

**Ending Tuberculosis and AIDS in Sri Lanka:
Urgent and immediate actions required to reach 2025
targets**

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Glossary of acronyms

ACF	Active Case Finding
AIDS	Acquired Immune Deficiency Syndrome
ADB	Asian Development Bank
AEM	AIDS Epidemic Model
ART	Antiretroviral Therapy
BB	Beach Boys
BCC	Behaviour Change Communication
CBO	Community Based Organisation
CSO	Community Service Organisation
CCM	Country Coordination Mechanism
DCC	District Chest Clinic
DIC	Drop in Centre
DDG	Deputy Director General
DGHS	Director General Health Services
DOT	Directly Observed Treatment
DOTS	Directly Observed Treatment Short Course (internationally recommended strategy for TB control)
DRS	Drug Resistance Survey
DR TB	Drug Resistant tuberculosis
DST	Drug Sensitivity (susceptibility) Testing
DTCO	District TB Control Officer
EMTCT	Elimination of Mother to Child Transmission
ESP	Essential Service Package
FHI	Family Health International 360
FPA	Family Planning Association
FSW	Female Sex Workers
GP	General Practitioner
HMIS	Health Management Information System
HIV	Human Immunodeficiency Virus
HR	Human Resources
HTS	HIV Testing Services
ISTC	International Standards for TB care
IBBS	Integrated Biological and Behavioural Surveillance Survey
IPT	Isoniazid Preventive Therapy
JMM	Joint Monitoring Mission
KAP	Knowledge, Attitudes and Practices
KP	Key Population
LIMS	Laboratory Information and Management System
LFU	Loss to Follow Up
MC	Microscopy Centre
MDR-TB	Multidrug-resistant tuberculosis
MTB/RIF	GeneXpert Mycobacterium tuberculosis (MTB)/rifampin (RIF)
MIS	Management Information System
MOIC	Medical Officer in-Charge
MOH	Medical Officer of Health
MOHNIM	Ministry of Health, Nutrition and Indigenous Medicine

M & E	Monitoring and Evaluation
MLT	Medical Laboratory Technologist
MSM	Men having Sex with Men
MTR	Mid-Term Review
NSACP	National STD/AIDS Control Programme
NCD	Non Communicable Disease
NGO	Non Governmental Organization
NPTCCD	National Programme for Tuberculosis Control and Chest Disease
NRDH	National Respiratory Disease Hospital
NSP	National Strategic Plan
NTRL	National TB Reference Laboratory
OPD	Out Patient Department
OR	Operational Research
OST	Oral Substitution Treatment
PHI	Public Health Inspector
PHLT	Public Health Laboratory Technician
PHC	Primary Health Care
PIMS	Patient Information Management System
PLHIV	People Living with HIV
PMCU	Primary Medical Care Unit
PMDT	programmatic management of drug-resistant TB
PPM	public-private mix
PR	principal recipient
PWID	People who Inject Drugs
QA	quality assurance
RDT	Rapid Diagnostic Test
SOP	standard operating procedure
SRH	Sexual and Reproductive Health
STD	Sexually Transmitted Disease
STI	Sexually Transmitted Infection
TB	Tuberculosis
UIC	Unique Identifier Code
UNAIDS	Joint United Nations Programme on HIV/AIDS
UHC	Universal Health Care
WHO	World Health Organisation

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Executive Summary

Sri Lanka is a low prevalence country for both tuberculosis (TB) and HIV. The Ministry of Health, Nutrition and Indigenous Medicine (MOHNIM) has committed to end both the diseases by 2025¹.

The END TB strategy's targets include a reduction of incidence of 80%, and in deaths, of 90%, by 2030. Ministerial summits of health ministers in the South-East Asia Region (SEAR) of WHO have endorsed these targets, while some countries, including India and Sri Lanka, have committed themselves to achieve the 2030 goals by 2025. This ambitious approach will only get close to the goals if there is rapid acceleration in TB control in Sri Lanka, which in turn, depends on radical change to the management, organisation and technical strategies of TB control efforts.

The most worrying issue of TB control in Sri Lanka is the gap of some 4,000 cases between the estimated incidence of 13,000 cases and the numbers of patients notified with TB. The population is ageing, which is putting upward pressure on TB rates. Two thirds of the pulmonary cases were smear positive, suggesting that too few cases are diagnosed on clinical grounds - and hence some miss out on treatment that might prevent them from becoming smear positive and transmitting the disease.

Each year about 1,000 people die from TB. Mortality is estimated to be falling, although treatment success has remained below the End TB strategy target of 90%. The comparatively high fatality rate (6.8% in the 2015 cohort) may reflect the advanced age of cases, or their co-morbidities, or both. HIV-associated TB and multi-drug resistant (MDR) TB remain relatively small problems in Sri Lanka. There were 24 cases of rifampicin resistant (RR) or MDR-TB detected in Sri Lanka in 2017 – only 47% of the total number estimated. A very high prevalence rate of TB was found among prisoners (1.68% in 2012). There are no data available on the amount of TB among diabetics, although about 9% of adults have diabetes mellitus which increases the risk of TB three-fold.

Business as usual will not help either (HIV or TB) programme. Programme reviews and modelling exercises done on both show that unless Sri Lanka fast track the recommended interventions, the End Disease targets will not be achieved.

Key messages coming out of the modelling exercise of TB, using a cost-effectiveness perspective, are that the key interventions in Sri Lanka are, in decreasing order of priority:

- Improving treatment outcomes amongst those diagnosed with TB
- Ensure timely access to TB diagnostic services
- Contact investigation amongst household contacts of notified cases
- Improve the diagnostic algorithm to include chest X-ray and GeneXpert.
- Of these interventions, *timely access to TB diagnosis* and *improved diagnostic algorithm* would have the biggest impact. Combined, the above four interventions can reduce TB incidence by over 50% by 2025, but ending TB will ultimately need new

approaches for *primary prevention* of TB disease. These measures may include, but should extend beyond, current approaches relying on preventive therapy. There is a need to avert transmission, reactivation and relapse from treatment. To achieve all these, we urgently need more evidence on effective approaches in the Sri Lanka setting, including inter-sectoral approaches.

To make the ending AIDS goal a reality for Sri Lanka, it is necessary to fast-track 90-90-90 targets, to reduce new annual HIV infections by 2020. The 2025 Ending AIDS goal will require the country to reach 95-95-95 treatment targets by 2025 instead of 2030 and reduce the number of new infections and AIDS related deaths to <50 as well as work towards zero discrimination.

The 2018 Integrated Biological and Behavioural Surveillance Survey (IBBS) which used a total of 3,431 FSW, MSM, transwomen, PWID and Beach Boys from different districts of Sri Lanka showed an overall low prevalence of HIV and active syphilis. The HIV prevalence was 0.24% for female sex workers (FSW), 0.22% for men having sex with men (MSM), 0.3% for People who inject drugs (PWID), 0.2% for Beach Boys. However, the presence of risk behaviours was noted including inconsistent condom usage, poor HIV health seeking behaviour, and poor knowledge of HIV, combined with poor coverage of HIV prevention programs (12.7% of FSW, 27% MSM, 2.7% for PWID and 14% Beach Boys).

At the end of 2017, the estimated numbers of people living with HIV (PLHIV) was 3500 (3000-4200) while the total reported PLHIV was 2391. In 2017, 285 new cases were identified most of whom were MSM and bisexual men followed by males with non-regular partners. The number of PLHIV represented by MSM/bisexual men has been gradually rising since 2010. Most cases are concentrated in the Western Province as in earlier years and the proportion of young people affected (15-24 years) has remained static around 10%, since the last eight years. Modelling of the epidemic over the years clearly show that the HIV infection among FSW and their clients will decline but the worrying factor is increasing trends of the infection among MSM and bisexuals and female partners of key populations and vulnerable populations.

According to the new HIV size estimation exercise ⁶, the estimated numbers of KPs are:

- Female sex workers (FSW) - 30,000 (20,000 – 35,000),
- Males who have sex with males (MSM) – 40,000 (30,000 – 50,000)
- Male sex workers - 6,000 (4,000 – 8,400)
- People who inject drugs (PWID) - 900 (650 – 1,200)
- Transwomen - 2,200 (2,000 – 3,500)
- Beach Boys - 4500 (3,000 – 6,000).

The size estimation report suggested that improvements in the estimates could be made, provided better quality data that are available from intervention programs and also the

various methods used in the present scenario, may not be applicable where many of the KPs remain hidden and inaccessible.

The main barrier is apparent from the treatment cascade which clearly shows that there are gaps in reaching PLHIV particularly KPs. Although efforts are being made to overcome this gap, challenges are considerable. Results from pilot programs will become available in the early part of 2019 following which evidence-based decisions can be made on scaling up or adapting those programs.

It was a good opportunity for both the national programmes to organise a national consultative workshop on accelerating journey towards ending tuberculosis and AIDS, concurrently with the Conference on Primary Health Care (PHC) Strengthening towards effective Universal Health Coverage to further review progress, effectiveness of interventions and to look for synergies between programmes to end both TB and AIDS from Sri Lanka.

This report includes recommendations, which are essential for increasing national efforts towards ending TB and AIDS. In the case of TB, the most important pre-requisite is to intensify the leadership of TB control efforts through strengthening the human resources at central unit level in the NPTCCD – without which, other essential activities will not be possible. This should rapidly be followed by an intensification of existing interventions to strengthen passive and active case finding. For the latter, household contact screening should be much more stringent, and prisons should be regularly screened. Innovative approaches to screen diabetics and the elderly should be developed and implemented widely. PHC reform is an excellent opportunity and should not be missed for mainstreaming TB diagnosis and treatment into the health service as a whole.

In the case of HIV, the most important issue is diagnosis through different approaches of testing services, that is accessible to different population groups and linking those positive for HIV to treatment ensuring adherence. This can be done by making available rapid tests using blood and oral fluid at sites that key populations frequent, and self-tests along with messaging and online counselling which will ensure confidentiality. At the same time steps are needed to ensure that stigma and discrimination does not create a barrier to accessing services.

1. Background

1.1 Disease Burden in Sri Lanka

Both National Programme for Tuberculosis Control and Chest Diseases (NPTCCD) and National STD and AIDS Control Programme (NSACP) have conducted external reviews of their programmes in 2017, in order to assess the progress made towards achieving their goals, targets and objectives as well as to make revisions to their implementation plans.

Sri Lanka has committed to achieve Sustainable Development Goals (SDG) and the Ministry of Health, Nutrition and Indigenous Medicine (MOHNIM) is working hard to provide Universal Health Coverage (UHC) to all citizens in Sri Lanka at free of charge at the point of delivery. The success of achieving better health indicators in the past in Sri Lanka was mainly due to the strong health care services focussed on family as well as strong health service delivery network with committed and well-trained health work force. Although the system has yielded many good results it does not operate with optimum efficiency that could be, hence need further interventions make further low cost as well as to optimize efficiency. The MOHNIM is now planning to re-organize its' delivery of primary health care services which includes government led general practitioner system to a define population.

It was a good opportunity for both national programmes to organise a “National consultative workshop on accelerating journey towards ending TB and AIDS”, concurrently with the “Conference on Primary Health Care Strengthening towards effective Universal Health Coverage” to further review progress, effectiveness of interventions and to look for synergies to end TB and AIDS from Sri Lanka.

1.2 National consultative workshop on accelerating journey towards ending TB and AIDS, October 15-16 2018

The overall objective of the national consultative workshop was to revisit the country's progress and challenges in further strengthening HIV & TB programmatic response in reaching targets of ending TB & AIDS by 2025. This will further contribute to the ongoing evidence-based approach in responding to the evolving health needs in the content of PHC strengthening initiative by identification of possible entry points and cross programme synergies.

Specific objectives of the workshop were:

- To create understanding about the achievements and challenges in the health system
- To identify entry points to leverage the health systems to reinforce reaching end TB & AIDS targets and examine the country 's potential of reaching end TB and AIDS disease targets, and
- To explore strategic options to accelerate process reaching ending TB and AIDS targets using cost effective approaches.

The said National Consultative workshop was convened with the Conference on “Strengthening PHC Towards effective UHC in Sri Lanka” with a joint opening session. (Please refer the annexed report of the conference for details)

The panel discussion on “Sri Lanka’s progress, challenges in ending TB and AIDS elaborated on strategy, targets, progress and key challenges, prioritization of interventions based on modelling outcomes and key gaps and opportunities in ending TB and AIDS.

In the session on “Information management for fast tracking ending TB and AIDS” speakers discussed about “Improving TB estimates for Sri Lanka: Need for a TB inventory survey” and on “Data for decision making for reaching ending disease targets”. Issues related to inadequate health related information and need for electronic information systems to fast track ending initiatives were also discussed in length.

Sri Lanka is in a transitional period with donor assistance hence, a session was dedicated on “Accelerating interventions in the context of fund transition” to discuss issues related to planning for transitioning from donor support while sustaining the achievements. Human resource needs for ending TB and AIDS were discussed along with the proposed human resource for health strategy. Transitioning from donor support - experience from Thailand was also shared.

During the session “Innovations & opportunities to fast track Ending TB and AIDS”; global and regional evidence of efficient use of innovative technologies / specific interventions for ending AIDS and TB were discussed. Opportunities and proposals for scaling up fast track response in Sri Lanka and scope for efficiency gains for ending TB and AIDS with strengthening PHC programme were discussed and recommendations were made. Participants made series of valuable recommendations about way forward to achieve End TB and AIDS targets in Sri Lanka and the workshop ended with joint synthesis and closing session.

This report is synthesised from summary transcripts of the above workshop sessions, information gathered from presentations, discussions, and recommendations of group works, external programme review reports, other technical reports and inputs from programmes.

1.3 Tuberculosis

Although the TB burden in Sri Lanka is not high, compared to neighbouring countries, there has been no evidence of a decline in incidence in the last 20 years. A mid-term review was requested in 2017 at the mid-point of the Global Fund’s support for 2015-2020.

The review team concluded that the priority issue for TB control in Sri Lanka was the gap of some 4,000 cases between the estimated incidence of 13,000 cases and the numbers of patients notified with TB. Since 2011, this gap has widened. Children may be disproportionately under-diagnosed contributed to overall under notifications of TB cases. The population is ageing, putting upward pressure on TB rates. Two thirds of the pulmonary cases were smear positive, suggesting that too few cases are diagnosed on clinical grounds - and hence some miss out on treatment that might prevent them from becoming smear positive and transmitting the disease.

Each year about 1,000 people die from TB. Mortality is estimated to be falling, although treatment success has remained below the End TB strategy target of 90%. The comparatively high fatality rate (6.9% in the 2016 cohort) may reflect the advanced age of cases, or their co-morbidities, or both. HIV-associated TB and MDR TB remain relatively small: over 90% of TB

patients were tested for HIV in 2017, and 29 HIV infected cases were found. There were 24 cases of rifampicin resistant or MDR-TB detected in Sri Lanka in 2017² – only 47% of the total number estimated among notified pulmonary TB cases. A very high prevalence rate of TB was found among prisoners (1.68% in 2012), but a study to provide data on the amount of TB among diabetics yielded no results. Tobacco smoking and malnutrition is likely to be a risk factor for TB.

1.3.1 Challenges in TB Control

Case finding was only about 65% of the estimated incidence at the time of review in 2016 (has further fallen in 2017), which probably represented both under-diagnosis and under-reporting.

As per the MTR (2017):

- There were significant weaknesses in the TB surveillance system: of the 13 WHO benchmark standards for monitoring and evaluation, 5 were met, 4 were partially met, 3 were not met and 1 was not applicable. TB surveillance data were neither internally, nor externally consistent over time. The exact scale of the problem of missing cases is therefore uncertain³.
- There was an urgent need to screen systematically the patients attending the out-patient departments (OPD), but many large hospitals did not have a facility for sputum testing for out-patients.
- There was a serious lack of laboratory technicians (MLT and PHLT) to do microscopy.
- Contact tracing and investigation was carried out only for two thirds of the household contacts, and was superficially performed.
- Active case finding (ACF) had been carried out, but had been done haphazardly among high risk populations. In 2016, over 32,000 people were included in ACF, and 6,400 were screened. Only 17 cases were found, all of whom were prisoners. WHO recommends ACF only in populations with at least 1% prevalence of TB, but the prevalence has not been established in most populations included in ACF in Sri Lanka.
- Lastly, half of all OPD attendances in Sri Lanka were in the private sector. There is an urgent need for more information on the services for TB provided in the private sector.

The consequence of obstacles to case-finding is delay in diagnosis, extensive disease when patients are finally diagnosed, and a higher risk of permanent lung injury, or death. Implementation of the national strategic plan (NSP), 2015-2020, was delayed. The programme appeared to be focusing on routine activities and postponing adoption of any new initiatives. Significant numbers of the staff of NPTCCD central unit were inadequately trained. Motivation was low. No annual report had been published since 2014.

The review concluded that *“unless radical steps were taken to improve case finding and programme performance, Sri Lanka will miss the WHO End TB Strategy targets for 2030. Business as usual was not an option”*.

The major recommendations in the MTR were

1. The Ministry of Health, Nutrition and Indigenous Medicine (MOHNIM) should urgently strengthen the NPTCCD central unit with 02 additional community physicians and 04 medical officers with at least post-graduate qualifications in community medicine, including a full-time epidemiologist to support Monitoring, (M&E) and Surveillance. The Director should clarify the policy directions of the NPTCCD and the planning approach used. Strong and effective action to strengthen the NPTCCD central unit is essential for success in addressing the other issues.
2. The NPTCCD Central Unit should set up 2-3 pilot districts, in collaboration with provincial and regional health directors. The aim is to prove that addressing the challenges above can significantly increase case finding within one year and improve treatment outcome. Remaining districts will learn from these pilots and will eventually follow themselves.

1.3.2 Subsequent developments in TB Control (post MTR(2017))

In exploring the problem of OPD, it is found that medical officers in OPD receive little or no in-service training on TB, are reluctant to attend training when it is provided, provide mainly symptomatic treatment, do not write records, and focus on “crowd clearance” in order to finish the work. Registers to ensure presumptive TB cases receive a sputum test are not properly maintained from the National Hospital, Sri Lanka, (NHSL) down to divisional hospitals, and from 10-72% of patients (depending on the facility) referred for sputum testing do not arrive at the laboratory. There are reports of patients attending OPDs multiple times before being diagnosed with TB, sometimes with fatal results. The lack of OPD records is key, and keeping such records, combined with following up presumed cases, would enable earlier diagnosis in patients presumed to attend OPD⁴.

Data from Gampaha and Kegalle on diabetes in TB patients (23% and 13%, respectively in 2016), reflects the rising epidemic of diabetes mellitus, and emphasised the urgent need for accurate data on the prevalence of TB among diabetic patients attending diabetic clinics. This may best be done by use of the mobile X-ray unit attending diabetic clinics in a phased manner.

To begin understanding the role of private providers in TB management, a patient pathway analysis was recommended in November 2017. However, it is still at the proposal level. The District Tuberculosis Control Officers (DTCOs) in the pilot districts have been unable to find the time to map the private providers in their districts. As per NPTCCD, a survey has been commenced on utilization patterns of private health sector in TB care and this survey will provide information on patient pathway in the private sector.

The Consultant Microbiologist of the National TB Reference Laboratory (NTRL) has raised the problem of the quality of sputum as a possible contributor to low case finding. Quality assurance is well conducted in the DCCs, but below the level of the DCC it is not carried out by random selection and checking of slides, thus introducing the possibility of bias in the checking. The MTR recommended a random re-check of 2000 slides. So far, this has not been carried out.

