to complete the treatment in an enabling environment.

Use of IT for improving the treatment adherence to be piloted in small population and successful strategy to be scaled up across the country. This will be a boon to the patient as the treatment adherence can be monitored using IT platforms.

#### **10.1.17 Ensure that gender issues are adequately addressed in NTP activities**

TB is one of the main causes of mortality for women of reproductive age in low income countries. TB and HIV coinfection increases women's health risks: pregnant women are susceptible to developing active TB during pregnancy or soon after delivery, making TB a leading cause of death during pregnancy and delivery, and thereafter. In Timor-Leste, economic barriers and stigma against women with TB may hinder women's ability to access treatment and care. Rural women often lack the financial resources necessary for transport to TB diagnostic and treatment services. It therefore appears unlikely that significant gender discrimination issues are inherent in NTP practices. Nevertheless, the NTP will further ensure that gender issues are adequately addressed in case finding and treatment activities. As part of this strategy, the NTP will implement gender assessment tools in collaboration with HIV programme. Other components of the NSP focus on improving access to health care services for poor populations, e.g., through the provision of financial support for X-ray services. These support measures will also address the specific needs of poor women in rural areas, and gender inequalities will be monitored with the collection of gender specific data on case detection and treatment outcomes in the TB recording and reporting system. A large proportion of the PSF used for population screening will be female community health volunteers at the village level. This will further improve communication issues with female patients and help reduce the threshold of females for seeking health care. The symptom screening of pregnant women has been synchronized with the RMNCH strategy.

## **10.2 STRATEGIC INTERVENTIONS FOR OBJECTIVE 2**

**Ensure successful treatment for 90% of the enrolled patients (all forms) by 2021, and more than 90% thereafter**

#### **10.2.1 Ensure regular supply of FLD at all treatment facilities**

The NTP will ensure the availability of drugs for the standard WHO regimens at all treatment facilities. This strategy also contains a comprehensive training programme focusing on drug management issues for staff at all levels of the health care system, in order to avoid overstocking or drug stock outs at any facility. The storage conditions for drugs at peripheral level facilities will be improved through the provision of adequate drug storage equipment to all such facilities.

#### **10.2.2 Ensure patient friendly support mechanism using new drug regimens for all cases**

Adherence to treatment is one of the key factors for preventing mortality and morbidity. DOT, where patient has to visit to take the drugs on daily basis, has been a challenge with patient as well as provider perspective. Moreover, recent TB Treatment Guidelines, WHO notes that treatment supervision is not always sufficient to guarantee better treatment outcomes, while the combination of treatment supervision with other treatment adherence interventions

(including social support, digital health interventions, etc.) significantly improves treatment outcomes of TB patients. WHO, therefore, recommends the use of a package of treatment adherence interventions in addition to health education and counselling as a means to improve patient adherence to treatment.

The NTP will use a mixture of types of adherence interventions depending on the specific patient situation. These include different combinations of patient education, staff education, material support (e.g., food, financial incentives, transport fees, bonuses for reaching treatment goals), psychological support and counselling. The treatment adherence interventions may also include tracer such as home visits, use of digital health communication (e.g., SMS, telephone calls) or a medication monitor. The interventions will be selected on the basis of the assessment of individual patient's needs, the NTP's financial resources and conditions for implementation in specific locations throughout the country.

### **10.2.3 Ensure TB Infection Control at all health facilities**

The NTP has taken an important step towards improving TB infection control at health care facilities through the development of new comprehensive TB infection control guidelines in 2013. In this strategy, the NTP will ensure that all components of the new TB infection control strategy will be implemented at all health care facilities through the implementation of a comprehensive training programme focusing on TB infection control issues, as well as financial support for the development of individual infection control plans based on the new national policy at all facilities.

### **10.2.4 Ensure adequate management of complications during treatment**

All TB cases receiving first-line TB drugs are principally managed on an ambulatory basis using community based DOT providers. However, a certain percentage of cases will require short-term hospitalization, either due to an initial presentation of the disease in a very advanced form, or due to the development of drug side-effects during treatment. The NTP will adequately link up with referral hospitals for proper care of and management of the side-effects including hospitalizations, if required, to ensure the adequate management of patients requiring hospitalization.

## **10.3 STRATEGIC INTERVENTIONS FOR OBJECTIVE 3**

**Provide MDR/RR TB diagnostic services to at least 75% of the presumptive MDR TB by 2020 and 100% by 2022; successfully treat at least 70 % of the diagnosed MDR patients and improve management of MDR-TB cases through country-wide implementation of the shorter MDR-TB treatment regimen.**

### **10.3.1 Ensure diagnosis of drug resistant TB (DR-TB)**

The new NTP manual clearly describes diagnostic criteria to identify presumptive DR-TB who require screening. Under this strategy, the NTP will ensure that health care providers at all levels are trained in the manual's diagnostic algorithm. Training will be provided as a component of the standard TB training course with inclusion of the recent changes in TB guidelines and diagnosis algorithm. The detection of DR-TB critically depends on access to GeneXpert and drug sensitivity testing. As part of this strategy, the NTP will ensure access to GeneXpert testing for all newly identified DR-TB suspects. The strategy will utilize the network of GeneXpert facilities. In addition, the NTP will ensure DST for all R-resistant cases detected

by GeneXpert through the shipment of sputum samples to the designated supranational reference laboratory.

