

LAO PDR

Ministry of Health

National Tuberculosis Control Programme

National TB Strategic Plan

Update 2017-2020

January 2017

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Abbreviations

ACSM	Advocacy communication and Social Mobilisation
ADR	Adverse drug reactions
BSL	Bio safety level
CCM	Country Coordinating Mechanism (Global Fund)
CILM	Centre of Infectiology of Laos Christophe Merieux
CHAS	Centre against HIV/ AIDS and STD diseases
DFB	Damien Foundation Belgium
DOTS	Directly Observed Treatment Short Course Strategy
DR-TB	Drug resistant tuberculosis
DTM	District TB manager
EQA	External Quality Assessment (TB microscopy)
4-FDCs	Four drugs Fixed Dose Combination tablets
GDF	The Global Drug Facility
GFATM	The Global Fund to fight AIDS, Tuberculosis and Malaria
GLC	Green Light Committee
ISTC	International Standards for TB cares
IUATLD	International Union Against Tuberculosis and Lung Diseases
KIT	Korean Institute of Tuberculosis
MDR	Multi Drug Resistance
MOH	Ministry of Health
NAAT	Nucleic Acid Amplification test
NCLE	National Centre of Laboratory and Epidemiology
NECHR	National Ethics Committee Health Research
NPS	National (TB) Prevalence Survey
NRL	National (TB) Reference Laboratory
NTC	National TB Centre (Vientiane)
NSP	National (TB) Strategic Plan
PICT	Provider Initiated Counselling & Testing
PMDT	Programmatic Management of Drug Resistant TB
PTB	Pulmonary tuberculosis
PTC	Province TB Coordinator
SLDs	Second Line (anti-TB) Drugs
SOP	Standard Operation Procedures
SRL	Supra National Reference Laboratory
WHO	World Health Organisation
XDR-TB (or XDR)	Extensively drug-resistant TB
Xpert	Xpert MTB/RIF (Cepheid molecular diagnosis test)

1 Executive Summary

The Lao PDR Ministry of Health started to integrate the National TB Program (NTP) in the country primary health care network in 1995 and completed successfully the first population based National TB prevalence survey in 2011 and reached the Millennium Development Goal target (MDG 6 Goal 4), by halving the TB prevalence in 2015 compared to 1990 level.

The National TB Strategic Plan 2017-2020 is in line with the WHO End TB Strategy. End TB has the vision of A WORLD FREE OF TB, zero deaths, disease, and suffering due to TB by 2035, and 35% reduction of TB deaths, 20% reduction in TB incidence and 0% TB-affected families facing catastrophic costs due to TB in 2020.

The Regional Framework for Action on Implementation of the End TB Strategy in the Western Pacific 2016–2020 is recommending:

- 1) A shift in the organization and operations of the national TB programmes (NTP) from service provision to public health approach;
- 2) A focus on equity to ensure all people receive quality care despite disparities due to socioeconomic factors and local epidemics;
- 3) Emphasis on health system strengthening and promotion of multisectoral actions within the context of universal health coverage (UHC) and social protection;
- 4) Universal application to all countries covering the whole spectrum of TB epidemiology; and
- 5) People-centred health care as an approach that consciously adopts the perspectives of individuals, families and communities, and sees them as participants as well as beneficiaries of trusted health systems.

The TB treatment coverage increased from 30% in 2011 to 37% in 2015 and 40% with more than 5000 notified TB cases all forms in 2016. Hence 60% among the tuberculosis patients remain undetected and untreated (40% TB case detection in 2016) continuing suffering a high level of morbidity and death while early diagnosis and treatment is key in preventing the transmission of the disease in the community and particularly to the new generations. High proportion among persons newly tested with HIV positive develop tuberculosis and 7-8% among all TB patients are co-infected by HIV. Higher mortality is observed among TB-HIV patients due to late HIV and TB testing and treatment. NTP started the programmatic management of drug resistant TB (PMDT) in 2011 and initiated shorter 9-month treatment for MDR-TB patients with over 80% treatment success since 2013.

Representative of the Ministry of Health, National programs TB and HIV programs at central level as well as province and district health authorities, civil society, partners and stakeholders discussed main challenges and priorities during the National TB Meeting in Thalad, Vientiane Province (28-30 November 2016). Participants identified the lack of population information and access to health services as important challenges, as well as low diagnosis capacity in district hospitals particularly for children, difficulties to reach high risk groups like elderly, prisoners, miners, migrant and people living in remote areas (ethnic minorities), persons living close to TB patients, delays in starting treatment of TB and MDR-TB.

Decreasing TB incidence by 20% in 2020 as per the End TB strategy targets requires to diagnose and treat both sensitive and resistant tuberculosis in all (public and private) hospitals, to remove geographical and financial access barriers for all TB patients; to engage the local authorities and the communities in recognizing and addressing their local tuberculosis epidemic and to engage other ministries and sectors.

This National TB Strategic Plan 2017-2020 intended for all actors and stakeholders involved in the fight against tuberculosis to serve as a reference and a guide in prioritising their activities for reaching the End TB targets.

1 End TB Strategy

WHO End TB Strategy was approved by the Sixty- seventh World Health Assembly in May 2014 and the Western Pacific Regional Office (WPRO) Regional Plan of implementation was approved by the 2015 Regional Committee Meeting. End TB has the vision of A WORLD FREE OF TB, zero deaths, disease, and suffering due to TB by 2035, starting with reduction of TB deaths 35% and reduction in TB incidence 20% in 2020 (compared to 2015) and 0% TB-affected families facing catastrophic costs due to TB from 2020 onwards.

Goal: End the global TB epidemic

Targets:

	MILESTONES		TARGETS	
	2020	2025	SDG* 2030	END TB 2035
Reduction in number of TB deaths <small>compared with 2015 (%)</small>	35%	75%	90%	95%
Reduction in TB incidence rate <small>compared with 2015 (%)</small>	20%	50%	80%	90%
TB-affected families facing catastrophic costs due to TB (%)	0%	0%	0%	0%

Principles

- Government stewardship and accountability, with monitoring and evaluation
- Strong coalition with civil society organizations and communities
- Protection and promotion of human rights, ethics and equity
- Adaptation of the strategy and targets at country level, with global collaboration

Pillars and components

1. Integrated, patient-centred care and prevention

- Early diagnosis of TB including universal drug susceptibility testing; systematic screening of contacts and high-risk groups
- Treatment of all people with TB including drug-resistant TB, with patient support
- Collaborative TB/HIV activities; and management of co-morbidities
- Preventive treatment of persons at high-risk and vaccination for TB

2. Bold policies and supportive systems

- Political commitment with adequate resources for TB care and prevention
- Engagement of communities, civil society organizations, and public and private care

providers

- c. Universal health coverage policy; and regulatory frameworks for case notification, vital registration, drug quality and rational use, and infection control
- d. Social protection, poverty alleviation and actions on other determinants of TB

3. Intensified research and innovation

- a. Discovery, development and rapid uptake of new tools, interventions, and strategies
- b. Research to optimize implementation and impact, and promote innovations

The first pillar “integrated, patient-centred TB care and prevention” comprises the core TB prevention and cares in the primary health care network (public hospitals) and systematic screening for active TB among high risk groups.

The second pillar “bold policies and supportive systems” is about political commitment, adequate government policies and funding towards universal health coverage, efficient health services, support from all relevant components of the health system to TB control, and social protection. MOH health system reform has assigned provinces to plan and monitor and district to implement quality TB services. Involvement of communities and all care providers is also necessary.