Revision of the diagnostic algorithm for TB to make it significantly more sensitive was addressed in June 2018, and now incorporates the use of chest X-ray (CXR) and Xpert MTB/RIF

(GeneXpert®). Both sputum microscopy and CXR are now recommended as first-line tests. Positive sputum microscopy is sufficient to diagnose a TB case. Any TB consistent abnormality on CXR should lead to a Xpert MTB/RIF (GeneXpert®) test if a diagnosis is not possible on microscopy. A negative CXR in a case with TB consistent symptoms should necessitate a referral to either the DCC or a consultant respiratory physician. However, low availability of CXRs and technicians, and policies that limit the number of X-rays that can be performed in one day is hampering implementation.

1.3.3 Modelling of the impact of different Control interventions in the Sri Lanka context

To work out what it will take to reach the End TB targets, the potential impact of given interventions on incidence and mortality was estimated by mathematical modelling. In brief, a set of mathematical equations was developed to capture the rates at which individuals move between states of disease, cure and unfavourable outcomes (including relapse) because of natural history of the disease as well as efficiency and coverage levels of interventions. These equations also capture the role of prevalent TB in driving transmission.

The robustness of any modelling study depends on the quality of data informing that study. The current study is informed by national data (about which there are concerns) and WHO estimates for the TB burden in Sri Lanka, including incidence and burden of drug resistance. However, there are some important indicators for which there is little or no evidence available. One example is the relative burden of TB in slums vs the general population.

The approach in the current analysis is

- (i) to adopt broad uncertainty ranges for those parameters where there is weak evidence, and
- (ii) to test the sensitivity of the model results to these assumptions.

1.3.4 Simulated results

Figure 1 shows the estimates for impact and costs for each intervention acting alone. Improving TB treatment outcomes is low cost, but does not have a big impact. In contrast, measures to improve timely diagnosis (increased HR and training for early recognition of TB symptoms, plus improving accessibility and use of diagnostic services) cost the most, but have the biggest impact.

Figure 1: Estimates for impact and cost (for each intervention acting alone)

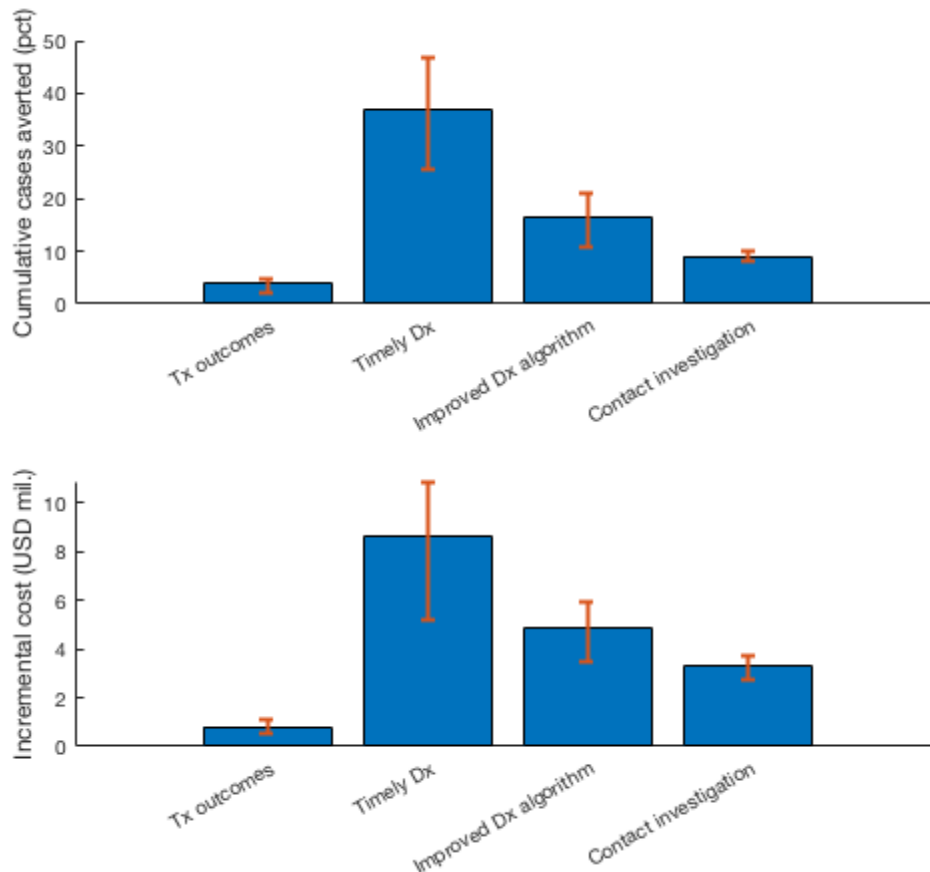


Figure 2 shows an ‘expansion pathway’ for combining the different interventions. The most cost-effective intervention (improving treatment outcomes) was selected as the first intervention. For the second, the intervention was selected from the remaining ones that, in combination with the first intervention, was the most cost-effective, and continued in this manner until all four costed interventions were selected. This process identifies, in decreasing order of priority: (i) improving treatment outcomes, (ii) timely access to diagnostic services, (iii) contact investigation amongst household contacts, (iv) improved diagnostic algorithm (including diagnosis facilitated by X-ray, and follow-up GeneXpert for DST). In combination, the measures shown in Fig.2 would require an overall incremental spend of about USD 20 million between now and 2025.

Figure 2: Expansion pathway for combination of different costed interventions

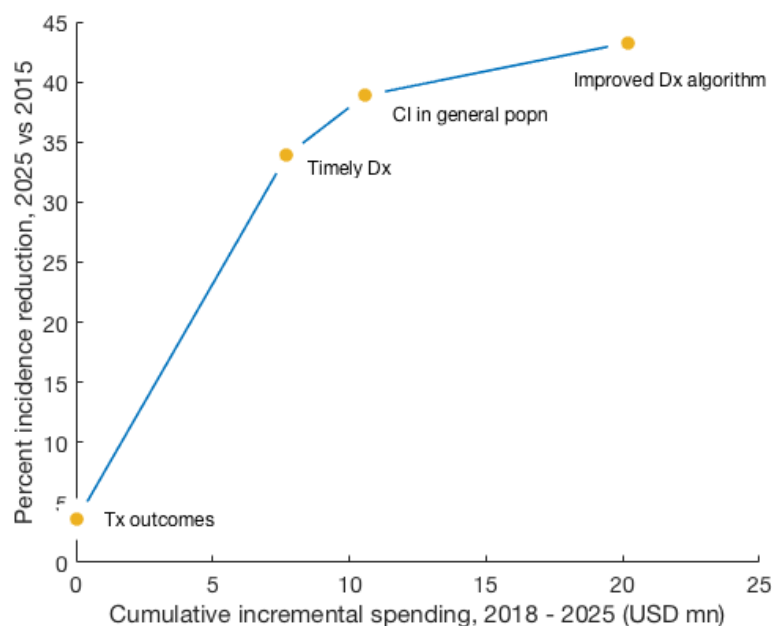
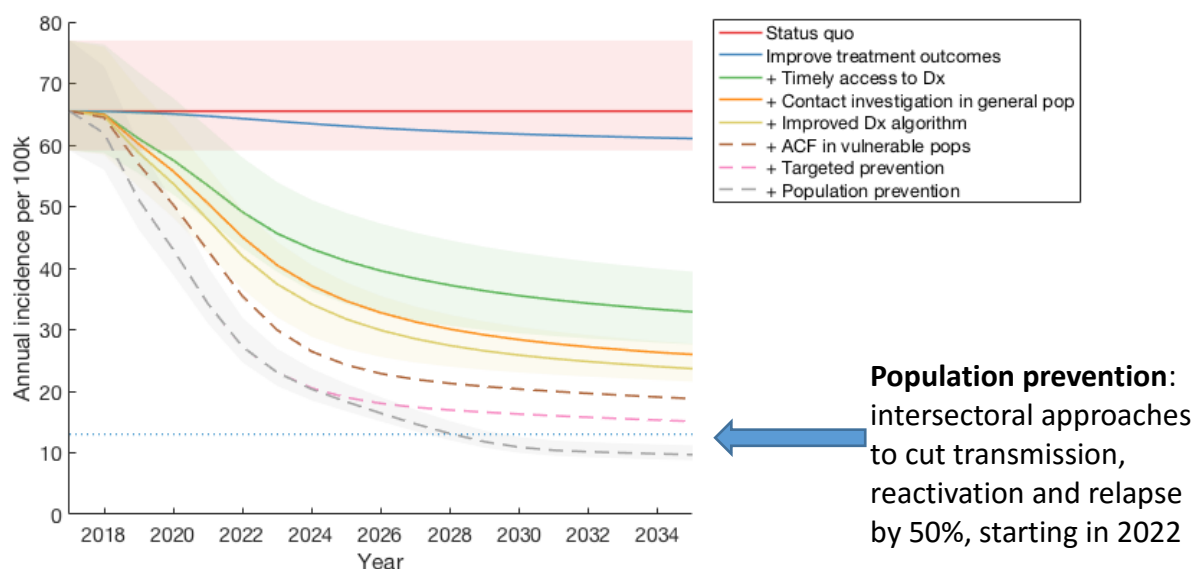


Figure 2 shows the sequence of interventions such that, at each stage, the sequential combination of interventions is the most cost-effective of those available. Overall, combined measures shown here could reduce TB incidence by 43% by 2025, with an investment of USD 20.2mn over this time. Note that – in the ‘timely Dx’ intervention scenario – the costs shown reflect only the costs of additional diagnosis and treatment as a result of improving TB services: Additional costs of the staff capacity involved were not considered here, assuming this to be covered by existing initiatives for reorienting Sri Lanka’s PHC system.

Figure 3: Projections for incidence between now and 2035



Assuming each intervention is included cumulatively and in succession. Sequence of costed interventions (solid lines) follows that suggested by Fig.2, and additional interventions (dashed lines) are shown as illustrative examples for reaching the End TB goals. Shaded areas show uncertainty

intervals, for clarity only shown for those four interventions having the greatest impact on incidence. The dotted, horizontal line shows the End TB goal for 80% incidence reduction. See Annex for details.

From this work, then, the key interventions in Sri Lanka, in decreasing order of priority, are as follows:

1. Improving treatment outcomes amongst those diagnosed with TB
2. Ensure timely access to TB diagnostic services
3. Contact investigation amongst household contacts of notified cases
4. Improve the diagnostic algorithm to include chest X-ray and Xpert.

Of these interventions, *timely access to TB diagnosis* and *improved diagnostic algorithm* (nos. 2 & 4) would have the biggest impact. Combined, the above four interventions can reduce TB incidence by over 50% by 2025. However, ending TB will ultimately need new approaches for *primary prevention* of TB disease. These measures may include, but should extend beyond, current approaches relying on preventive therapy. Steps should be taken to avert transmission, reactivation and relapse from treatment. There is a pressing need for more evidence on effective approaches in the Sri Lanka setting, including inter-sectoral approaches.

Ongoing changes in Sri Lanka's health system may facilitate some of the interventions described here. One important example is the Essential Services Package (ESP) for PHC strengthening pilots supported by the World Bank and the Asian Development Bank. This initiative involves health system reorientation focused on new Primary Medical Care Units, which will offer TB services. These and other developments in Sri Lanka's health system may play an important role in improving TB service delivery to achieve UHC and reaching End TB goals.

1.3.5 MDR TB

Significant achievements

- Rapid expansion of Xpert MTB/RIF (GeneXpert®), with government and Global Fund (GF) contribution, and 18 machines are in place as of October 2018
- Utilization of available machines at several sites is improving (though not optimal yet)
- Increasing number RR/MDR-TB patients are being enrolled on second line treatment
- Standard operating procedures (SOP)s for the shorter regimen have been printed, and two (02) patients initiated on treatment, 05 more short courses ordered

Key challenges identified

- The decline in total case notifications means less patients in whom to detect MDR-TB.
- Low screening for drug resistance
- Universal drug susceptibility testing (DST) for all TB cases is still some distance away and there are delays in the uptake of Xpert MTB/RIF (GeneXpert®) in some of the centres. NPTTCCD reports that a plan has been developed by NTRL and now it needs to be implemented.

- Delays in diagnosis of DR-TB as evidenced by increasing number of deaths among MDR-TB patients, patient interviews and review of the records for diagnosis and treatment
- MDR-TB services for treatment initiation remain completely centralised at the National Hospital for Respiratory Diseases (NHRD)
- Psychosocial support mechanisms for patients on second-line treatment are not fully in place

1.4 HIV - AIDS

Sri Lanka has made the bold declaration of Ending AIDS by 2025 and has developed a road map to achieve this goal⁵. The External Review of The National Health Sector Response to HIV and Sexually Transmitted Infections (STIs) conducted in September 2017⁶, identified several gaps and challenges while highlighting strengths of the national response. Soon after the review the National Strategic Plan (NSP) for HIV and STIs 2018-2022⁷ was developed which provides indicators and targets to facilitate achieving the goal of Ending AIDS in 2025.

Sri Lanka needs to achieve fast-track targets of 90-90-90 by 2020 along with getting to zero discrimination and, the 2025 Ending AIDS goal will require the country to reach 95-95-95 targets by 2025 instead of 2030 and reduce the number of new infections and AIDS related deaths to <50 as well as work towards zero discrimination.

Keeping this goal in mind, Sri Lanka has attempted to enhance its activities both in terms of data gathering and program intervention and several actions have been taken since 2018 which are summarised below:

1.4.1 New Available Data

Since the beginning of 2018, several new data have become available through new sources including the Population Size Estimation of KPs⁸, Rapid Assessment of Drug Use Patterns (RADUP) in Sri Lanka⁹, the Integrated Biological and Behavioural Surveillance (IBBS) survey undertaken among key populations (KPs) ⁸ and update of the AIDS Epidemic Model (AEM) using the newly available data. In addition, the annual analysis of case reporting data for 2017 provides some fresh insights into the epidemic including the treatment cascade. Finally, progress has been made in relation with the process of validation of Elimination of Mother to Child Transmission (EMTCT) of HIV¹⁰.

According to the new size estimation exercise⁸, the estimated numbers of KPs are:

- Female sex workers (FSW) - 30,000 (20,000 – 35,000),
- Males who have sex with males (MSM) – 40,000 (30,000 – 50,000)
- Male sex workers - 6,000 (4,000 – 8,400)
- People who inject drugs (PWID) - 900 (650 – 1,200)
- Transwomen - 2,200 (2,000 – 3,500)
- Beach Boys - 4500 (3,000 – 6,000).

However, the size estimation report suggested that improvements in the estimates could be made provided better quality data was available from intervention programs and also the various methods used in the present scenario may not be applicable where many of the KPs remain hidden and inaccessible.

As data on people who use drugs (PWUD) and PWID was limited a rapid assessment, using a cross sectional exploratory design, was conducted among non-institutionalized PWUD (n=283) and PWID (n=174) in selected districts of Sri Lanka to understand the pattern of drug use⁹. The assessment found that dependence was largely on opioids and among PWID heroin was commonly injected, mostly daily with a majority (>80%) sharing their used needles and syringes. Less than half received any medical treatment although counselling was provided to most and >90% had been apprehended by police and a large majority (84% PWID and 78% PWUD) had been to jail. Harm reduction services are not available.

The 2018 IBBS report¹⁰ which used a random sampling technique for a total of 3,431 FSW, MSM, transwomen, PWID and Beach Boys from different districts of Sri Lanka showed an overall low prevalence of HIV and active syphilis. The HIV prevalence was 0.24% for FSW, 0.22% for MSM, 0.3% for PWID, 0.2% for Beach Boys. However, the presence of risk behaviours was noted including inconsistent condom usage, poor HIV health seeking behaviour, and poor knowledge of HIV, combined with poor coverage of HIV prevention programs (12.7% of FSW, 27% MSM, 2.7% for PWID and 14% Beach Boys).

At the end of 2017, the estimated numbers of PLHIV was 3500 (3000-4200) while the total reported PLHIV was 2391¹⁰. In 2017, 285 new cases were identified most of whom were MSM and bisexual men followed by males with non-regular partners. The number of PLHIV represented by MSM/bisexual men has been gradually rising since 2010. Most cases are concentrated in the Western Province and the proportion of young people affected (15-24 years) has remained static, around 10%, since the last eight years.

The treatment cascade shows that 68% of the estimated number of PLHIV have been diagnosed and living with HIV so far (n=2391)¹⁰ although many of these cases were diagnosed many years ago and have been lost to the system so it is not clear whether they are still alive. At present, of the 2391 cases, 54% (n=1229) are receiving antiretroviral therapy (ART) and 34% are virally suppressed¹⁰. Thus there are gaps in all the targets of the treatment cascade, the major gap being in the first target of 90 – people living with HIV who know their status. In addition, ensuring linkages of those diagnosed with HIV to care and treatment needs attention.

Using these new data, the AEM has been updated which is still under review (annex 1). The preliminary data from the model suggest that among adults, MSM will lead the epidemic followed by the group “low risk females” who are usually wives or partners of high risk men (clients of sex workers, married MSM, BB and PWID etc). Attempts at assessing the most appropriate intervention program among KPs that could help reach the 2025 goal shows, this will be possible only if, interventions are intensified such as to include the coverage indicators

and targets of the National Strategic Plan along with enhanced treatment targets. Only other scenario that would sufficiently reduce new infection below <50 is, MSM focussed prevention coupled with fast track treatment targets. However, it is important to bear in mind that the ground reality of achieving the targets provided in models may not be practical.

1.4.2 New Program Responses

Since 2018, several attempts have been made to enhance intervention programs with the aim of increasing reach to KPs and getting them into HIV testing services (HTS). These efforts include:

Pilot on KP led Interventions instituted by Family Planning Association (FPA) and supported by the Global Fund. This intervention has been designed and is led by an external consultant who has trained staff and is responsible for data analysis emanating from the pilot. It is being piloted in Puttalam, Gampaha, Colombo and Kalutara among KPs. Teams consisting of a team leader, admin officer, and four field officers carry out the field operations and they are assisted by four national coaches (two of whom belong to a KP group) who are based in FPA and whose role it is to monitor, train, and supervise team members. The intervention is based on mapping KPs in specified areas by KPs themselves using different techniques and approaching them with prevention information verbally and promoting HTS. Initial tests are done using a single rapid diagnostic test (RDT) with finger prick blood and if reactive, they are taken to nearby STD clinics for further tests and confirmation of diagnosis. Results are reported back to individuals within 1-2 weeks and FPA is provided with anonymous results for the KP group at a later time. If an area has no or very few HIV positive people identified, the team moves on to the next designated area. If, however, there are HIV positive individuals identified, the team remains there to provide further support. This model will be expanded next year.

Enhanced Peer Outreach Approach (EPOA) is another pilot started in mid-July by “FHI 360” to provide support to both NSACP and FPA to boost reach and HTS. A KP representative is posted in the FHI 360 office who is also a member of the Country Coordination Mechanism of the Global Fund. Capacity building of the KP organisations to enable them to reach more KPs for HTS is one of the main activities undertaken. Different approaches are being tried to reach KPs such as identifying seeds from different backgrounds and using the respondent driven sampling approach to reach their networks¹¹; accessing hidden MSM and transwomen through social media such as Grindr, Facebook and other apps. This is being piloted in Colombo and Gampaha in areas not covered by the Global Fund grant. Follow up of individuals is only done if they are found to be HIV positive when they are connected with the NSACP system. Information is computerised.