### **10.3.2 Ensure treatment of MDR/RR TB**

The treatment of MDR-TB cases as per the national policy requires hospitalization during the intensive phase of treatment. The NTP plans the implementation of two additional treatment facilities at the National hospital (HNGV), which will complement of the existing MDR-TB treatment facility at Klibur Domin, to be able to cope with the expected increase of MDR-TB case numbers due to the countrywide implementation of routine GeneXpert testing. It will ensure the uninterrupted supply of second-line drugs according to the revised standard MDR-TB treatment regimen specified in the new NTP manual. After completion of the initial phase, the NTP will ensure close supervision of all MDR-TB patients during ambulatory treatment in the continuation phase through the development of a country wide network of doctors and nurses specifically trained in the management of MDR-TB. All MDR/RR-TB patients will be provided nutrition support package throughout the full course of treatment to improve adherence.

### **10.3.3 Intensive training for all MDR-TB treatment sites for scale up of the shorter regimen**

The country wide implementation of the shorter MDR-TB treatment regimen requires the re-training of all staff involved in MDR-TB management. Under this strategy, the NTP will ensure that staff in all treatment sites will receive adequate training for using the shorter MDR-TB regimen by 2023.

### **10.3.4 Introduce testing for SLD resistance to ensure that all patients with rifampicin resistance detected by Xpert are tested for SLD resistance**

According to WHO's recently updated MDR-TB policy, treatment with the shorter MDR-TB regimen requires the exclusion of resistance to fluoroquinolones in countries in which a high resistance level against this drug category can be expected. Under this strategy, the NTP will ensure that LPA testing for SLD resistance will be made available at the NRL.

### **10.3.5 Ensure adequate infection control for staff involved in MDR-TB activities**

Infection control measures are described in the NTP's Infection Control Guideline. All health care providers will periodically be provided with personal N-95 masks, as a protective measure. All treatment sites will be reviewed on a case-by-case basis and an infection control plan will be developed and implemented at each facility.

### **10.3.6 Ensure adequate management of drug side-effects under MDR/RR TB treatment**

Programme will undertake system strengthening initiatives to improve the management of adverse effects of the treatment. Protocols will be developed in view of the new regimen and disseminated and the concerned health staff will be trained and monitored for the identification and proper management of the ADRs including systematic documentation.

## **10.4 STRATEGIC INTERVENTIONS FOR OBJECTIVE 4**

**Ensure timely and accurate recording and reporting from all (100%) of reporting centres electronically by 2021**

#### **10.4.1 Ensure countrywide implementation of electronic recording/reporting using the DHIS system**

The TB recording and reporting tools revised in accordance with the recent changes in diagnostic and treatment guidelines. Electronic system for case-based recording and reporting system will be developed and introduced across the country. This will enable NTP to improve their monitoring and supervision. This will improve the referral and feedback mechanism. The platform will also facilitate drug logistic management, avoid duplication of work in manual recording and reporting system, faster transmission of data and automation of preparing the reports. In addition, it will facilitate in extending the social support system for the TB patients.

### **10.5 STRATEGIC INTERVENTIONS FOR OBJECTIVE 5**

**Ensure availability of quality TB services, in line with current international standards and provided by qualified personnel at 90% of all facilities by 2020 and 100% of the facilities by 2022**

#### **10.5.1 Comprehensive training**

NTP will impart comprehensive training programmes to train all staff at all levels (using new NTP training modules) in collaboration with INS. The initial training and regular retraining of all staff involved in NTP activities is a key requirement for the successful and quality-controlled implementation of TB control activities. The NTP has developed a comprehensive set of training modules based described in the new NTP Manual. Under this strategy, it will ensure that staff at all facilities will receive intensive training on newly developed training modules. In addition, the regular re-training of all staff will be ensured. E-training modules and knowledge bank will also be developed for imparting the training. Self-administered e-training will be piloted and adapted based on the pilot for scale-up across the country. Staff completing the training successfully will be awarded certificate and incentivized to motivate others to complete the training at the earliest. NTP proposes that every health facility providing services for TB has trained human resources available to ensure that quality TB services are provided to patients.

#### **10.5.2 Enhanced supervision and monitoring**

NTP recognizes the need of the regular supervision of staff at all health care facilities implementing its activities. NSP proposes the training of staff at the central and municipality levels in supervisory requirements based on the new NTP manual and training modules. The plan is proposing budget for transport facilities at all levels, as well as the regular provision of financial support for meal costs and fuel to ensure the conduct of supervision activities in regular intervals as specified in the NTP manual. Accountability at all levels will be strengthened through various onsite checklist and follow ups.

#### **10.5.3 Capacity development of central level staff**

This strategy will include provisions for the regular participation of central level staff at international TB training courses and regular international TB meetings to further develop the managerial capacity of staff at the central level.

#### **10.5.4 Ensure adequate technical support**

Technical support for the interventions proposed in this NSP will be of key importance to ensure their successful implementation. Under this strategy, the NTP will ensure the



continuation of the long-term collaboration with WHO, including the continuation of long-term staff as well as short-term consultants to address specific technical issues. National capacity will be developed and maintained through this technical support.

#### **10.5.5 Ensure coordination of all partners**

The NTP has established successful collaborations with a number of civil society partners involved in TB control. The continuation and further development of these partnerships will be of key importance for the further strengthening of TB control activities in Timor-Leste. Under this strategy, the NTP will ensure the further development of partnership activities through the implementation of regular formal partnership meetings focusing on the evaluation of the TB control situation as well as the discussion of strategic directions for future developments of TB control activities. TB technical working group (TWG) will be key body to ensure the coordination of the partners through regular meetings of the TWG.

#### **10.5.6 Ensure regular programme evaluation**

NTP will continue periodic programme evaluation to ensure that all NTP activities are technically sound and implemented in the most effective way. These include the conduct of a joint monitoring mission every three years, an epidemiological assessment of the TB situation every three years, and the conduct of regular rGLC monitoring missions. NTP also envisages intra-municipalities evaluations for cross-learning of best practices and motivate the key TB staff. In such evaluations, central team along with selected staff of one municipality will visit another municipality in a standardized protocol for programme evaluations. Every district will be covered at-least once in two years. Observations of such evaluations will be discussed in the quarterly meeting for cross-learning and scaling up of best practices.