The third pillar on research includes operational researches at country level to improve approaches and interventions for universal access to optimal diagnosis and treatment.

Figure 1: The 3 pillars of the END TB strategy



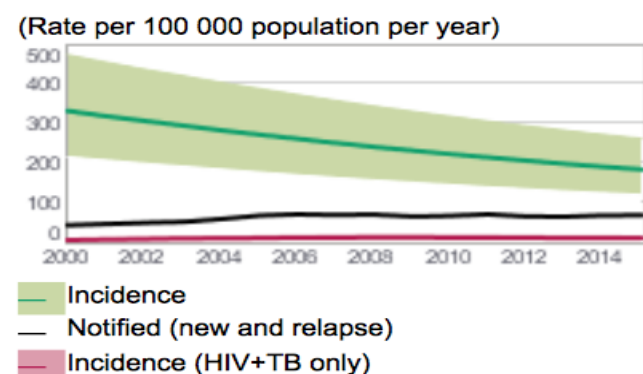
The Western Pacific Regional Office (WPRO)’s STB unit has developed a Regional Framework for Action on implementation of the End TB Strategy that was endorsed by Member States in 66th Regional Committee Meeting in Oct 2015.

The National TB Plan follows the vision of the Lao PDR 8th Health Sector Development Plan (HSDP) in which “investment in health is considered as investment for socio-economic development... By 2020, the government wants to bring the country out of the under-development status; the health sector has to contribute to the target by bringing the health status out of under developing...”. The 8th HSDP will contribute to improve quality of life, promote good living style, and eradicate poverty for reaching the health targets of the 8th National Social Economic Development Plan (NSED 2016-2020).

2 TB Epidemiology

Lao PDR (6.8 M population in 2015) is a high TB burden country. The National TB Program (NTP) started the DOTS strategy in 1995 with the support of WHO and the Damien Foundation Belgium (DFB). Lao PDR has reached the Millennium Development Goal target (MDG 6 Goal 4), by halving the TB prevalence in 2015 compared to 1990 level (Figure 2).

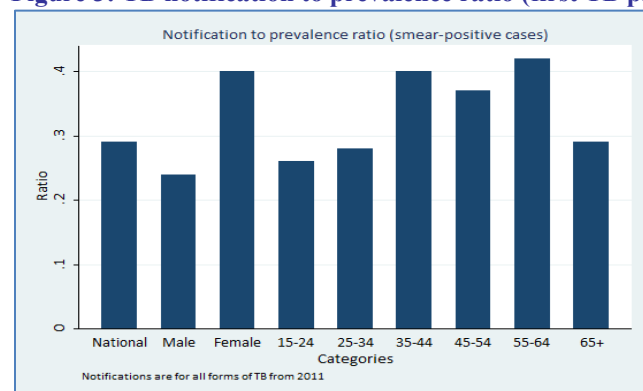
Figure 2: TB incidence in Lao PDR 1990-2015



Source: WHO country profile 2016

After the first National TB prevalence survey (2010-11), WHO re-estimated the prevalence of TB all forms at 540/100,000, 1.9 times higher than in previous estimates. TB prevalence was 2.3 times higher among men, increasing with age, and 1.5 times higher in urban area compared to rural areas and demonstrated also the limitations of diagnosis algorithm using only symptoms and microscopy. Half of the bacteriologically positive TB patients had no symptoms and were identified by chest X-ray and direct sputum smear microscopy detected only 45% of the culture confirmed TB cases. The average National notification to prevalence ratio for smear positive TB cases was estimated below 30%, (men (23%) and women (40%)) (Figure 3)

Figure 3: TB notification to prevalence ratio (first TB prevalence survey 2010-11)



Source: Lao NPS report 2011

The Centre of Infectiology of Laos Christophe Merieux (CILM) identified the first MDR-TB case in 2010 and NTP started the programmatic management of drug resistant TB (PMDT) in 2011. Frequency of multidrug resistance (RR/MDR-TB) is estimated 5.2% (3.1–7.3) among new cases and 28% (25–30) among the retreatment cases (WHO country profile 2015), the first National drug resistance survey will refine the estimates (results expected end 2017).

The GARP Lao report 2015 estimated a low 0.29% HIV prevalence among adults aged 15-49 years in 2014, but increasing from 0.16% in 2003. Sex workers (SW), Men who have Sex with Men (MSM), Transgender (TG), and people who inject drugs (PWID), are most affected. CHAS reported 7,072 cases of HIV (AIDS registry) and estimated 11,958 PLHIV by end of 2015. 3,336 (60.6%) adults and children were under ARV treatment (in 2014). 88% among TB patients all forms had an HIV test result including 7.6% HIV positive (2015). CHAS provided Cotrimoxazole

preventive therapy (CPT) to all TB-HIV patients and antiretroviral treatment (ART) to 80% of the TB-HIV patients (2014) while Isoniazid Preventive Therapy (IPT) is not implemented evenly.

Table 1. TB burden in Lao PDR 2015 (WHO TB country profile 2016)¹

Population 2015		6.8 million	
Estimates of TB burden*, 2015			
	Number (thousands)	Rate (per 100 000 population)	
Mortality (excludes HIV+TB)	3.3 (2–5.1)	49 (29–75)	
Mortality (HIV+TB only)	0.25 (0.14–0.39)	3.6 (2–5.7)	
Incidence (includes HIV+TB)	12 (8–18)	182 (118–260)	
Incidence (HIV+TB only)	0.59 (0.36–0.88)	8.7 (5.3–13)	
Incidence (MDR/RR-TB)**	0.76 (0.39–1.1)	11 (5.7–16)	
Estimated TB incidence by age and sex (thousands)*, 2015			
	0-14 years	> 14 years	Total
Females	0.69 (0.01–1.4)	3.7 (1.1–6.2)	4.4 (1.2–7.5)
Males	1.5 (0.86–2.1)	6.6 (4.4–8.8)	8 (5.2–11)
Total	2.1 (1.4–2.9)	10 (7.4–13)	12 (8–18)
TB case notifications, 2015			
Total cases notified	4 638		
Total new and relapse	4 534		
- % tested with rapid diagnostics at time of diagnosis	37%		
- % with known HIV status	90%		
- % pulmonary	91%		
- % bacteriologically confirmed among pulmonary	85%		
Universal health coverage and social protection			
TB treatment coverage (notified/estimated incidence), 2015	37% (26–57)		
TB patients facing catastrophic total costs			
TB case fatality ratio (estimated mortality/estimated incidence), 2015	0.3 (0.16–0.52)		
TB/HIV care in new and relapse TB patients, 2015			
	Number	(%)	
Patients with known HIV-status who are HIV-positive	310	8%	
- on antiretroviral therapy			
Drug-resistant TB care, 2015			
	New cases	Previously treated cases	Total number***
Estimated MDR/RR-TB cases among notified pulmonary TB cases			280 (190–360)
Estimated % of TB cases with MDR/RR-TB	5.2% (3.1–7.3)	28% (25–30)	
% notified tested for rifampicin resistance	36%	40%	1 689
MDR/RR-TB cases tested for resistance to second-line drugs	14		
Laboratory-confirmed cases	MDR/RR-TB: 33, XDR-TB: 0		
Patients started on treatment ****	MDR/RR-TB: 33, XDR-TB: 0		

¹ <http://www.who.int/tb/country/data/profiles/en/>

3 TB programme achievements, issues

The National TB Program (NTP) started in 1995 and integrated TB control services in 5 central, 18 provincial and 142 district public hospitals and in 912 of 954 (95%) health centres. 160 basic TB units in central, province and district hospitals perform quality assured microscopy laboratory and can treat TB patients. Nearly all health centres (village level) have been trained to identify TB symptoms and to collect and send sputum specimens to district TB laboratories.

