

STRATEGIES FOR
EFFECTIVE TB CASE
FINDING IN PRISONS
AND CLOSED SETTINGS

2

STOP TB FIELD GUIDE

Stop  Partnership

2

**STOP TB
FIELD
GUIDE**

STRATEGIES FOR
EFFECTIVE TB CASE
FINDING IN PRISONS
AND CLOSED SETTINGS



StopTB Field guide 2: Strategies for Effective TB Case Finding in Prisons and Closed Settings

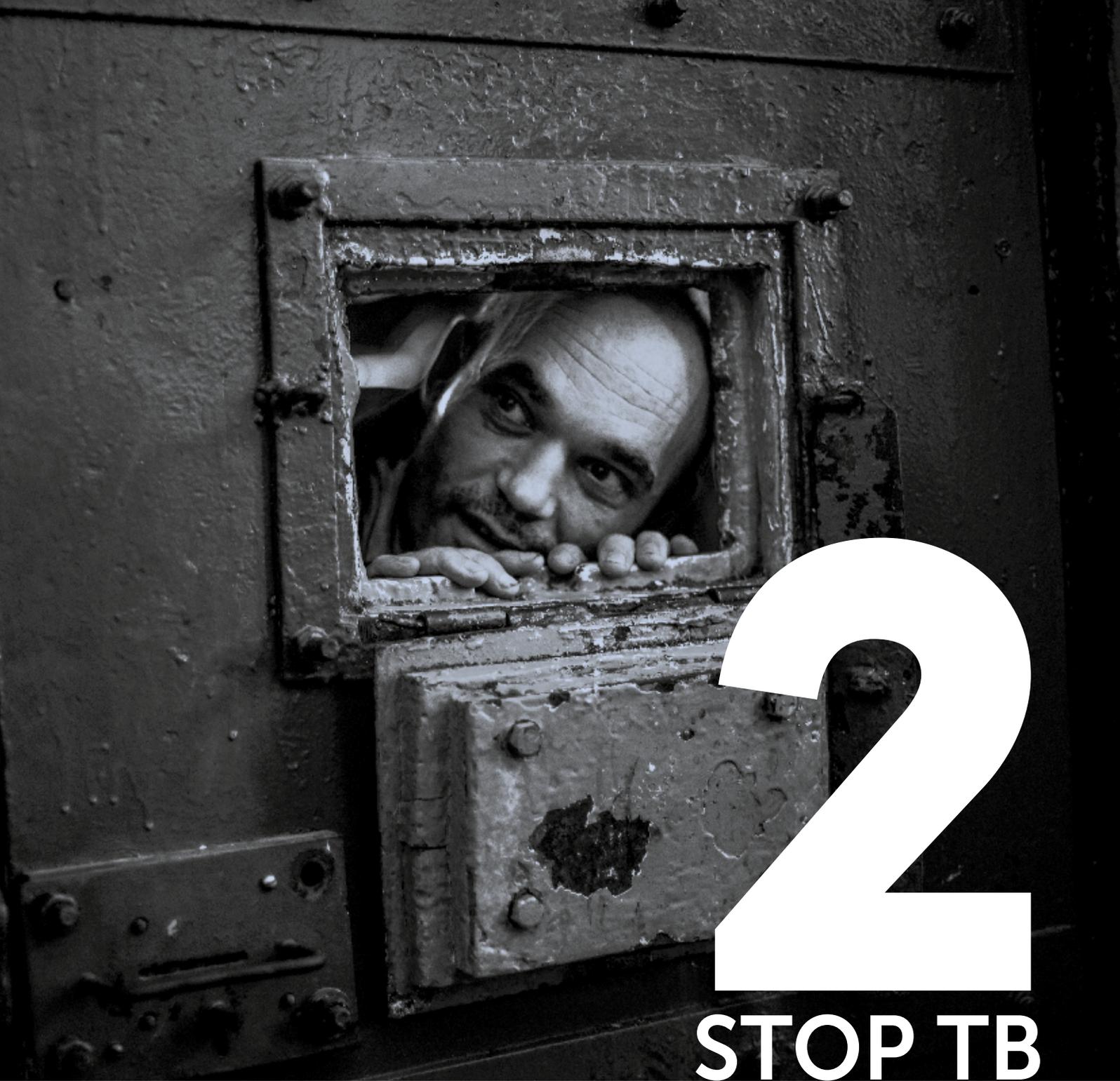
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STOP TB
FIELD
GUIDE

STRATEGIES FOR EFFECTIVE TB CASE FINDING
IN PRISONS
AND CLOSED SETTINGS

LUSAKA CENTRAL PRISON



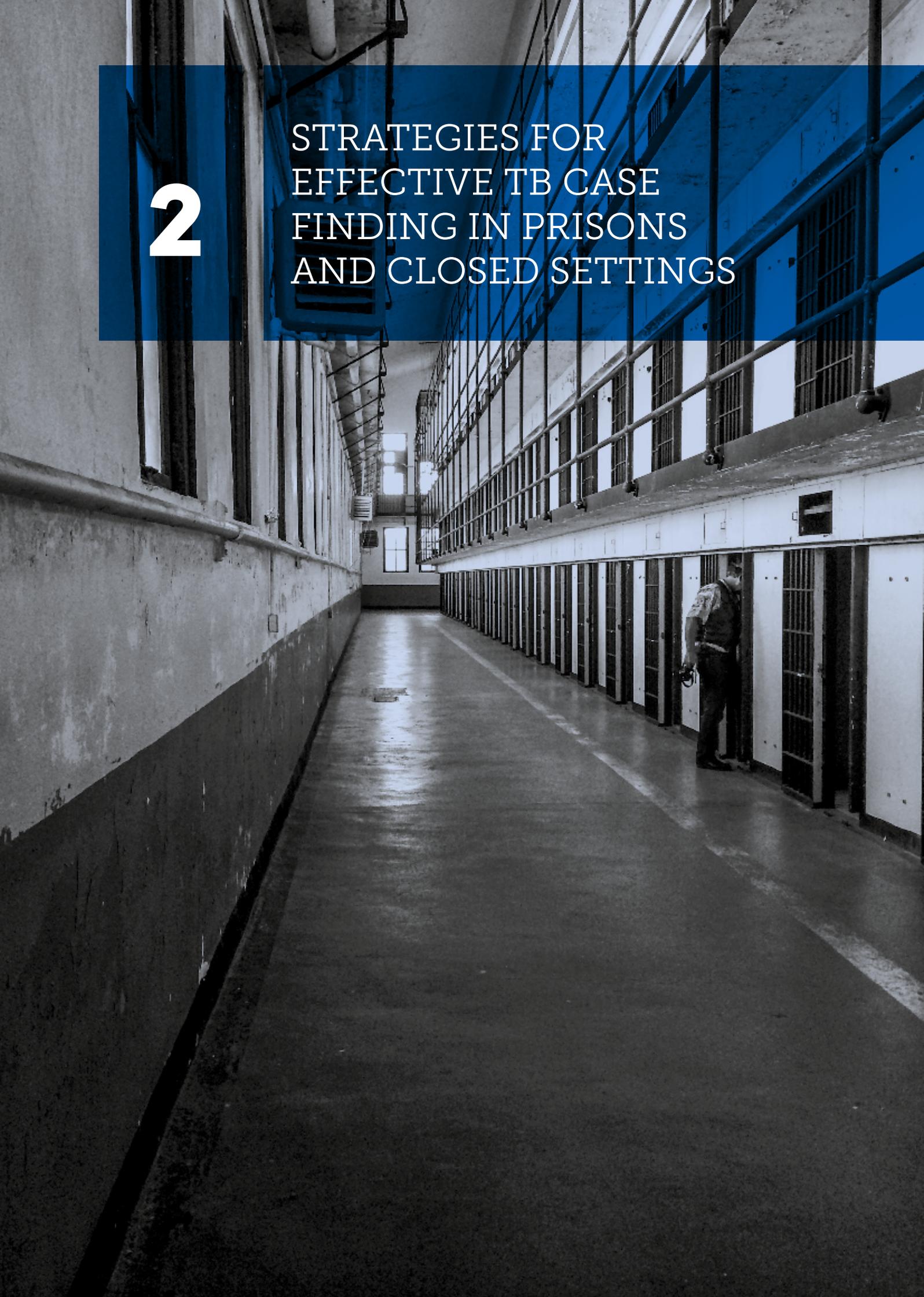
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STRATEGIES FOR EFFECTIVE TB CASE FINDING IN PRISONS AND CLOSED SETTINGS



PURPOSE OF THIS DOCUMENT

This document is one in a series of 11 field guides produced by Stop TB Partnership in collaboration with the Global Fund to Fight AIDS, Tuberculosis and Malaria, Interactive Research and Development Global (IRD), KIT Royal Tropical Institute, and multiple global experts and implementation partners. The field guides rely on practical experiences and expertise of implementers and are meant to help national TB programmes and other TB programme managers to identify the best strategies for finding people with TB who are missed by routine health services.

This document is not to be treated as guidance, but rather as a collection of considerations, tools, experiences and examples that highlight successes and challenges in implementing effective TB case-finding interventions and may assist in their planning.

Working in prison settings to find missing people with TB has its specific challenges and limitations, but interventions can be successfully implemented, making an important impact on public health outcomes in communities and even entire nations. This field guide describes a number of experiences and practical lessons that can assist in designing and implementing effective TB services in prisons.

This field guide went through extensive peer review by the agencies and individuals acknowledged below. It presents a range of examples from peer-reviewed literature and implementation practice. Where not cited, examples are provided by TB REACH.

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The production of these field guides represents a significant effort, bringing together more than 60 experts from over 30 different institutions globally in the spirit of partnership to help address a major barrier in the TB response: the fact that millions of people with TB are still missed by the current routine health systems.

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Abbreviations

ART	Antiretroviral therapy
B-	Bacteriologically negative (tuberculosis)
B+	Bacteriologically positive (tuberculosis)
CSO	Civil society organization
CXR	Chest X-ray
DOTS	Directly observed treatment, short-course
DR-TB	Drug-resistant tuberculosis
DST	Drug-susceptibility testing
DS-TB	Drug-susceptible tuberculosis
FBO	Faith-based organization
HIV	Human immunodeficiency virus
IGRA	interferon-gamma release assay
MDR-TB	Multidrug-resistant tuberculosis, defined as resistance to rifampicin and isoniazid
M&E	Monitoring and evaluation
MoH	Ministry of Health
Moj	Ministry of Justice
MoU	Memorandum of Understanding
NGO	Nongovernmental organization
NSP	National Strategic Plan
NTP	National TB programme
SS+	Sputum smear positive
TB	Tuberculosis
TBI	Tuberculosis infection, also referred to as “latent tuberculosis infection”
TPT	Tuberculosis preventive therapy
TSR	Treatment success rate
TST	Tuberculin skin test
WHO	World Health Organization
Xpert	Xpert MTB/RIF assay, a cartridge-based nucleic acid amplification test (NAAT) for rapid tuberculosis diagnosis





1. INTRODUCTION



1. INTRODUCTION

1.1 Why TB case finding in prisons is important

It is estimated that globally more than 10.4 million people are imprisoned and that four to six times as many people are passing through detention each year (1). On any given day, as many as 3 million people are held in pre-trial detention awaiting their sentence (2).



Prison and detention might encompass a broad network of institutions. For the purposes of this field guide, “prison and detention” refers to prisons, jails, police cells or special pre-trial detention centres. Depending on the setting, prisons might house those individuals who have been sentenced, those awaiting trial, migrants detained while waiting for the outcome of their immigration status request, people deprived of liberty because they live with drug dependency, and people with mental illness being detained in the absence of appropriate care facilities (3).

High TB prevalence: Studies in 21 countries from all regions of the world have reported substantially higher prevalence of TB in prisoners than in the general population, varying from 3.7 to 1,000 times (most between 4 and 50 times) (4). Another recent review estimated that 2.8% of all incarcerated people globally have active TB (5). The prevalence, however, varies widely across countries. For instance, TB prevalence in prisons in 24 sub-Saharan Africa countries ranged from 0.4 to 16.3% (6), estimated at 5.3% in East and Southern Africa and 2.9% in West and Central Africa (5). Once introduced into a prison setting, if not effectively addressed, TB can multiply rapidly. Furthermore, inadequate treatment programmes or poor adherence may lead to the emergence of drug-resistant and multidrug-resistant (DR/MDR) forms of TB, which may be exported back into the community (7).