#### **10.5.7 Ensure sustainability**

In order to ensure the future financial sustainability of the TB control programme, the NTP will engage in intensified discussions with the MoH about possibilities for domestic financing for individual components of the NSP. In addition, the NTP will continue integration within the health systems, enhance collaboration with community and civil societies and garner cross-sectoral support on TB engagement.

## **10.6 STRATEGIC INTERVENTIONS FOR OBJECTIVE 6**

### **Ensure adequate support for operational research to foster innovation**

Ongoing research into TB in Timor-Leste is valued by the MoH and partners, as a driver of the development of strategic programmatic intervention and evidence based responses to the epidemic. Studies such as Catastrophic Cost Study, DHIS survey, DRTB prevalence survey, etc. are being carried out with support from various academic institutions. NTP envisages undertaking research on how to implement the newer interventions and strategies and monitor their impact. It will encourage involving key staff working in TB programme and partners to involve and engage in research activities to improve their knowledge and analytical skills. This will enable them to utilize research findings as evidence based guidance to improve TB programme activities.

The following operational research has been identified which requires further funding:

- Training and capacity building of all stakeholders in operational research

- Different innovative strategies to implement patient support system and DOT
- Drug susceptibility testing pattern of first-line drugs (FLD) and second-line drugs (SLD)
- Testing all TB patients for diabetes and its effect on TB treatment
- Effectiveness of using tuberculin skin test (TST) in under 5 children in high transmission setting
- Extra-pulmonary TB in children – innovations for improved diagnostics
- Sample transport system using innovative new transport mechanisms
- Factors influencing delay in health seeking behaviours
- Feasibility study for new diagnostics and drugs for TB endorsed by WHO.

## **11 BUDGET**

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The NSP has been costed based on the existing programme norms, incorporating the costs for newer activities. The existing activities will be intensified and scale-up in phase-wise manner to achieve the targets. The plan to move towards ending TB in line with End TB strategy essentially requires introducing vulnerability mapping, introducing LTBI management and use of rapid molecular diagnostics including newer regimen. These interventions are to be introduced upon availability of the investments. The expansion of the social protection scheme and food packages for the TB patients including DSTB patients through the Ministry of Solidarity. The budget for 2020 will be the continuation of the existing proposed activities and preparations for the implementation of the NSP. Majority of the activities will be introduced and scaled-up during 2021 to 2023 and the same will be continued in 2024, and hence the budget will be projected accordingly. Objective- and strategic intervention-wise budget summary is given below:

<b>Strategic Intervention wise budget requirements in US\$:</b>						
<b>Particulars</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>TOTAL</b>
<b>Detect at least 80% of incident TB cases (all forms) by 2021 and &gt;90% of incident cases by 2022</b>	<b>1821396</b>	<b>5315919</b>	<b>4861652</b>	<b>4582696</b>	<b>3723275</b>	<b>20304938</b>
Intensified case finding at high load health facilities	0	1260291	1363810	1378386	1393690	5396177
Vulnerability mapping, screening and monitoring	26544	1170755	852647	588955	126494	2765394
Community engagement with active case finding to cover hard to reach area	1400000	1600000	1300000	1200000	800000	6300000
Strengthen involvement of the private sector	968	19051	19103	19158	19216	77496
Intensify advocacy and communication about TB for the general population	13040	249266	249979	250728	251515	1014528
Build HW capacity at CHC and health posts for identification of presumptive TB patients	24188	26595	27924	29320	30786	138814
Ensure screening of case contacts	25365	33764	35152	30610	32140	157031
Ensure implementation of all components of WHO's TB/HIV policy	4251	127835	174260	198727	248783	753854
Strengthening quality diagnosis: microscopy	140615	77307	69289	125988	55251	468450
Ensure access to Xpert MTB/RIF for presumptive MDR-TB and presumptive TB patients among at risk population (PLHIV, Paediatric, DM, contacts etc)	18935	202145	143290	34110	35816	434297
Introduction of a new diagnostic algorithm	90935	98375	134990	151554	156916	632771
Ensure quality diagnosis: children	6346	13118	7330	7696	8081	42570
Strengthen collaboration between the NTP and the RMNCH program	0	5000	5000	5000	5000	20000
Strengthen Collaboration with the National Nutrition Programme to address Malnutrition and Diabetes in TB Patients	0	10000	10000	10000	10000	40000
Strengthen Community Engagement utilizing an integrated approach through Government Health System and Implementing Partners	20663	50362	52330	54397	56567	234320
Address social protection and poverty alleviation issues, as well as other TB determinants	46375	368580	412899	494235	488997	1811086
Ensure that gender issues are adequately addressed in NTP activities	3171	3475	3649	3831	4023	18149