3.1 TB diagnosis

Achievements

- NTP is scaling-up rapid molecular testing (Xpert MTB/RIF®, Cepheid) since end of 2013 to 13 sites in 12 provinces (2016). The Centre of Infectiology of Laos Christophe Merieux (CILM) can test resistance to second line TB drugs (quinolones and injectable) by rapid molecular method (LPA).
- The National TB Reference Laboratory (NRL) is testing all presumptive drug resistant TB patients by Xpert MTB/RIF (2013). NRL can also perform phenotypic drug sensitivity testing (DST) for first line drugs and quinolones and second line injectable drugs (2015). The CILM can test by LPA (sputum and culture) the resistance to Isoniazid and Rifampicin and second line drugs (Hain Genotype MTBDR sl) while the Korean Institute of Tuberculosis (KIT) performs full phenotypic drug sensitivity testing
- 37,066 presumptive TB patients² had a bacteriology examination in 2015 and 4,638 TB cases all forms started a TB treatment. More than 5000 TB cases are expected in 2016 (Q3 projection). The high proportion (77%) of bacteriologically positive TB cases reflects a relatively low capacity for clinical diagnosis of TB especially among children (table 2). Central and provincial hospitals and few district hospitals only can use and read properly chest X-rays for TB diagnosis.

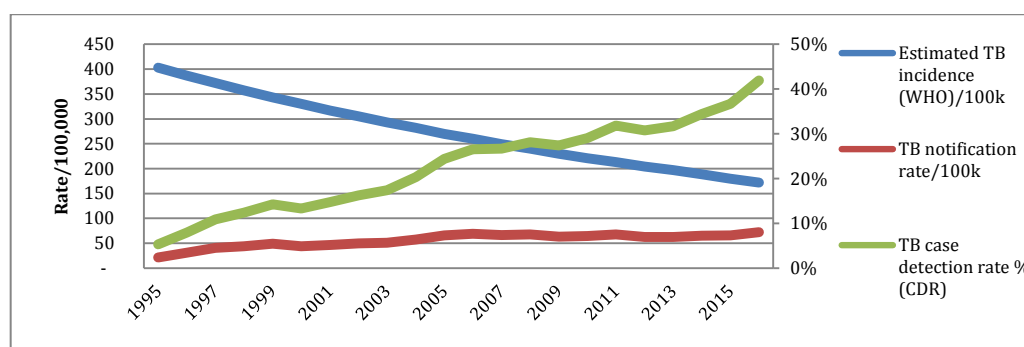
Table 2: TB notification 2015-16

Year	Presumptive TB screened by TB lab.	Xpert testing (% coverage)	New and relapse Bacterio+ PTB	Clinical PTB	Extra-Pulmonary TB	Total with retreatment & "others"
2015	37,066	12,703 (34%)	3,503 (77%)	625 (14%)	406 (9%)	4,638
2016*	39,489	18,338 (46%)	3,740 (74%)	856 (17%)	426 (8%)	5,218

Source NTC data, *2016 3 quarters projection

- The TB treatment coverage increased since 1995, stagnated between 2006 and 2010 and increased from 30% in 2011 to 37% in 2015³ and is expected to pass 40% in 2016 (Figure 4).

Figure 4 Progress in TB treatment coverage (≈ case detection rate) Laos, 1995-2016



Source: NTC: *2016 Q3 projection

² TB services referred 58% of the presumptive TB patients (9.1% positive), HIV services 1.8% (3.4% positive), MCH 0.3% (3.1% positive), private clinics and pharmacies 2.1% (18% positive), health centres 26% (7% positive), prisons 0.8% (15.5% positive), community organisations 2.9% (7.7% positive), household contact tracing 0.8% (3.6% positive) and OPDs and mobile camps 7.3% (6.8% positive).

³ TB notification rate vs. estimated incidence rate, TB cases all forms, WHO country profile 2015

- Since mid 2015, NTC mobile teams examined 18,435 persons in 3 prisons and 27 districts; 5640 (32%) patients with TB symptoms and/or chest X-ray suggestive of TB were tested by Xpert, 434 (8%) were bacteriology positive (350 new patients) and 111 patients were diagnosed with clinical TB.
- During the National TB meeting (28-30 Nov-16), NTP and partners identified issues and proposed priority interventions for increasing TB detection:

Issues

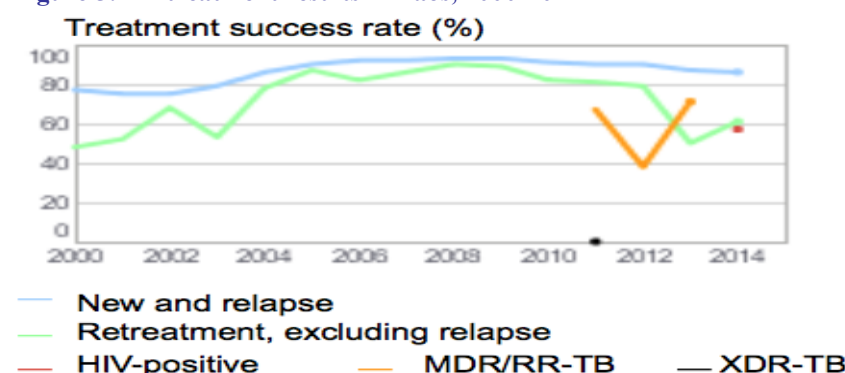
- o Lack of information on TB disease and TB treatment in the population
- o Low TB diagnosis capacity at district level.
- o Barriers in accessing elderly, workers, miners, migrant and ethnic groups.
- o Lack or under-use of budget for transportation of specimens
- o No systematic screening among household contacts of TB patients,
- o Limited diagnosis capacity and preventive therapy of TB in children
- o Need to establish TB committees at national and province/district levels
- o Limited collaboration with HIV programme, other health programmes and other sectors
- o Limited support for transportation and incentives for TB staff

3.2 Management of TB patients

Achievements

- New TB patients (Rifampicin sensitive) receive 2RHZE/4RH (category 1), re-treatment cases Rifampicin sensitive receive 2SRHZE/6RHZE (category 2) while RR/MDR-TB cases are treated with an adapted second line drugs regimen.
- Close to 90% new smear positive TB complete treatment successfully since 2005 (figure 5), while the rate is lower among retreatment cases. However above 5% among treated TB patients die while under treatment more particularly among clinically diagnosed pulmonary TB and extra pulmonary TB, possibly correlated with a higher HIV co infection rate in those groups of patients.

Figure 5: TB treatment results in Laos, 2000-2014



Source: NTC

Issues:

- Delays in starting treatment of TB and MDR TB patients due to delays in transporting specimens to laboratories, incomplete coverage of Xpert testing and low clinical diagnosis capacity in districts.

3.3 MDR-TB

Achievements

- MDR-TB patient receive financial support during the whole treatment.

- NTP started a shorter 9-month MDR treatment regimen in 2013⁴ that provides better treatment outcomes (>80% treatment success in 2015 cohort, table 3).