Escorted services for HTS to STD clinics by FPA under the Global Fund grant is continuing but there is now a greater effort by FPA to directly work with KPs whose capacity is being enhanced with the help of FHI 360.

NSACP pilot with the KP program under the Global Fund grant has been initiated in Jaffna, Kurunegala, Anuradhapura, Badulla. Peer Educators have been recruited by NSACP from KP

communities along with field supervisors and a management assistant. In Jaffna, MSM and TG programmes, started last month and already 150 people have undergone HTS.

Expansion of HTS to all hospitals by NSACP has been done and this includes Base Hospitals and above (beyond STD clinics).

A client feedback mechanism has been established by FHI⁰360 at STD clinics using an electronic system with 5 questions. It is being piloted in 05 STD clinics.

Engagement of General Practitioners (GPs) is another new initiative that is being conducted by NSACP. With the help of FHI 360, GPs who are in the private sector have been trained to provide HTS to patients deemed to be at risk of HIV. For assessing risk, GPs will be given a risk assessment matrix and communication materials. RDTs have been provided to them and if a person is reactive using the RDT, s/he will be linked with the NSACP for further evaluation. A mobile app is being developed that will enable GPs to report to NSACP immediately.

Elimination of Mother to Child Transmission (EMTCT) is on track as detailed in the draft national validation report⁹ which highlights main successes and achievements as follows:

- Syphilis and HIV screening of pregnant women have exceeded 95% since 2016.
- Approximately 95% of pregnant women register at government antenatal clinics and approximately 5% attend private sector facilities where national EMTCT protocols are followed.
- All HIV exposed infants undergo early infant diagnosis and none were found to be HIV positive in 2016 or 2017.
- Programme data indicates that MTCT rate is below 2% and over 95% of pregnant women living with HIV received option B+.

In addition, for EMTCT, there is ongoing effort to engage the private sector and the laboratory accreditation process has started.

1.4.3 Immediate Future Plans:

In addition to the pilots that have already been initiated, there are other activities planned for the immediate future:

- A mobile app “STAY SAFE” has been developed for young people and will be launched soon. It is a risk assessment tool and will promote HTS.
- Internet peer education will start in Sinhala and Tamil by end 2018.
- Nine more STD clinics will start by end 2018. There will be a total of 41 STD clinics (including NSACP).
- As the main thrust is in the Western Province, specifically Colombo and Gampaha, mobile labs will be launched in these cities during World AIDS Day.
- Unique identifier code is being established and will be piloted in two selected districts.

- The activities outlined within the Communication Strategy¹² will be started and a social marketing program is being considered for which a social marketing company will be contracted.

1.4.4 TB-HIV

Special mention is needed for HIV and TB services and activities. NSACP has been working with the NPTCCD for many years, to ensure smooth collaboration between the STD and chest clinics for the diagnosis and management of TB in PLHIV. Representatives from NPTCCD attend the quarterly meetings of HIV Care sub-committee of the National AIDS Committee (NAC) and the Director NSACP attends the TB Advisory Committee hosted by NPTCCD. There are joint training events for clinicians of the STD and chest clinics in the counselling, management and treatment of HIV and AIDS as well as HIV-TB. All PLHIV are tested for TB and 92% of TB patients have been screened for HIV either with RDTs available at some chest clinics or through referral to STD clinics. Data is shared across the two programmes at regular intervals. Within the last year, a cough centre has been opened at the NSACP as a one stop shop where TB diagnosis is conducted among PLHIV every week by a visiting chest physician and Isoniazid Preventive Therapy is provided. It has been agreed that Xpert MTB/RIF (GeneXpert[®]) machines available in district chest clinics can be used by the STD clinics provided NSACP provides the cartridges. NSACP is willing to provide more RDTs to chest clinics if requested.

2. Current Status

2.1 Current status of the TB epidemic in Sri Lanka

There have been no material changes in the TB epidemic since the epidemiological analysis carried out for the MTR in 2017. Data for 2017 suggest that estimated incidence is unchanged. However, the reduction in case notifications continues – 8,511 cases were notified in 2017, and national case finding numbers for the first 3 quarters of 2018, suggest the 2018 total will be significantly lower. While uncertainty as to the underlying incidence of TB persists, these reductions are likely to be due to ongoing deterioration in the performance of TB service delivery.

2.1.1 Current status of the key efforts to control the TB epidemic in Sri Lanka

- 1 No significant progress in 15 months on strengthening the central unit of the NPT. Motivation among the staff remains low. Two medical officers have entered, but two have left. One of the new arrivals has important IT skills and has been instrumental in making progress towards an electronic, case-based surveillance system. However, this change in HR does not, address the gaps in leadership skills and or fill the gaps in competence that need to be addressed to drive TB control forward.
- 2 The Director's position is now vacant, and the Deputy Director is due for transfer. These vacancies at the top of the programme provide a great opportunity to strengthen the leadership and capacity of the NPTCCD.
- 3 A review of the pilot districts' case finding data for Q1 showed no significant increase in case-finding. This is disappointing, but not surprising: review of their performance in June, 2018, showed that there was no increase in the number of referrals of patients for testing, and no increase in the sensitivity of the diagnostic algorithm, apart from an increase in CXRs in Kegalle, that, for unclear reasons, did not increase the yield of cases. The reasons given for failure to increase the number of CXRs performed in Gampaha and Kaluthara included:
 - a. Restrictive policies at local level, eg: no CXR requests allowed from OPD, not more than 40 films permitted/day, Medical Officers (MOs) not permitted to order CXRs, etc
 - b. Hospitals without X-ray machines
 - c. Non-functioning machines
 - d. Inadequate numbers of radiographers
 - e. X-ray films out of stock

2.1.2 Issues highlighted at the National Consultation on Ending TB & AIDS, October 15-16, 2018 (for TB)

The importance of addressing the human resource constraints at central and district levels was emphasised by the Deputy Director of NPTCCD in his presentation on the challenges facing TB control. He also recommended greater involvement of the general health services in the diagnosis and management of TB and engagement of the private sector. While some progress

had been made since the MTR, notably in setting up the pilot districts and increased training, these constraints were still the major challenges.

The modelling work on TB that has been summarised, also pointed out the very high return on investment that could be gained from improving TB service provision, especially if the staffing and service quality issues could be improved. It was therefore concerning that the Sri Lankan government budget contribution has fallen over 50% since 2015. However, overall, some USD 35 million, additional to current spending levels, may be all that is required to bring TB down to pre-elimination levels of 1 per 100,000 population.

Dr Paul Nunn presented the work of the MTR. He mentioned that the policy in relying on symptoms and sputum smear microscopy for diagnosis would miss two thirds of the cases, and that the recent change in policy for the diagnostic algorithm to include chest X-ray and Xpert MTB/RIF (GeneXpert®) was designed to increase the sensitivity of the algorithm. However, active case finding opportunities were being missed, and infection control was basic in many facilities. Human resource policies remain weak and require strengthening at the highest levels.

Innovation was addressed by Dr Mukta Sharma, WHO/ SEARO. In both TB and HIV/AIDS too few cases are being found, and of those that do enter the health system for screening, too many leak away in the subsequent steps of diagnosis, initiation of treatment, completion of treatment (in the case of TB), and follow up (after treatment, in TB). There is great potential in improving service provision through new mobile technologies and electronic recording and reporting systems, such as the Nikshay in India. Several countries in the region have successfully engaged the private sector with innovations such as free provision of drugs to private patients and involvement of pharmacies in both case detection and case holding. The key message from her presentation was the importance of implementation research to generate new ideas, try them out, improve them over time, create efficiencies and focus investment where it can have the biggest impact. Susan Sparkes, WHO/Geneva spoke about, how synergies across programmes can improve programme efficiencies. Dr Mark Landry, WHO/SEARO stressed how better information systems, based on electronic methods, could ensure more efficient flows of information and enhance the efficiency of the health system as a whole. PHC restructuring was a great opportunity to help develop these information systems, which would also benefit the “vertical” programmes.

Dr Nunn’s second talk addressed the opportunities for improving service provision in Sri Lanka and focused on the necessary steps.

In the group work session on “screening and diagnosis of TB”: challenged to come up with ideas for finding more cases, the participants felt strongly that social media had a big role in improving peoples’ awareness and health seeking behaviour. Radio and TV would be needed to reach the elderly, an increasingly important group with a high incidence of TB. Messages would need to be in Tamil as well as Sinhala. The estates were felt to be an important target for ACF. Outreach projects should address the slums, but screening needs to be as efficient as possible and make use of Xpert MTB/RIF (GeneXpert®) as well as chest Xrays. Some mentioned that service provision needs to be much more patient friendly, showing more

respect to patients, especially the poor, and opening at more convenient hours for working people. Incentives were thought necessary to increase awareness and encourage better performance from MOs in the public sector, as well as the private practitioners. Public Health Inspectors and Estate Medical Assistants should be much more involved in case finding according to some participants, and NGOs could be made responsible for setting up systems to transport sputum to labs for Xpert MTB/RIF (GeneXpert[®]) or culture. Videos showing how to produce a good specimen are now available in several languages and suitable for many different cultures,¹. School children could help identify suspected cases at home and more attention given to religious places, would yield more cases, especially in the elderly and poor.

In the group work session on *“Treatment, care and monitoring the response”*, the group highlighted the following major challenges to Directly Observed Treatment (DOT) uptake: the lack of easy financial support for patients, the lack of family based DOT, the limited number of DOT providers and lack of client-friendly DOT administration hours, and stigma. The proposed recommendations were: to introduce family-based DOT; introduce evening /night time DOT administration sessions, hire NGO/CBOs as DOT providers and introducing a mobile -app for DOTS. The group also advised improving counselling services before and during treatment; the introduction of micro-finance support; frequent testing via PHC sites (rather than asking all patients to visit DCC); increasing patient supervision; and improving client friendliness in treatment and follow-up as measures to enhance treatment adherence.

Groups also addressed *“Strengthening systems for health”*, *“Empowering communities and engaging other sectors”*, and *“Synergy across programmes”*. One major theme in these discussions was the role of stigma, which was felt to be a huge and unaddressed problem. TB was thought to be lagging behind HIV in social marketing and communications to reduce stigma and engage the general population. TB survivors should be used as ambassadors to encourage more referrals for screening and testing than is done currently. Migrant health issues need to be properly assessed, including the role of foreign labour in bringing TB cases into the country. NGOs should form an umbrella organisation, one group asserted, to strengthen patient and family support and ensure that patients got the social protection they were entitled to. NGOs engaged in TB or HIV/AIDS should coordinate so that organisations engaged with both diseases.

The synergies that were put forward to link TB and HIV/AIDS included sharing epidemiological expertise at central unit level, ensuring NGOs worked on both diseases, sharing lab equipment such as the Xpert MTB/RIF (GeneXpert[®]) platform for both diagnosis of TB, rifampicin resistance and for estimation of HIV viral load. The programmes could work together for clinician awareness, counselling patients about the two diseases, especially with respect to contact tracing and informing family members, including training family members to supervise treatment. Both disease programmes need to go into prisons, and screen foreign labour groups and could better coordinate these activities. DCCs and STD clinics should ensure that they screen for the “other” disease as part of their diagnostic work up. Some staff felt that

¹<http://intuneforlife.org/project/sputum/> Accessed 20 November, 2018.

they were simply “recipients of line ministry instructions” (rather than partners) and that programmes were too “vertical” and insufficiently engaged regional and provincial staff.

2.2 Current status of the HIV epidemic in Sri Lanka

The epidemic continues to remain low but Sri Lanka has a long way to go to reach the Ending AIDS goal of 2025. However, the determination of the NSACP and its partners in the field to make this a reality, is commendable as is apparent from the progress made since the External Review of 2017 and if such efforts are further enhanced and coordinated, reaching that goal may become a possibility.

The main barrier is apparent from the treatment cascade which clearly shows that there are gaps in reaching PLHIV particularly KPs as well as failure to put known PLHIV on treatment. Although efforts are being made to overcome this gap, challenges are considerable. Results from pilot programs will become available in the early part of 2019 following which evidence-based decisions can be made on scaling up or adapting those programs.

In the meantime, while piloting some of these initiatives and also with the changes in the ongoing intervention programs, several issues have been highlighted. Some of these issues remain the same as those presented during the External Review while others directly pertain to ground experience during the pilots and as per group discussions in the National consultation on Ending TB & AIDS. These are summarised below:

2.2.1 Reaching KPs and enrolling into HTS:

- Reaching KPs remains a problem. The present efforts appear to be augmenting access to more KPs with more being tested for HIV, however, this still has not penetrated the networks of KPs especially those who are more hidden. An example is the sex trade for FSW that is well organised where FSW are protected by a hierarchy of managers, handlers, etc. In the KP intervention model, very often the identification of FSW is based not on self-identity but on circumstances of poverty where it is assumed that she is supporting herself by selling sex. In general, KP identification remains a problem and STD doctors sometimes disagree with the identity of the KP brought to the STD clinic. Accessing males, especially young MSM who may be different in several ways and penetrating their networks is difficult. Prevention services are missing essential components such as harm reduction and availability of Pre-Exposure Prophylaxis (PrEP).
- HIV testing algorithm has not been changed resulting in delayed provision of results which could lead to loss to follow up (LFU). The use of oral fluid point of care testing has not been considered.
- The new models of intervention being piloted are aimed to increase HTS and those reached are then not followed up further if HIV negative. Moreover, for reaching given targets in the available time, rapport building is a challenge. This is an opportunity lost as further contact for prevention is not possible.

- Incentives used for field officers for bringing KPs to HTS has created problems as fraudulent vouchers were created to increase numbers. The role of incentives needs revisiting.

2.2.2 Capacity of KP organisations and vulnerability of young people:

Understanding KP networks, which may be multiple, is possible through meaningful engagement with the community and empowerment of communities. Despite efforts to engage more KPs directly and enhance their capacity, this remains as a challenge especially as education levels are low and skills are limited.

Knowledge and awareness among young people regarding HIV and STIs is low and efforts to provide sex education has so far been *ad hoc*. This is an issue as HIV rates among young people and adolescent pregnancy rates has been static for several years.

2.2.3 Loss to Follow Up (LFU) and Stigma and discrimination:

LFU, which was highlighted in the External Review, remains an issue and occurs at different steps of the treatment cascade. This has been identified especially with PWID in whom adherence is difficult to ensure. Also, where poverty is an overriding issue, HIV takes a back seat especially when there are no symptoms. All known HIV positive cases are followed individually. It is to be noted that in the case of PWID availability of harm reduction services, in particular opioid substitution therapy which is considered to be essential for ensuring adherence¹³, is absent.

Lack of a conducive environment for KPs identified during the External Review, remains a major obstacle for KPs to seeking and remaining within services. Some KPs avoid services for fear of discrimination by some staff members. Consequently, late diagnosis remains an ongoing problem with high numbers of PLHIV reporting with CD4 counts of >350 which has been static since 2015. In addition, KPs are often arrested and several court cases have been recorded under the Vagrancy and Brothel House Ordinance and section 365a. Repealing of laws to overcome legal challenges is a target in the NSP and remains to be addressed.

2.2.4 Coordination:

There is an apparent lack of coordination of all the various activities on HIV that is sometimes reflected in the field. This can result in duplication as the same people may be being reached through different programs such as prisons and KP interventions and between the different KP models being piloted.

2.2.5 Commitment of policy makers:

- To achieve the 2025 goal more engagement from high level policy makers is essential and still has not been fully realised. Engagement is required from the Minister of Health so that changes can be made both centrally and at the district level. This is essential to ensure resources required for intensification of activities at different levels including revision of the organogram of the NSACP, all of which was highlighted in the External Review with targets in the NSP.
- Laboratories still require improvements to ensure EMTCT – from National Reference Laboratory to the district level. Requirements for maintenance of different equipment

need to be understood and resourced for example more sophisticated equipment require service agreements with the companies and cannot rely on the government bio-engineering department.

- Procurement delays are a major obstacle and stock outs are common. The procurement supply chain management system needs to be better managed.

2.2.6 Data management

- The electronic Information Management System (EIMS) is still in the process of being established. Whether all necessary data points are being linked will become clear only once it is set up. STD clinics must be able to enter data electronically, for which, in addition to computers other essential facilities are not yet in place such as smooth internet connection, trained staff, process of maintenance of computers, etc.
- At present, the electronic MIS has concentrated on existing HIV intervention programs but there are other sources of data which have not been explored such as that of returnee migrants.
- Unique Identifier Code (UIC) is being set up but KPs are concerned about their confidentiality being breached.
- Health MIS (HIMS) is being established across MOH but discussions with NSACP have not yet started for alignment across systems.

3. Opportunities

3.1 Commitments to End TB

The End TB strategy, approved by the World Health Assembly in 2014, has triggered accelerated efforts to end the TB epidemic, as a public health threat, globally and regionally. The strategy's targets include a reduction of incidence of 80%, and in deaths, of 90%, by 2030. Ministerial summits of health ministers in the South East Asia Region (SEAR) of WHO have endorsed these targets, while some countries, including India and Sri Lanka, have committed themselves to achieving the 2030 goals by 2025. This ambitious approach will only get close to the goals if there is rapid acceleration in TB control in Sri Lanka, which in turn, depends on radical change to the management, organisation and technical strategies of TB control efforts.

3.2 The transition period TB: the end of external donor support to Sri Lanka

External donor support of TB control in Sri Lanka will, eventually, come to an end, which demands a twin approach. On one hand, the remaining donor funds need to be spent on interventions or commodities that will best position Sri Lanka's control of TB for the point at which funding is 100% from government sources. On the other, policy makers in MOHNIM, accustomed to donor support for many years, need to be aware of the full range of issues that government funds will soon need to support.

3.3 The drive towards Universal Health Care (UHC) and TB in Sri Lanka

The Hon. Minister and the senior echelons of MOHNIM are fully committed to the reform of primary health care (PHC) that they see as necessary to deliver UHC³. Improvements in TB control need to be embedded in these reforms if the acceleration of the progress towards ending TB is to be achieved. Notably, the capacity to diagnose TB must be made available at the level of the general practitioners or the primary medical care units (PMCU) that are central to the PHC reforms. However, it seems that the NPTCCD has not yet been fully engaged in the discussions that are designing the Essential Service Package (ESP), which will be the main element of PHC reform. The current alignment of TB diagnostic services in the ESP is more or less the same as the existing approach and is too centralised to encourage the increase in referrals that is needed. Furthermore, it should include treatment of latent TB infection that could be done at MOH clinics, or PMCU level.

Current policy and practice on the filling up of administrative posts in NPTCCD need to be reviewed and revised to allow suitable medical professionals with relevant experience, qualifications, competence and proven achievements to take up the challenge to "End TB" in Sri Lanka.

This report makes the case that "Ending TB" by 2025, or even by 2030, requires full alignment of TB control strategies with the emerging reforms to PHC, and the development of the ESP. At the same time the PHC reform, provided it takes TB properly into account, represents a great opportunity to implement the radical change in approaches to TB in Sri Lanka without which there will be no progress in TB control.

3.4 Commitments to End AIDS by 2025

The present review was undertaken to assess whether the country is progressing towards the Ending AIDS targets. At the same time, to emphasise the changing scenario in the country of declining donor support and introduction of the changes to the health sector like PHC reforms.