<b>Strategic Intervention wise budget requirements in US\$:</b>						
<b>Particulars</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>TOTAL</b>
<b>Detect at least 80% of incident TB cases (all forms) by 2021 and &gt;90% of incident cases by 2022</b>	<b>1821396</b>	<b>4225795</b>	<b>3777631</b>	<b>3498639</b>	<b>2639180</b>	<b>15962641</b>
Intensified case finding at high load health facilities	0	187986	291505	306081	321385	1106957
Vulnerability mapping, screening and monitoring	26544	1170755	852647	588955	126494	2765394
Community engagement with active case finding to cover hard to reach area	1400000	1600000	1300000	1200000	800000	6300000
Strengthen involvement of the private sector	968	19051	19103	19158	19216	77496
Intensify advocacy and communication about TB for the general population	13040	249266	249979	250728	251515	1014528
Build HW capacity at CHC and health posts for identification of presumptive TB patients	24188	26595	27924	29320	30786	138814
Ensure screening of case contacts	25365	33764	35152	30610	32140	157031
Ensure implementation of all components of WHO's TB/HIV policy	4251	127835	174260	198727	248783	753854
Strengthening quality diagnosis: microscopy	140615	77307	69289	125988	55251	468450
Ensure access to Xpert MTB/RIF for presumptive MDR-TB and presumptive TB patients among at risk population (PLHIV, Paediatric, DM, contacts etc)	18935	202145	143290	34110	35816	434297
Introduction of a new diagnostic algorithm	90935	97693	134274	150803	156127	629832
Ensure quality diagnosis: children	6346	6981	7330	7696	8081	36433
Strengthen collaboration between the NTP and the RMNCH program	0	5000	5000	5000	5000	20000
Strengthen Collaboration with the National Nutrition Programme to address Malnutrition and Diabetes in TB Patients	0	10000	10000	10000	10000	40000
Strengthen Community Engagement utilizing an integrated approach through Government Health System and Implementing Partners	20663	39362	41330	43397	45567	190320
Address social protection and poverty alleviation issues, as well as other TB determinants	46375	368580	412899	494235	488997	1811086
Ensure that gender issues are adequately addressed in NTP activities	3171	3475	3649	3831	4023	18149

Particulars	2020	2021	2022	2023	2024	TOTAL
<b>Ensure successful treatment for 90 % of the enrolled patients (all forms) by 2021, and more than 90% thereafter</b>	<b>155473</b>	<b>358125</b>	<b>312421</b>	<b>256008</b>	<b>224661</b>	<b>1306689</b>
Ensure regular supply of FLD at all treatment facilities	140113	179256	174869	158241	137941	790420
Ensure patient friendly support mechanism using new drug regimens for all cases	8340	72498	70813	69641	58188	279479
Ensure TB Infection Control at all health facilities	0	59000	59000	20000	20000	158000
Ensure adequate management of complications during treatment	7020	47371	7740	8127	8533	78790
<b>Provide MDR/RR TB diagnostic services to at least 75% of the presumptive MDR TB by 2020 and 100% by 2022; successfully treat at least 70 % of the diagnosed MDR patients and improve management of MDR-TB cases through country-wide implementation of the shorter MDR-TB treatment regimen</b>	<b>93738</b>	<b>847758</b>	<b>844812</b>	<b>1004679</b>	<b>1036765</b>	<b>3827752</b>
Ensure diagnosis of Drug Resistance TB (DR-TB) including SLD resistance for all patients with rifampicin resistance detected by Xpert	50926	709887	685097	798342	855261	3099513
Ensure treatment of MDR/RR TB	37619	132185	153743	200067	174919	698533
Intensive training for all MDR-TB treatment sites for scale up of the shorter regimen	880	968	1016	1067	1121	5052
Ensure adequate infection control for staff involved in MDR-TB activities	3813	4194	4404	4624	4855	21891
Ensure adequate management of drug side effects under MDR/RR TB treatment	500	525	551	579	608	2763
<b>Ensure timely and accurate recording and reporting from all (100%) of reporting centers electronically by 2021</b>	<b>27370</b>	<b>318964</b>	<b>166690</b>	<b>217663</b>	<b>268685</b>	<b>999371</b>
Ensure countrywide implementation of electronic recording/reporting using the DHIS system	27370	318964	166690	217663	268685	999371

<b>Particulars</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>TOTAL</b>
<b>Ensure availability of quality TB services, in line with current international standards and provided by qualified personnel at 90% of all facilities by 2020 and 100% of the facilities by 2022</b>	<b>472547</b>	<b>1029520</b>	<b>941760</b>	<b>882903</b>	<b>911938</b>	<b>4238668</b>
Comprehensive Training	0	129648	52500	65000	77500	324648
Enhanced supervision and monitoring	383650	608014	552293	516913	539823	2600693
Capacity development of central level staff	0	8300	8715	9151	9608	35773
Ensure adequate technical support	0	144000	144000	144000	158400	590400
Ensure coordination of all partners	63897	68335	71752	75339	79106	358430
Ensure regular programme evaluation	25000	25000	90000	50000	25000	215000
Ensure sustainability	0	46224	22500	22500	22500	113724
<b>Ensure adequate support for operational research to foster innovation</b>	<b>25000</b>	<b>50000</b>	<b>25000</b>	<b>70000</b>	<b>0</b>	<b>170000</b>
<b>Social Security System</b>	<b>0</b>	<b>5559346</b>	<b>5597499</b>	<b>5188506</b>	<b>5147822</b>	<b>21493173</b>
<b>GRAND TOTAL</b>	<b>2595524</b>	<b>13479632</b>	<b>12749834</b>	<b>12202456</b>	<b>11313145</b>	<b>52340591</b>