High rates of MDR-TB: Drug resistance in prisons varies widely. In countries of Eastern Europe and Central Asia, high rates of drug resistance have been reported, with up to 50% of all people with TB in prisons being diagnosed with MDR-TB in some settings (8,9). In other countries, drug resistance was found at similar rates as in the surrounding communities (6).

Impacting the health of communities and nations: TB in prisons does not stay confined, and there is evidence that mass incarceration in the countries of Eastern Europe and Central Asia has been associated with an increase in TB prevalence in the general population (10). It is also estimated that 6.3% of the TB in the general population in low- and middle-income settings is attributable to exposure in prisons (11). Transmission of TB occurs not only in prison, but also through contact with family members, and upon release when TB is not properly diagnosed or treated or when linkages to treatment in the community are not adequately supported.

There is also growing evidence that prison staff are at high risk for infection if TB among prisoners is not adequately addressed. A study in Malaysian prisons found an 81% prevalence of TB infection (TBI) among prison staff – a figure that was higher than the TBI prevalence among health staff in the same state (52%) and in the general population (32%) (12). Furthermore, given their close contact, family members of prisoners and prison staff are at risk of acquiring TB. While not a focus of this guide, these populations serve as a testament to the necessity of addressing TB in prisons in order to preserve the health of both prisoners and communities.

Urgent need to expand treatment: The treatment success rate (TSR) reported in prisons is considerably lower than in the respective civil population (13). Early case finding allows for prompt initiation of effective treatment and has been found to be one of the determinants of successful TB treatment (14,15). Detecting and treating TB in prisons is a public health priority and should be recognized as such by policymakers and implementers in all settings.

Rights-based approaches: There is a body of literature produced by Stop TB Partnership and other partners that discusses the need for rights-based approaches to TB. Prisons and other places of detention, like no other settings, demonstrate the need for rights-based approaches in health, as punitive policies cause overcrowding, and failure to provide prisoners with basic amenities and minimal standards of healthcare contribute to the rapid spread of TB, HIV and other epidemics in prisons. By focusing on TB case finding in prisons, implementers can also help address larger issues in prisoner health and contribute to improving conditions of detention.

1.2 Factors contributing to TB in prisons

There are a number of factors contributing to the higher prevalence and incidence of TB in prisons. These include factors influencing the chance of having been exposed to TB prior to being incarcerated, factors contributing to getting infected with TB while in prison, and factors contributing to (re-) activation of prior TB infection (4).

Due to social, economic and behavioural factors, individuals entering prison may have been exposed to TB prior to imprisonment or during prior incarceration (16). According to several reports, including one from the UN Special Rapporteur on Extreme Poverty and Human Rights, the majority of people who are imprisoned globally are extremely poor, have lacked access to opportunities throughout the course of their lives, and are among the

most marginalized (17,18,19). The people who are most at risk for TB are often the same as those most at risk for incarceration and, in fact, repeated incarceration.

Within prisons, malnutrition, poor ventilation, and prolonged direct contact with people with active TB due to overcrowding are common and contribute to rapid TB transmission. The odds of TB transmission are influenced by the intensity, duration and frequency of contact with someone with active TB, and by the bacterial load of the source case, which increases with the duration of illness without proper medical attention (16). In settings where punitive and retributionist policies are common, incarceration rates are high and extreme overcrowding has been observed, providing ample opportunity for TB to spread.

Box 1.

A look at TB progression in Zambian prisons (20)

The TB REACH project run by CIDRZ in Zambian prisons observed TB rates among prisoners of 7.3% at entry, 12.1% at mass screening and 6.4% at exit pre-project implementation in Lusaka prison. Entry and mass screening included clinical diagnosis through chest X-ray (CXR), which was not available for exit screening possibly explaining the lower prevalence found at exit. The prevalence of bacteriologically confirmed TB among detainees residing in Lusaka prison was found to be 4.5 times higher than that found in the population of Lusaka Province and indicates the high level of risk of TB to the incarcerated population. The fact that HIV infection showed a pattern of increasing positivity rates at testing (16.6% at entry, 24.5% at mass and 31.6% at exit screening) is a further cause for concern.



HIV – the most important risk factor for developing TB disease in individuals with TBI – is a major health problem for prisoners around the world (5,21). In a study of 75 countries reporting HIV prevalence in prisons, 20 countries had HIV prevalence that exceeded 10% (22). Other factors also contribute to (re-) activation of TBI, including poor nutrition, stress and anxiety, smoking, and use of alcohol and other substances (7).

Despite clear recognition of the risks for TB in prisons and the opportunities to address them, in many countries the right to health for prisoners is not fully effectuated due to resource constraints; lack of adequate health services and diagnostic facilities within the prison premises; and challenges that prisoners face in attending civic health services (23,24). Significant delays in diagnosis of TB among prisoners lead to poor treatment outcomes and high death rates. As a result, being sentenced to imprisonment may result in a death sentence, constituting a major public health and human rights emergency that must be addressed by implementers.

1.3 What to expect

The number of people with TB that implementers can expect to find in prison settings will depend on the prevalence of TB among the imprisoned population and prison staff, which in turn depends on previous TB screening efforts and existing control measures. In situations where access to TB diagnosis and treatment has been low, the prevalence and screening yield can be expected to be high. For example, a TB REACH systematic screening program in six prisons in Zambia, where no routine screening had previously been implemented, identified 429 people with TB in the course of one year. This constituted a 371% increase in TB detection compared to the previous year and translated into a prevalence of 6,428/100,000 – 15 times the estimated TB prevalence in the general population (20). A similar intervention in South Africa's largest prison found a TB prevalence of 3.5% among a group of already incarcerated and newly entering prisoners who consented to the screening (25).

A project in prisons in Punjab, Pakistan (highlighted in Box 2 below) led to a 9-fold increase in notifications among prisoners. Consequently, the intervention was considered an important one for the prisoners who had had limited access to TB services prior to the intervention. However, the resulting notification rate of 233/100,000 prisoners screened was no higher than the estimated incidence in the general population, indicating that the effect of this intervention on TB in the wider population was likely limited.¹

Box 2.

Screenings for TB in Punjab, Pakistan

At the time of the intervention, prisons in the Punjab region housed around 55,000 prisoners who had limited access to health services and TB diagnosis and treatment. At all participating prisons, laboratories were set up and basic TB management units were established. All newly entering prisoners were screened verbally. If prisoners were identified as having TB symptoms, they were asked to provide sputum. Periodic mass screenings using the same screening algorithm were also implemented. During 2 years of project implementation, 379,729 prisoners and prison staff were screened, resulting in the identification of 883 TB patients. This represented a 9-fold increase in notifications compared to the year prior to the start of the project.

¹ Punjab's TB Control Programme, Screening for TB in prisons. Implemented with funding from TB REACH W1, 2010–2011.

In Viet Nam, the national TB programme (NTP) with assistance from Nordic Assistance to Vietnam (NAV) set out to strengthen TB diagnosis in 17 prisons. As the NTP had already tried to improve access to TB diagnosis in the prisons in previous years, the intensified case finding did not lead to an increase in identification of sputum smear-positive (SS+) TB. However, the expansion of access to CXR led to a 43% increase in identifying all forms of TB.

As described in Section 2.2, entry screening, mass screening and exit screening will yield different rates of confirmed TB in all people screened. The positivity rate further depends on the screening and testing algorithms used and on whether previous TB screening and control measures have been implemented.



Setting up TB care and prevention in prison might be challenging, and implementers will encounter numerous barriers related to the specific prison and detention settings. Therefore, it is important to understand the prison context, what choices to make, and the anticipated challenges, so that they can be addressed without a negative impact on the activities.

1.4 Assessing the local context for addressing TB in prisons



The first step in developing any TB intervention is to review the baseline situation and assess the context within which the intervention will be implemented. An estimation of the prevalence will help in the planning of resources for diagnosis and care. Descriptions of how health care is organized within a prison and inventories of the availability and accessibility of TB services will provide valuable insight into how best to implement TB case-finding interventions.

Estimating TB burden

Publications and reports on systematic screening efforts or prevalence surveys in national prisons, pre-trial detention centres or similar settings could serve as a good source for estimating the prevalence of drug-susceptible (DS-) and drug-resistant (DR-) TB in the target population.

In order to understand the proportion of people with TB currently missed by the prison health system, current notifications of various forms of TB among prisoners can be compared to the estimated prison TB prevalence. Compiling notifications is relatively straightforward if a prison or

detention centre is registering TB as a separate reporting unit (26). This may be the case in bigger prisons that run their own health facilities. However this task is more challenging if the diagnosis and notification of prisoners with TB are done in a civic clinic outside of the prison. In such cases, it is advisable to ask the clinic to keep a separate register for monitoring TB in the prison setting or use a special code or address for patients referred by the prison or detention system. Baseline notifications can be established through a hand count covering at least the last four quarters, but preferably the past 12 quarters, to enable identification of trends.

Figure 1.

Example of a TB register provided to a civic clinic to track prisoners

Basic management unit TB register

Date of registration	BMU TB no.	Name	Sex (M/F)	Age	Address*	Health facility where treatment card is kept**	Date treatment started

* In case the patient is currently in prison, enter the home address or address of next of kin and indicate temporary address in prison by adding (IP)

** In case several copies are kept, the most peripheral facility should be entered

Who is responsible and how is health care organized for prisoners and prison staff?

Who is responsible

For the design of an effective TB intervention, it is important to understand who is responsible for providing health services and, in particular, TB services in prisons and pre-trial detention settings, and how these services are organized. In many countries, health services for prisoners are not governed by the Ministry of Health (MoH), but organized and run by the Ministry of Justice (MoJ), the Ministry of Internal Affairs, and/or the local (municipality or district) administration (24). The MoH in most cases remains responsible for setting health policies and standards. Some countries have policies and guidelines describing health services and

health programmes for prisoners, but the division of roles and responsibilities is not the same across or even within countries. Depending on the setting and region, authorities may have variable combinations of roles and responsibilities. Civil society organizations (CSOs) and nongovernmental organizations (NGOs) may be involved and may be providing special health and social services for prisoners. Roles and responsibilities may also differ in pre-trial detention and in various forms of prisons (e.g. high-security, medium-security and pre-release open detention). Table 1 provides a checklist to map responsibilities for health care in prisons or other detention settings.

Table 1.

Checklist for assessment of roles and responsibilities for health care in prison settings

(Note: Prisons, police cells and other pre-trial detention centres may have different attributes and thus if the scope of the intervention covers facilities of more than one type and in more than one region, there might be a need for several of these checklists.)

Responsibility/Role	Name of Authority, Type of Staff, or Partner Organization
Prison health policy	
Prison TB policy	
Provision of health services (within prison setting or referral to outside health services)	
Provision of health services (within prison setting or referral to outside health services)	
Implementing TB services (diagnosis, treatment, screening, prevention, referral services, transfer, follow-up)	
Recruitment and management of prison health staff	
Salaries of prison health staff	
Training and supervision of prison health staff	
Procurement and distribution of medicines and medical supplies for prisons and detention centres	
Maintenance of medical facility and equipment in the prison setting	

How is healthcare organized

Set-up, access and utilization of health services for prisoners vary across countries and across prison settings. Health services may be organized within the prison premises or through referral to public health facilities, occasionally combined with a health provider visiting the prison or detention centre at regular intervals. In either design, prison health services are frequently found to be very poor, understaffed and under-resourced (6). Implementers need to assess the type of diagnostic, treatment, care and prevention services that can be provided, and how easily prisoners can access these services. See also Table 2.

Access to services

While standard health services for prisoners are generally included in national policies, the reality of accessing these services is grim, with prisoners experiencing substantial delays or a complete lack of access (24). For instance, if a prisoner needs to be referred to a public health service, transport and prisoner escort need to be arranged. However, both are usually in short supply and only made available in cases of medical emergencies or very severe conditions. Even if services are provided within the prison facility, prisoners may not have unlimited access to all parts of the facility and may need to ask permission to leave their cell block. If that is the case, the logistics of requesting and receiving permission have to be clarified and individuals in charge have to be introduced, since they are the gatekeepers of access to services such as screening, diagnosis and treatment. When access to health services is considered a privilege rather than a right, juveniles, women, pre-trial detainees and immigration detainees are often disproportionately disadvantaged (18,27).