This report summarises the current situation of HIV prevention, care and treatment in the country, highlighting recent developments and issues and sets out recommendations for immediate action that, if implemented, would provide the radical change that is called for.

3.5 The transition period HIV-AIDS: the end of external donor support to Sri Lanka

External donor support of HIV and AIDS in Sri Lanka will, eventually, come to an end. In order to facilitate transition to domestic funding, the NSACP has prepared a transition plan. The transition plan however, needs to be strengthened to addresses all aspects of programming from implementation mechanisms, monitoring, reporting and financing. It is essential to plan for resources so that the plan is fully domestically funded. Human resources plan needs to be meticulous and an efficient mechanism of financial support to Community-Based Organizations CBOs / Non-Governmental Organization (NGO) needs to be developed. Transition plan, laws and regulations and the capacity of the service system needs to take into account, the CBOs for services provision must be capacitated. Smooth transition needs a long-term plan that is discussed and agreed upon at the highest level.

3.6 The drive towards Universal Health Care (UHC) and HIV-AIDS in Sri Lanka

The Hon. Minister and the senior echelons of MOHNIM are fully committed to the reform of PHC to deliver UHC. The Global Fund had pointed out that for long term sustainability of fighting against the three diseases; countries should be able to sustain programs to achieve lasting impact and to move towards eventual achievement of UHC¹⁴. However, linkages need to be identified so that reforms do not hamper Ending AIDS by 2025 rather ways to enhance this achievement need to be identified¹⁵. The recent Lancet Commission on “Advancing global health and strengthening the HIV response in the era of the Sustainable Development Goals” the International AIDS Society highlights that “HIV should be carefully and strategically integrated within primary care and the broader global health agenda, with the scale and pace of integration geared to national and subnational circumstances and the needs of the populations in greatest need of HIV services”.

4. Recommendations

4.1 Recommendations to End TB & AIDS by 2025

1. Establish a high level working group /task force on ending TB & AIDS to address radical improvement in the control of TB & HIV chaired by the Hon. Minister, with high level representatives from all relevant sectors: patients, communities, health workers, regional officers, NGO/CSOs, consultant respiratory physicians, consultant venereologists, WHO, Director /NPTCCD, Director NASCP, DDG PHS I, DGHS etc. Total numbers not to exceed 20.
2. Immediate steps need to be taken to appoint full time Directors with relevant experience, qualifications, competence and proven achievements to both programmes
3. Immediate measures need to be taken to fulfil the essential human resource needs in central and regional programmes of both HIV and TB
4. More active participation and engagement of NPTCCD and NSACP in PHC reforms in order to optimize the opportunities in reaching ending disease targets
5. Implement an advocacy and communication campaign on Ending TB & AIDS. For AIDS, enactment of the existing Communication Strategy ¹⁴ is required.
6. Development of a comprehensive and long-term transition planning to facilitate smooth transition from donor support to fully domestic support

4.2 Specific recommendations on Ending TB

4.2.1 Policy level

- Ensure that the NPTCCD is sufficiently staffed. An epidemiologist and database manager should be added to the existing cadre in order to achieve the WHO benchmarks for surveillance, monitoring and evaluation, by 2020. The cadres of Consultant Community Physicians and MOs also require strengthening.
- Ensure that the discussions that are developing the PHC approach in Sri Lanka fully involve the disease control programmes and that the NPTCCD central unit fully represents the needs for TB control in these discussions.
- Take the necessary steps to decentralise the management of MDR-TB to at least 2 or 3 more centres, including Kandy and, in/around Jaffna. This should include ensuring patient-centred care for all patients including provision of psycho-social-economic support
- In the context of PHC reform, ensure that diagnostic confirmation of TB is available at PMCU/ divisional hospital (where diagnostic services are located), initially under the overall supervision and monitoring of the Chest Clinic. (For the detailed planning of the ESP, the availability of the different TB diagnostic tests – microscopy, Xpert MTB/RIF, LPA, culture and drug susceptibility testing - should be mapped to the desired level in the health service). This will require ensuring that sufficient numbers of laboratory technicians are trained and made available for public health work, including TB.
- In future GF grant cycles, NPTCCD should focus their specific attention to optimally utilize the available donor support in long term investments rather than day to day expenditures,

which eventually will help to develop sustainable and resilient health systems supporting towards ending TB

- As part of the PHC reform, screening of contacts should be done at community level, and CXRs need to be made available. Public health inspectors should be specifically trained, or re-trained, to ensure all household and other close contacts are properly screened.
- All large hospitals, especially the teaching hospitals, should be made accountable to institute rapid TB testing and record keeping for presumed cases of TB attending OPD.
- Policy needs to be modified to ensure that clinical follow-up be made possible at any place where there is a Medical Officer trained in TB control and management. Only selected cases with severe adverse events need to be referred to higher level.

4.2.2 Programme level

The newly appointed Director, NPTCCD should develop by end of Q2, 2019:

- A plan of action to increase the referrals for testing for TB, and to overcome the obstacles to getting a CXR as a first line screening test. This will involve further investigation of the barriers at district level throughout the country by all DTCOs. The plan should include a close examination of the high sputum positivity rate and consideration given to increase the diagnosis of clinical cases of TB, among those found to be sputum smear negative.
- A plan for regular screening for all prisons.
- A plan to initiate work to carefully determine the level of TB in other possible high risk groups such as the elderly and diabetics in clinics.
- A convincing series of steps to determine the role of the private sector in TB control, including an analysis of the pathways taken by patients to arrive at a diagnosis. On the basis of this information, a further plan should be developed by end Q1 2019 to engage the private sector to support national policy on TB control, requesting policy support from the Director General of Health Services (DGHS) as necessary.
- A system for transporting sputum from health facilities to labs must be established, and its performance should be regularly monitored.
- A plan for regular supportive supervision in which staff training should be embedded
- A plan for revision of the surveillance, monitoring and evaluation approach for TB which will achieve the WHO benchmarks by 2020, including consideration of using drug purchasing data as a means of estimating incidence.
- A plan to implement guidelines for management of latent TB infection as per recent WHO recommendations including use of newer drugs like rifapentine.
- A plan for transition to newer drugs and regimen for management of RR/MDR-TB including systems for monitoring and management of adverse events in all patients on second-line treatment

The Director/ NPTCCD, should ensure by end of 2019:

- A comprehensive plan for infection control for TB in Sri Lanka, with appropriate links to any existing airborne infection control (IC) strategies. This plan should include health facility infection control assessments with an accredited infection control engineer; the introduction of administrative controls for IC, consideration of mechanical ventilation

where necessary; and making personal protection available with N95-standard respirators for all exposed staff.

- Review an anti-stigma toolkit and consider if it could be useful in Sri Lanka. Look at stigma as a possible cause of delay in the patient pathway analysis
- A mechanism for establishing collaboration with paediatricians to investigate the situation of childhood TB, and draw up plans to improve the number of childhood referrals and childhood investigation of TB making full use of modern technology that is now available.

4.2.3 Management and leadership

Restoration of management capacity and leadership skills in the NPTCCD is essential to all the other steps recommended in this report for TB, and is therefore of top priority. Working together, the DGHS, responsible DDG-PHS -I, and the new Director, NPTCCD, should take the necessary steps to improve the management and organisation of the NPTCCD, with particular focus at the central unit level, and ensure that:

- Selected existing staff are trained up to be able to address programme needs;
- Recruitment of sufficient staff with the essential skills required by the programme is done in a timely fashion;
- A plan is made for the reinstitution of supportive supervision of provinces and districts, with increased collaboration with provincial and regional health authorities and a combined, inclusive approach.
- The NSP (2015-2020) is revised and focused to an action-oriented document that makes clear the priorities, and revises the budget;
- DTCOs are properly engaged, involved and supported and their workload is reviewed and revised accordingly.

4.2.4 Implementation level

The Director, NPTCCD, working with Regional Directors of Health Services (RDHS), should ensure that

- active case finding is regularly and appropriately performed at district level, by holding DTCOs accountable. In pilot districts intensify household contact screening using CXR and physical examination for two quarters and evaluate results. If productive, extend into all districts. If not, modify approach.
- **Presumed case registers are used in all OPD**, and the MOIC/OPD is made accountable for using them to trace the cases that disappear between OPD and laboratory;
- In collaboration with the Director, NTRL, a verification study of about 2,000 randomly selected sputum smears taken from below the DCC be carried out to ensure that sputum examination at these levels is performing optimally, or, if not, appropriate measures are taken. Steps should also be taken to improve the quality of sputum produced by patients by using one of the video-assisted approaches that has been shown to have an impact⁴.

- Universal DST for all TB cases is achieved by end 2021. This will require that Xpert MTB/RIF (GeneXpert®) utilisation is increased to at least three tests per port, per working day.
- For MDR-TB patients, the Director NPTCCD should ensure initiating cases on the newer, WHO-approved regimens, with strict drug safety monitoring management practices, and adequate social and economic support for patients and their families.

4.3 Specific recommendations on End AIDS by 2025

During the external review of the NSACP conducted in 2017, five broad overarching recommendations were made:

- Continue services to KPs and enhance reach to different marginalised and hidden population groups including young people
- Simplify diagnostic algorithms and streamline ART delivery processes
- Improve data gathering and analysis systems
- Enhance capacity of NSACP and ensure adequate resources
- Obtain commitment from the highest level for enhanced mobilisation of resources and buy in from different sectors

As discussed in the sections above, some actions have been undertaken since the review but a lot more needs to happen to reach Ending AIDS targets. The key actions that are needed to be taken immediately at the policy, programme and implementation levels are presented here:

4.3.1 Policy level

- Initiation of discussion to address punitive laws to promote a conducive environment for KPs. Addressing these requires multi-sectoral engagement and high level advocacy.
- Development of a comprehensive and long term transition planning from donor support to fully domestic support is urgent.

4.3.2 Programme level

- Revision of the HIV testing algorithm and making available different methods of testing that are applicable in different situations including self-testing, home testing using phone and video call support (for intimate sex partners).
- Development of tools to address stigma of KPs and PLHIV by health care providers, law enforcement and services providers from other sectors
- Development of a coordination plan to ensure all sectors work together to End AIDS.
- Development of a coordination plan to ensure that all implementers and funders supporting implementation work together from a common platform. This will allow

coordination of all pilot projects in order to maximize the use of lessons learned from each.

- Development of systems for partner notification to address “low risk females” who are a vulnerable group as shown in the AEM.
- Development of a robust data management and analysis system ensuring that data can be used for decision-making for reaching ending disease targets. To provide an evidence based response, a good understanding of the context and the epidemic is a prerequisite and appropriate data needs to be available and analyzed. It is important to ensure that the electronic MIS being established covers all domains and links with HMIS being developed for the MOH.
- Alignment of electronic case records across the MOH while at the same time protecting confidentiality of KPs.

4.3.3 Implementation level

- Development of a culture of understanding the local context beginning from the field level. This is essential to adapt services to ground realities and requires meaningful engagement of KPs. For this staff at the STD clinics must be trained not only to gather and enter data but to analyze the data on a regular basis so that changes in the field are understood enabling real time action and correction.
- Further exploring use of virtual spaces and social media apps for different KPs and building from the experience of other countries may help reach the hidden.
- Building capacity of community (KPs) is key for both reaching KPs, which should be through and with KPs, as well as sustaining KP engagement in the AIDS response in a meaningful manner.
- Maintenance of focus on high-transmission geographies, people at highest risk for HIV, and the package of interventions that are most likely to have the largest effect in each different situation.
- Development of age sensitive SRH education tools for young people and use of virtual spaces to reach them.

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Annexure 1

Achieving TB elimination in Sri Lanka: a mathematical modelling analysis

Background

In this analysis we address the following questions on TB control in Sri Lanka:

- What combination of interventions will be needed, and at what scale, to end TB in Sri Lanka by 2025?
- What are the resource requirements of fully implementing these interventions?
- What additional data needs to be collected, in order to fully inform control priorities?

We use mathematical models of TB transmission, combined with the available data. In so doing, these results are intended to inform discussion on intervention priorities, and how the required levels of intervention coverage could be achieved in practice.

Current epidemiology of TB in Sri Lanka

Box 1 to the right highlights some key points on Sri Lanka's TB epidemic. It is well-known that Sri Lanka has excellent health indicators, which are on par with many high-income settings. However, the stagnant TB burden remains an exception to these trends. A push to End TB in Sri Lanka would not only have important implications for population health in the country but – on the heels of malaria elimination – could also provide an exemplary reference, for other countries in the region and elsewhere.

Incidence: **64** per 100,000 population, estimated

Case detection rate: **65%** (8511 cases notified in 2017)

Drug resistance: **0.6%** of notified cases estimated to have multi-drug or rifampicin resistance

HIV-coinfection: **0.3%** of notified TB cases are HIV coinfectd

Box 1: key indicators in Sri Lanka's TB epidemic (from WHO TB report, 2017)

There are several challenges with TB control in Sri Lanka today. In care settings, the disease is generally not high on the list of clinical priorities. As a result, it is thought that TB cases may visit several different providers, undergoing a lengthy diagnostic delay, before finally accessing a TB diagnostic test. The driving issue here is not the availability of diagnostic tests, but rather the need for appropriate human resources and management structure, in order to recognise and link TB symptomatics to care as rapidly as possible.

Moreover there are population subgroups who are thought to bear a disproportionate TB burden, including urban slums and prison populations. These and other populations may present priorities for focusing future efforts in active case-finding.

Other complicating factors in Sri Lanka's TB burden include comorbidities such as diabetes and malnutrition, both of which are known to elevate the risk of developing active TB disease. There is limited evidence for the co-prevalence of these risk factors and TB in Sri Lanka. Nonetheless, addressing these and other risk factors may, in future, become increasingly important approaches to prevention of TB.

Mathematical modelling

Mathematical modelling offers a systematic approach for estimating the impact of given interventions. In brief, we develop a set of mathematical equations to capture the rates at which individuals move between different states, for example as a result of diagnosis and treatment initiation. These equations also capture the role of prevalent TB in driving transmission; in doing so, a model provides a framework for estimating the potential incidence and mortality impacts of given interventions.

The current study is informed by WHO data and estimates for TB burden in Sri Lanka, including incidence and burden of drug resistance (see box 1). However, there remain certain important indicators for which there is little or no evidence available. One example is the number of provider visits that a TB symptomatic needs to undergo, before a provider attempts a TB diagnosis (this is related to the amount of training and HR support available in care settings). To accommodate these parameters, we incorporate a range of possible values. We employ a Bayesian melding framework to capture the uncertainty in these and other model outputs, and to propagate this uncertainty systematically to model outputs (e.g. for the impact of a given intervention).

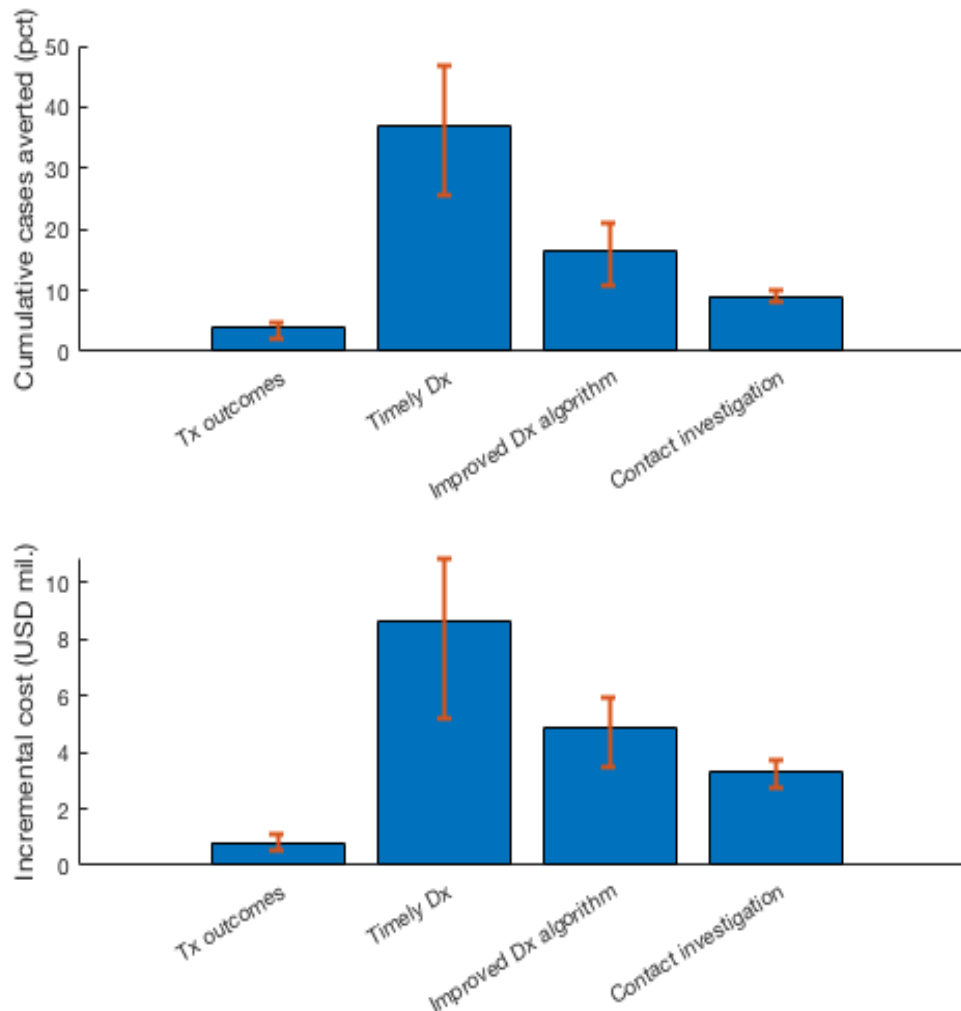
The model is a deterministic, compartmental framework distinguishing smear-negative, smear-positive and extrapulmonary TB; it incorporates the acquisition and transmission of multi-drug-resistant TB, as well as taking into account programmatic spending on treating false positive diagnoses of TB (as a result of imperfect specificity of the diagnostic tools being used, and the low prevalence of TB in this setting).

We model the interventions listed in table 1. Interventions in the upper half of the table, which are informed by existing epidemiological and cost data, are denoted as the ‘costed’ interventions. As noted below, these measures can bring about significant reductions in TB burden, but cannot meet the End TB goals alone. There is a need for further data collection and evidence generation to inform the additional interventions that might be implemented. In the present exercise, we present some hypothetical and illustrative intervention scenarios, listed in the lower half of table 1 (under the heading ‘not costed’). For these interventions we only illustrate the projected epidemiological impact, and not their costs: they serve to highlight areas where future data collection would be invaluable (for example, studies to elucidate the relative burden of TB in different vulnerable populations, to help focus active case-finding).

Simulated results

Concentrating first on costed interventions, Figure 1 shows estimates for impact and resource requirements, for each intervention acting alone. Results illustrate that improving TB treatment outcomes offers the lowest cost, but is not highly impactful: it only results in a ~4% decline in incidence between 2019 and 2025. In contrast, measures to improve timely diagnosis (increased personnel and training for early recognition of TB symptoms and uptake of diagnostic services) costs the most, while also being the most individually impactful.