Table 3: MDR-TB treatment results in Laos 2011-2015

MDR-TB Lao PDR	2011	2012	2013	2014	2015
Diagnosed RR/MDR	8	18	13	27	38
Died before treatment	3	1	1		1
Other treatment	1	2	1		
Refused treatment			3	2	3
No drug resistance		2	1		
Transferred out				1	2
Started on MDR treatment	4	13	7	24	32
Cured	3	6	5	18	25
Complete					2
Died	1	5	1	5	2
Lost of F-U		2	1	1	3
On treatment					
<i>Treatment success rate</i>	<i>75%</i>	<i>46%</i>	<i>71.4%</i>	<i>75%</i>	<i>84%</i>

Source: NTC and MDR-TB treatment centre, Setthathirath Hospital, Vientiane (Oct. 16)

- 2016 GLC monitoring mission recommended giving high priority to the implementation of the End TB strategy, assign sufficient human resources to PMDT, make an optimal use of Xpert and plan the use of second line LPA tests, ensure full enrolment on treatment using patient centred cares, switch to programmatic implementation of the shorter 9 month regimen (from operational research), collaborate with HIV programme to address HIV as a risk factor, aiming at early diagnosis and treatment of HIV infection; and access to new drugs for TB patients with additional drug resistance.

3.4 TB-HIV

Achievements

- HIV epidemic is estimated low in the general population but increasing in high risk groups. However frequency of TB is very high among newly diagnosed HIV patients, Data collected by joint teams in the 10 ART centres of the country show an average 20% of TB diagnosed among the new HIV positive patients (reference), possibly reflecting generally late diagnosis and treatment of HIV infection. 76% among TB patients all forms had an HIV test result in 2014 and 88% in 2015 (Figure 4). 7.6% were HIV positive in 2014 and 2015.
- CHAS provided CPT to all TB-HIV patients and ART to 211/266 (80%) TB-HIV patients in 2014. 80% among TB-HIV patients received ART in 2014 while IPT is unevenly implemented.

Issues:

- o Higher mortality among TB-HIV patients due to late HIV and TB testing and treatment.
- o Limited coordination between nr two programmes and implementation of the TB-HIV activities in some provinces
- o The 3 “Is” are implemented in some ART centres only.
- o Patients receive TB drugs and ART from different units (not patient centred)
- o Some TB-HIV patients do not receive ART or start after too long delay.

⁴ Van Deun A, Maug A K J, Hamid Salim M A, Das P K, Sarker M R, Daru P, Rieder H L. Short, highly effective and inexpensive standardized treatment of multidrug-resistant tuberculosis. Am J Respir Crit Care Med. 2010 Sep 1;182(5):684-92

3.5 Engagement of all health care providers and collaboration with other sectors

Achievements

- Engaging all physicians and health staffs (OPDs, medical departments of public and private hospitals) is key in reaching TB detection and treatment targets country wide
- NTC and Soutien Pneumologique International (SPI), and association of volunteer French pulmonologists, conduct training on lung diseases and the Practical Approach on Lung Health (PAL) for physicians of TB wards, OPDs and infectious diseases hospital wards each year for improving diagnosis and care of respiratory diseases including TB.
- Population Services International (PSI) and NTP trained franchised private clinics in diagnosis and treatment of tuberculosis and follow-up of TB patients (starting in 2008). 175 franchised Sun Quality Health (SQH) clinics referred 1412 (4%) TB suspects for sputum examination in 2013, 1096 (3.1%) in 2014 and 793 (2.1%) in 2015
- TB programme is under the MoH Department of Communicable Diseases Control (DCDC) and has links with with other MoH departments like EPI, RMNCH, military, police at central level and within Province Health Offices and District Health Offices.

Issues

- TB is not considered as one of MOH priorities;
- PAL is not ruled out systematically;
- OPDs have limited capacity and no SOP in TB triage;

3.6 Advocacy, Communication and Social Mobilisation (ACSM)

Achievements

- 71% among interviewees in KAP survey (2010) knew about TB disease, but only 27% of TB patients went to see the doctors for consultation and getting correct treatment, and 73% went to consult other practitioners. Only 43% got free TB treatment at provincial and district hospitals and 57% got incorrect treatment from pharmacist, traditional healer, private clinics, village health workers and village health volunteers. Albeit TB knowledge is high, practices or behaviours were often incorrect. This may be due to the dis-satisfaction of patients: only 45% were satisfied by the services given by health personnel in the provincial and district hospitals and patients have often to pay when they come to get treatment or services.
- IEC messages are broadcasted at central and province level through different media TV, radio spot, newspapers, posters, mobile team for all provinces.
- Community based organisations (CBOs) and volunteers use local loud speakers in villages as well as billboards, posters, leaflets, and education campaign by community based partners, IEC in schools for teachers and students.

Issues:

- o ACSM does not cover remote areas and minorities,
- o The frequency of TV and radio spots is limited and TB information is not reaching all population due to language barriers,
- o Quantity and quality of IEC material is limited,
- o IEC material and messages need to be reviewed by MoH/NTC.
- o Participation of Ministry of information and culture, and Ministry of Education is limited;

3.7 Monitoring and supervision

Achievements

- NTC central supervisors visit the provinces 2-3 times a year, province TB co-ordinators (PTC) visit the districts and health centres quarterly and district TB managers (DTM) visit the health centres quarterly.
- The NRL trains/retrains the laboratory technicians at all levels and supervise the scaling-up of GeneXpert in provincial laboratories
- NTC administration and finance team trains province and district staffs on programme management, administration and accounting.

- NTC M&E unit is still using a paper based TB information system as official supporting documents for official reporting. Districts send quarterly reports that are aggregated at province level and sent to central level.
- Since 2015, NTC statistical unit is scaling-up a country wide electronic TB information system (all provinces and 50% of the districts are accessing and reporting in the web based TB information system in 2016). NTC is collaborating with MoH Health Information System and Health System Strengthening (HSS) project in integrating the TB information system into the DHIS 2 system to enter TB data directly in the system at district level.
- NTC holds a National TB meeting every two years with province health directors and province TB coordinators. Provinces organise a yearly review and planning workshop with all districts each year to review TB programme implementation.
- NTP and partners have conducted a KAP survey on tuberculosis (2010), the first National TB prevalence survey (2010-2011) and the first external TB review (2013) and the first DRS is currently on going (2016).

Issues:

- o TB information system remains paper based system
- o Limited number of districts have the capacity to report electronic data in web based TB information system (2016)
- o Need to switch to integrated HMIS at district level (DHIS2)

3.8 Procurement, logistics and funding

Achievements

- TB drugs (first and second line) procured through the Global Drug Facility (GDF) until 2017. NTC and PR procurement unit prepare the TB drugs orders in collaboration with the Clinton Health Access Initiatives (CHAI).
- TB drugs and laboratory tests and consumables are stored in the Medical Products Supply Centre (MPSC, Vientiane Capital) and managed with M-Supply.
- The Global Fund (GF) supported the TB programme since 2003 through successive grants: LAO-202-G03-T (Oct.03-Sep.08), LAO 405-G05-T (Oct. 05-Sep.10), LAO 708-G08-T (Oct. 08-Sep. 13) and LAO-T-GFMOH (Oct 11- Dec. 16) and with the first NFM grant (Jul. 15-Dec. 17) (Table 4).