Supplies and other interventions

For services that are reported as available, the quality and continuity of supplies should be assessed. In addition, it is important to understand and coordinate with other special health programmes or initiatives that may be implemented in prisons. For example, if there are already HIV prevention interventions in the prisons, there may already be sensitiza-

tion activities and special health services that can be built upon. Vice versa, when implementing TB case finding in prisons, access to HIV testing needs to be included. If programmes are aiming to include prison staff and relatives, the health services these individuals use most frequently will also need to be assessed.

Table 2. Barriers for prisoners in accessing health services

Barrier	Considerations and issues to check
Access to health services outside prison premises	<ul style="list-style-type: none"> • Prisoners who want to seek health services need to ask permission to visit a public health facility. • Obtaining an escort is often difficult. • Can sputum be collected in the prison facility and transported to the TB laboratory? • Are there any possibilities of organizing TB screening sessions in the prison as outreach by outside clinics/mobile teams?
Access to health services within the prison	<ul style="list-style-type: none"> • Can prisoners freely access the health services or do they need permission to leave their cell block? • Who is the person/entity that grants permission (could be the warden, but often delegated to the prisoner cell leader)? • To what extent is attending health services considered a privilege? This can be assessed by conducting interviews with guards and wardens to understand their readiness to implement health programming. • Is money or favours exchanged for the privilege of accessing health services? This can be assessed by consulting with prisoners (if possible), community members who have family in prisons, and CSOs and NGOs that work with prisoners. • What are the opening days and hours of the health services?
Quality of available health services	<ul style="list-style-type: none"> • How many and which level of health staff are allocated to the prison? • How many of the available health staff positions are vacant? • What is the number of incarcerated persons per health provider? • What is the training level of health service providers within the prison? • What diagnostic equipment is available and what is the situation with continuity of medical supplies? • Are medicines available? • Do prisoners have to pay (formally or informally) for diagnosis and/or treatment, and/or procure items through relatives (if so, for what and how much)? • What are the systems available for transfer out and follow-up of prisoners with TB?

Are there any TB services available for prisoners?

Comprehensive HIV or TB policies or programmes for prisoners are rare. If such programmes are operational, they often cover only part of the prisons in a given setting (6). In order to find missing people with TB among prison populations, the full buy-in of prison authorities and relevant partners is necessary. If there is resistance or reluctance among authorities, this should be discussed and the underlying reasons identified. Perceived barriers may relate to financial considerations if the prison health budget is limited. In other situations, prison health staff and health service capacity may be considered insufficient to allow for the extra activities. In Zambia, a study showed that a tripartite memorandum of understanding (MoU) between the Ministry of Home Affairs, MoH and Ministry of Community Development was instrumental in overcoming such barriers and had the potential to mobilize a substantial increase in the human and other resources available for prison health services (28). In other settings, implementers might consider getting all the stakeholders to gather in agreement in similar ways.



Security is another frequently voiced concern, and there is often general reluctance to let outsiders enter the prison facility and freely interact with prisoners. In most cases, explaining the intended intervention in detail, highlighting the right of prisoners to obtain health services, and discussing concerns to arrive at a mutually agreeable solution will assist in overcoming these hurdles. Establishing prison health committees can be an effective way to bring the rights of prisoners to the attention of both the prison authorities and the prisoners and to push for better health service coverage and access (29). Such committees can include formerly incarcerated persons, family members of those currently incarcerated, NGOs and other nongovernmental bodies working with prisoners and those recently released, and health and human rights bodies.



Buy-in of individual facility staff leadership is also key. Prison wardens may not be aware of the severity of the risk posed by TB. Discussions around staff occupational health and safety and the impact of programmes on the community can also prove more convincing to many prison authorities. Soliciting support from MoHs is sometimes useful. Sometimes, however, relationships between MoHs and MoJs may be strained due to competing influences, and these political realities are important to consider. Prison health may also be of interest to other influential policymakers, and their support might need to be enlisted. Study tours to exemplary programmes in other countries, involving joint delegations with representatives of prison security and health staff (including higher level policymakers), have proven effective in building interest.



How are prisoners diagnosed with and treated for TB?

Once the support of prison authorities has been secured, a joint assessment of currently available TB services and gaps should be conducted:

- Does TB screening take place among prisoners at entry, during incarceration and at release or transfer?
- If such screening is taking place, how is it organized, which screening and diagnostic algorithms are used, and which diagnostics are used?
- What is the population eligible for screening, what proportion of the eligible population is actually screened, what is the usual frequency of screening, and how many people are usually identified with TB through such screening?
- What challenges have been noted?
- Are any screenings done for prison staff?

Access to diagnosis

It is important to understand how prisoners access TB diagnosis when they develop symptoms. The presumptive TB and notification registers are a good starting point for assessing this. However, more nuanced understanding of the main challenges and barriers to accessing diagnosis and care must be acquired.



Staff in TB REACH prison projects in Ethiopia and Zambia reported that, prior to the project, prisoners had to be referred for diagnosis to a health facility outside of the prison. Organizing transport and escorts took weeks, which significantly delayed or entirely prevented prisoners from being diagnosed.

There may be a difference between prisons and (pre-trial) detention centres in terms of access to TB diagnosis. Experience has shown that health and other services are often less established in pre-trial detention because people are expected to be there only temporarily. However, in many settings, individuals may spend several months or years in detention while awaiting trial (16).



It is important to note whether TB diagnosis leads to a more punitive or more tolerable environment for the prisoner – i.e. are the conditions in isolation for prisoners with TB even worse than in regular cell blocks, or are sick or medical wards more tolerable with additional nutritional support? These conditions may influence the willingness of prisoners to come forth with symptoms and how interventions need to be organized. Interventions may also include advocacy around the lack of need for prolonged isolation, as persons with DS-TB are significantly less likely to expose others to TB after 2–3 weeks of treatment.

Availability of screening and diagnostic equipment

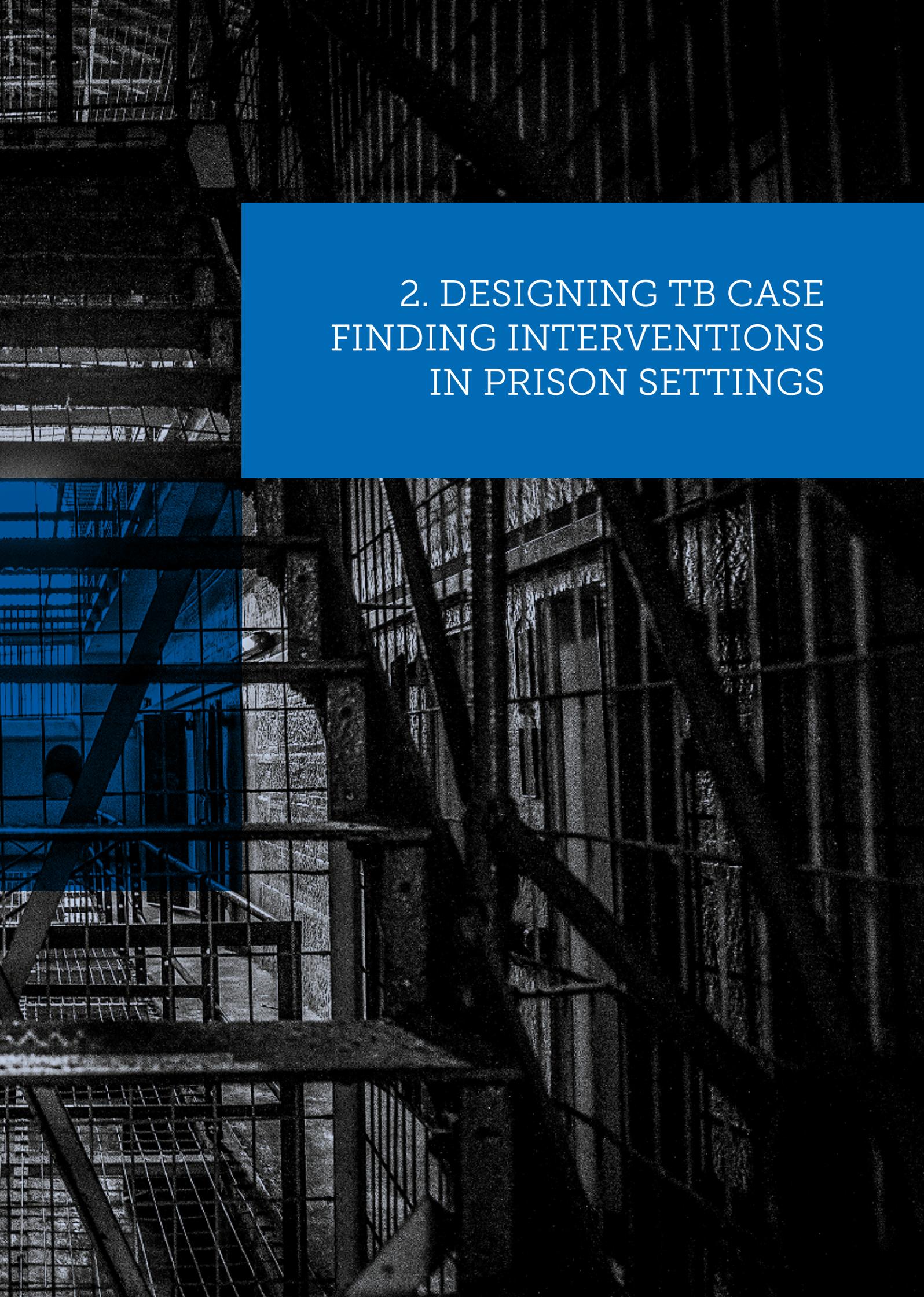
It is also important to understand whether there is a laboratory that will be available for sputum testing once the programme is established, or if specific laboratories in the civic sector will need to be enlisted to support the prison interventions. While this is particularly crucial to address for one-off mass screening events that may cause a sharp increase in the number of prisoners being tested, it is also important for other prison interventions that aim to make an impact over the long term. In addition, the diagnostic and testing tools available to prisons (such as CXR and GeneXpert machines) may vary and implementers might consider negotiating to borrow and/or purchase this equipment for long-term interventions (see also Section 2.4).

How do prisoners access treatment?

Current TB notification in prisons should show where and how patients are notified, and how treatment is organized. In most situations, the treatment will be organized within the prison or detention centre; usually the entire treatment course is handed to a dedicated person supervising TB treatment. In exceptional situations where prisoners need to attend a public facility at regular intervals to collect refills, this may be challenging. Prisoners with TB may also be transferred to a specialized TB prison, a TB ward or designated TB cells.

Treatment outcome data and transfer practices will provide useful insight into whether or not people with TB in prisons are receiving adequate treatment. TB programmes in prisons have reported high rates of loss to follow-up due to the lack of timely communication to health staff regarding the imminent transfer or release of prisoners and the lack of an effective system to transfer patients to providers in the recipient prison or community. A useful checklist for conducting the baseline assessment can be found in the Tuberculosis Coalition for Technical Assistance Guidelines for control of tuberculosis in prisons (7).



A dark, grainy photograph of a prison interior. The image shows a staircase with metal railings and a wall with a barred window. The lighting is low, creating a somber and institutional atmosphere. A blue rectangular box is overlaid on the right side of the image, containing white text.

2. DESIGNING TB CASE FINDING INTERVENTIONS IN PRISON SETTINGS

2. DESIGNING TB CASE FINDING INTERVENTIONS IN PRISON SETTINGS

Prisons and other closed settings facilitate transmission of TB, so it is key to curb transmission through early detection and effective treatment and to ensure that infection control measures are put in place. Addressing infection control measures outside of finding the missing people with TB is not covered in this guide. Further guidance on how to develop an infection control plan can be found in the WHO policy on TB infection control in health care facilities, congregate settings and households (30) and TB prevention and control care in prisons (31).

2.1 People to be screened

Prisoners and people in detention do not comprise a homogeneous and stable population. Depending on their sentence, prisoners are expected to be incarcerated for shorter or longer durations. During this period, prisoners may be transferred between prisons and detention centres, and the continuous enrolment, transfer and discharge of prisoners causes the population to fluctuate.