Figure 1. Estimates of impact (upper panel) and cost (lower panel) of the costed interventions listed in table 1, when acting individually



Next, Figure 2 illustrates an ‘expansion pathway’ for combining the different costed interventions. Here we follow a standard approach in health economics: for the first intervention in this sequence we choose the most cost-effective of the interventions shown in Figure 1 (that is, improving treatment outcomes). For the second, we choose the intervention from the remaining set that, in combination with the first intervention, is the most cost-effective: we iterate in this manner until all four costed interventions have been selected. The figure illustrates that this process would identify, in decreasing order of priority: (i) improving treatment outcomes, (ii) Timely access to diagnostic services, (iii) contact investigation amongst household contacts, (iv) Improved diagnostic algorithm (including diagnosis facilitated by X-ray, and follow-up Xpert for DST). In combination, the measures shown in Fig.2 would require an overall incremental spend of USD 20.2 million between now and 2025.

However, we note that these estimates only relate to TB programmatic costs, and do not address the additional capacity in primary care personnel that would be needed, to support these interventions. We assume that this HR capacity will become available as a result of

broader initiatives (currently underway) to reform Sri Lanka's primary health care provision. Nonetheless, additional costing analysis (see Annex 1B) suggests that – to recruit an additional 1000 Medical Officers, with responsibilities including TB, would cost an additional USD 25mn between 2018 – 2025, in salary for these staff.

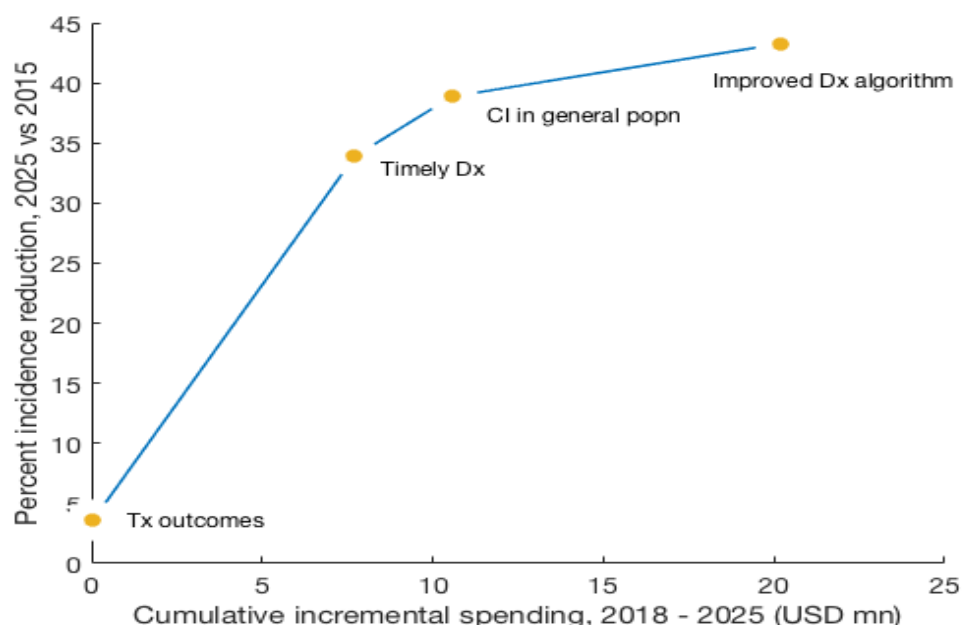


Figure 2. 'Expansion pathway' of costed interventions in Table 1. Figure shows the sequence of interventions such that, at each stage, the sequential combination of interventions is the most cost-effective of those available. Overall, combined measures shown here could reduce TB incidence by 43% by 2025, with an investment of USD 20.2mn over this time. Note that – in the 'timely Dx' intervention scenario – the costs shown reflect only the costs of additional diagnosis and treatment as a result of improving TB services: we do not incorporate the additional costs of the staff capacity involved, assuming this to be covered by existing initiatives for reorienting Sri Lanka's primary care system.

Figure 3 (solid lines) show the incidence trajectories of this sequence of interventions, acting in successive combination. Results suggest that the collected impact of these interventions (yellow curve) is to reduce incidence by 43% by 2025, compared to 2015.

However, this impact falls short of the 80% target for incidence reduction. To meet those targets it is necessary to adapt additional interventions, shown as dashed lines in Figure 3. One example is the implementation of active case-finding, in population subgroups accounting for a substantial proportion of overall TB burden: the figure shows an illustrative example consistent with urban slums, and in Annex 1A we also illustrate the case of ACF in prison populations. However, even these measures are insufficient to reach the End TB goals. Ultimately there is a need for *preventive measures* to prevent TB disease and infection on the population level (see also Table 1). In fig.3 we illustrate an example where population preventive measures are instated by 2025, and succeed in cutting transmission, reactivation and relapse by half.

Population preventive measures are those that are not restricted to any specific risk group, in contrast to current WHO guidelines for household contacts and PLHIV. We hypothesise that intersectoral approaches, particularly measures to address social determinants of TB (such as poverty alleviation and improved living conditions) could be important. However, there is currently insufficient evidence to quantify the potential impact of these interventions. Given their potential importance (Fig.3), addressing these evidence gaps is a critical question for future research.

Nonetheless, we can ask: *how effective should any future population prevention measures be, and when should they be implemented by?* Figure 4 addresses this question, in order to meet the End TB goals by 2025. In particular, the figure illustrates that the End TB goals could be met by any population prevention measure that is at least 50% effective in cutting transmission, reactivation and relapse, and that is initiated by 2022 at the latest.

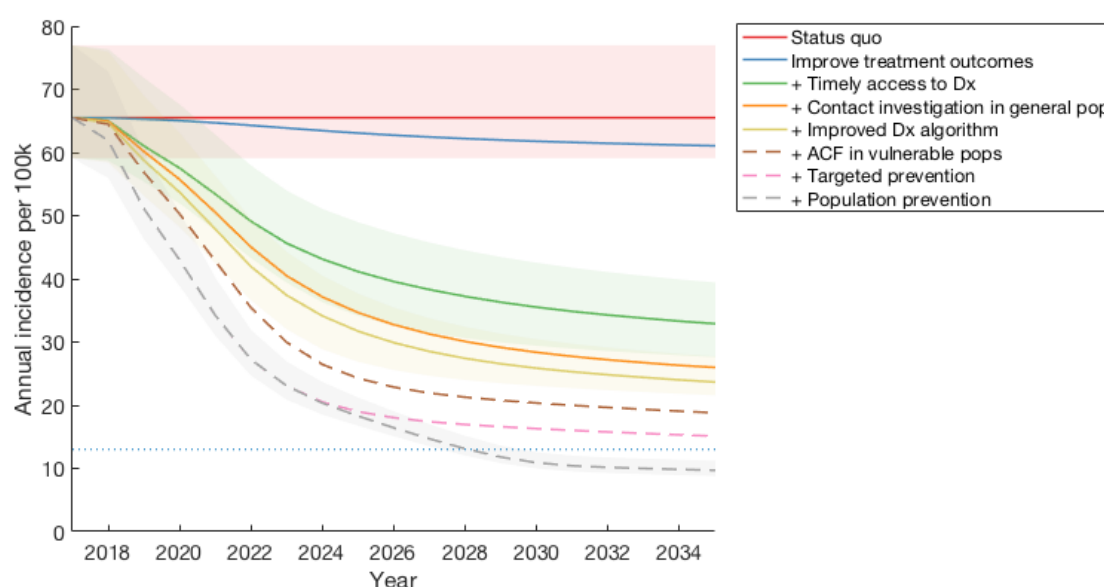


Figure 3: Projections for incidence between now and 2035, assuming each intervention is included cumulatively and in succession. Sequence of costed interventions (solid lines) follows that suggested by Fig.2, and additional interventions (dashed lines) are shown as illustrative examples for reaching the End TB goals. Shaded areas show uncertainty intervals, for clarity only shown for those four interventions having the greatest impact on incidence. The dotted, horizontal line shows the End TB goal for 80% incidence reduction. See table 1 for details on intervention scenarios.

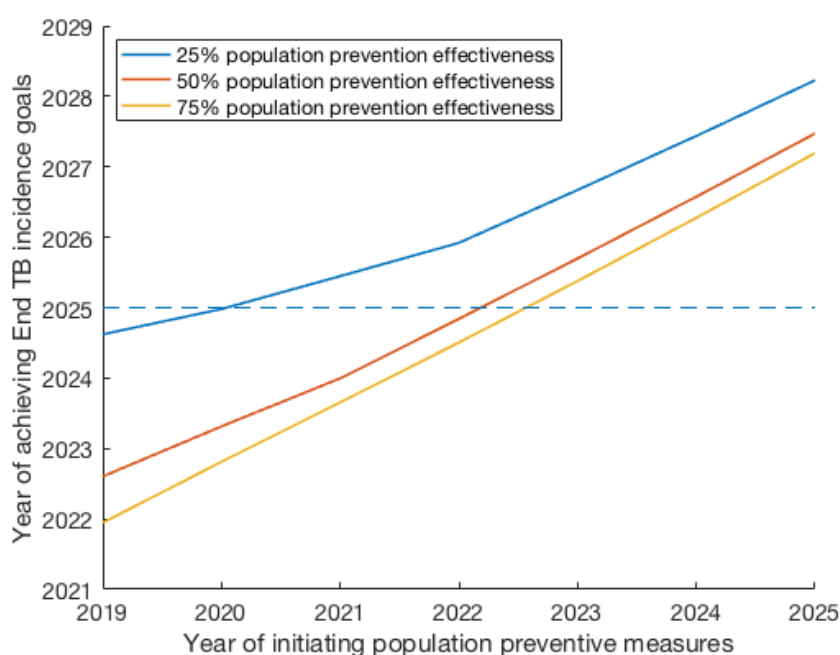


Figure 4: Requirements of future prevention interventions, to meet the End TB goals. This analysis relates to the ‘population prevention’ scenario shown in grey in Fig.1, and examines different scenarios for the implementation of this scenario. Horizontal axis shows the year in which population preventive measures are initiated (we assume a three-year scaleup period). Different curves show different scenarios for the effectiveness of these measures, assuming to act simultaneously on transmission, reactivation and relapse. Vertical axis shows the year in which 80% reductions in incidence are ultimately achieved, and the dashed line shows the target for ending TB by 2025.

The following table gives further details on the interventions modelled in Figure 1 above.

Intervention	Activities	Modelled effects
Costed interventions		
Improved treatment outcomes	Strengthened patient support to reduce mortality while on TB treatment and to promote completion	- Increased treatment initiation rates from 88% (assumed) to 95%
	Deployment of newly recommended, less toxic regimens for MDR-TB	- First-line treatment success increases from 85% to 90%
Timely access to diagnostic services	Increased staff at both clinical and lab levels, to ensure that symptomatic are linked to TB diagnosis facilities as soon as possible after presenting for care.	- Second-line treatment success increases from 50% to 80%, through use of new regimens
	This includes: (i) Increased capacity for MOs in OPDs to refer symptomatic,	Reduces the number of care seeking attempts (provider visits) that a symptomatic needs to undergo, before finally being tested for TB (with whatever diagnostic test)
		Intervention reduces number of visits from 4 (assumed) to 1.5 - i.e. there are sufficient trained

	and (ii) Increased PHLT and MLT staff to ensure capacity for conducting diagnostic tests	staff that a symptomatic is able to access a TB test after only 1 – 2 provider visits
Improved diagnostic algorithm	Microscopy and X-ray for all symptomatic, with Xpert for all smear positive/X-ray abnormalities	<p>'Sensitivity' of diagnosis increased amongst smear negative pulmonary TB cases, from 25% (assumed) to 90%</p> <p>As a result of universal DST, all MDR cases are initiated on appropriate therapy</p>
Contact investigation in general population	Amongst all notified cases (pulmonary and extrapulmonary), screen for TB amongst household contacts	Assume 2.9 contacts per case on average
<u>Not costed: hypothetical and illustrative</u>		
Active case finding in vulnerable populations	Sustained screening for symptoms and with mobile X-ray units, with Xpert confirmation amongst TB presumptives	No current data exists for the TB burden in high-risk populations, other than prisons. In Annex 1A we illustrate that ACF in prisons, although a helpful first step, cannot affect country-level TB burden by a significant amount. There is a need to identify alternative target populations. Here for illustration, we model a subpopulation that is 6% of the overall population, and has twice the prevalence as the rest of the population: this is consistent with urban slums, for example, but may also include the homeless, diabetics, and other vulnerable groups.
Targeted preventive measures	<p>Dietary support focused in vulnerable populations (urban slums, estates and prisons) to eliminate adult malnutrition in these populations by 2025.</p> <p>Also, full implementation of WHO preventive therapy guidelines (all close contacts and HIV infected)</p>	<p><u>Assuming</u> (i) a prevalence of malnutrition of 15% in these populations; (ii) that this risk factor triples the risk of LTBI developing into active disease; (iii) and that this is reversible through some form of dietary support.</p> <p>Also, that each notified case has 4 close contacts, of whom 50% have LTBI</p>
Population preventive measures	Intersectoral measures such as infection control in the household; improving living conditions for the poor; etc, that are <i>expected</i> to reduce opportunities for TB transmission, but are as yet <i>unproven</i> as TB interventions	Assume that such measures succeed in cutting TB transmission, reactivation and relapse by a given amount (see Fig.2)

Summary of findings

A cost-effectiveness perspective suggests that key interventions in Sri Lanka are, in decreasing order of priority:

1. Improving treatment outcomes amongst those diagnosed with TB
2. Ensure timely access to TB diagnostic services
3. Contact investigation amongst household contacts of notified cases
4. Improve the diagnostic algorithm to include X-ray and Xpert.

Of these interventions, *timely access to TB diagnosis* and *improved diagnostic algorithm* (nos. 2 & 4) would be the two most impactful. Combined, the above four interventions can reduce TB incidence by over 40% by 2025, but ending TB will ultimately need new approaches for *primary prevention* of TB disease. These measures may include, but should extend beyond, current approaches relying on preventive therapy: there is a need to avert transmission, reactivation and relapse from treatment. To achieve these effects, there is a pressing need for more evidence on effective approaches in the Sri Lanka setting, including intersectoral approaches.

Other important data gaps need to be addressed, for example:

- Patient pathway surveys will offer critical information on the delays to diagnosis. Such surveys will be critical in informing the number of provider visits before a TB symptomatic experiences a diagnostic test. Reflecting the staff capacity for enabling access to TB services, this is a key parameter underlying the importance of 'timely access' interventions.
- More detailed subnational studies of TB burden, including an understanding of the true burden of TB in vulnerable populations, such as urban slums and those known to have diabetes. Such information will help in targeting active case-finding most efficiently.
- The potential value of public health and information campaigns to encourage timely uptake of TB services, amongst those suffering from TB symptoms.

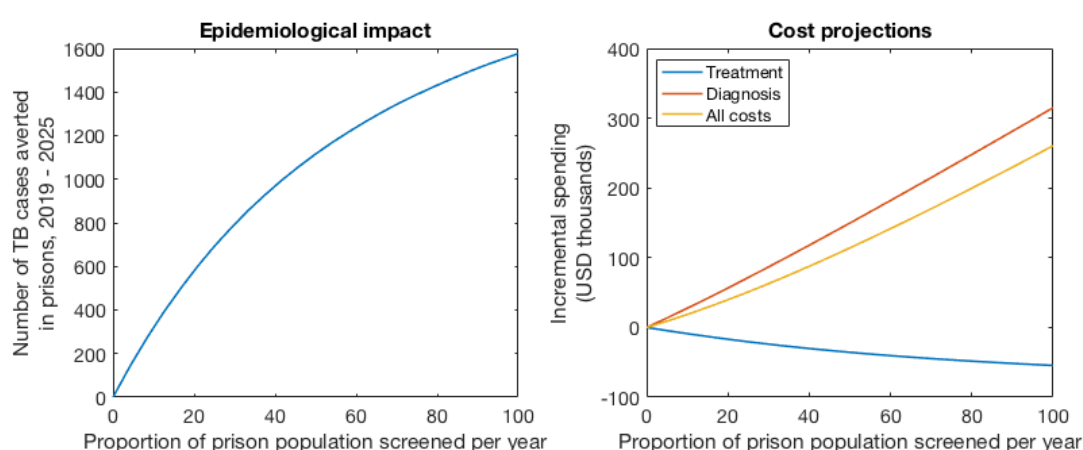
Ongoing changes in Sri Lanka's health system may facilitate some of the interventions described here. One important example is the Essential (Health) Services Package (ESP) for Sri Lanka, supported by the World Bank and the Asian Development Bank, and currently under discussion with the Ministry of Health. This initiative involves health system reorientation focused on new Primary Care Medical Units, which will offer TB services. These and other developments in Sri Lanka's health system may play an important role in improving TB service delivery.

Annex 1A: Potential impact of active case-finding in prisons

Here we explore the potential impact of active case-finding efforts, concentrated in prisons. Unfortunately there is insufficient data for robust projections. Nonetheless we provide illustrative results, informed by plausible assumptions for parameter values, as described below.

We consider a prison population of size 24,000 in Sri Lanka, assuming a TB prevalence in this population of 1600 per 100,000 population (NPTCCD, *pers.comm.*). Additionally, we account for the importation of TB into prisons by incarceration: disadvantaged socioeconomic groups are likely to be over-represented in prison populations, relative to the general population. The importation of TB due to new incarcerations is thus likely to be at a rate higher than that suggested by the community TB prevalence. For the sake of illustration, and in the absence of relevant data, we assume a TB prevalence amongst new incarcerations of 200 per 100,000 (consistent with the community prevalence of TB in high-burden settings such as India).

We assume an active case-finding intervention that screens a given proportion of the prison population per year, using mobile X-rays and symptom screening, and followed by the use of Xpert for confirmation. The remainder of the TB care cascade is assumed to be the same as for routine ('passive') TB services.



The figure illustrates the potential epidemiological impact (left-hand panel) and incremental cost (right-hand panel) of this intervention. For example, screening 50% of the prison population per year could avert ~1100 cases of TB between 2019 and 2025, at an incremental cost of USD 110,000 (right-hand panel, yellow curve), partly reflecting a shift from treatment costs to diagnosis (comparing orange and blue curves).

We also note that the overall impact indicated by the left-hand panel only accounts for < 2% of projected, cumulative incidence in Sri Lanka over this period. That is, while prisons may be a helpful starting point for ACF efforts, they cannot affect the national epidemic on their own. There may be a need to broaden the scope of ACF efforts to larger populations that are more epidemiologically relevant to the country-level epidemic.

Annex 1B: Economic inputs for modelling TB interventions in Sri Lanka

Table 1: Cost per diagnostic test

	USD	Rs
Genexpert ¹	20.02	3430.76
Chest X-ray (mobile) ¹	14.65	2518.42
Chest X-ray (standard) ²	6.82	1170.00
Smear ²	4.19	720.00
Smear mobile ³	5.50	944.24
Sputum Culture ²	8.33	1430.00

Note: ¹Uses the Scenario Building Cost estimation technique.

² Costs from private sector used as a proxy

³ combines information from both methods.

See Annex 1C for Scenario Building Cost estimate for Gene expert, and for mobile X-ray

The information in this table is important as the basis for taking decisions in choosing the mode of diagnosis. Considering cost alone standard chest x-ray and smear processes are cheaper than the mobile options. However under particular conditions where mobility is restricted such as in the case of prisoners, and the elderly in the rural and estate sectors, these options could be important in creating accessibility.

Large numbers may have to be screened to diagnose one patient with TB if the general population is considered. However screening is an important strategy in targeting 'risk groups, such as those in prison, urban slums, and those with compromised immunity such as diabetics and cancer patients.