<b>Summary of Resource Requirement in US\$</b>							
<b>Particulars</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>TOTAL</b>	<b>%</b>
TOTAL	2595524.14	13479632.29	12749834.16	12202455.60	11313144.91	52340591.10	100%
A. Program activities	2595524.14	7920286.05	7152335.44	7013949.43	6165322.79	30847417.85	59%
B. Social Security System	0.00	5559346.239	5597498.722	5188506.172	5147822.113	21493173.25	41%
<b>A. Program activities</b>							
1.0 Human Resources (HR)	274789.73	1728602.17	1836736.84	1887144.58	1915502.43	7642775.76	15%
2.0 Travel related costs (TRC)	160839.72	1603188.85	1519276.65	1288109.58	830449.14	5401863.93	10%
3.0 External Professional services (EPS)	99312.93	588431.08	450340.13	507344.64	478849.37	2124278.16	4%
4.0 Health Products - Pharmaceutical Products (HPPP)	136910.45	348257.47	399014.10	441654.67	444564.27	1770400.96	3%
5.0 Health Products - Non-Pharmaceuticals (HPNP)	143612.21	354053.75	506961.28	596137.74	635184.25	2235949.23	4%
6.0 Health Products - Equipment (HPE)	69658.00	433056.00	172654.00	185066.00	121850.00	982284.00	2%
7.0 Procurement and Supply-Chain Management costs (PSM)	100594.13	216556.31	283270.76	327530.47	343493.81	1271445.48	2%
8.0 Infrastructure (INF)	0.00	99000.00	99000.00	0.00	0.00	198000.00	0%
9.0 Non-health equipment (NHP)	24389.00	509789.00	81589.00	24389.00	24389.00	664545.00	1%
10.0 Communication Material and Publications (CMP)	12422.30	107904.10	108034.11	79085.81	81240.10	388686.42	1%
11.0 Programme Administration costs (PA)	130620.67	137151.71	144009.29	151209.76	158770.24	721761.67	1%
12.0 Living support to client/ target population (LSCTP)	42375.00	194295.62	251449.28	326277.18	331030.18	1145427.26	2%
13.0 Payment for Results	1400000.00	1600000.00	1300000.00	1200000.00	800000.00	6300000.00	12%
<b>B. Social Security System</b>	0.00	5559346.24	5597498.72	5188506.17	5147822.11	21493173.25	41%



**Projections for the programmatic performance during NSP period**

Particulars	Baseline (program documents & reports)	<b>National Strategic Plan (2020-2024)</b>						
	2018	2020	2021	2022	2023	2024	TOTAL (5 YEARS)	Source / Remarks / Assumptions
Population (in thousand)	1264.139	1304.954	1325.207	1346.075	1367.506	1389.45		<a href="#">Analytical report on population projections Vol 9</a>
Estimated Incidence (including HIV) (number)	6300 (4100-9000)	6368	6202	5718	5177	4516		Global TB Report 2019 & assumptions
Incidence Rate (per 100,000 population)	498 (322-711)	488	468	425	379	325		Global TB Report 2019 & Reduction assumed based on the intensified activities to improve treatment coverage for TB including LTBI with targetted approach for vulnerable population
Estimated % reduction in incidence		2.01%	4.10%	9.24%	10.87%	14.15%		Global TB Report 2019 & assumptions
Total TB Notification	3906	4933	5445	5315	4812	4197	24701	
<b>TB notification (new &amp; relapse)</b>	<b>3782</b>	<b>4776</b>	<b>5272</b>	<b>5146</b>	<b>4659</b>	<b>4064</b>	<b>23917</b>	TB notification actual / expected based on coverage
Case notification rate (in percentage)	60%	75%	85%	90%	90%	90%		Estimated to be achieved
Case notification rate (per 100,000 population)	299.18	366.00	397.80	382.28	340.72	292.50		

% Bacteriologically confirmed cases among Pulmonary TB	55%	60%	65%	75%	80%	80%		<i>Proposed by NTP; Numerator: Bacteriologically confirmed pulmonary TB cases; Denominator: Notified pulmonary TB cases</i>
Pulmonary bacteriologically confirmed	1738	2407	2878	3242	3131	2731	14390	<i>Assumed to reach 80% of pulmonary TB cases to be bacteriologically confirmed cases by end of plan</i>
Pulmonary clinically diagnosed	1421	1605	1550	1081	783	683	5701	<i>Assumed to reduce proportion of clinically diagnosed cases to 25%</i>
Extrapulmonary	623	764	843	823	746	650	3827	<i>Assumed to have 16% EPTB cases</i>
Adults	3464	4299	4692	4528	4054	3495	21067	
Children <15	318	478	580	617	606	569	2850	<i>Assumed to improve paediatric case notification to reach to 14% by end of 2024. Numerator: TB cases &lt;15 years; Denominator: All TB cases (New &amp; relapse); To increase proportion of paediatric cases to 10% in 2020, 11% in 2021, 12% in 2022, 13% in 2023 and 14% in 2024 onwards)</i>
New	3648	4607	5085	4963	4494	3920	23070	
Relapse	149	169	187	182	165	144	847	
<b>DRTB:</b>								
Estimated RR/DRTB among notified TB cases	147	182	201	197	178	155		<i>RR/DRTB rate: Among New patients (~3.3%) &amp; retreatment (~18%) notified TB cases</i>
Estimated to be initiated on treatment	12	55	101	118	160	140	<b>573</b>	<i>Assumed to reach 90% of estimated cases among notified</i>
% coverage among estimated for treatment	8%	30%	50%	60%	90%	90%		

<b>Preventive treatment:</b>								
Coverage for preventive treatment among Children below 5 years (contact of bacteriologically confirmed cases)		85%	90%	95%	100%	100%		
Children below 5 years (contact of bacteriologically confirmed cases)	1193	1673	2119	2519	2561	2233	11105	<i>Assumed to improve coverage to &gt;95% by 2022 with average family size of 5.8 and 0-5 yrs to be 14.1%; Bacteriologically confirmed cases from row number 15*5.8 family size*14.1% proportion of 0-5 years age group among population = provides 0-5 years age group population among bacteriologically confirmed cases families</i>
Household contacts - Adults (contact of bacteriologically confirmed cases)	0	988	2339	3913	4987	7613	19841	<i>Assumed to improve coverage to &gt;70% by end of the plan; Bacteriologically confirmed cases*4.8 (5.8 family size-1 index cases) and less no. of paediatric contacts 14.1%= adult household contacts among index cases; Coverage of 10% in 2020, 20% in 2021, 30% in 2022, 40% in 2023 and 70% in 2024</i>
PLHIV	0	300	300	200	137	157	1094	<i>Assumed to reach 100% of PLHIV under care by 2022; PLHIV on ART 524 (till 2019); Assumed 237 new infections detected with 50% under care ART (2020) and to reach 80% under care till 2024; All under ART care who are not TB patients are to be put on TPT;</i>
<b>TOTAL Preventive treatment (among household contacts and PLHIV)</b>	<b>1193</b>	<b>2961</b>	<b>4758</b>	<b>6631</b>	<b>7685</b>	<b>10004</b>	<b>32039</b>	