To estimate the screening needs of a given prison facility, implementers will have to acquire the average number of prisoners and the turnover (i.e. number of new detainees and number of releases each month). These numbers may fluctuate substantially over time. Prisons usually

do daily headcounts to keep track of average occupancy by day and by month. While this information is important for the planning and monitoring of activities, prison authorities may treat this information as confidential.



Prison populations include people in pre-trial detention, prisoners entering prison as first-time offenders or after having been imprisoned before, and prisoners who have already been imprisoned for over 6 months. The prisoner population may include migrants, people living with mental illness who are being held in detention in the absence of appropriate care, people who use drugs, and small children staying in prison with their mothers. Although these population groups may have different TB risk profiles, all are potentially at high risk for TBI and activation of latent infection. Therefore, all groups should be included in case finding and screening efforts. In addition, prison staff should be considered a population at risk for infection due to close contact with prisoners. The following paragraphs present some risk groups of prisoners who may require special attention.

WOMEN

Although more than 90% of prisoners are male (1), the female prison population has risen disproportionately over recent years. It is important to give special attention to the needs of female prisoners as they may face different barriers in accessing diagnosis and treatment (32). Because the female prison population is small in number, all women might be incarcerated with the same highly restrictive security regime, and services for female prisoners may be more limited. Furthermore, women may bring small children with them who also need to be provided with TB services (32).

MIGRANTS

A special group of concern is comprised of migrants held in detention until they are deported or processed. Diagnosis of TB among this group should be a concern for both the host and home countries.

PRISON STAFF

As indicated earlier, prison staff are at heightened risk for TB through their contact with prisoners, although better nutrition and living conditions provide some level of protection. Relatives of prison staff and detainees are indirectly at risk as contacts.

PRISONERS LIVING WITH HIV AND PRISONERS WHO USE DRUGS

Rates of HIV in prisons are high and prisoners living with HIV may need additional services and support when being engaged in TB case-finding interventions. Global evidence suggests that in some settings, the majority of the prison population may be incarcerated on drug-related crimes. Within this group, the majority are serving sentences due to drug possession for personal use. Addressing the needs of people who use drugs in TB case-finding interventions may be enhanced by providing access to substitution therapy in prisons.

2.2 Selecting models for finding people who are missed in prisons

Case-finding approaches in prison settings can be grouped into five main models:

- Screening at entry
- Continuous identification and testing of people with symptoms
- Mass screening
- Exit screening
- Contact investigation

These models can be implemented on their own or in combination, depending on the context and expected effect. At a minimum, entry screening and continuous identification and testing of people with presumptive TB should be provided. This section discusses the advantages and disadvantages of each model and provides considerations for where and when to implement these approaches. Table 3 summarizes the main considerations, and Section 2.4 discusses considerations for choosing optimal screening algorithms for these models.

Entry screening

If implemented systematically, entry screening has proven to be an effective way to limit TB from entering prisons (33). Given the higher prior risk for TB among people who are incarcerated, the systematic screening of all prisoners entering a prison or pre-trial detention facility is of key importance. Entry screening implemented in five prisons in Tanzania using CXR followed by Xpert MTB/RIF testing or Xpert only found active TB in 1.1–1.6% of all prisoners at entry.² In Ethiopia, symptom screening followed by microscopy implemented by the German Leprosy and Relief Association, MoH and the Federal Prison administration in seven prison facilities identified TB in only 0.3% of those entering prisons.³ However, even if the numbers identified are not very high, they are still higher than in the general population. Entry screening remains of importance throughout all stages of a prison programme, and should continue once TB care facilities have been established. The individual with TB entering the prison will benefit from early

detection and treatment, which enhances the chances of cure. Early screening also serves as a protective measure for the entire prison population.

Where and when to do entry screening

If the prison facility has a clinic on the premises, the health and TB screening at entry should take place there. In the absence of an official clinic, a room or space that provides privacy and sufficient ventilation should be made available for verbal screening and sputum collection.

For entry screening to be most effective, all prisoners should be screened as soon as possible upon entry. Ideally, the entry screening for TB should be integrated into a general health screening and should be considered part of the standard package of administrative intake activities performed within 24 hours of entry. It is important that prison authorities, health staff and prison wardens agree on how to organize screening as part of the entry process and at what point prisoners should be brought for screening.

² LMU&NIMR, *Application of the Xpert MTB/Rif® assay as a routine screening tool for the prison population in Tanzania. Implemented with funding from TB REACH W3, 2015.*

³ GLRA, *Intensifying TB case finding in prison settings. Implemented with funding from TB REACH W4, 2014.*



Ensuring that no one is missed

Prisoners may arrive in prisons or pre-trial detention centres at any time of the day or night, which may cut short administrative admission processes at entry. People newly entering the prison outside of office hours should still be screened the following day. Daily lists of new entries should be reviewed to ensure that no one is missed.

Continuous proactive identification of presumptive TB and enhanced access

Any person with TB symptoms should have easy access to medical attention, including testing for TB. Continuous proactive diagnosis and treatment of all people with TB relies on the routine health services provided to prisoners. If the initial assessment of the prison identifies barriers to accessing health services and TB diagnosis (see check list in Table 2), these need to be addressed. Education of prisoners is crucial to raise awareness in order to facilitate the recognition of TB symptoms and (self-)referral for testing. Prisoners should be made aware of their rights, encouraged to seek medical care, and informed about accessing diagnosis and care. Education sessions and education materials with appropriate messaging in local languages will need to be developed.



Several prison interventions have effectively made use of prisoners to provide peer education, and to identify and refer fellow prisoners with TB-related symptoms for testing. One way of organizing peer interventions in prisons is to deliver educational sessions in the courtyard or communal areas during times that prisoners are allowed to leave their cells. In the Zambia prison programme, a drama group was formed among the prisoners elected to become peer educators.⁴ These peer educators were also trained to identify and refer prisoners with symptoms of TB for testing.

Where and when to implement this approach

In all prison settings, diagnosis should be made easily accessible. Prisoners with any symptoms consistent with TB should immediately be evaluated and their sputum tested. If no TB diagnostic laboratory services are available in the prison, the best solution is to set up such diagnostic facilities. This was done successfully in prison projects in Punjab⁵ and Ethiopia⁶. If it is not feasible to set up diagnostic facilities within the premises, it will likely be much easier to set up a system for collection and transportation of sputum samples, rather than having to transport the prisoners with symptoms. However, for prisoners with symptoms with no bacteriological confirmation, referral for CXR is highly recommended and should be organized wherever possible. Options for referral should be discussed with prison health staff and wardens, and a referral system that allows symptoms to be addressed quickly should be devised.

⁴ CIDRZ, *TB screening in six prisons in Zambia. Implemented with funding from TB REACH W1, 2012.*

⁵ Punjab's TB Control Programme, *Screening for TB in prisons. Implemented with funding from TB REACH W1, 2010–2011.*

⁶ GLRA, *Intensifying TB case finding in prison settings. Implemented with funding from TB REACH W4, 2014.*

Mass screening

A mass screening exercise at the start of a new prison TB programme provides insight into the TB prevalence at baseline and can contribute to cutting transmission, improving treatment outcomes, and preventing deaths and drug resistance. It can also generate arguments to advocate for better TB services. Mass screenings in prison settings where TB case finding has been limited and access to treatment haphazard usually deliver high numbers of missed people with TB.



However, to ensure long-term impact, such one-off mass screenings must be followed by sustained:

- Entry screening to ensure that people with active TB are diagnosed and placed on treatment; and
- Early detection of people developing TB while in prison through enhanced access to testing for any person with presumptive TB.

A study in Brazilian prisons in which prisoners were screened twice – first through mass screening and then with a repeat screening after one year – found a high tuberculin skin test (TST) conversion rate and no reduction in active TB. No other active case finding had been introduced. The researchers concluded that mass screening alone is not sufficient to stop high rates of transmission within prisons (34).

Once entry screening and continuous easy access to diagnosis and appropriate treatment have been established, transmission of TB can be expected to decrease. Under these circumstances, new patients primarily arise from activation of TBI, likely due to deprived conditions in the prison and/or life circumstances prior to detention. Mass screening is then no longer expected to yield as many people with active TB as at the start of the TB intervention, but could still be a strategy utilized by some prisons.

Symptom screening in prisons might not be sufficient, as many people may present as asymptomatic. Therefore, mass screening with CXR repeated at regular intervals is considered to be important for early identification of asymptomatic TB patients who would otherwise not be identified by peer education and referred for presumptive TB (16).



A prison in Port-au-Prince, Haiti introduced digital CXR as a screening tool for systematically screening all prisoners. With verbal entry screening and microscopy being systematically performed, the addition of CXR screening resulted in a 6-fold increase in TB diagnosis (15). A mass screening in prisons in Tanzania using CXR followed by Xpert MTB/RIF testing found bacteriologically positive (B+) TB in 1.4% of the prisoners. When repeated a year later, no significant reduction was found (B+ TB was diagnosed in 1.1%).⁷ Also in Tanzania, a prison project that operated a few years earlier and in prisons with no prior TB interventions found higher rates at baseline (3.6%) and a reduction to 2.3% a year later.⁸ The results of these projects emphasize the fact that once-a-year screenings may not be enough; instead, more frequent, regular screenings might be necessary along with continuous case finding in the prison population.

⁷ LMU&NIMR, *Application of the Xpert MTB/Rif® assay as a routine screening tool for the prison population in Tanzania. Implemented with funding from TB REACH W3, 2015.*

⁸ NIMR, *Establishment of a mobile diagnostic and training center and GeneXpert in selected facilities in Mbeya Region, Tanzania. Implemented with funding from TB REACH W1, 2013.*

Because prison staff are at continued risk for TB, they should also be screened preferably twice a year. This can be organized as part of a mass screening event in the prison.

Where and when to do mass screening

A mass screening intervention needs to be organized in a prison. If a prison has a clinic and laboratory, the prisoners can be invited to present at the clinic, individually or in groups, to be screened and tested. If the facility has no laboratory, sputum can be collected and transported to a nearby laboratory for testing. When prisons do not have advanced clinical facilities or laboratories, screenings can also be organized as a mobile outreach activity with a CXR van. This has been done in several places, such as Zambia, Ethiopia and Tanzania. For mass screenings, a room offering privacy and a well-ventilated sputum collection area should be set up; this can be a fixed or temporary room, or it can be installed by use of a makeshift room or tent if nothing else is available.



The prisoners will go through different steps in the screening process.

In order to ensure that the correct results are captured under the right name at each step, the prisoner should move through the screening steps carrying a coded form for:

- X-ray/symptom screen
- Xpert or microscopy test, and
- HIV test (if included).

The forms and samples need to be coded with the same codes in order to link results to the individual. For this purpose, programmes have started using barcodes on printed stickers to label the forms and samples.