Whether such a screening strategy is cost beneficial for a specific population would depend on its incidence

For example when lost earnings of an individual due to withdrawal from the labour force is 6,713,316, and the cost of a standard chest x-ray is 1170 then even x-raying 4000 persons to detect 1 person would be cost beneficial: as 4,680,000 < 6,713,316 (cost of screening 4000 is less than the averted lost earnings due to TB of one person).

Table 2: Composition of cost (USD)

	Consumables	Equipment	Personnel	Overheads
X-ray (mobile)	31.88	18.62	40.44	9.06
Genexpert	71.48	9.04	10.39	9.09

Table 5 is interesting in showing that the needed category of resources may vary by diagnostic category: for instance mobile x-rays have heavy costs both in terms of personnel and consumables, while in the case of Genexpert it is the consumables (the cartridges) that proves financially challenging in providing the service. Currently this is donated by the Global Fund and it seems crucial that Sri Lanka try to continue to get foreign funding to cover this expenditure in the context of global fund withdrawing its financing, given Sri Lanka's Middle Income status.

3. Price of TB drugs

Table 3: Price of TB drugs as taken from the MSD database titled Estimates 2019

	Price
Isoniazid (H) (100mg)	0.679
Rifampicin (R) (150mg)	6.26
Pyrazinamide(Z) (500mg)	4.18
Ethambutol (E) (400mg)	5.54
Streptomycin (S) Streptomycin Sulphate for injection BP, 1g, vial?	1093.08
Fixed Drug Combinations (FDC)	
H (75 mg)+R (150mg)+E(275mg)	6.09
H (75mg)+R(150mg)	3.91
H(75mg)+R(150mg)+ Z(400mg)+ E(275mg)	8.22

This only includes first line drugs for the treatment of TB.

Protocol for treatment has to be linked to drug costs to calculate the cost of TB treatment under different patient scenarios.

4. Potential changes in the provision of services through PHC reforms

The Essential care package (version 2.2, dated 22/08/2018) has been drafted in line with the Cluster Health Service system currently under discussion in the Ministry of Health, involving funding from the World Bank and the Asian Development Bank. The Cluster Health Service system involves five levels of service provider: home and community services, Medical Officer of Health and Clinics (preventive services), Primary Medical Care Unit, Divisional Hospitals and Apex (Base and above) Hospitals. The primary focus of this health system reorientation is the PMCUs, envisaged to have two Medical Officers in the future. These PMCU MOs can play a major role in tuberculosis control and eradication as recognized by the ESP package.

- These MOs will be involved in presumptive/suspicion diagnosis, ordering regular laboratory testing and in treatment (including DOTS) for TB.
- PMCUs will have a major role to play in diagnosing and treating Diabetes Mellitus, considered to be a risk factor of TB.
- The PMCUs will also focus on improving the nutritional status of households by providing nutritional supplements and health education, which could help counteract the impact of malnutrition on TB.

However the ability to achieve the perceived outcomes will depend heavily on providing the necessary medical staff to the PMCU.

5. Human Resource Issues

5.1 Medical Officers

The problem of Increasing Medical Officers arises at 2 points: the need to have two MOs attached to the newly planned PMCU and the need for ensuring the provision of a second Medical Officer to District Chest Clinics (currently 26 chest clinics in the country).

This second Medical Officer if attached to District Chest Clinics could be very useful in improving rapid diagnosis, ensuring efficacy of treatment through better patient and household awareness creation and ensure greater interest in contact tracing. Likewise having two doctors attached to a PMCU, particularly if they function in the evening time as well, would allow for the identification and diagnosis of symptomatic individuals.

Currently there is a shortage of trained medical officers, as well as a mal-distribution of existing staff. There are only 1063 Medical Officers at present so meeting the staffing needs listed above would not involve significantly enhanced budgets as the scarcity of medical officers would limit new recruitment and the main thrust will be in reallocating existing staff.

In the context of both these interventions the cadre of Medical Officers will need to increase by around a 1000. In the short run the number of doctors cannot be increased per se so there will be a need to reallocate medical officers in a systematic way. This will not result in a larger budgetary burden in terms of salary – but may involve higher payments in the form of overtime (particularly given evening operations at the PMCU if they materialize – currently this ranges from around Rs 530 upwards depending on the grade.

Doctors can only work four hours overtime per day. Many of them are currently doing overtime so this may not lead to a major budgetary burden. The challenge will lie in setting performance targets to ensure that working time and over time is used productively in the control of TB. In the case of the Chest Clinics it may also necessitate clear spelling out of TORs for the two MOs. In the long run this additional demand for medical officers is likely to be met – partly as a result of the increased number of foreign graduates returning to the country.

Salary of Medical Officer as given by National Programme for Tuberculosis Control and Chest Diseases (NPTCCD) accountant working on salaries

Staff category	Basic + Allowances (but no OT)
Medical Officer (MO)	100,000
Consultant	120,000
Registered Medical Officer (RMO)	77,000

The Salary structure for the Public Sector as determined in 2016 reports the salary of Medical Officers is used for cross checking these numbers:

Service Category	Salary Code	Initial Step	Years	1st slab	Years	2nd slab	Years	3rd slab	Years	4th slab	Maximum
Medical Officer	SL 2-2016	52955	3	1335	7	1345	2	1630	16	2170	104355
Medical Officer Specialists	SL 3-2016	88,000	12	2700							120,400

The figures for Medical Officers and Consultant given tally with the maximum level so this could be considered the upper bound. This results from the figures being issue in relation to the centre, where staff are often more senior.

Given the current salary of Medical Officers (overtime not included) if 1000 additional Medical officers were to be recruited immediately the budgetary burden of such a measure would then be around 53,000,000 as the recruits would be relatively junior. Such a move may reduce overtime payments, if supervision is systematically handled.

Table 4: Medical Officers and RMO/AMO Number and rate per 100,000 population

Year	Medical Officers	Registered/Assistant Medical Officers
1991	2934 (17.0)	1201 (7.0)
1995	4577 (25.3)	1376 (7.6)
2000	7963 (41.1)	1349 (7.0)
2005	10,198 (51.9)	1274 (6.5)
2010	14,668 (71.0)	1107 (5.4)
2015	18,243 (87.0)	936 (4.5)
2016	18,968 (89.5)	883 (4.2)

Source: Health Bulletin 2016

While the Medical Officer numbers are growing gradually, the number of Registered/Assistant Medical Officers, a category that had less training than Medical Officers but carried out some of the same work is dwindling as training for this category had been stopped many years back and currently the number is decreasing with retirement/resignations.

Table 5 gives the number of Medical Officers at District Chest Clinics. The numbers are very uneven and not related to disease burden or population, but seem to show a greater clustering in more urban locations.

5.2 PHLT and MLT staff to ensure capacity for conducting diagnostic tests

Number of MLTs in the country is very low and has been growing very slowly.

Number of MLTs over the last 7 years is given below.

Year	Medical Laboratory Technicians	Microscopists
2011	1480	284
2013	1483	262
2015	1554	245
2016	1566	288

Source: Annual Health Bulletin 2016

Salary of Public Health Laboratory Technicians and Medical Laboratory Technicians as given by National Programme for Tuberculosis Control and Chest Diseases (NPTCCD) accountant working on salaries:

Public Health Laboratory Technician	41,000
Medical Laboratory Technician (MLT)	41,000

The Public Health Inspectors play a major role in contact tracing. The number of Public Health Inspectors has not risen significantly however despite a widening of the activities they are currently involved in.

Annex 5 clearly highlights the problem in the context of this staff category: shortage of staff, with some districts having no PHLTs recorded.

5.3 Public Health Inspectors

This category of staff is particularly important in the context of contact tracing. The numbers however are far too low given the vast array of duties carried out by this staff category in the context of public health

Number of Public Health Inspectors and per 100,000

Year	Public Health Inspectors
1991	914 (5.3)
1995	932 (5.1)
2000	1486 (7.7)
2005	1512 (7.7)
2010	1436 (7.0)
2015	1604 (7.7)
2016	1692 (8.0)

Source: Health Bulletin 2016

Public Health Inspectors salary is Rs 41,000 per month. The table below gives the distribution of PHIs in District TB clinics by district.

5.4 Pharmacists and Dispensers

The table below shows the dearth of pharmacists at district clinics. While dispensers are available at the District Chest Clinics, a lack of pharmacists affects timely ordering and stock management, that can have impacts on patients seeking care.

Table 5: State of available staff at District Chest Clinics on 2018.08.30

No	District	Medical Officer	Nurse	Pharmacist	Dispenser	DTCO	Public Health Inspector	Public Health Laboratory Technician	Radiographer
1	Kandy	9	7	1	3	1	2	4	2
2	Matale	4	3		1	1	1	1	
3	Nuwara eliya	2	2		1		1	1	
4	Ampara	1	2		1	1	1	1	
5	Batticaloa		2		1	1	1	1	
6	Vavunia	1			1	1	1	1	
7	Kalmunai	2	2		1		2	1	
8	Trincomalee	2	1	1	1	1	1	1	
9	Jaffna	1			1		1	1	
10	Killinochchi	1			1		1		
11	Mannar	1			1		1	2	
12	Mullaitivu				1	1	1		

13	Anuradhapura	1	3		1	1	1	2	
14	Polonnaruwa	4	1	2	1	1			
15	Kurunegala	10	7	1	2	1	2	4	2
16	Puttalam	2	2	1	1	1	2	1	
17	Kegalle	3	5	1	2	1	2	2	1
18	Rathnapura	6	4	2	2	1	1	4	1
19	Galle	3	3	1	1	1	2	3	1
20	Hambantota	2	3		1	1	1	1	
21	Matara	2	3			1	1	1	
22	Badulla	4	4	1	3	1	2	1	1
23	Monaragala	1	1		1	1	1	1	
24	Colombo	21	10	2	5	1	8	5	3
25	Gampaha	4	5	1	2	1	2	2	
26	Kalutara	2	2	1	1	1	1	2	1

Annex 1C: Scenario-building for unit costs used in the analysis

Cost per Gene test

Per test	USD	Rupees
Equipment Cost		
Gene Xpert Machine cost	1.71	293.14
Air Conditioner	0.02	4.20
Refrigerator	0.01	1.25
Cool boxes – 2 numbers	0.01	0.89
Grinder	0.01	0.88
Vortex	0.03	4.63
Autoclave	0.01	1.05
Printer	0.01	1.05
	1.81	307.09
Consumables cost		
Gene test Cartridge cost	13.44	2307.74
Other materials used during tests such as Hypochlorite solution, ethyl alcohol	0.15	25.19
Disposable sputum cup	0.06	10.00
Glass jar	0.02	3.90
Laboratory white coat for the test	0.33	56.19
Surgical mask	0.12	20.60
Gloves	0.07	11.45
Printer cartridge and stationary	0.12	20.00
	14.31	2455.07
Personnel Costs		
Salary of MLT cost	0.90	155.30
Salary of data operator - 1/4 time	0.26	44.21

Salary of Administrative Officer - 1/4 time	0.20	34.09
Salary of Microbiologist – 1/4 time	0.72	123.11
	2.08	356.71
Overhead Costs		
Electricity	Taken as 10% of the cost 1.82	Taken as 10% of the cost 311.89
General Administration		
Maintenance		
Total	20.02	3430.76

Source: Author calculations

Composition of Costs

Per test	USD	Rupees	% of cost in US \$
Equipment Cost	1.81	307.09	9.04
Consumables cost	14.31	2455.07	71.48
Of this Gene test cartridge	13.44	2307.74	
Personnel cost	2.08	356.71	10.39
	18.20	3118.87	
Overhead costs (10% of other costs)	1.82	311.89	9.09
	20.02	3430.76	

Source: Author calculation

Verification step

Comparison of laboratory costs of rapid molecular tests and conventional diagnostics for detection of tuberculosis and drug-resistant tuberculosis in South Africa

Authors: Maunank Shah, Violet Chihota, Gerrit Coetzee, Gavin Churchyard and Susan E Dorman

Published in *BMC Infectious Diseases* 2013 **13**:352

Component costs for Xpert tuberculosis diagnostic test

	Consumables cost per test, in \$ (% of total) [uncertainty range][†]	Equipment cost per test, in \$ (% of total) [uncertainty range][†]	Labor * cost per test, in \$ (% of total) [uncertainty range][†]	Overhead cost per test, in \$ (% of total) [uncertainty range][†]	Total cost per test, in \$ [uncertainty range][†]
Xpert MTB/RIF South Africa 2013	\$11.97 (80%) [\$11.49– \$19.47]	\$0.93 (6%) [\$0.70–\$3.99]	\$1.13 (8%) [\$0.94–\$4.30]	\$0.90 (6%) [\$0.22–\$1.12]	\$14.93 [\$13.36– \$28.88]
Xpert Sri Lanka 2018	\$ 14.31 (71.5%)	\$ 1.81 (9.0%)	\$ 2.08 (10.4%)	\$ 1.82 (9.1%)	\$ 20.02

Note: Assuming both studies refer to the same type of test.

The conclusion emerging from this exercise is that the cost of the cartridge is the biggest economic burden. If this could be funded by some international external agency once the global fund withdraws the other costs can be covered with local funding.

Cost of Mobile x-ray – working for 2 consecutive days on each trip

	USD	Rs
Equipment Cost		
Mobile x-ray	3.10	532.21
Vehicle cost	0.49	84.03
	3.59	616.25
Consumable Costs		
Consumables per x-ray	1.40	240.00
Fuel and maintenance cost	0.70	120.00
	2.10	360.00
Personnel Costs		
Medical Officer	1.77	303.03
Radiographers (two persons)	1.44	248.48
Public Health Inspector	0.72	124.24
Driver	0.58	100.00
Labourers (three persons)	0.87	150.00
Administrative officer (1/4)	0.16	27.27
Accommodation for 2 persons	1.55	266.67
Refreshments	0.85	146.67
	7.94	1366.36
Overhead costs	1.021	175.81
	14.65	2518.42
Number of x-rays per 2 days	30	

Annex 2

AIDS Epidemic Model (AEM): Policy and Impact Analysis for Sri Lanka

What is AIDS Epidemic model?

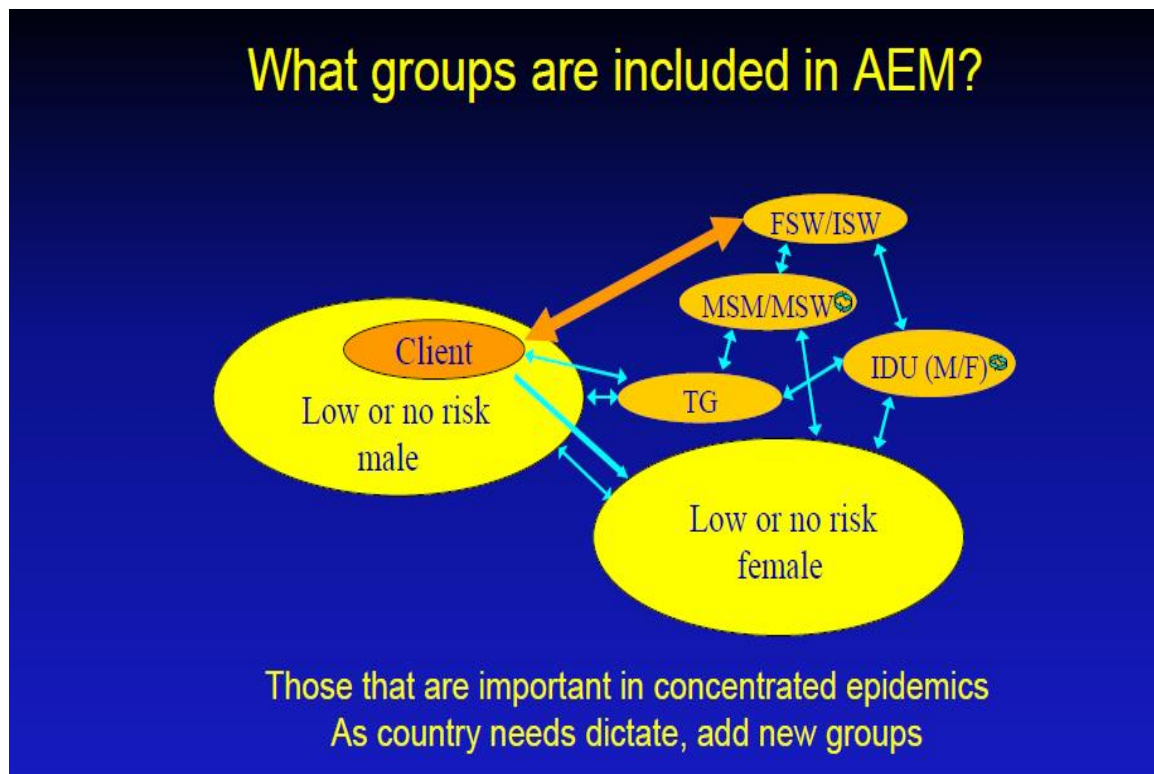
AEM is a behavioral process model which Simulate transmission dynamics in concentrated epidemics.

Major transmission routes included:

- Vaginal sex (sex work, casual and marital)
- Anal sex (receptive and insertive)
- Needle sharing

–ART by sub-population

- Infectivity reductions on ART
- Coverage of ART in a given population
- Eligibility criteria



Calculation of new infections

- **New Infections**

= Size of risk group

x Freq of contacts

x HIV prevalence of partners

x Fraction unprotected

x Transmission probability

x Adjustments for STI & circumcision

x Adjustments for ART

Size of Gen M, Gen F, FSW, Client,
IDU, MSM, MSW

Frequency of each type of contact:
sex freq, injecting freq

HIV prevalence for each group
(calculated) – compare w/observed

Condom use , Clean needle use

Sex: M to F, F to M, M to M
IDU: per injection
(Use as fitting parameter)

•ART infectivity reduction
•Coverage of ART

•STI cofactor and fraction with STI
•Circum cofactor and fraction circumcised



EAST-WEST CENTER

5

What is needed in a tool to help choose the programs producing greatest impacts?