Table 4: GF support to Lao PDR TB programme 2003-2017

GF grant no.	202-G03-T	405-G05-T	708-G08-T	LAO-T-GFMOH (SSF)	LAO-T-GFMOH (NFM)	Total
2003-04	906108					906108
2004-05	618230					618230
2005-06	757041	595460				1352501
2006-07	645194	580366				1225560
2007-08	603818	658831	2288144			3550793
2008-09	-	837216	2080102			2917318
2010-11	-	920830	2181751			3102581
2012	-	-	1821999	1570519		3392518
2013	-	-	1592597	1685480		3278077
2014				3397709		3397709
2015				796565	2250449	3047014
2016				-	3015208	3015208
2017					1973533	1973533

- Government contributed 20% of the amount of last GF grant and committed additional investment in health as part of the “willingness to pay” GF scheme.
- MoH is the principal recipient of the Global Fund grants while the National TB Centre (NTC), Population Service International (PSI), the Lao Positive Health Association (LaoPHA), Promotion Education Development Association (PEDA) are sub recipient.

- NTC coordinates the activities of 3 the Centre of Infectiology Merieux Laboratory (CIML) and two community based organisations (CBOs): Lao Youth Union (LYU) and the Mutual Assistance for Attapeu People (MAAP).

Issues:

- Scaling up TB case detection capacity with modern diagnosis tools and treatment coverage will require continuous high investment in molecular testing, chest x-ray capacity development and standard quality TB drugs over the coming years for reaching 70% case detection rate (now called treatment coverage) of the revised NSP 2017-20. (Figure 6 in Chapter 5, NSP costing)
M-supply is being piloted in some provinces; therefore, timely reporting is still a challenge for effective PSM

4 National TB Strategic Plan 2017-2020 Priorities and Main Interventions

The National TB Action Plan 2017-2020 is in line with the WHO post 2015 END TB strategy.

The Regional Framework for Action on Implementation of the End TB Strategy in the Western Pacific 2016–2020 is recommending:

- 1) A shift in the organization and operations of the national TB programmes (NTP) from service provision to public health approach;
- 2) A focus on equity to ensure all people receive quality care despite disparities due to socioeconomic factors and local epidemics;
- 3) Emphasis on health system strengthening and promotion of multisectoral actions within the context of universal health coverage (UHC) and social protection;
- 4) Universal application to all countries covering the whole spectrum of TB epidemiology; and
- 5) People-centred health care as an approach that consciously adopts the perspectives of individuals, families and communities, and sees them as participants as well as beneficiaries of trusted health systems.

Vision: Lao PDR free of tuberculosis – zero deaths, disease and suffering due to tuberculosis.

Goal: To reduce the burden of tuberculosis and to reach the targets of the End TB Strategy

Impact indicators by 2020:

- **35% reduction in Number of TB deaths compared with 2015**
- **20% reduction in TB incidence rate to 146/100,000 compared with 2015 % (182/100,000)**
- **0 TB affected families facing catastrophic costs due to TB**

TB incidence will be re-estimated after the second TB prevalence survey in 2019

Objectives: as per the three pillar of the END TB strategy

1. Integrated, patient-centred care and prevention
2. Bold policies and supportive system
3. Operational research

Objective 1: Integrated patient centred care and prevention

Estimated 60% among the tuberculosis patients remain undetected and untreated (40% TB case detection in 2016) continuing suffering a high level of morbidity and death and transmitting the disease in the community.

The first objective of the TB programme is to accelerate the decline in TB incidence (by 20% in 2020) by increasing early diagnosis and appropriate treatment of tuberculosis and multi drug resistant tuberculosis in all health facilities of the primary health care network; reducing geographical and financial access barriers for TB patients; engaging all physicians and other health workers in all public hospitals and health centres and in private sector and continuing active case finding in prioritised high risk groups like persons living with HIV, household contact persons of TB patients, prisoners, miners, factory workers, other congregate settings and patients with comorbidities (diabetes).

Outcome indicators by 2020

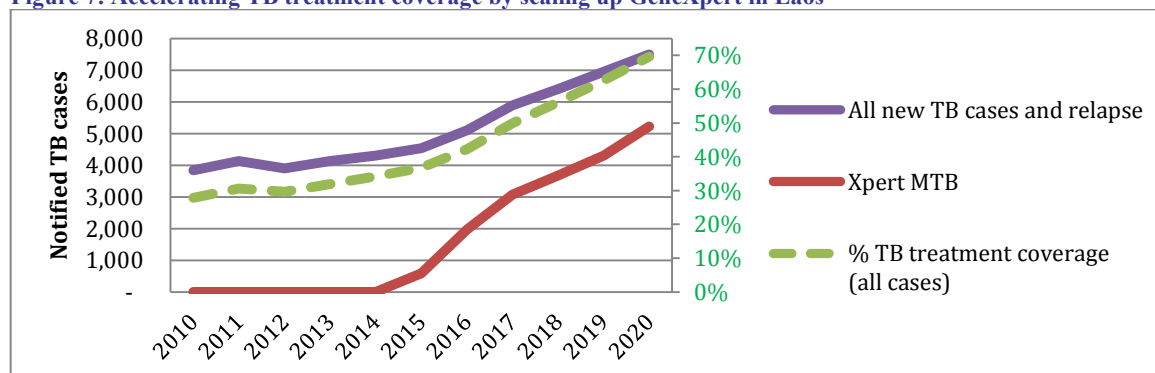
- (1) 70% TB treatment coverage (notified/estimated incidence of TB all forms new and relapse), from baseline 37% (26–57) in 2015 (table 5 and epidemiological assumptions for NSP 2017-20 in Annex 1)
- (ii) Xpert testing for all presumptive TB/MDR-TB patients (100%) at their first contact with health system
- (iii) Enrolling all 100% of TB and MDR-TB patients on adequate treatment.

Table 5: Targets for TB case detection, 2017-2020 (update Oct.-16)

	2015	2016	2017	2018	2019	2020
Population (X1000)	6,781,127	6,896,406	7,013,645	7,132,877	7,254,136	7,377,456
Estimated TB incidence /100,000 (a)	182	175	168	160	153	146
No. of patients screened	37,066	39,500	41,000	42,000	43,000	44,000
Bacteriology positive pulmonary TB	3,505	3,942	4,436	4,708	4,997	5,401
rate/100,000	51.7	57.2	63.3	66.0	68.9	73.2
Clinically diagnosed pulmonary TB	622	750	1000	1200	1400	1500
Extra pulmonary TB	409	407	450	500	550	600
Total (new and relapse)	4,536	5,099	5,886	6,408	6,947	7,501
Notification rate/100,000 (b)	66.9	73.9	83.9	89.8	95.8	101.7
treatment coverage (=b/a)	37%	42%	50%	56%	63%	70%

Source NTC, see epidemiological assumptions for NSP 2017-20 in Annex 1

Figure 7: Accelerating TB treatment coverage by scaling up GeneXpert in Laos



1.1 Early diagnosis of TB and MDR-TB

Priorities (National TB Meeting 28-30 Nov. 16)

- Providing GeneXpert and Chest X-ray in all provinces, districts that have high TB prevalence, together with health staff capacity building
- Providing microscopy/sputum test and appointed staff at health centre in remote and rural areas
- Building provincial capacity for ACF teams
- Ensuring TB contacts/families receive screening services or ACF
- Collecting data of high risk children: malnourished, chronic fever, chronic respiratory infection, close contacts of TB patients, backbone/spine deformation, inflammatory gland/lymph nodes/muscle/ chronic bone inflammation, meningitis, etc.
- Screening mobile population and migrant people for TB
- Building capacity for village heads or VHV/VHW for health education in communities to encourage presumptive TB persons accessing services and support TB cases (telephone cards coordinating with health centres and DTM)