Step 1

Defining the process for the screening

Systematic screening of all prisoners is labour-intensive and needs to be well planned. First, prison authorities will have to assist with the flow of patients. This task will vary in complexity, depending on the size of the prison. Security regulations might prohibit groups of prisoners from gathering for screening. Even if prisoners come one by one, they may need to be accompanied by guards. Freedom of movement often differs for prisoners in facilities with different levels of security. The screening might have to occur in groups, with prisoners arriving block by block and with prison authorities providing guards for crowd control and flow. Whatever the choice of process

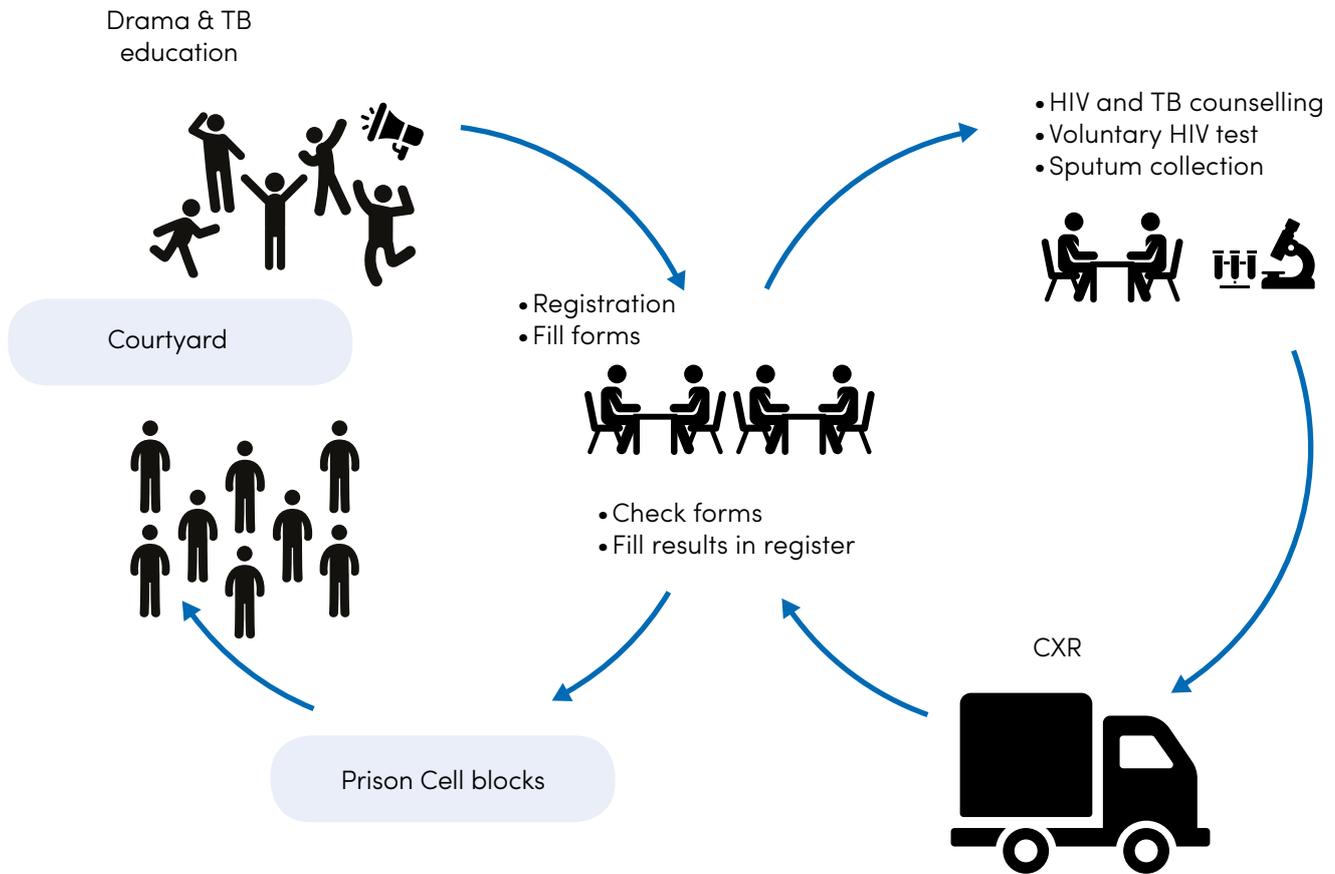
for screening, it is crucial that prisoners be treated with respect and that all of the questions they may have about the screening are addressed. Prisoner buy-in and their understanding of the screening are important for any future TB activities in a prison.

To ensure a smooth process and get the full buy-in of all stakeholders, it is important for the prison director/warden, security staff, prisoner representatives, health staff and screening team to define the screening model and flow collaboratively. It could be beneficial to draw a map of the proceedings based on discussions among these stakeholders (see Figure 2).

Figure 2.

Example of mass screening flow

Mass Screening Flow Chart



Step 2

Deciding on realistic numbers to screen each day

After deciding on the process, implementers will have to negotiate how many days will be needed to screen the entire prison population. This will depend on the process, the number of screeners, the time it takes to screen and to instruct participants on how to produce a good sputum sample, the number of sputum samples that can be processed each day, and the hours during which screening can take place. A list of all prisoners present in each block will assist in planning and allow for tracking the coverage of the screening.

When planning the screening, it is important to consider the days and times at which prisoners can be reached. In most cases, prisoners are granted limited hours during the day when they are allowed to leave their cell block. Prisoners who are working towards release sometimes leave the prison early in the morning on consecutive days for work, which may make it challenging to include them in the screening. Prisoners who have special tasks within the prison may also not be available for screening at certain times of the day. Prison wardens need to be consulted to ensure that all prisoners are covered.

Step 3

Education

Before starting the mass screening, staff and volunteers (see Section 2.3) need to be trained. Conducting education sessions for prisoners explaining the importance of TB screening and the procedures of the screening can also save time during the intervention itself. TB stigma may be very high among prisoners and prison staff and thus sensitization activities may have to be planned before or on the screening day in order to engage both prisoners and staff in the screening.



A screening programme in prisons in Brazil used focus group discussions with prisoners, their relatives, and health and safety professionals to identify the main myths and concerns related to TB, and used this information as the basis to develop appropriate peer education tools and materials addressing stigma and fears.⁹

There is not sufficient evidence on the most optimal frequency for performing mass screenings. Conducting mass screenings among all prisoners and prison staff twice a year has been recommended (31) and implemented in some countries such as Ukraine.¹⁰ However, mass screening is labour-intensive and may not always lead to identification of many people with undiagnosed TB. For this reason, other countries have opted to implement mass screening campaigns in prisons once a year.¹¹ The numbers of additional people with TB being identified through the mass screening may provide guidance on whether the frequency is too high or too low.

Exit screening

In situations where prison living conditions and access to TB diagnosis and treatment in prison have been compromised, exit screening is expected to yield high numbers of active TB as a result of both transmission in the facility and activation of TBI. However, if entry screening and early detection of incident cases are well established, exit screening will likely yield the lowest number of cases and therefore will be the lowest priority. Furthermore, exit screening for diagnosis only has value if initiation and continuation of treatment after transfer or release can be guaranteed. Medical consultations as part of the exit protocol remain important as a means to ensure treatment continuation for those who started treatment while in detention.

One of the most important challenges with regard to exit screening and performing exit consultations for those on treatment is the need for health staff to be informed well in advance. Unfortunately, prisoners' release or transfer to another facility is often decided on short notice when the facility risks becoming overcrowded when receiving large numbers of new detainees. Implementers need to keep these challenges in mind and have discussions with security and prison directors/wardens on establishing an information flow that allows medical consultation to take place (see Section 2.5 for more details).

⁹ NTP, TB programme in prisons of Brazil. Implemented with TB REACH funding, 2014–2015.

¹⁰ Personal communication, Ukraine programme staff

¹¹ Personal communication, programme staff in Philippines and Tanzania

Contact investigation

Contact investigation in the community is usually performed among household or close social contacts of people diagnosed with TB. In prison settings, prison staff who are diagnosed during regular screenings and family members of incarcerated persons who are diagnosed with TB at entry could benefit from this intervention. See the field guide on contact investigation in this series for more details. If all prisoners and prison staff are regularly screened through the approaches described in preceding sections, the added value of contact investigation may be limited inside the facility. However, if mass screening is not feasible, but entry screening and regular access to TB diagnosis have been established, contact investigation among cellmates becomes an important tool to limit transmission and can be implemented when a person with TB is identified (7).

Where and when to implement this approach

For contact investigation within the prison, all prisoners residing in the same cell (or cell block) as the person with active TB are invited to be screened for symptoms and by CXR followed by a sputum test. A list of direct contacts can be obtained from the prison authorities. If peer educators have been trained for each block, they can be asked to do the first screening and referral. For the diagnosis, the same channels may be used as described earlier (CXR, sputum). Contact investigation should be done immediately when a patient is diagnosed, but may also be repeated at certain intervals.

Table 3. When to use which case-finding modality

Case-finding modality	When to use	How to organize
Entry screening	In all prison settings	<ul style="list-style-type: none"> • As an integral part of health screening during intake • By prison health staff or prison volunteers
Continuous identification and easy access to testing for individuals with presumptive TB	Needs to be ensured in all prison settings	<ul style="list-style-type: none"> • Set up diagnostic and treatment facilities within the prisons • If not feasible, organize collection and transport of sputum • CXR
Mass screening	Recommended in all prison settings where access to diagnosis and treatment has been compromised	<ul style="list-style-type: none"> • A (visiting) dedicated team with assistance of prison volunteers and prison staff • Mobile lab and CXR if these are not present in the prison facility
Exit screening	In settings with high TB prevalence Treatment follow-up needs to be organized	<ul style="list-style-type: none"> • As an integral part of the health package prior to transfer or release
Contact investigation	If TB is reasonably well controlled through entry screening and continuous early diagnosis, and mass screening is no longer yielding many new TB diagnoses, contact investigation should become a routine activity in prisons.	<ul style="list-style-type: none"> • Inviting all cellmates or other close contacts for screening and testing either by prison health staff or prison volunteers

2.3 Who conducts the screening?

TB case-finding projects in prisons rely on prison health services but have frequently been initiated and supported by NGOs or CSOs and NTPs. Interventions utilize the support of prison and civilian health staff, as well as volunteers recruited from the prison population.

Health staff

Before starting a case-finding project in a prison, the health and laboratory staff available to implement health and TB activities have to be assessed on their knowledge with respect to TB diagnosis, treatment and care, and their familiarity with TB screening activities. Larger prison facilities usually have dedicated health staff assigned to the facility who run clinics and attend to medical emergencies. Smaller prisons or pre-trial detention centres often rely on part-time health staff visiting the prison at regular intervals or on referral of patients to a nearby civilian health facility.

Recruitment, training and supervision

If there are no permanent health and laboratory services present in the prison facility, additional staff may need to be recruited on a permanent or temporary basis for ensuring continuous TB diagnosis and care and for conducting specific screening activities. Prison health authorities will have to agree to either supervise or work alongside these staff, and therefore the buy-in of and collaboration with authorities will be necessary. While staff assigned to prisons in most cases report to prison health authorities, it is considered beneficial if the NTP takes responsibility for technical supervision and guidance.

If it is easiest for outreach teams to visit the prisons, these teams need to be properly introduced and engage with prison health staff in a collaborative manner.

The training of health staff and prison security officers needs to include general knowledge about TB symptoms, disease, diagnosis, treatment and infection control. Training further needs to cover screening and testing algorithms, reporting and recording. A part of the training should also be dedicated to discussion of the logistics of the active case-finding modalities that have been chosen. Prison health staff may provide useful insights based on their experience with

implementing other interventions. When the screening begins, weaknesses and challenges in implementing the selected protocols according to plan must be identified. If major challenges prohibit protocols to be followed, this needs to be discussed between health staff and the prison authorities so as to identify alternative solutions.

Incentives

As with any special health programmes, prison health staff may receive (performance-based) incentives such as salary top-ups and others, as long as continuity of the screening efforts over time can be guaranteed. TB screening should be considered part of the job description of prison health staff and incentives are neither a prerequisite nor a guarantee for success. In Tanzania, one project was successful without incentives¹², while in another project, prison staff in some facilities lacked motivation despite incentives being available.¹³ Additional discussion of incentives is prominently featured in the Introductory field guide of this series.

Safety

It is crucial that the safety of the health team be guaranteed. There should be a briefing by the prison authorities with instructions on what (not) to do, on recognizing and acting on situations of heightened risk, and on how to interact with prison volunteers.

¹² NIMR, *Establishment of a mobile diagnostic and training center and GeneXpert in selected facilities in Mbeya Region, Tanzania. Implemented with funding from TB REACH W1, 2013.*

¹³ LMU&NIMR, *Application of the Xpert MTB/Rif® assay as a routine screening tool for the prison population in Tanzania. Implemented with funding from TB REACH W3, 2015.*

¹⁴ Recommendation n° 44/2013 National Council Justice and Resolution n° 4/ 2016 CNPCP (verbal communication)

Peers

Prison programmes have successfully worked with peers acting as educators, assisting with screening of all prisoners at entry, and assisting with the implementation of mass screenings (6). Peer education before and during a (voluntary) mass screening in a Haitian prison resulted in a screening uptake of 99% (15). Furthermore, peer educators are a key resource for continuously identifying and referring those who develop signs of TB for diagnosis.

Recruitment, training and supervision

To be effective, peer educators need to be allowed to have contact with fellow prisoners and should be provided with the supplies and space with which to raise awareness, educate their peers and implement screening. Prison authorities will have to approve such a role and could help to identify the prisoners most likely to be interested and to be successful.