Inputs:

For each key population:

- Size
- Risk behaviors
- HIV prevalence

For each possible program:

- Population served
- Coverage
- Effectiveness
- Unit cost

NOTE: these are specific to country or province modeled



Outputs:

For the epidemic:

- Sources of new infections
- Epidemic trends

For each choice of program(s):

- Infections averted
- Lives saved
- Comparative costs

Comparisons of effects on course of epidemic & key policy indicators



EAST-WEST CENTER

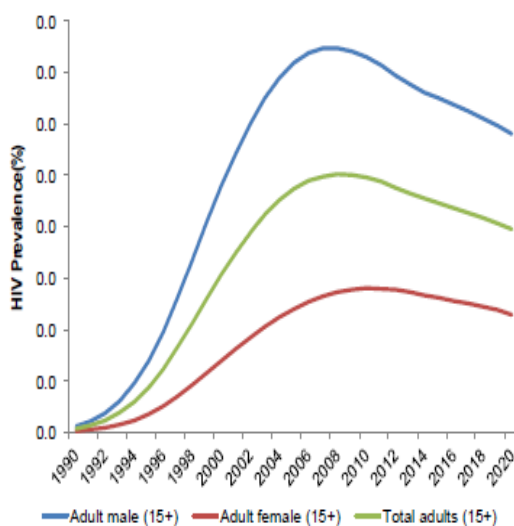
6

Sri Lanka Baseline

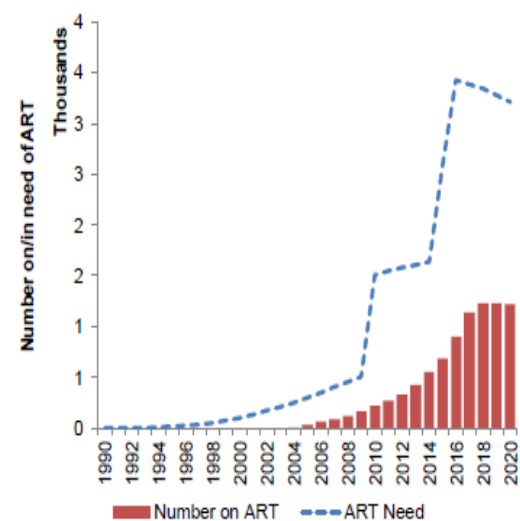
Results for the year: **2017**

New HIV infections:	151
Current PLHIVs:	3,386
Annual AIDS death:	190
Annual ART needs:	3,388
Number on ART:	1,142
Male-Female Inc Ratio:	2.75
Cumulative infections:	7,517
Cumulative deaths:	4,131
Cumulative M/F Ratio:	2.74

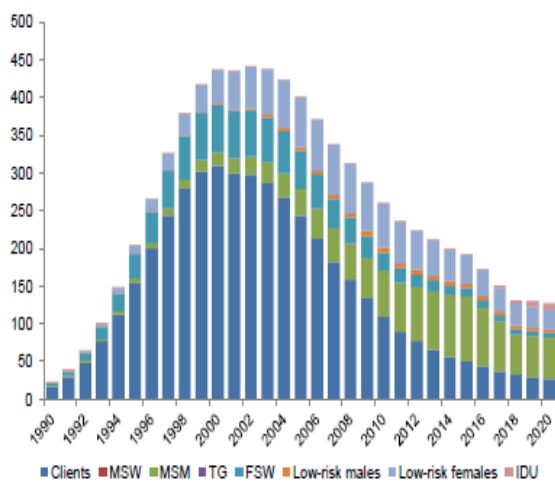
HIV prevalence by population, 1990-2020



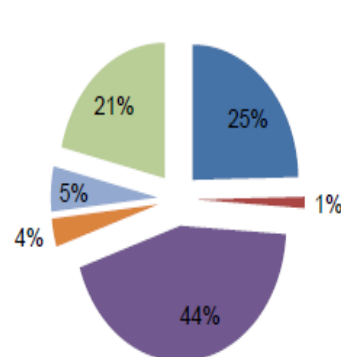
ART Coverage vs. Need among Total Adult, 1990-2020



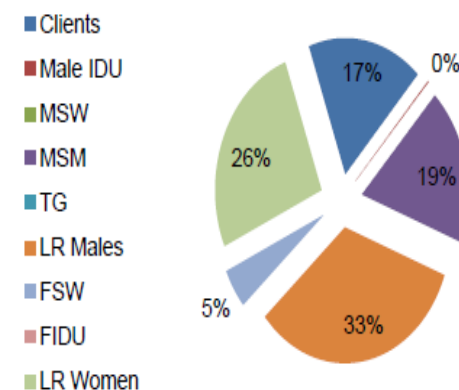
Annual New HIV Infections: by Risk Population, 1990-2020



Distribution of new HIV infections in 2017
Total 151 HIV Infections



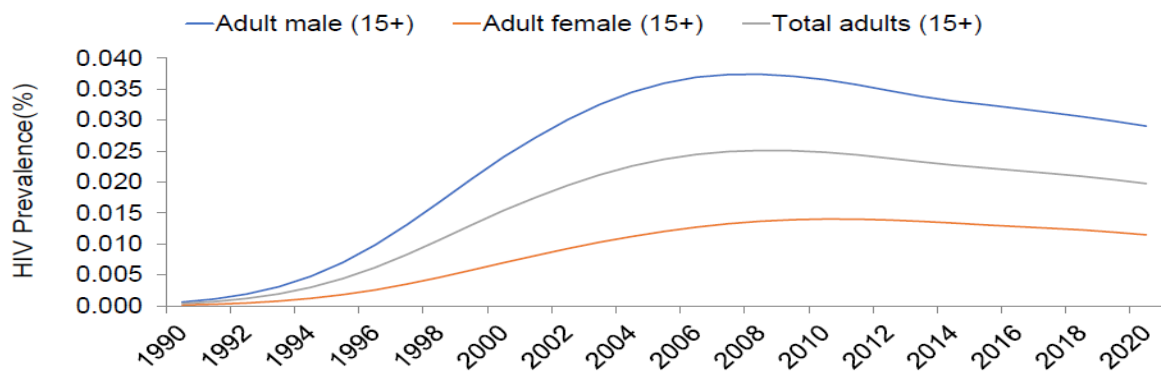
Distribution of current HIV infections in 2017
Total 3,386 HIV Infections



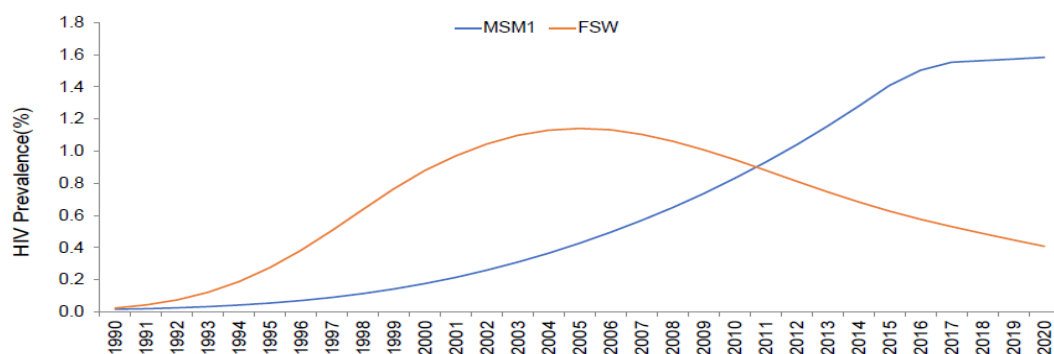
Summary of AEM results -2017

New HIV Infections :	151
Current adult PLHIV:	3386
Annual deaths:	190
Annual ART needs:	3,388
Number on ART :	1,256
Cumulative infections:	7,517
Cumulative deaths:	4,131

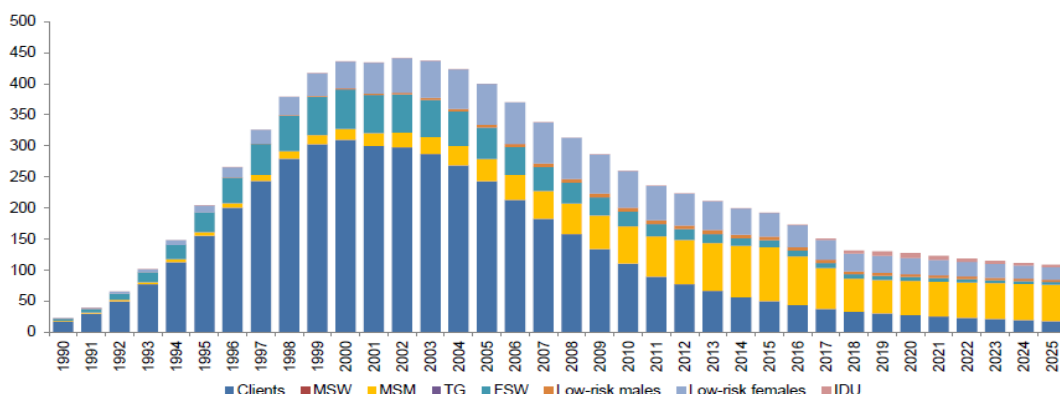
Adult HIV Prevalence



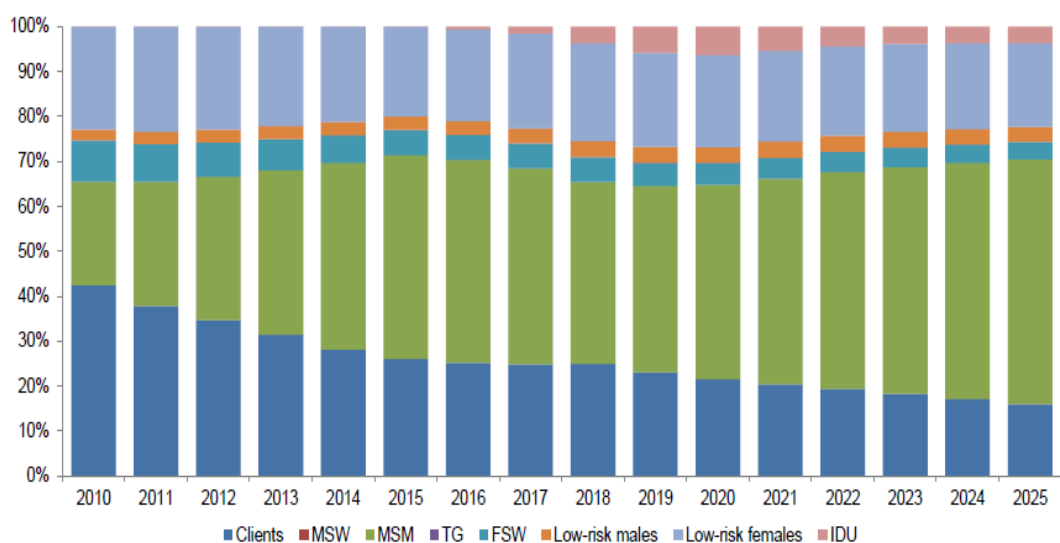
HIV Prevalence among Key populations

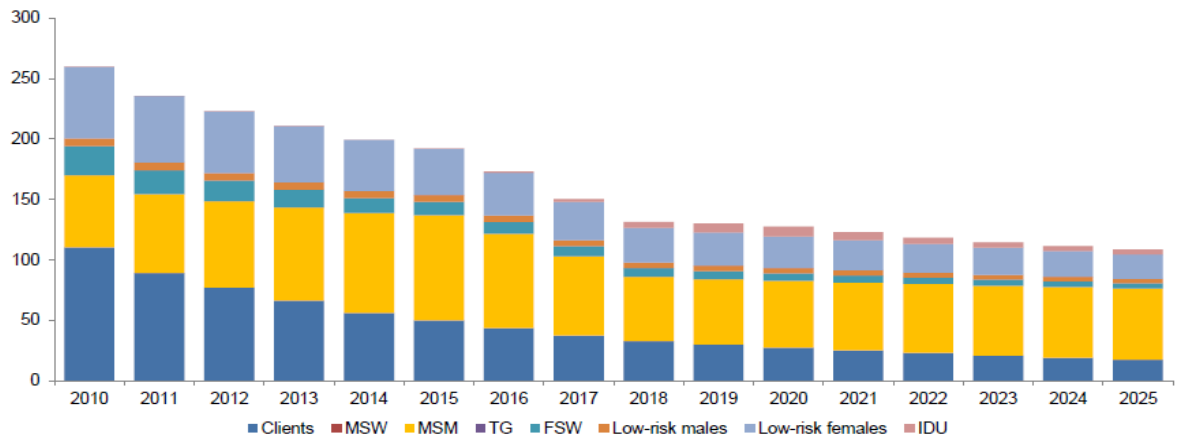


Annual New HIV infections by Key populations



Proportion of New HIV infections by sub populations 2010-2025





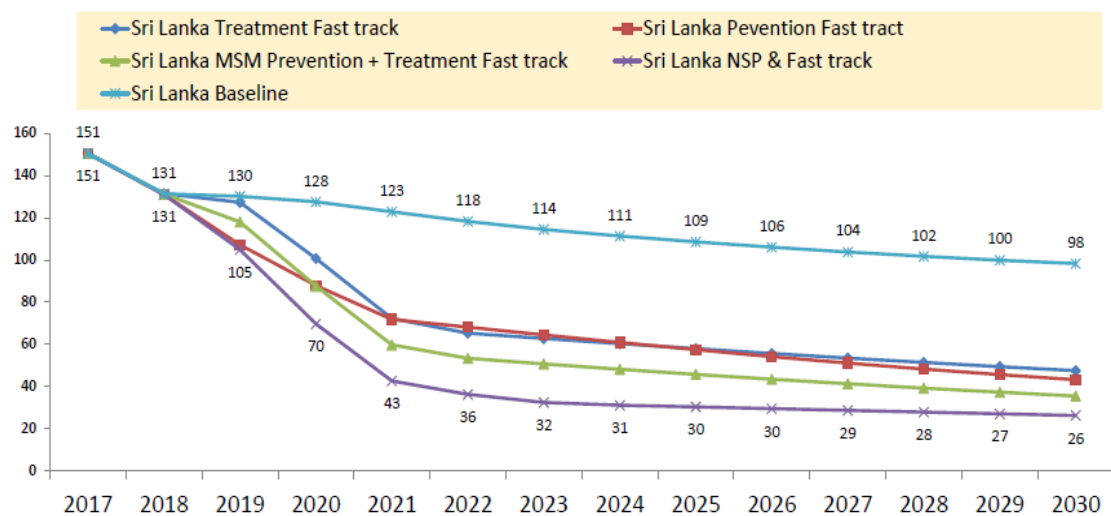
Key messages for AEM baseline results

- Sri Lanka is still a low level HIV epidemic country
- Adult HIV prevalence is less than <0.1%
- Major mode of transmission in the past was sex work
- Current major mode of HIV transmission is MSM
- Future major mode of transmission also will be MSM
- Sri Lanka has not seen a major IDU epidemic
- Contribution of MSM is getting higher and higher
- Coverage is ART is still low <40%

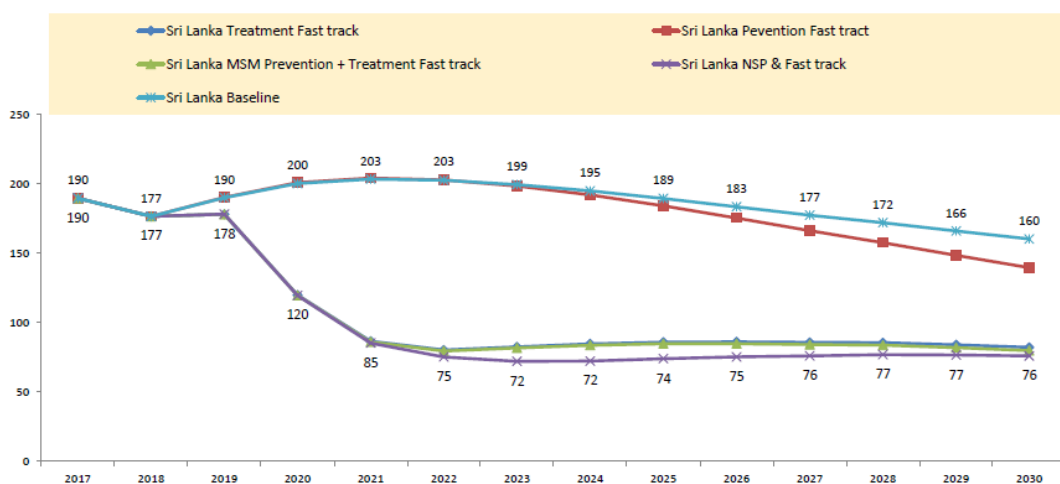
Policy and impact analysis

1. Baseline Scenario
2. Treatment Fast Track Scenario
3. Prevention Fast Track Scenario
4. National Strategic Plan and Fast Track Scenario
5. MSM Prevention and Treatment Fast Track Scenario

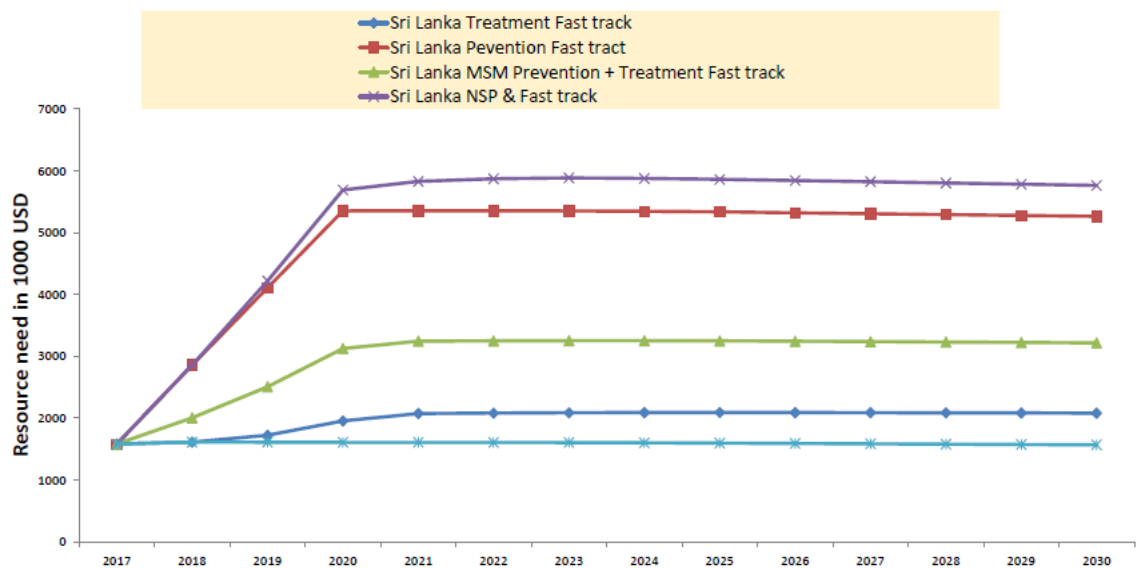
No. Adult New Infections, 2017-2030



Total Deaths among adults with HIV, 2017-2030



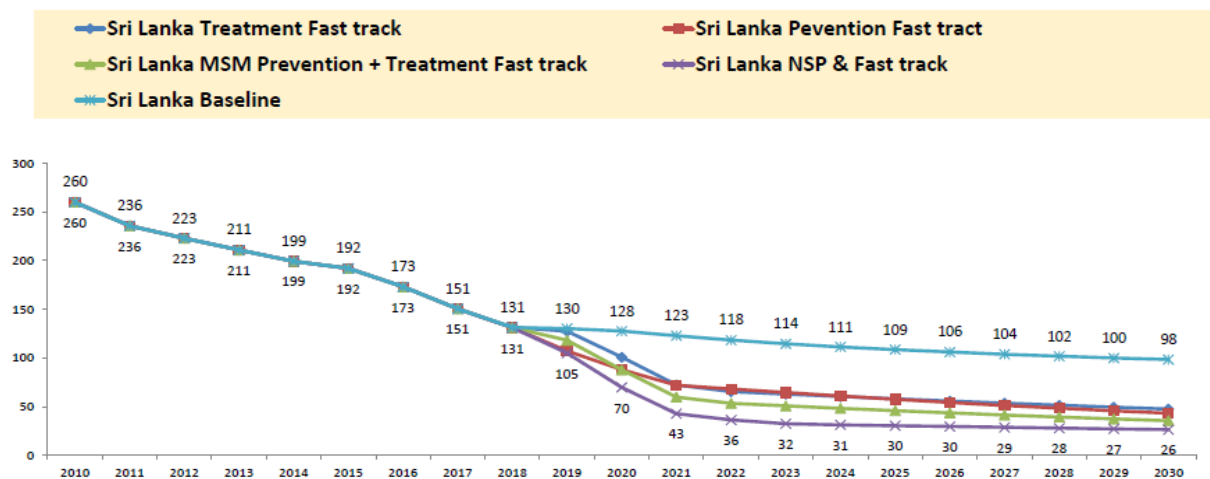
Total Resource Needs, 2017-2030



What is ending AIDS ?