- Setting-up mobile team for health education campaign, increasing budget for IEC materials in province and villages to reach out remote/rural areas
- Developing guideline and flip chart, adapted SOP for training at all health service levels: provincial, district and health centres
- Informing all levels of authorities about TB situation through formal/official letter
- Including TB patients costs for diagnosis and treatment in National Health Insurance system minimum package
- MOH prioritising TB in epidemic disease control; each province must submit a plan and budget to fight TB to MOH and to National Assembly
- Establishing committee and a responsible officer for TB in all hospital units/wards, OPD, IPD, MCH, Paediatric and EPI, etc., all levels of authorities, mass organizations, civil society organizations to screen for TB
- Responsible officer at district level should encourage private clinics and incentives to partners for screening TB and referring to testing
- Giving roles and responsibility for paediatric sections and incentive for those responsible officers, setting up targets for TB notification
- Selecting VHV/VHW who are Village committee members for respectfulness by villagers.
- Setting up surveillance network at village levels (village head, VHV/VHW...)
- Setting up surveillance for mobile population and migrants from other countries
- Expanding PAL into TB services at all districts
- Refresher training for TB focal points and lab technicians at least once a year (including paediatricians)
- Sending officers to study MDR TB for understanding causes of MDR TB and finding solutions and prevention methods
- Continue field supervision at all levels on a regular basis
- Giving incentives to VHV/VHW for sending sputum samples to health centers and districts and transportation fees for less than 50 KM distance

Main interventions

- Organise transport of sputum specimens from all TB units (including district and military hospitals) to GeneXpert laboratories
- Equip selected high TB burden district hospitals with digital chest X-ray and Xpert (new portable GeneXpert Omni system) for screening all presumptive TB patients at free of cost
- Train all physicians and nurses in TB wards, OPD, IPD, medical departments/services of all public and private hospitals (central, province and district level) on diagnosis of TB and chest X-ray reading
- Ensure that all retreatment TB cases and all other presumptive DR patients are tested for resistance to Rifampicin by Xpert
- Diagnose and treat TB in children by paediatricians and physicians in hospitals at all levels through training and supervision conducted jointly by NTP and paediatricians
- Train/retrain HCs nurses, village health volunteers (VHV) and village health workers (VHW), private clinics and private pharmacists on identification and referral of presumptive TB patients as well as on contact tracing and TB patient follow-up and support
- Train and set up Practical Approach on Lung Health (PAL) in all provinces to improve the diagnosis and management of pulmonary tuberculosis and other respiratory diseases (asthma, bronchitis, pneumonia, COPD).
- Increase the number of private franchised Sun Health Quality (SHQ) clinics and pharmacies identifying and referring presumptive TB patients.
- Engage mine companies and other large companies (e.g. garment factories)

- Screen high-risk groups for TB: persons living with HIV, TB contacts, prisons, poor, migrants, mothers attending ANC, patients with co-morbidities like diabetes.
- Train Village Health Committee (VHC), HC, village authority, VHV in activities for increasing TB case detection
- Maintain quality assured TB laboratory in collaboration with the supra national reference laboratory (SRL) for SOPs, quality assurance of culture (panel testing and on-site visits), sending of MDR-TB patients specimens for full DST in KIT (Seoul, Korea)
- NRL to train regional/provincial lab to supervise/support peripheral TB laboratories at all levels who need the support the most;
- Update laboratory guidelines and SOPs including infection prevention and control (IPC)

1.2 Treatment management of TB and MDR-TB

Priorities (National TB Meeting 28-30 Nov. 16)

- Developing legal decrees and measures for all TB/MDR-TB patients to receive and complete the treatment and for patients' close contact persons to be screened for TB
- Having supportive policy for poor and disadvantaged people for hospital admission
- Effective health education (both patients and family prior to the treatment)/(standardizing IEC for all levels)
- Incentives for DOT managers (districts, prisoner's authorities, health center, village heads, VHV/VHW) to ensure the completion course of TB treatment
- When patients don't receive treatment, village heads or responsible authorities/concerned officers for TB reach out the patients and coordinate and facilitate the outreach team
- Setting up patient data collection system such as, address, telephone number, family members'
- Improving services and motivations of health staff corresponding to promotion, certificates and measures
- Construction for TB/MDR-TB patients and laboratory buildings (special zone)
- Cooperating with neighbouring countries for cross border disease control

Main interventions

- Enrol on treatment 100% of TB and MDR-TB patients under adequate TB regimen (after testing for resistance) with quality assured TB drugs and patient social support
- Provide isoniazid preventive therapy (IPT) to children under 5 and persons living with HIV (adult and children) and who have no TB symptoms.
- Supply WHO pre-qualified first and second line TB drugs without interruption
- Prepare FDD registration of New TB drugs (Bedaquilin and Delamanid)
- Support 100% RR/MDR-TB patients for transportation, lodging, food, follow-up culture examinations and prevention and management of adverse drug reactions (ADR).
- Ensure infection control: administrative, environmental and personnel protection (surgical masks to patients and N95 masks to personnel)
- Train/retrain all physicians on PMDT and infection prevention and control (IPC)
- Provide annual medical check-up to health personnel;
- Report adverse drug reactions (ADR) to the Food and Drug Department (FDD).
- Increase the bed capacity for treating MDR-TB (central and province levels)
- Provide ICU equipment and consumables in the MDR-TB treatment centre
- NTC to follow-up the continuation phase at SLDs treatment at provincial level

1.3 Collaborative TB/HIV activities

Priorities (National TB Meeting 28-30 Nov. 16)

- Revising TB/HIV committee' s roles and responsibility (Central to district)

- Emphasizing on educating drug resistant patients and TB/HIV patients to be aware and pay attention to prevent disease spread to others
- Coordination between TB and HIV focal points or HIV-TB must take initiative and responsibility together including recording and reporting so that all levels have the same data and routine data/information exchange
- Updating guideline to be correspondent defining clear roles and responsibilities fro (NTC and CHAS) at all levels
- Defining clear responsibilities for responsible officers (corresponding to competition, promotion and measures)
- Quarterly meeting or semi annual meeting to be routine to sharing experience and lessons learned in each province

Main interventions

- Strengthen TB-HIV collaborative activities
- Screen all persons living with HIV for TB in ART centres and provide Isoniazid preventive therapy (IPT) to persons with no TB symptoms (implemented by CHAS)
- Provide HIV counselling and testing to all TB patients
- Provide early ART to all TB-HIV patients in collaboration with the National TB program and the National AIDS program

Objective 2: Bold policies and supportive systems

Objective 2 interventions aim at improving the management of TB programme as part of the health system strengthening framework, including human resources, training and supervision, logistic and integrated district based Health Information System (DIHS2) for data management, reporting and for local data analysis.

Objective 2 Priorities (identified by partners during the National TB Meeting 28-30 Nov. 16)

- Prioritizing TB as National public health issue
- Integrating the Three Is into the MOH sector wide strategy in all health care settings at all levels;
- Integrating TB into DHIS2 system together with staff recruitment, training and maintenance
- Standardising programme management based on the results/outcomes of the implementation
- Open an Hot Line for TB notification
- Assigning staff as per title and roles (adequate numbers, knowledge, capacity, motivation and key responsibility) and train persons for replacement
- Replacement staff should be 3 generations: (senior, middle and young based on titles)
- Involving public, private and civil organizations (PPM)
- Public investment for TB control (prevention, treatment and care)
- Monitoring and supervision of NTP partners activities
- National Health Insurance Funding should cover TB (diagnosis and treatment)
- Financial allocation should be used in accountable, efficient and timely manner (for Monitoring and Evaluation)
- Mobilizing funding externally to support essential activities and filling gaps
- Conducting second TB prevalence survey.