Adequate training and supervision of peer educators involved in screening is key. Due to high turnover, regular training sessions for new peer educators should be planned. Furthermore, much of the ongoing peer education and screening of prisoners takes place within the cells and beyond the oversight of health staff. Peer-to-peer mentorship programmes for peer educators have proven to be an effective way to maintain knowledge and motivation.

Incentives

While the provision of financial incentives to peer educators will usually not be an option, being selected as a peer educator, being granted enhanced access to peer prisoners and becoming part of a health promotion team will often be considered an incentive in itself. Alternatively, a reduction in prison sentence was offered in Brazil, where prisoners were offered a 1-day reduction in their prison sentence for every 3 days they volunteered.¹⁴

Safety

Peers need to understand the risks associated with TB, and their safety against potential aggression from fellow prisoners needs to be discussed prior to the start of the assignment.

NGOs and CSOs

In many countries, NGOs and CSOs exist that already provide legal, social and targeted health support to prisoners during incarceration and after release. Collaborating with these NGOs and CSOs during screening activities may be useful, for example, with an NGO that provides services for HIV prevention and testing. Organizations that provide social support after release can be highly instrumental in the continuation of TB treatment and for contact investigation among the families of prisoners.

2.4 Considerations for various screening algorithms

Screening options and diagnostic tests.

Screening

a. Symptom screening

Screening for productive cough alone has proven to be ineffective in identifying presumptive TB (35).



In a Brazilian prison, a comparative evaluation found that symptom screening for cough only followed by smear would have missed over 80% of TB diagnoses (36). A study in a Johannesburg prison found that symptom screening (cough ≥ 2 weeks and/or night sweats and/or weight loss) had a sensitivity of only 29% (25). As these examples suggest, symptom screening alone will still miss around two thirds of B+ TB cases.

In Zambia, all prisoners screened at entry, during a mass screening, and at exit were considered at risk and were tested by smear microscopy and culture regardless of presence of symptoms.¹⁵ Instructions on how to produce a good sputum sample enabled most prisoners to be effectively tested. Only 67% of all bacteriologically-confirmed prisoners had one or more TB-related symptoms (cough, fever, night sweats or weight loss) (20). An analysis of a Ukonga prison screening using an algorithm of CXR followed by Xpert testing for abnormal CXRs showed that 60% of people identified with active TB did not present with any classical symptoms of TB.¹⁶

If symptom screening is done in the absence of CXR, or for early detection of presumptive TB in between screenings, it is recommended that an inclusive definition of presumptive TB be used – one that includes any sign of potential TB, such as cough of any duration, night sweats, fever, chest pain, or unintended weight loss.



Apart from the classic symptoms of TB, there are a number of other risk factors for TB that can assist in identifying individuals at higher risk of having active TB who should be referred for testing, even if they do not (yet) present clear TB-related symptoms (4,37). These include:

- A history of TB diagnosis and (incomplete) treatment
- HIV infection, which has been identified as the most important risk factor for active TB
- Malnutrition (a BMI $< 18.5 \text{ kg/m}^2$), which is a significant predictor of TB in several countries
- Poor socioeconomic status, poor housing (crowding, poor ventilation) and poor access to health care services prior to and during incarceration
- Crowding and spending less time outdoors while in prison, which have been found to be risk factors for developing TB while in prison
- Longer duration of imprisonment, which has been found to be a risk factor in some countries but not in others (e.g. spending > 2 years in prison increased the risk 2-fold compared to < 1 year in prison in Georgia, but no increased risk was found in Zambia for longer duration)
- Previous imprisonment, which increases the risk of having active TB
- History of injection and other drug use

¹⁵ CIDRZ, TB screening in six prisons in Zambia. Implemented with funding from TB REACH W1, 2012.

¹⁶ LMU&NIMR, Application of the Xpert MTB/Rif[®] assay as a routine screening tool for the prison population in Tanzania. Implemented with funding from TB REACH W3, 2015.

b. CXR

Given the lack of reliability of verbal screening in prisons, CXR is an important tool for screening and diagnosis of TB in prisoners and should be used wherever possible (36). A study among 1,000 prisoners in South Africa found that CXR had a sensitivity of 70.6% using culture as the gold standard. The sensitivity could be further enhanced to 79.4% by adding cough of any duration (25).



CXR is not only highly recommended as a screening tool, it can also be used to aid in clinical diagnosis of TB and other pulmonary diseases.

Interpretation of CXRs is not always easy. Trained health staff have to be hired for CXR reading if they are not available in the prison or staff need to be trained with the help of a radiologist or pulmonologist.



Computer-aided reading of digital CXR has been used in screening to successfully identify individuals with presumptive TB in projects in Zambia (38). A similar project in Tanzanian prisons concluded that computer-aided reading could reliably evaluate CXRs from a mostly asymptomatic prison population, although with a diagnostic performance inferior to that of expert readers, but comparable to that of local readers (39). When large numbers of people are being screened every day, an automated reading system may be ideal.

Optimal cut-off scores at which people are considered to have presumptive TB based on automated reading of the CXR during screening will need to be carefully defined and will depend on characteristics of the population to be screened (e.g. prevalence of TB, HIV and other diseases with CXR abnormalities). To find out more about the use of CXR, refer to the field guide on CXR in this series for more details.

c. HIV testing

Given the high prevalence of HIV in prison settings and the likely high prevalence of TB/HIV coinfection, it is recommended that voluntary counselling and testing for HIV always be incorporated into prison TB screenings. Confirmation of HIV infection may be considered a reason to offer Xpert testing for TB, irrespective of whether the person has any TB symptoms.

Diagnosis



Good-quality sputum is important, and therefore people need to be instructed on how to produce a good sputum sample. This is even more important when inviting for screening people who do not (yet) complain of a productive cough, as is common during screening with CXR or during systematic testing of all prisoners. Experience has shown that with good instruction almost every person can submit a good-quality sputum sample. Education leaflets or instructional videos may be of help.

a. Smear microscopy

Smear microscopy has been found to have low sensitivity in settings with high HIV prevalence or other factors leading to immune suppression (20,36) and therefore is no longer the test of choice to confirm TB in prison settings.

b. GeneXpert

Molecular tests such as Xpert MTB/RIF are the preferred test to confirm the diagnosis of TB in prison settings. Xpert testing has the advantage of identifying presumptive MDR-TB patients. In prisons that do not have a designated GeneX-

pert machine, transport of sputum to the nearest facility with GeneXpert capabilities should be organized. Sputum collection, sample transportation flows and results communication back to the prison should be carefully designed (see Box 3). During mass screening, a mobile unit with GeneXpert and CXR can be brought into a prison facility. Implementers must consider the number of tests to be done on a daily basis. If the capacity for GeneXpert is low and the programme has the capacity for liquid culture, culture may be considered as an alternative in order to increase the daily numbers to be tested, for instance, during a mass screening.

Box 3. Checklist for organizing sputum transportation

THE FOLLOWING CHECKLIST DESCRIBES CONSIDERATIONS FOR ORGANIZING EFFECTIVE SPUTUM TRANSPORT:

- Establish who will be in charge of transporting the sputum (e.g. prison administration, NGO, laboratory).
- Ensure agreement is reached and signed with the laboratory that assumes testing of samples (agree on maximum number of samples to be expected, who provides the cartridges, who provides sputum containers, maximum time between sample arriving and results being available, and how results will be reported).
- Decide how confirmed patients will be registered, notified and enrolled on treatment and who will be responsible for this (e.g. in prison lab, NTP, outside lab, mobile team, etc.).
- Design referral forms with feedback slips to be filled out and sent with each sample.
- Establish a presumptive TB register.
- Ensure continuous availability of sputum collection pots, transport packaging, and referral forms.
- Instruct individuals on how to produce a good sputum sample.
- Store samples in a refrigerator until transport is available or ensure transport the same day.
 - Package the sample according to the local standards for transport (ideally triple packaging, including cold chain, if transport takes longer than a few hours – see also some packaging tips in the field guide on laboratories in this series).
 - Enter details in presumptive TB register.
 - Monitor adherence to protocols and take follow-up action as required.

c. Culture and drug-susceptibility testing (DST)

In countries with high rates of DR-TB, even higher rates have often been found in prisons relative to the general population (40,41). In these settings, all efforts should be made to organize culture and DST for all confirmed TB patients. In countries where resistance to second-line TB treatment is also common, DST should be considered a standard of care (31).

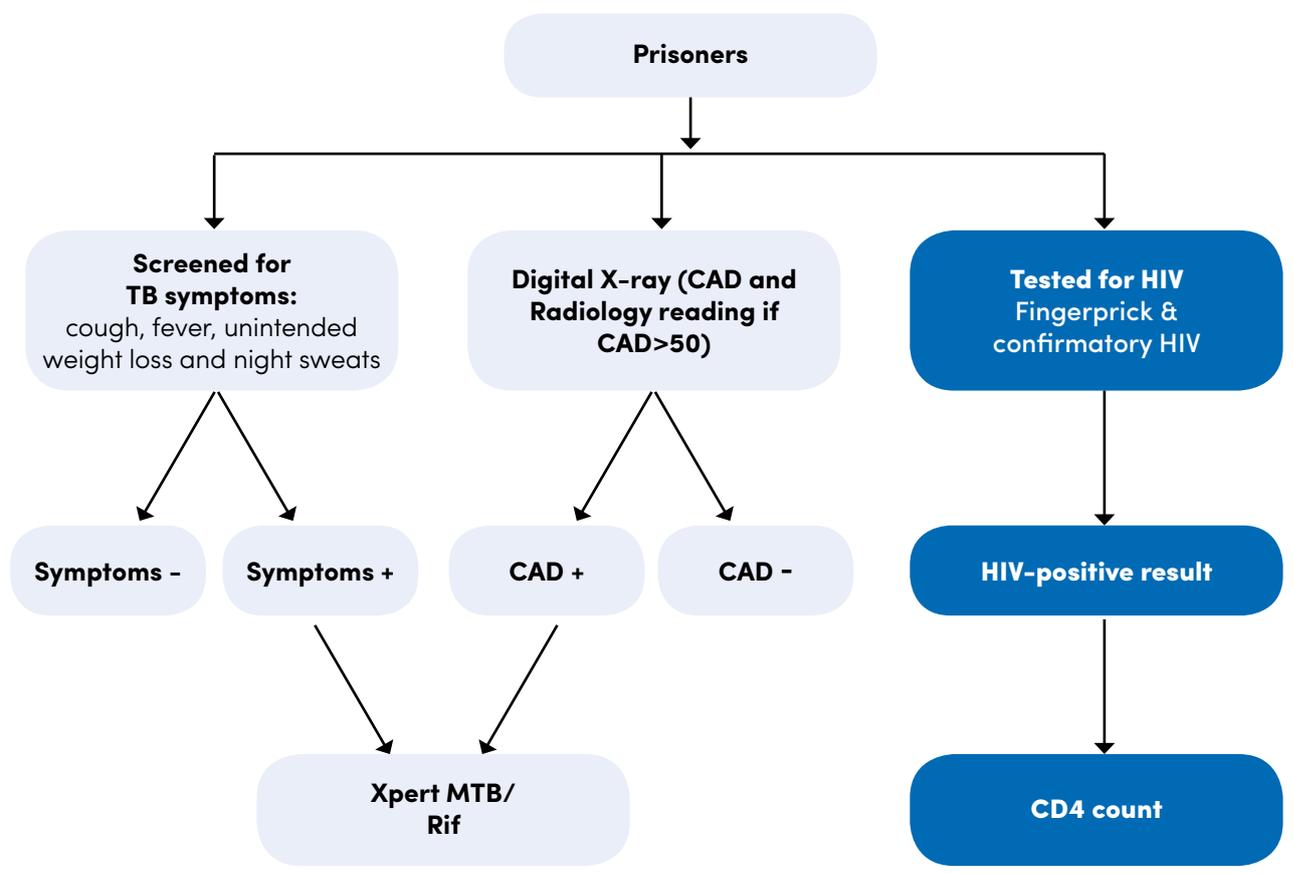
Although culture and universal DST are the gold standard, in most settings with relatively low prevalence of DR-TB, it is unlikely that culture can be used for routine diagnosis. Furthermore, some studies

in settings with a low prevalence of DR-TB have shown no increased levels of drug resistance among prisoners compared to the surrounding population (42,43,44). In such settings, there is no need to overload the culture laboratories with routine DST, unless an outbreak is suspected. Meanwhile, Xpert MTB/RIF can assist in identifying rifampicin-resistant cases and may be used as the basis for initiating standard second-line treatment. If resources allow, samples can be sent simultaneously for DST. Results can then be used to update the treatment if necessary.