Vulnerable population congregate settings	0	200	400	800	1600	3200	6200	<i>Assumed to increase coverage of congregate settings of key population for LTBI</i>
Vulnerable population (mapping, assessment and screening)	0	0	94	4801	8890	11897	25682	<i>Assumed to 5% of population requiring treatment annually among identified vulnerable population (~20% of the total population considering malnutrition, smoking habits and previously treated Tb patients cohort)</i>
<b>TOTAL TPT (among vulnerable population)</b>		<b>200</b>	<b>494</b>	<b>5601</b>	<b>10490</b>	<b>15097</b>	<b>31882</b>	

## 12 SUMMARY

The National Strategic Plan (2020--2024) with four key areas DETECT-TREAT-PREVENT-BUILD intends to set the path for the country to move towards Ending TB and achieve the commitments of the UNHLM targets by 2035.

**DETECT** intends to concentrate on coverage with rapid molecular diagnostics through focusing on case finding at high load health facilities and screening and monitoring of the vulnerable population through systematic mapping and regular follow up through the engagement of the health system staff and community. This component covers and enables access for treatment of TB including DRTB and LTBI.

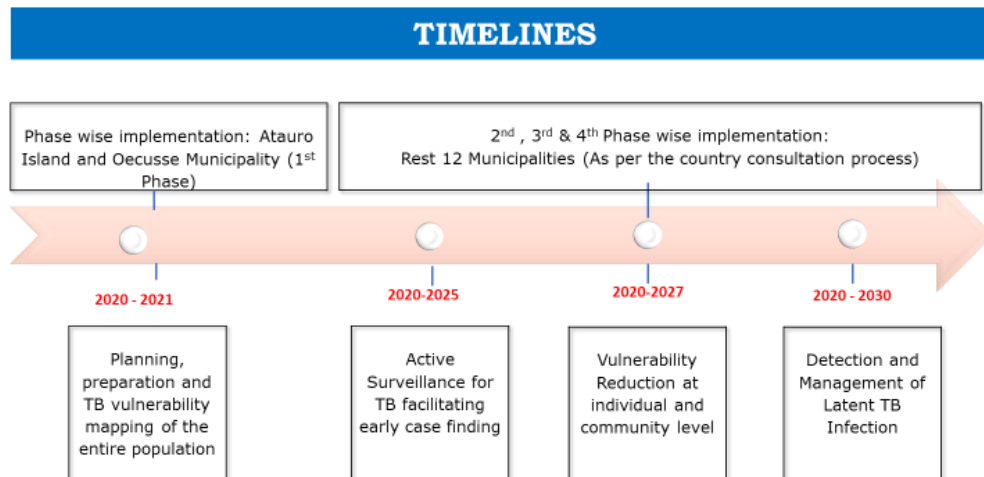
**TREAT** component focuses on 100% coverage of all the notified TB cases to be initiated on treatment at the earliest possible with best possible regimen and extending the DOT component in real sense with patient-centred care with use of IT tools for treatment adherence, appropriate counselling and ensuring social protection through TB Pension for every TB patient including drug-sensitive TB patients.

National Strategic Plan (NSP): Timor-Leste (2020-24)		
AREAS	KEY ACTIVITIES	TARGET AND TIMELINES
DETECT	<ul style="list-style-type: none"> <li>• <b>Intensified Case Finding</b> at high load health facilities</li> <li>• <b>Mapping</b> of major vulnerabilities for TB: Malnutrition, Tobacco, Diabetes, Alcohol, Socio-Economic Determinants etc.</li> <li>• A strategy focusing on <b>diagnosing all TB cases earlier</b> by rapid molecular diagnosis: ACF</li> </ul>	Map: ~ <b>200,000 HH</b> (2021-2024) Case Detection: <b>90%</b> of Estimated TB Cases
TREAT	Treat all TB cases with patient centered care, application of IT tools for Rx adherence, counselling and social protection	90% of detected cases successfully treated (2021-24)
PREVENT	Stop new TB infections: <ul style="list-style-type: none"> <li>• Prevent the emergence of TB in susceptible populations by screening for LTBI and treatment using newer 3HP/ 3RH regimen</li> <li>• Airborne Infection Control in <u>health facilities, and community</u></li> <li>• Community awareness</li> </ul>	~ 32,000 household contacts & ~30,000 vulnerable population ~ 18% to 99% Coverage during 2020 - 2024
BUILD	Build and strengthen supportive systems including enabling policies, empowered institutions and human resources	NTF ↓ PM for ending TB for Multi-Sectoral Coordination (MAF): 2020