Indicators

- Revised National TB strategic plan 2017-2020 is available in all relevant Ministries and Departments and to all provinces and districts.
- The TB information system is integrated in DHIS2 in all districts by 2018
- M supply is used for uninterrupted provision of diagnosis consumables and TB drugs to all provinces in 2018 and to all districts in 2019

2.1 TB programme management and sustainability

The new TB plan is oriented towards increased knowledge and ownership by provinces and districts regarding their local TB epidemic continuous surveillance and adequate response. Province Health Directors review their local TB epidemic in collaboration with the province TB coordinator, all districts TB managers and other local partners (Gov. Unions, NGOs/CBOs) at least once a year.

Main interventions

- Decentralise the TB programme ownership, management and adaptation of priorities and interventions at Provincial Health Direction level: e.g.: Meeting on TB with communicable diseases committee (CDC) at provincial level; Province Health Director (PHD) to discuss TB with provincial governor 2 times a year
- Train health care workers in identification and referral of presumptive TB, systematic TB screening of persons living in same household than a TB patient, as well as on TB treatment follow-up
- Training/retraining on TB programme for health facilities staffs at all levels
- Scaling -up the use of DHIS2 for improving data analysis capacity for orienting/updating TB strategies and interventions at central, provincial and district level.
- Report TB data directly in DHIS2 system including training and monitoring of TB staff at central, province and district levels.
- Maintain regular programmatic supervision at all levels: Central (NTC) supervisors visit each province 2-3 times a year, each district at least once a year and each health centre every other year and visit TB patients on each possible occasion; Province supervisors visit each district at least twice a year; District TB coordinators visit health centres every quarter.
- Conduct an intermediate external TB review
- Secure uninterrupted supply of WHO prequalified first and second line TB drugs, TB diagnosis tests (Xpert tests), equipment, consumables and other supplies
- Secure transportation of laboratory specimens from all levels.
- Ensure registration and access to Bedaquilin and Delamanid
- Ensure maintenance of laboratories and other equipment
- Implement infection control -administrative, environmental and personal protection- in OPDs and IPDs, triage; providing surgical masks (for patients) and respirators (N95) (for personnel and visitors) as per IPC guidelines
- Improve ventilation in health facilities (using infection control engineering)
- Provide annual check-up (with chest X-ray) for health staff working in TB/DR-TB

2.2 Develop multisectoral approach

- Strengthen the collaboration with partners in Ministry of Health and in other sectors
- Collaborate with ministries of Security and Interior for ensuring TB prevention diagnosis and care in prisons
- Collaborate with ministry of Labour and Welfare to develop TB prevention diagnosis and care at the work place
- Involve CBOs/CSOs in supporting health centres and district hospitals to optimise and standardise approaches and algorithms, increase synergy in TB detection and TB patients support.
- Ensure representation of CBO/CSOs and key affected populations in TB TWG/Task force
- Integrate TB prevention and cares in training/retraining of health centre staffs

- Create a TB committee at different levels and organize quarterly meeting to promote TB at village and community levels

2.3 Advocacy Communication and Social Mobilization

- Involve local authorities, chiefs of villages, pagodas
- Train peer treatment partner for DOT such as: head of family, head of village, community, health staff, village health volunteers (VHV)
- During outreach activities in villages, identify and refer persons with TB symptoms to nearest TB unit and if possible collect sputum specimens for laboratory examination
- Expand health education by media and outreach activities through community partners
- Distribute posters and brochures on TB awareness in villages
- VHV to communicate with ethnic groups for giving health education
- Create HE material in local languages, posters, brochures, radio TV on air
- Support samples transportation cost for VHVs
- Involve former TB patients during advocacy events
- Increase frequency of IEC using radio and TV regularly on air
- Produce TB education medias and material (leaflets, posters etc.) in local languages
- Use SMS for diffusing TB awareness messages
- Conduct a second KAP survey on TB and access to TB services (first KAP in 2010)
- Review ACSM material with NTC and MoH Health education department.
- Conduct IEC on TB in schools and other organisations at all levels including close settings (military, police) and in prisons.
- Develop IEC on TB at the workplace in collaboration with private companies
- Conduct TB awareness and detection when visiting villages for other health purpose
- Advocate for TB awareness and TB control with the monks in pagodas.

2.4 Social support to TB and MDR-TB patients

- Provide social and financial support to TB and MDR-TB patients
- Develop Universal Health Coverage (UHC)
- Approach the National Health Insurance system to cover TB patients diagnosis and treatment expenses; Include the transportation of TB patients from peripheral health centres to referral secondary hospitals
- Encourage the population to contribute to insurance systems
- Advocate to local authority for contributing funding for TB and MDR-TB patients support

Objective 3: Operational research

- Create OR units and conduct survey on 2 topics each year (NTC should provide the topics for the survey)
- Develop operational research including patients' surveys.
- Intensified case finding among high-risk groups and high prevalence areas to increase knowledge on local epidemics.
- Conduct drug resistance surveillance
- Conduct the second National TB prevalence survey in 2019

Annex 1: Outcomes of groups discussion with partners on priority interventions for the TB National strategic plan 2017-20 (National TB Meeting in Thalad, Vientiane Province, 28-30 November 2016)

1 Case Detection

- 1.1 Providing GeneXpert and Chest X-ray in all provinces, districts that have high prevalence, together with health staff capacity building
- 1.2 Providing microscopy/sputum test and appointed staff at health centre in remote and rural areas
- 1.3 Building provincial ACF teams
- 1.4 Ensuring TB contacts/families receiving screening services or ACF
- 1.5 Data collection of high risk children: malnourished, chronic fever, chronic respiratory infection, close contacts of TB (Ps+, Ps-b+), backbone/spine malformation, inflammatory gland/lymph nodes/muscle/ chronic bone inflammation, Meningitis, etc., Children living in high burden of TB infection
- 1.6 TB screening of migrant people
- 1.7 Building capacity for village heads or VHV/VHW for regular continuous health education in communities to encourage presumptive TB persons accessing services and support in case TB cases found (Telephone cards coordinating with health centres and DTM)
- 1.8 Set-up mobile team for health education campaign, increased budget for IEC materials in province and villages to reach out remote/rural areas
- 1.9 Developing guideline and flip chart, SOP as appropriate simple and standard at all health service levels: provincial, district and health centres (training)
- 1.10 Formal/official letter to all levels of authorities about TB situations
- 1.11 Including TB in National Health Insurance system
- 1.12 MOH priorities includes epidemic disease control, each province must develop plan including budget to be submitted to MOH and National Assembly
- 1.13 Establishing committee and responsible officer for TB in all hospital units/wards, OPD, IPD, MCH, Paediatric and EPI, etc., all levels of authorities, mass organizations, civil society organizations to screen for TB
- 1.14 Responsible officer at district should encourage private clinics and incentives to partners for screening TB and referring to testing
- 1.15 Giving roles and responsibility for paediatric sections and incentive for those responsible officers, setting up indicators to those for TB notification
- 1.16 Selecting VHV/VHW who are Village committee members for respectfulness by villagers. Setting up surveillance network at village levels (village head, VHV/VHW...)
- 1.17 Setting up surveillance network at village levels (village head, VHV/VHW...)
- 1.18 Setting up surveillance for mobile migrants from other countries
- 1.19 Expanding PAL activities into TB services at all districts
- 1.20 Refresher training for TB focal points and lab technicians at least once a year (especially paediatricians)
- 1.21 Sending officers to study MDR TB for understanding causes of MDR TB and finding solutions and prevention methods
- 1.22 Continue field supervision at all levels in regular bases
- 1.23 Giving incentives to VHV/VHW for sending sputum samples to health centers and districts and transportation fees for less than 50 KM distance