Algorithms

Figure 3 shows an effective algorithm used during mass screening in a prison programme. Table 4 gives an overview of possible screening and diagnostic algorithms, describes the advantages and disadvantages of each, and provides guidance on when to use which option. Further guidance on the use of different algorithms can be found in WHO’s operational guide for systematic screening (45).

Figure 3. Example of an algorithm used in screening of prisoners¹⁷



¹⁷ CIDRZ, TB screening in six prisons in Zambia. Implemented with funding from TB REACH W1, 2012.

Table 4.

Potential algorithms and their use in prison settings

Algorithm	Advantage	Disadvantage
<p>1. CXR screening combined with verbal screening followed by Xpert (if symptoms are established and/or abnormal CXR)</p> <p>Preferred algorithm for mass screening and entry screening</p>	<ul style="list-style-type: none"> • Reasonable sensitivity and specificity in identifying presumptive TB • Reasonable sensitivity and high specificity for diagnosis among those tested 	<ul style="list-style-type: none"> • Logistically more challenging since it might require a mobile screening unit • High initial costs for both CXR and GeneXpert
<p>2. Verbal screening (inclusive definition of presumptive TB) followed by Xpert</p> <p>Most commonly used option for continuous identification and testing of presumptive TB in prisons and for entry screening in absence of CXR</p>	<ul style="list-style-type: none"> • Relative high sensitivity and specificity as a diagnostic test • Logistically easier than use of CXR 	<ul style="list-style-type: none"> • High workload for testing all presumptive TB cases due to low specificity of verbal screening • High proportion of TB cases missed due to low sensitivity of verbal screening • Limited options to diagnose bacteriologically negative (B-) pulmonary TB • High start-up cost for GeneXpert
<p>3. Testing all individuals by CXR and testing all by Xpert (regardless of having symptoms or abnormal CXR)</p> <p>Can be used for entry screening and mass screening if resources allow</p>	<ul style="list-style-type: none"> • Greater number of B+ pulmonary TB will be diagnosed through this algorithm than through the first option (including those without CXR abnormality or symptoms) • A large number of B- pulmonary TB cases will also be identified 	<ul style="list-style-type: none"> • High initial costs (CXR and GeneXpert) • High running costs and workload because of large numbers to be tested
<p>4. Testing all individuals by Xpert regardless of having symptoms*</p> <p>Can be considered for entry screening in settings with high HIV prevalence and for mass screening when very high prevalence is expected and CXR is not available (and resources allow)</p>	<ul style="list-style-type: none"> • Similarly large number of B+ pulmonary TB cases will be identified • Does not require CXR • Does not depend on verbal screening with low sensitivity, particularly in high HIV prevalence settings 	<ul style="list-style-type: none"> • High initial costs (GeneXpert) • High running costs and workload because of large numbers to be tested • Limited options to diagnose B- pulmonary TB
<p>5. Verbal screening (inclusive definition of presumptive TB) followed by smear microscopy</p> <p>Not recommended</p>	<ul style="list-style-type: none"> • Low cost 	<ul style="list-style-type: none"> • More than 50% of B+ TB cases may be missed due to low sensitivity of both screening and testing • Still high workload for testing all presumptive TB cases due to low specificity of verbal screening

* Tanzania TB REACH W3 project compared CXR-Xpert with Xpert on everyone. Differences were not conclusive.¹⁸

¹⁸ LMU&NIMR, Application of the Xpert MTB/Rif® assay as a routine screening tool for the prison population in Tanzania. Implemented with funding from TB REACH W3, 2015.



TB/HIV COINFECTION

Prison settings are high-prevalence settings for both TB and HIV. Therefore, collaborative TB/HIV interventions are important. Engaging in TB case finding without concurrently addressing HIV in prison populations is likely to be less successful in curbing TB transmission and preventing progression to active disease (35). WHO guidelines strongly recommend that all HIV-positive people be screened and tested for TB (46). Furthermore, voluntary counselling and HIV testing should be offered to all people screened for TB and to all people identified with TB symptoms. Patients identified with TB/HIV coinfection should be treated for both TB and HIV, with TB treatment initiated first in most cases and in accordance with national guidelines. People living with HIV without active TB are eligible for TB preventive therapy (TPT) (see Section 2.5). Box 4 summarizes the main issues to consider.

Box 4.

Checklist for organizing collaborative TB/HIV interventions

THE FOLLOWING CHECKLIST DESCRIBES CONSIDERATIONS FOR ORGANIZING EFFECTIVE TB/HIV COLLABORATIONS:

- Assess whether HIV-related interventions are implemented in the prison.
 - (Which interventions? Frequency? How are they organized? What prison staff are involved? Are peers used?)
- Is screening for TB included?
- Are isoniazid preventive therapy and co-trimoxazole preventive therapy provided?
- Discuss options for collaborative activities (e.g. combined screening at entry, mass screening; combined training; combined supervisory visits).
- How is access to antiretroviral therapy (ART) organized? (Discuss opportunities for collaboration and for combining treatment services.)
- Which systems and services are in place to facilitate continued ART after release (e.g. social services, NGOs, CSOs, faith-based organizations (FBOs); link up and explore possibilities to use the same channels for TB treatment).

Ethical and human rights concerns

Mobilizing prisoners and ensuring good coverage of TB screening interventions in prisons may seem simple, as prisoners are quite literally a “captive audience”. While in some countries TB screening in prisons is mandatory, in other countries coercion into screening is illegal and prisoners have a right to opt out. In the latter context, informed consent needs to be obtained. In all settings, prisoners have the right to be fully informed about TB prevention, diagnosis and treatment.

In many countries, health services for prisoners are limited at best. Therefore, setting up a TB screening and treatment programme in isolation may pose challenges when other illnesses are identified. It is important to decide how individuals with symptoms and/or CXR abnormalities that are not confirmed as TB will be referred for appropriate medical care.

In prison and detention settings, confidentiality is likely to be more challenging, yet important to maintain – both during screenings and during diagnosis and treatment.

Other considerations

Experience from TB REACH projects has demonstrated that a mass screening exercise in a prison system (where no routine TB screening had been implemented up to that point) may yield a high number of new patients. Preparations should be made for this possibility in order to prevent the overload of the treatment system and lack of treatment. This means that serious considerations must be given to the capacity of the supply chain of diagnostic equipment, commodities and medicines. Storage of these supplies needs to be secured. If transport of sputum from sputum collection to testing site will be required, the capacity of the transport system, packaging and cold chain need to be assessed and secured.

In some settings, prisoners without TB may try to be admitted to the less crowded TB cell block or to a designated TB prison where nutritional support and a more relaxed environment may seem attractive. To this end, someone may ‘borrow’ and submit sputum from a known TB patient. By doing so, a prisoner will put him/herself at risk of infection. Therefore, sputum collection should be done under supervision in a well-ventilated room. Peer educators will usually know if such risks exist and can assist in supervising. Furthermore, prisoners should be educated and made aware of the risks posed by active TB. Prison overcrowding and high rates of TB in prisons identified through case-finding projects must be raised with prison authorities and politicians as a public health and human rights concern.

2.5 Facilitating successful treatment

Linkage and retention in care and treatment

Communication of results

Treatment should be organized promptly upon diagnosis, including adequate treatment of MDR-TB and extensively drug-resistant (XDR-) TB and/or HIV when these are identified. While test results for HIV are mostly available immediately during the screening, the results for TB are usually not. Implementers need to identify how prisoners will be informed of the results of their screening and testing, and whether confirmed TB patients (B+ or B-) need to be seen by a clinician to start treatment. The best way to convey this information is to invite all prisoners back to receive their results, so that treatment can be initiated if TB is confirmed and further TB education can be provided if the results are negative. Informing prisoners individually of their test results will ensure a form of confidentiality. However, if this is not feasible, for instance during mass screening, prisoners should be informed that they will be contacted again if TB is found and given options on accessing further testing for TB and/or HIV if they develop symptoms at a later stage. Programmes need to take care in relating HIV results in a manner that is confidential and that links individuals with support.

Separating prisoners with TB from general prison populations

All people identified with TB should be placed in a designated TB cell or ward until they are no longer infectious (as confirmed by a negative smear result). Most prisons should be able to dedicate one cell specifically for prisoners with TB. Overcrowding should be prevented and adequate ventilation ensured. In countries with high rates of drug resistance to first-line and second-line medicines, TB patients need to be separated according to their resistance profile. To facilitate this, dedicated TB prison hospitals are usually set up in high MDR/XDR burden countries.



Isolation should not be punitive or prolonged, and programme implementers should work towards ensuring that prison authorities are aware of when it is safe for prisoners with TB to join the general prison populations.

Management of coinfection

If no active TB is identified, but the HIV test is positive, individuals should be started on ART and offered isoniazid preventive therapy; if active TB and HIV are identified, patients should be initiated on TB treatment and then ART in accordance with national and international coinfection management guidelines (47,48).

Strategies for transfer and release

A prisoner's transfer or release from a prison or detention centre poses a major challenge, jeopardizing initiation and completion of treatment if not well planned (49). Prison case-finding projects have reported that transfer or release of prisoners often takes place without much prior notice and that prisoners may leave before they have been informed of the outcome of the screening, before treatment has been initiated, or before they have completed treatment, leading to a high proportion of prisoners with TB lost to follow-up (50).



Health staff in successful prison programmes have been able to reach agreements with prison authorities to be notified well in advance of the release or transfer of patients receiving TB or other treatment. This notice allows the health staff to prepare referral forms and discuss with the prisoner how and where to continue treatment. In the case of transfer to another prison facility, the recipient facility should be informed.

At a minimum, prisoners who are still on treatment should be handed official transfer out documents upon release, which they can share with the health facility where they will continue treatment. One copy should be kept at the prison health facility and one copy should be sent to the district NTP manager. A referral note, however, is no guarantee that the patient will immediately seek continued treatment, as searching for housing and a job may take priority. Some prisoners may have to travel a great distance from where they were incarcerated to the region where they are officially "registered" with a health unit. Some might lack the identification documents necessary to continue treatment. Attempts should be made to set up an appointment for the prisoner at the new health facility, link them to prisoner health and rights NGOs, and provide sufficient medication at exit to cover the intermediate period.



In the Netherlands, a prison TB nurse starts discussions

immediately at the start of treatment about how to continue treatment if the prisoner's release from prison happens before the end of treatment. Upon release, the prisoner is provided with one week of medication and an appointment at a public health clinic in his or her home town (15).

In many countries, prisoners who are released from prison are linked to social services or an NGO, CSO or FBO for social support upon release. Where such organizations or institutes exist, implementers should ensure linkages for continued medical care such as TB treatment, ART or for other health needs. In Kyrgyzstan, MSF and ICRC implemented a project that specifically focused on prisoner follow-up post-release. Community workers were tasked with case-managing recently released prisoners and ensuring that they continued their DS- and DR-TB treatment. An incoming TB REACH Wave 6 project will evaluate the acceptability of video DOTS for treatment adherence among Haitian prisoners while they are in prison and once they have been released.

Establishing an electronic prisoner health management and tracking system with unique identifiers is highly recommended. This facilitates the tracking of screening, diagnosis and treatment activities, as well as the movement of prisoners during transfer and release; such a system can also improve communication between prison health services and community health systems.



Brazil now uses a web-based TB surveillance system

(Tbweb) through which an automated e-mail is sent to the receiving facility when a prisoner is transferred or released, and the receiving clinic can access the data directly. Furthermore, all prisoners have a health record that is sent with them. As a result of this system, the documented TSR among prisoners rose from 72% in 2006 to 90% in the 2015 cohort (15). An electronic tracking system is also a useful approach to deal with the challenge observed in some prisons of prisoners occasionally providing a false name and address during entry into detention in order to prevent being labelled as a multiple offender. Linkages to social services can also overcome this challenge.

Deportation of illegal migrants on TB treatment poses a special challenge. Ideally, such patients should be officially transferred to a treatment programme in their home country or be allowed to complete treatment.