- Reduction new HIV infections to 10% or less from 2010 level

New Infections for Adults , 2010-2030



Key messages from scenarios

- Baseline scenarios show continuing to reduce HIV epidemic, but not enough to ending AIDS
- National Strategic scenarios already include fast tract targets and can produce ending AIDS impact
- New infections in 2010 is 260 while new infections from NSP scenarios will be 26 in 2030
- “MSM prevention + Treatment fast tract” scenario is the most cost effective scenario.
- Resource need for treatment is low due to less number of PLHIV in Sri Lanka.
- Having all PLHIV on ART is a very important strategy
- Since MSM is the major mode of transmission currently as well as in future, prevention among MSM is also very important

Annex 3

Summary of key points and proposed recommendations of National Consultation on Ending TB and AIDS by 2025, October 15-16, Colombo

The National consultative workshop on accelerating journey towards Ending tuberculosis and AIDS in Sri Lanka was convened Colombo during 15 & 16 October 2018. The summary of the key points discussed are listed here for easy reference. There are many recommendations made by participants during the discussions as well as during working groups. All the major recommendations made at policy, national, provincial and programme level are being synthesized in the main report. However, the key points discussed and proposed are listed here for reference.

Key points discussed:

TB Control related issues:

- Major challenge faced in TB control in Sri Lanka is case detection and related issues. There is a gap of detection and there are about 4000 missing cases.
- Treatment success rate is 84.6%; loss to follow up rate is 4%; death rate is 7%, pediatric case detection is less than 3%; OPD referral is less than 2%; MDR patients on treatment at present are 24; MDR treatment success rate is 65% only and inadequate referrals of presumptive TB cases are other major challenges.
- Validity and reliability of WHO estimation on TB disease burden is a critical issue in planning, monitoring and evaluation. TB inventory survey is also not cost effective given the low prevalence. Better to validate the information using triangulation of data from multiple sources
- Information systems -plays a key role in disease ending agenda. Introducing electronic information systems is good. However, steps need to be taken from the beginning on sustainability, ensure quality of electronic data, ability to share data (enterprise architectural issues) while maintaining confidentiality, measures to facilitate use of data for decision making at all levels.
- Inadequate human resources at both national and district level, specially, CCPs, Epidemiologist, and Data Manager at national level, inadequate number of medical officers for TB prevention, microscopists and improper skill mix were the major constraints.
Possibility of task shifting, job expansion was discussed as a temporary measure to fill up the long duration between recruitment, training and deployment and also due to low priority given as MOHNIM has to respond to the health needs of 58million outpatients and 7 million inward patients with its 130000 manpower. Trade unions should be treated as partners from the beginning to facilitate solutions for HR issues and also for fast tracking interventions.
- Inadequate facilities for conducting Chest X-rays at OPDs, insufficient involvement of private and indigenous healthcare providers, constrains and limitations in mobility of TB control staff are the health sector related other issues.

- Insufficient involvement of NGO/CBO/CSO, limitations in obtaining and administering donor support, limitations in obtaining media support and inadequate knowledge and attitudes towards TB control are the social sector related issues presented.

The other major points raised at the discussion were:

- What combination of interventions will be needed, and at what scale, to reach the End TB goals within established timelines?
- What are the resource requirements of fully implementing these interventions?
- What additional data needs to be collected, in order to inform control priorities?
- Need for linking symptomatic patients to TB diagnosis facilities as soon as possible with,
 - Increased capacity for MOs in OPDs
 - Increased PHLT and MLT staff for diagnostic tests
- Need of deployment of new treatment regimen
- Necessity of strengthening patient support systems
- Possibility of deploying rapid molecular test /Xpert test for all smear positive/X-ray abnormalities
- Need for improved diagnostic algorithms

HIV, AIDS prevention & control related issues:

- Infection among females is static and among men having sex with men, gay and bisexuals as well as among drug users it is increasing. Infection among low risk women, mainly wives of Bisexuals and MSM is also increasing.
- Case detection remains a major constraint of achieving HIV, AIDS control targets at national level as well as district levels. However, low prevalence itself has caused lot of challenges to programme as, the programme has to do 1.2 million slides (in total of 21 million population) to find out 185 HIV cases. Hence need to identify and employ cost effective approaches.
- Leakages in cascade is also a challenge, as it affects the achievement of 2nd and 3rd 90 targets
- Long time is taken to provide HIV testing results to the field, and it will be good to re-visit the algorithm and try to shorten the time duration from Testing to reporting,
- Inadequate strategic information supply for estimation models requires, thus, resulting unrealistic estimates for base values.
- Stigma , discrimination and punitive laws discouraging of HIV and AIDS patients to seek health services
- Identifying and reaching hidden population and bringing the for HIV testing is a major concern
- New infection among young population is static
- Loss to follow up specially MSM and bisexuals is a serious problem

- Issues related to data sharing while maintaining confidentiality, electronic medical records, supply of robust data requires for M&E need higher level interventions.
- Transition from Donor support to domestic funding is critically affecting the scale and pace of intervention implementation at central as well as district level. This has affected the HR and funding part and on sustaining the service delivery models for KP via CSO conducted through donor funds. Transition experience from Thailand was discussed, which highlighted the importance of well-planned transition document – well communicated with all levels and also importance of CSOs and community engagement on sustaining HIV response.

Recommendations for Ending TB:

Policy level

- Need to setup a high level working group to monitor progress of achieving 2025 end targets of both the diseases.
- Appoint epidemiologist and database manager to NPT and achieve WHO benchmarks by 2020
- Ensure all large hospitals are made accountable to institute rapid testing for presumed cases of TB
- Strengthening Latent TB management: WHO has introduced 12 dose regime. Price reduction of the drugs are expected soon
- Need to assess the global and regional evidence and best practices carefully before adopting to see their suitability in low prevalence setting like Sri Lanka

Programme level

- Ensure optimum use of presumed case registers, until ePIMS is available.
- Introduce an electronic reporting system for presumed TB cases, follow them up and monitor them periodically
- Collaborate with paediatricians to investigate situation of childhood TB
- Consider drug purchasing/prescribing data as a means of estimating incidence
- Review an anti-stigma toolkit and consider if it could be useful in Sri Lanka
- Examine stigma as a possible cause of delay in the ongoing patient pathway analysis and implement suitable interventions to minimize stigma
- Review the duties of DTCOs and re-distribute the work at DCC with more responsibilities with TB prevention for DTCOs and more clinical work for other MOs
- Implement more continuous medical education (CME) sessions on TB diagnosis for OPD Medical Officers and Intern Medical Officers
- Get private sector more involved in screening their patients for tuberculosis
- Get field PHIs more involved in contact tracing and get all contact screened for the disease

- Prepare and implement social marketing programmes to increase the awareness of general public about ending tuberculosis and AIDS from Sri Lanka
- Similar programmes should be implemented to educate and get the maximum cooperation of media personnel, school teachers, religious leaders and other community leaders about the elimination programme
- Conduct special programmes to get the support of lowest level politicians such as elected Members of Pradeshiya Sabha and Councilors of Municipal Councils

Recommendations for Ending AIDS:

Communication and awareness

- Need full implementation of communication strategy
- Publicize the HOTLINE number.
- Reduce stigma to maximum possible level through awareness and training

Reaching & Testing

- Establish mechanisms to test of inbound migrants at point of entries and or in the field
- Accelerate contact tracing
- Make rapid testing widely available at hospitals including OPD setting, medical wards, etc
- Promote self-testing, home testing using mobile applications /video call support (ie: for intimate sex partners)-as cost effective measures to enhance testing
- Promoting HIV testing thorough mobile apps for assessment of HIV risk
- Point of care testing – Change the algorithm according to the risk group and speed up the delivery of test results
- A National policy on HIV tests and testing algorithm (type of tests to be done – screening and confirmatory) to ensure good quality
- Strengthen the existing community-based testing system
- Reach of key populations through Face Book groups, connecting through peers
- Introduce a unique identification number to facilitate follow up and stay in care pathway
- Engagement of KPs- Strengthen provider-initiated testing
- Ensure NGO/CBO support: Equip the drop in centers with testing mobile units

Multi-sector support

- Obtain GP services: Sensitize NGOs & GPs and educate to improve testing via GP
- Introduce HIV testing into Colombo Municipality Council system
- Ensure private sector engagement:
 - Linking of HIV testing of out migrants in private sector with the national system
 - Implementation of ILO policy

Synergies across HIV and TB program/service delivery

- NGOs can share the work of HIV and TB; as an example, FPA has two models work in HIV and the same models can be used in the TB as well.
- Most of the clinics are located nearby. The resources sharing can be done e.g., some laboratory equipment such as Xpert MTB/RIF (GeneXpert®) can be shared together. Counselling may also provide as a joint service.
- HIV program usually trained a family member to get the supply of ARV for the patient similarly NPTCCD also can train a family member as a DOT provide to get 3 or 6 months of medications
- There are places where both programmes can coordinate and synergies.
 - Both groups are screening the prison inmates which can be done as a single combined screening & health education programme for prisons.
 - Joint Advocacy meetings with provincial and regional authorities, clinician awareness programmes could benefit both programmes as the participation will be more.
 - Public education programs & school awareness programmes can be also combined to increase participation and to use limited resources effectively.
 - Contact tracing also can be done together. However, there are some logistics constraints for NPTCCD, so can piggy back on NSACP
 - Both TB and HIV have to do active case finding. However, their lot of confidentiality issues persists.
 - Screening programs can work together : PWID /PWUD; foreign labour groups; Urban slums, etc.
- Having combined programs will also have issues like attending to discrepancies between administrative units, sharing /misusing resources, need to plan together, etc.
- National level and the district level staff need to communicate with each other. Needs common monitoring and review meetings as well.
- Provincial and regional health authorities seem to be kept dissociative of vertical campaign. They are being considered as just recipients of Line Ministry instructions rather than partners. The Regional and provincial staff need to be engaged more in deciding and designing health programmes in their respective regions, so that they can ensure effective use of scarce resources

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Annex 4

Day 1, Monday 15th October 2018

TIME		ACTIVITY	PRESENTER
SESSION 1- JOINT INAUGURATION			
8:00	8:45	Registration of Participants	Secretariat
8:45	9:00	Ceremonial lighting of lamp/National Anthem	Master of Ceremonies – Dr Alan Ludowyke and Ms.Sonali Silva
9:00	9:05	Welcome Remarks by MoH	Dr Anil Jasinghe, Director General of Health Services
9:05	9:10	Welcome Remarks by WHO	Dr Razia Pendse, WHO Representative
9:10	9:15	Overview of the Conference “Strengthening PHC towards effective UHC in SRL”	Dr S Sridharan, Deputy Director General (Planning), MoH
9:15	9:20	Ending AIDS and TB in SRL by 2025: Challenges and Opportunities	Dr Susie Perera, Deputy Director General (Public Health Services)
		Key Note Speeches	
9:20	9:30	SDGs and UHC Perspectives, Global Learning and their Relevance to SRL	Dr Ajay Tandon, Lead Economist, World Bank
9:30	9:40	Multi-sectoral approaches, stewardship and political leadership in UHC	Dr. Brian Chin, Social Sector Specialist, ADB
9:40	9:50	Strengthening the PHC System: an imperative for UHC	Dr Phyllida Travis, Director, WHO SEARO
9:50	10:00	Global trends and innovations in addressing NCD and ageing in primary health care	Prof. Dr. Liesbeth Borgermans, WHO consultant
10:00	10:10	Catalytic financing for ending AIDS and TB in Sri Lanka: current and future priorities of TGF	Mr. Luca Occhini, Regional Manager of South East Asia, The Global Fund
10:10	10:20	Fast-track towards ending AIDS in Sri Lanka and the critical role of communities	Mr. Eamonn Murphy, UNAIDS Regional Director for Asia and the Pacific,
10.20	10.30	Address by the Guest of Honor: Global perspective on ending TB and AIDS and the role of a strong health system to achieve UHC	Dr Ren Minghui, Assistant Director General, WHO

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10.30	10.35	Address by the Secretary of Health	Mrs B G S Gunathilake, Secretary of Health
10:35	10:50	Address by the Chief Guest, Hon. Minister of Health	Dr Rajitha Senaratne, Hon. Minister of Health, Nutrition and indigenous Medicine
Launching of the SRL UHC Policy and Health Labor Market Analysis			
11.00	11.30	TEA BREAK & GROUP PHOTO	
JOINT SESSION 2 – CELEBRATING SRI LANKA’S ACHIEVEMENTS, ADDRESSING THE CHALLENGES			
Chair: Dr Anil Jasinghe, Director General of Health Services, Ministry of Health, Nutrition and Indigenous Medicine (MOHNIM)			
Co-Chair:Mr Janaka Sugathadasa, Former Secretary of Health			
11:30	11:40	Health Systems Overview	Prof Lilani Rajapakse, Consultant (Sri Lanka HiT review))
11:40	11.50	SRL Universal Health Coverage Policy	Dr Susie Perera, Director (Organisation Development), MoH
11:50	12:00	Essential Service Package and its feasibility	Dr Xavier Modol, WHO Consultant
12:00	12:10	Key issues on ESP from the Provinces	Dr Palitha Bandara, Provincial Director of Health Services, North Central Province
12:10	12:20	Health System Enhancement Project of ADB: Addressing vulnerable populations	Dr Anil Dissanayake, Project Director of Asian Development Bank Project
12:20	12:30	World Bank project for reorganizing Primary Health Care in	Dr Jayasundara Bandara, Project Director of World Bank Project
12:30	1:00	Discussion	
1:00	2:00	LUNCH	
Participants for “Ending TB & AIDS in Sri Lanka” leave to Conference room 2 & 3 (1st floor)			
Participants for “PHC strengthening ” will remain at Jubilee ball room, Ground floor			
SESSION 3 – Sri Lanka’s Progress , Challenges in Ending TB & AIDS			
Chair: Dr Susie Perera, Deputy Director General of Health Services (Public Health Services-I), MOHNIM			

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Co - Chair: Mr. Eamonn Murphy, UNAIDS Regional Director for Asia and the Pacific			
2.00	2.15	National TB Strategy (2015-2020) Targets, Progress & key challenges	Dr M.A.C. Refai, Deputy Director, National Programme for Tuberculosis Control and Chest Diseases (NPTCCD)
2.15	2.25	Prioritizing interventions for Ending TB In Sri Lanka : Modelling evidence and cost effectiveness	Dr Vineet Bhatia , Medical Officer- MDR TB, WHO/SEARO (with Dr Sandeep Mandal & Prof. Amala de Silva)
2.25	2.40	Key gaps & Opportunities for ending TB in Sri Lanka	Dr Paul Nunn, Independent Consultant
2.40	2.50	Discussion	
2.50	3.05	National HIV/AIDS strategy (2018-2022) Targets, Progress & Key challenges	Dr Lilani Rajapaksa, Director, National STD/AIDS Control Programme (NSACP)
3.05	3.15	Projections from AIDS epidemic modelling and impact analysis	Dr Ariyaratne Manathunga, Consultant Venereologist/ NSACP
3.15	3.25	Key gaps & Opportunities for ending AIDS in Sri Lanka	Dr Tasnim Azim , Independent Consultant
3.25	3.35	Discussion	
3.35	3.45	TEA	
SESSION 4- Information for fast tracking ending TB & AIDS Chair : Dr Sudath Samaraweera, Deputy Director General of Health Services (ET & R), MOHNIM Co-Chair: Dr Mukta Sharma, Regional Advisor (TB/HIV/STI/Hep) WHO/SEARO			
3.45	4.00	Data for decision making for reaching ending disease targets	Mark Landry, Regional Advisor , Health situation & trend assessment (WHO/SEARO)
4.00	4.15	Improving TB estimates for Sri Lanka : Need for a TB Inventory survey	Philippe Glaziou, Epidemiologist, TB Monitoring and Evaluation, GTB, WHO/HQ (Webinar)
4.15		Discussion & Networking	

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Day 2, Tuesday -16th October 2018

TIME		ACTIVITY	PRESENTER
Start	End		
9:00	9:10	Summary of Proceedings Day 1	Dr Susie Perera, Deputy Director General (PHS-I) MOHNIM
SESSION 5 – Accelerating Interventions in the context of fund transition Chair: Dr Sunil De Alwis, Additional Secretary (Medical Services), MOHNIM Co-Chair: - Dr Susie Perera, DDG (PHS -I), MoHNIM & Ms. Blanca Gil Antunano, FPM, GFATM			
9.10	9.20	Planning for Transitioning from Donor support : NSACP	Dr Lilani Rajapaksa , Acting Director, NSACP
9.20	9.30	Addressing Human resource needs for Ending TB & AIDS in Sri Lanka	Dr Dileep de Silva , Head, HRH coordination Unit, Ministry of Health
9.30	9.40	Transitioning from Donor support & sustaining the achievements : Experience from the Thailand	Dr Petchsri Sirirund, CCM Secretariat, Thailand
9.40	9.45	Discussion	
SESSION 6- Innovations & Opportunities to fast track ending TB & AIDS Chair: Dr Lakshmi Somatunga, Additional Secretary (Public Health Services) Co-Chair: Dr Susie Perera, Deputy Director General of Health Services (Public Health Services-I) MOHNIM			
9.45	10.05	Efficient use of innovative technologies / Specific interventions for ending AIDS & TB: Global & regional evidence	Dr Mukta Sharma, Regional Advisor (TB/HIV/STI/Hepatitis) WHO SEARO
10.05	10.15	Is there a scope for efficiency gains for ending TB & AIDS? Initial findings in SRL with emphasis on TB & HIV	Dr Susan Sparkes (Technical Officer) Health Financing, World Health Organization, Geneva
10.15	10.30	TEA BREAK	

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10.30	11.15	Opportunities and Proposals for scaling up/ fast track programme response in Sri Lanka	Dr Paul Nunn (TB) & Dr Tasnim Azim (HIV) & Dr S Senanayake
SESSION 7: Group work –Accelerating interventions to reach end TB & AIDS targets Chair: Dr Lakshmi Somatunga, Additional Secretary (Public Health Services), MOHNIM Co-Chair: Dr Susie Perera, Deputy Director General of Health Services (Public Health Services-I)			
11.15	1.25	Group work /World Cafe Guidelines	Lead consultants (Dr Paul Nunn & Dr Tasnim Azim) with faculty
1:30	2:00	Group presentations & Synthesis by Chairs	7 minutes each
2.00	3.00	LUNCH	
JOINT SESSION - SYNTHESIS AND CLOSING CEREMONY			
3:00	3:45	Synthesis of the Conference and way forward <ul style="list-style-type: none"> Ending TB/HIV Meeting Summary & PHC Conference Highlights Integrated synthesis on way forward 	Dr Susie Perera, Deputy Director General of Health Services (Public Health Services-I) Dr Razia Pendse, Country Representative , WHO /Sri Lanka
3:45	4:00	Closing Remarks	Hon Dr Rajitha Senaratne, Minister of Health, Nutrition & Indigenous Medicine
4:00	4:15	Vote of Thanks	Dr S . Sridharan, Deputy Director General (Planning), Ministry of Health
4:15	5:00	TEA BREAK	

END OF CONFERENCE