2 Case management

- 2.1 Developing legals (decrees) and measures for all TB patients to receive and complete the treatment and patients' contacts to be screened for TB
- 2.2 Having supportive policy for poor and disadvantaged people when hospital admission
- 2.3 Developing laws for TB and MDR TB
- 2.4 Effective health education (both patients and family prior to the treatment)/(standardizing IEC for all levels)

- 2.5 Incentives for DOT managers (districts, prisoner's authorities, health center, village heads, VHV/VHW) to ensure the completion course of TB treatment
- 2.6 When patients don't receive treatment, village heads or responsible authorities/concerned officers for TB reach out the patients and coordinate and facilitate the outreach team
- 2.7 Setting up patient data collection system such as, address, telephone number, family members'
- 2.8 Improving services and motivations of health staff corresponding to promotion, certificates and measures
- 2.9 Construction for TB patients and lab buildings (special zone)
- 2.10 Cooperating with neighbouring countries for bordering disease control

3 TB/HIV collaborative activities

- 3.1 Revising TB/HIV committee' s roles and responsibility (Central to district)
- 3.2 Emphasizing on educating drug resistant patients and TB/HIV patients to be aware and pay attention to prevent disease spread to others
- 3.3 Coordination between TB and HIV focal points or HIV-TB must take initiative and responsibility together including recording and reporting so that all levels have the same data and routine data/information exchange
- 3.4 Updating guideline to be correspondent defining clear roles and responsibilities fro (NTC and CHAS) at all levels
- 3.5 Defining clear responsibilities for responsible officers (corresponding to competition, promotion and measures)
- 3.6 Quarterly meeting or semi annual meeting to be routine to sharing experience and lessons learned in each province

4 Local authorities involvement and community participation

- 4.1 Conducting provincial, district, health centre, VHV/VHW meetings to discuss about the TB situation
- 4.2 Proposing to have a National TB control committee, also in provincial and district..
- 4.35 Developing legal/notice/official informing from central to inform the local authorities about the TB Control activities and case management measures including TB/MDR TB for their support because this affects the overall development
- 4.4 Proposing TB to be one of the priority agenda of the village development platform
- 4.5 Integrating and collaborating with civil society organization and development partners
- 4.6 Continue campaign the World TB Day 24 March each year

5 IEC

- 5.1 Revising IEC to be more BCC and developing SOP for TB health education
- 5.2 Revising contents of health education to be simpler, diverse in multiple means for media, ethnicities and advertisements such as: flip charts, brochures, posters, DVD, tales, theatre, radio, TV, community speakers together with training on how to use the materials and materials provision
- 5.3 Having lessons learned meeting with other sectors: HIV/AIDS, Malaria, Community development work, Three builds/Government directives, etc., collaboration with concerned line ministries for education curriculum
- 5.4 Expanding responsibility and implementation of the programme to partners; avoiding overlapping and duplicated information sharing
- 5.5 The need for evaluation from the health education campaign or not

6 Programme management and sustainability

- 6.1 Integrating TB into DHIS2 system together with staff recruitment, training and maintenance
- 6.2 Prioritizing TB as other priority disease
- 6.3 Standardising programme management based on the results/outcomes of the implementation as measurment mean against indicators set (achieved or not?)
- 6.4 Having Hot Line for TB notification

- 6.5 Assigning staff to be correspondent to title and roles (adequate numbers, knowledge, capacity, motivation and absolute responsibility) and train persons for replacement once promotion or turn-over
 - 6.6 Replacement staff should be 3 generations: (senior, middle and young based on titles)
 - 6.7 Involving public, private and civil organizations (PPM)
 - 6.8 Public investment for TB control (prevention, treatment and care)
 - 6.9 Monitoring and supervision for partners to be systematic
 - 6.10 National Health Insurance Funding should cover TB (screening and treatment)
 - 6.11 Financial allocation should be accountable, efficient and timely (For Monitoring and Evaluation)
 - 6.12 Mobilizing funding externally to support essential activities and filling gaps
 - 6.13 Conducting again the prevalence survey nationwide to assess the prevalence of TB burden in Laos
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Annex 2 Epidemiological and Programmatic Assumptions for LAO PDR NSP 2017-20 targets

1. Case detection targets and assumptions

Year	population	Estimated prevalence** of all TB cases	Estimated incidence of all TB cases	Estim. Incidence rate (WHO)	Notification rate bacteriology+ new and relapse	Notification rate all cases	% TB treatment coverage (all cases)	Sputum smear exam for diagnosis (SSM and/or Xpert)	Positive rate by microcopy ZN	Microcopy+	Xpert MTB	Nb. Bact.+ PTB (SSM and/or Xpert) new and relapse	rate	Clinical PTB	New Extra Pulm	All new TB cases and relapse
2010	6,233,000	35,466	13,775	221	50.0	61.5	28%	31749	9.8%	3119	-	3,119	9.82%	394	323	3,836
2011	6,338,961	34,357	13,502	213	51.6	65.2	31%	35980	9.1%	3271	-	3,271	9.09%	516	349	4,136
2012	6,446,723	33,696	13,151	204	47.5	60.4	30%	34576	8.9%	3061	-	3,061	8.85%	484	351	3,896
2013	6,556,318	33,016	12,916	197	48.8	63.0	32%	35623	9.3%	3197	-	3,197	8.97%	541	392	4,130
2014	6,667,775	32,317	12,602	189	48.2	64.6	34%	35034	9.20%	3212	-	3,212	9.17%	685	408	4,305
2015	6,781,127	31,603	12,355	182	51.7	66.9	37%	37066	8.43%	2774	587	3,505	9.46%	622	409	4,536
2016	6,896,406	30,873	12,069	175	58.8	77.4	44%	39500	8.35%	1814	2,240	4,054	10.26%	856	427	5,336
2017	7,013,645	30,154	11,783	168	63.6	84.3	50%	41000	8.30%	1361	3,100	4,461	10.88%	1,000	450	5,911
2018	7,132,877	29,432	11,413	160	66.4	90.3	56%	42000	8.20%	1033	3,704	4,738	11.28%	1,200	500	6,438
2019	7,254,136	28,707	11,099	153	69.4	96.2	63%	43000	8.10%	697	4,334	5,031	11.70%	1,400	550	6,981
2020	7,377,456	27,957	10,771	146	73.8	102.2	70%	44000	8.00%	176	5,267	5,443	12.37%	1,500	600	7,543

- 1 NTC data 2010-2015, then projections
- 2 Estimated decline in incidence 3.7% per year
- 3 12.6% Xpert MTBRIF positive (T) among all tested patients (as first test)
- 5 *CHAS: Centre against HIV-AIDS and sexually transmitted diseases
- 6 Estimated 2% population growth per year