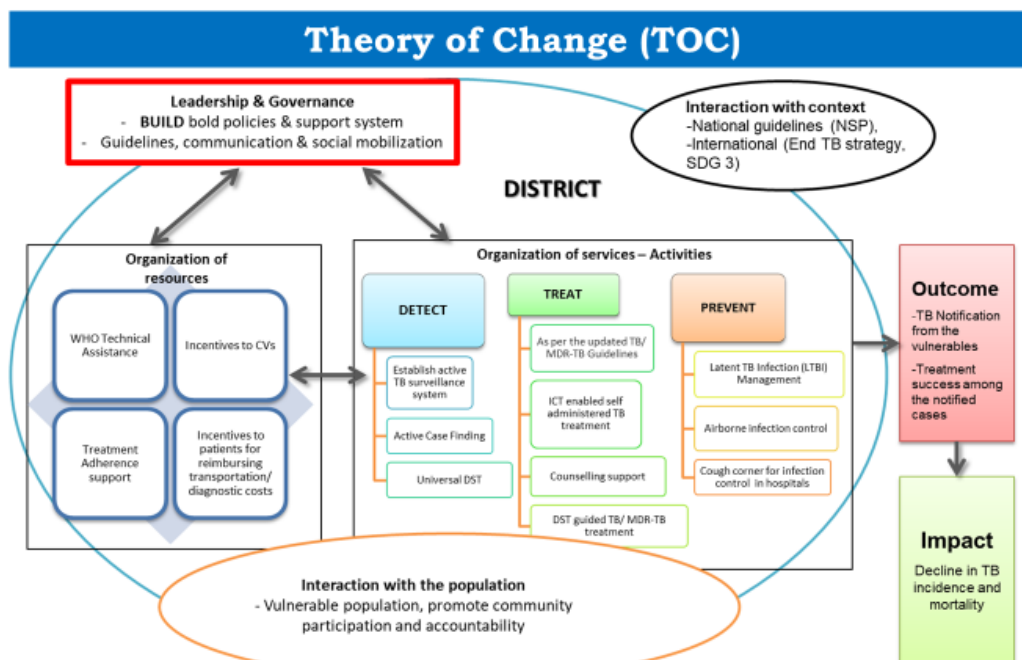
**PREVENT** component intends to prevent emergence of TB with provisions for screening for LTBI and its treatment along with preventing infection transmission through appropriate airborne infection control measures. It also stresses on community education and awareness to ensure that all the eligible population come forward to access the services at the earliest and prevent breakdown of infection to disease.

**BUILD** component has highest political and administrative commitment with formation of the National and Municipality Task Force for Ending TB with multi-sectoral coordination in 2020 and will be driving the country's efforts towards Ending TB. It will bring in accountability of every stakeholder and mobilize the commitment and resources for the cause of TB in the country.

The first two years will build the systems, pilot and demonstrate the strategies and create enabling environment for scaling up the adapted strategies across the country. This will set the tone for moving towards Ending TB with active surveillance helping for early case detection, inter-sectoral coordination for vulnerability reduction at individual and community level with reduction of the pool of infection by actively detecting and managing the latent TB infection starting from household contacts of bacteriologically confirmed cases to at risk population in the community.



Under the leadership, governance and guidance of the National Task Force led by Honorable Prime Minister of Timor-Leste with able and high end technical assistance from WHO country office, country will integrate the resources for impactful and efficient organization of services around three key areas DETECT-TREAT-PREVENT for enabling NTP to improve TB notification from the vulnerable population for appropriate treatment for successful outcome with overall impact in reducing the TB incidence and mortality with zero catastrophic cost.



Source: TOC on Timor-Leste end TB proposal is developed from HSS framework, Olmen et al, ITM, 2012

## 13 ANNEXURE

### 13.1 ANNEXURE 1: WHO MAF – TB BASELINE ASSESSMENT CHECKLIST

<h2 style="color: #0070C0;">WHO MAF -TB baseline assessment checklist</h2> <h3 style="color: #0070C0;">(Timor-Leste: 2019 TB Mid-Term Review)</h3> <p style="color: #C00000; font-weight: bold;">NOT EXHAUSTIVE LIST</p> <p><i>Note: in short explanation/comments box you can note who/what institution is responsible for this element, and also if element needs adaptation, or is not applicable according to national constitutional, legal and/or regulatory frameworks and other relevant factors</i></p>			
I. COMMITMENTS	In place	To be strengthened	Short Explanation/Comments
<p><b>A. Sustainable Development Goals for 2030 (2016--2030)</b>  <i>Target 3.3 to end the tuberculosis (TB) epidemic, and other relevant targets</i></p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>(note which targets/commitments made officially/explicitly at national level)</i></p>
<p><b>B. WHO End TB Strategy (2016--2030/35 and associated World Health Assembly Resolutions) Targets for incidence, deaths reduction and zero catastrophic costs (2030/2035) and milestones (2020, 2025), adapted to national level; End TB pillars and principles applied</b></p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>NSP revision using 'Patient-Centred Approach Framework' is in line with WHO END TB Strategy</i></p>

<p><b>C. Political Declaration of the United Nations General Assembly high-level meeting on Ending AIDS (2016)</b>  <i>2020 90/90/90 targets for TB coverage, TB treatment, and reaching targets for key populations</i></p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>The involvement of Education Ministry needs to be more intensive in providing information and education. Timor-Leste faces the TB risk factors; Malnutrition, alcohol and tobacco usage, especially among young people.</p>
<p><b>D. Moscow Declaration</b> of WHO Global Ministerial Conference on Ending TB (2017) and associated WHA resolution</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<p><b>E. Political Declaration of the United Nations General Assembly High-Level Meeting on TB (2018)</b></p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>The active case finding should be intensified. The involvement of community must be improved in supporting TB case finding. Community must be involved in each step of planning and implementation of activities. The other thing, the health facilities need to apply the patient-centric approach</p>
<p><b>F. National, regional, country group/bloc targets/commitments</b> or other global targets and/or other commitments to TB</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Needs to be in place in the revised NSP</i></p>
<p><b>II. ACTIONS</b></p>	<p>Exists</p>	<p>To be strengthened</p>	<p>Short Explanation/Comments</p>
<p>A. Development, funding and implementation of a national strategic plan (and national and local operational plans) to end (or eliminate) TB with a multisectoral perspective and covering government and partners, consistent with WHO End TB Strategy, other WHO guidance, and UN High-Level Meeting Declaration</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>The initiative to establish the National Task Force (NTF) which consists of high-level people in government and non-government in Timor-Leste is one of the crucial steps that has been taken to bring multi sectors involvement against TB. This step needs to be followed it up with MOU which explain with more detail role and responsible of each sector.</p>



B. Development, establishment and use of a national MAF-TB	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NTF need to have regular meeting to discuss and then commit with the concrete actions that need to be taken in resolving the problems identified
C. Establishment, strengthening or maintenance of a national multisectoral mechanism (e.g., inter-ministerial commission) tasked with providing oversight, coordination and periodic review of the national tuberculosis response	<input type="checkbox"/>	<input checked="" type="checkbox"/>	CCM and TWG could play this role and provide progress information to established NTF
D. Revisions to plans and policies, and associated activities, based on monitoring, reporting and recommendations from reviews	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Needs to be strengthened
E. Engagement of government with civil society, tuberculosis-affected communities and patient groups with activities enabled and undertaken by these groups	<input checked="" type="checkbox"/>	<input type="checkbox"/>	There are many CSOs in Timor-Leste, but only limited number of them is already involved in TB. The community engagement need to be improved
F. Engagement of government with parliamentarians and activities undertaken by them related to TB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Commission F of Parliament sensitized on TB by WHO
G. Engagement of government with the private sector institutions and providers and activities enabled and undertaken by the private sector	<input type="checkbox"/>	<input type="checkbox"/>	NA
H. Delivery of TB prevention, diagnosis, treatment and care services	<input type="checkbox"/>	<input checked="" type="checkbox"/>	All activities that relate with these issues need to be intensified. Multistakeholders need to be involved in supporting the successful intervention
I. Development and enforcement of relevant legislation (e.g., mandatory notification, anti-discrimination, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Based on training result, community mentioned the attitudes of health care providers that related with barrier of TB patients to do seeking care. A clear standard operating

			procedure and follow it up with training for health care worker need to be conducted intensively.
J. Universal health coverage policy – development and implementation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
K. Multisectoral actions on social determinants of TB	<input type="checkbox"/>	<input checked="" type="checkbox"/>	To be strengthened by designing social protection package (Financial Incentives and Food Basket) for the TB patients, and its implementation by relevant ministries
L. Maintenance or strengthening of national health information and vital registration systems	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
M. National TB Research Plan in place and engagement with research institutes, public and private partners	<input type="checkbox"/>	<input type="checkbox"/>	NA
N. Media campaigns and social mobilization	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Based on training result, lack of information in one of the key barriers of care cascade from community and system perspective. The social mobilization and media campaign need to be carried out with local wisdom consideration
O. Special Initiatives towards accelerating to end TB	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The involvement of religious leader could be one of strategy and TL need to bring the TB survivors to voice their needs actively. The peer support group could provide psychosocial support to TB patient and it could be initiated from DR-TB survivors
<b>III. MONITORING AND REPORTING</b>	<b>Exists</b>	<b>To be strengthened</b>	<b>Short Explanation/Comments</b>
A. Routine recording and reporting of TB cases, treatment outcomes and other End TB Strategy indicators via national information system, consistent	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Needs to be strengthened, and country needs to move to TB Digital Database/ DHIS 2

with WHO guidance and that meets WHO quality and coverage standards for TB surveillance			
B. Routine death registration, with coding of causes of death according to international standards, in national vital registration system that meets WHO quality and coverage standards	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
C. National surveys and other special studies	<input type="checkbox"/>	<input checked="" type="checkbox"/>	In training, there were people mentioned about traditional healer as preference for treatment. Timor-Leste needs to conduct a specific study with anthropology approach. The result of this study could be useful in identifying the proper strategy to intervene the community.
D. National TB report (annual), and associated information products customized for particular audiences	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
E. Annual government reporting to WHO on TB	<input type="checkbox"/>	<input checked="" type="checkbox"/>	NA
F. Civil society and NGO reports, and associated products	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Need to have CSO and NGO reports their activities that related with TB

IV. REVIEW	Exists	To be strengthened	Short Explanation/Comments
<p>A. Periodic (e.g., annual) review of the tuberculosis response using a national-level review mechanism (e.g., inter-ministerial commission), with:</p> <ul style="list-style-type: none"> <li>• high-level leadership – preferably under the direction of the head of government or head of state, especially in countries with a high tuberculosis burden</li> <li>• a multisectoral perspective</li> <li>• engagement of key stakeholders including civil society and tuberculosis-affected communities, and parliamentarians, local governments, the private sector, universities, research institutes, professional associations and other constituencies, as appropriate</li> </ul>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Ongoing – Recently concluded 2019 TB Mid-Term Review (MTR). This was the first time that this review was staggered and very comprehensive (or innovative), starting from 5 to 9 August 2019 and then from 16 to 27 September 2019. Besides all components of review, country could get detailed review on PMDT and Laboratory, and Community Engagement, including social-determinants and components. This review is then immediately followed by national consultation to revise national strategic plan (NSP) to end TB by using ‘Patient-centred framework approach’ supported by WHO at all levels.</i></p>
<p>B. Periodic review of the National TB Programme (or equivalent), including independent experts, either specific to TB or as part of health sector reviews</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<p>Needs to be in place</p>

## MAF-TB Roadmap to 2023