Treatment observation

While still in prison, treatment should preferably be provided and observed by prison health staff. Preference is given to the strict monitoring of medicine intake throughout the treatment. In places with limited access to health services, TB and other medicines may be commodities of high value, and thus the temptation to sell or trade medicines may increase. While prison volunteers can play an important role in educating their peers on the importance of completing treatment, the practice of using fellow prisoners as treatment supervisors and thus positioning them as gatekeepers to accessing treatment should be avoided.

LINKAGE TO CARE:

- Establish a clear flow of information from laboratory result to individual prisoner.
 - Decide who will inform the prisoner of the result, when, where and how.

START OF TREATMENT PROTOCOL:

- Health care worker initiates treatment, involves peer educators in education and treatment support.
- Explain importance of treatment completion and discuss where and how patient will complete treatment if released before end of treatment; discuss transfer protocols in such a case.
- Fill out patient treatment card and treatment register; record address and contact details of prisoners and relatives or friends where the prisoner is most likely to stay when released.
- Facilitate completion of treatment:
 - Involve peer educators in treatment support.
 - Agree with prison authority in charge to be informed in a timely manner of prisoners' imminent transfer or release.
 - In case of transfer or release, prepare a transfer note and give it to the prisoner (keep a copy to follow-up on success of transfer and to establish final treatment outcome).
 - Involve social services, NGOs, CSOs or FBOs in treatment support upon release.

Treatment of TBI

In accordance with WHO's guidance on contact investigation, household contacts of people with active rifampicin-susceptible B+ TB who have no signs of active TB are eligible for and should be offered TPT (51). This is particularly important for highly susceptible contacts, such as children, people living with HIV, and other immunosuppressed contacts.

Since prisoner populations are at high risk for infection – as illustrated by the high prevalence of TBI (52,53) – and highly susceptible to the activation of TBI, they have been considered for routine TPT.

TST or interferon-gamma release assay (IGRA) can be used to identify TBI. Unfortunately, the little evidence available to date suggests that the success of effectively implementing routine provision of TPT for prisoners may be limited, with adverse reactions ranging from 1% to 55% and completion rates ranging from 3% to 87% (54). TPT is most likely hampered by the same challenges described in Section 2.5 regarding linkage to care and retention in treatment. For projects considering implementation of routine TPT for prisoners, see Box 5.





3. OWNERSHIP, PARTNERSHIP & ACCOUNTABILITY

3. OWNERSHIP, PARTNERSHIP & ACCOUNTABILITY

As in any programme, motivated leadership is essential. In many countries, the health care within prisons or in pre-trial detention falls under the responsibility of the MoJ or Ministry of Internal Affairs, but local administration may be responsible for hiring, firing and paying the salaries of health staff, and providing some of the medical supplies. In most countries, the MoH will also have certain responsibilities, such as policy-setting and provision of supplies. The national strategic plan (NSP) should indicate how TB in prisons is to be addressed and describe collaborative arrangements. It is important to map authorities and their responsibilities, and to ensure buy-in of each stakeholder through the collaborative development of a TB programme in prisons. If additional laboratories or clinics are established in prisons, and if additional health and laboratory staff are recruited to cope with the increased workload, it is important to have these costs included in the relevant budgets to ensure continuity.

Some TB programme modalities described in this guide – such as routine entry screening, continuous proactive identification, diagnosis and treatment of TB, and health consultations at exit – are in most cases best implemented by the existing prison health service and staff. Other TB interventions, such as mass screening or provision of TB and HIV services through visiting teams in the absence of in-prison services may require the assistance of an NGO or NTP staff. Good relationships between external partners (e.g. NGOs) and home affairs/correctional authorities from senior levels down to those in charge of individual facilities are important to facilitate access to prisons. This access may be challenged at any time due to political sensitivities. It is good to keep in mind that the first priority of prison authorities is to ensure that prisoners remain in custody, thereby guaranteeing the security of prisoners and staff. This priority may be at odds with creating the ideal circumstances to perform screening, diagnosis and treatment of TB.

Effective collaboration between stakeholders, institutes and staff once established needs to be monitored. Regular meetings to discuss progress, identify obstacles for success, identify solutions and formulate a way forward aid in building trust and help to foster collaboration.

Prison management will need to be informed and to agree with any planned activity taking place in the prison or detention centre. Furthermore, staff will need to be engaged in activities and therefore should be granted time to participate. A nice example of commitment by prison authorities was in a Zambian prison project when the prison officers-in-charge were present during drama and education sessions for the prisoners in order to demonstrate their support for the TB interventions (55).

In Chhattisgarh, India, the officials from the state TB programme supported by the International Union Against Tuberculosis and Lung Disease (The Union) successfully advocated for regular sensitization of prisoners with policymakers and administrators of the State Department of Prisons. These authorities instructed prison staff to organize three monthly education meetings with prisoners using videos, flipcharts, contests, and question and answer games. Increased care seeking, along with sputum testing either in prison or in civil laboratories, led to a 38% increase in TB notifications (15).

“For prison TB screening programs to be successful, we recommend that prior to program implementation, linkages between the National TB Program, prisons and community health clinics must be strengthened for continuity of TB care upon release; prison health management teams should be established.”
(Final report, Zambia prison project)



The TB REACH Wave 4 prison programme in Brazil reported that it was only successful in those prison(s) where some form of TB diagnosis and treatment had already been established, and where screening was permitted within prison premises. The successful prisons also made the necessary resources available, the prison authorities fully supported the TB screening, and good collaboration was established between the MoJ, MoH, the state and municipality-level authorities. Intra- and inter-sectoral articulation of goals guaranteed their sustainability after the project ended.



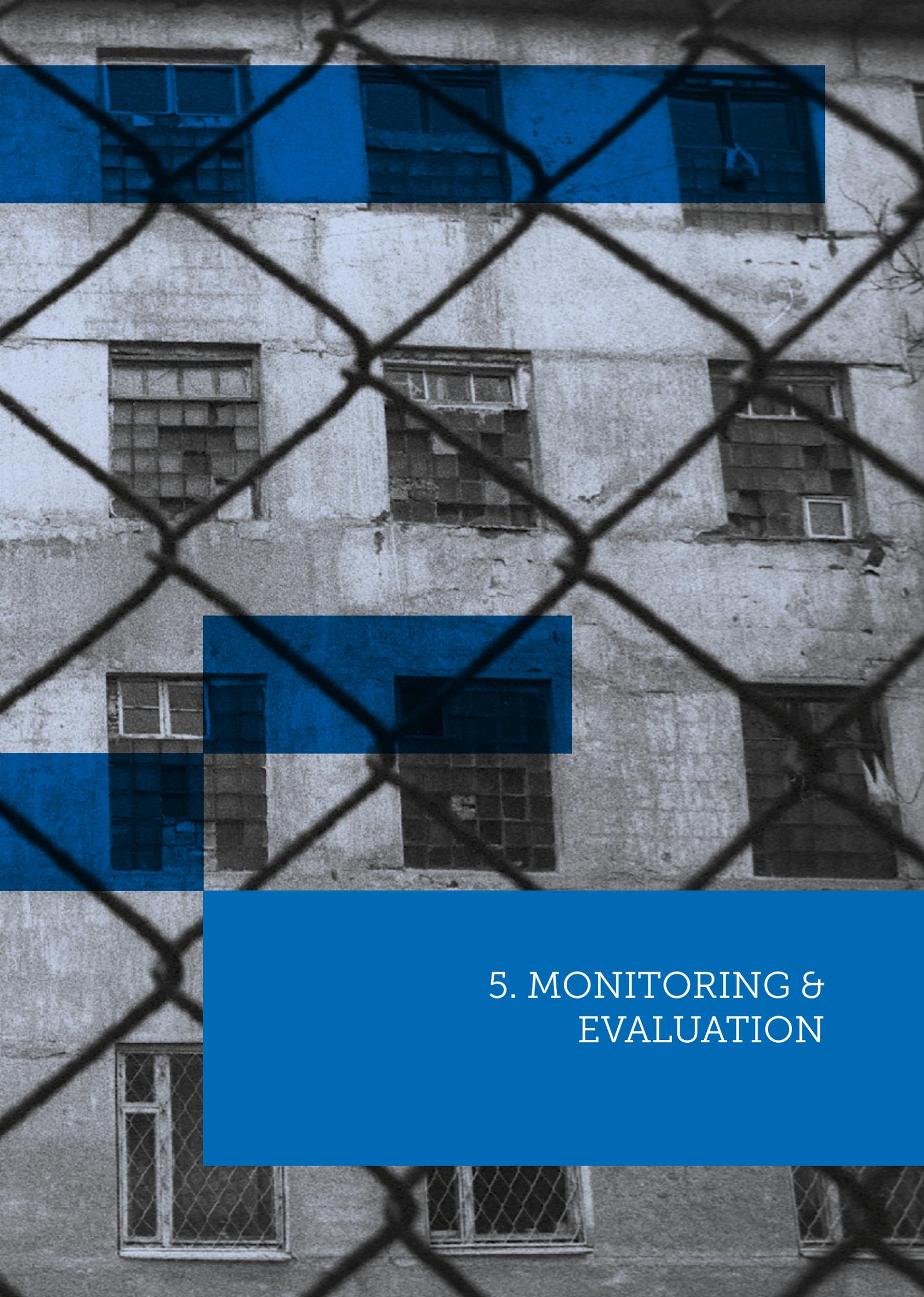
4. RESOURCE CONSIDERATIONS / MAJOR COSTS

Prison programmes may have high initial costs due to the need to renovate or establish screening facilities within the prison premises; install rapid diagnostic facilities (e.g. GeneXpert and CXR) or procure a mobile screening unit; and put in place isolation wards for treating infectious prisoners. Prison (health) staff need to be informed accordingly, and screening teams and peer educators need to be selected and trained.

During the start-up phase, screening activities are likely to be labour-intensive with high consumption of GeneXpert cartridges and other laboratory supplies. This is especially the case when simultaneously starting mass screening, initiating entry screening and providing rapid diagnosis for anyone developing signs of TB. An effective supply chain will need to be established and sustainable funding secured.

Once capital investments have been made, it is likely that the cost of continuing the screening programme will be relatively low. During this phase, it is important to consider the cost of maintaining specimen transport, Xpert MTB/RIF tests and DST if required, infection control, laboratory capacity, treatment support and registration, monitoring, and adequate transfers. Although they are effective in early detection of TB, repeated mass screenings are labour-intensive and come with high costs. Therefore, mass screenings should only be considered as a routine measure if entry screening and continuous proactive identification of TB has been established. Mass screening, if included, will need to be planned and appropriately budgeted.





5. MONITORING & EVALUATION

5. MONITORING & EVALUATION

5.1 Monitoring system

Monitoring and evaluation (M&E) of prison projects can be set up in similar ways as for other active case-finding strategies. Prison projects do have a number of special considerations:

- In order to evaluate the effectiveness of different types of screening processes and assess drop-out rates along the screening cascade for each intervention, it is recommended that screening data be compiled, disaggregated by type of screening (i.e. entry, mass, exit and early diagnosis).
- It is also recommended that screening data be compiled separately for prisoners and for prison staff because coverage, drop-out rates and expected yield for these two groups may differ.
- Monitoring of treatment outcomes requires special attention. In the case of a prisoner's transfer or release from prison before the end of treatment, it is often the case that no outcome is recorded, even if patients have been transferred with official transfer notes. Although the clinic where the treatment was initiated is responsible for recording the treatment outcome, in practice, efforts are seldom made to uncover this information. In many cases, the location to which the prisoner was transferred is not known (50). Ensure adequate patient transfer to another prison or civic treatment facility and keep copies of transfer notes to enable inquiry into treatment outcomes.
- To assess if the screening has led to an increase in the number of prisoners and staff being diagnosed and starting treatment, notifications during the intervention should be compared with notifications at baseline. Notification rates per 100,000 population are not always possible to calculate due to the fluidity of the prison population. Fluctuations in the number of prisoners and the difference in prisoner turnover rates complicate comparisons of notification data over time and across prison programmes. Ideally, an average annual prison population number is calculated by compiling daily head counts for the year and dividing the number by 365. If these numbers are not released by the prison authorities, an average population number for the period under assessment will need to be estimated based on observed occupancy at different times.
- In some places, TB data for prisoners and patients among prison staff are reported as a separate TB reporting unit, while in other places, patients are notified in the TB register of a civic clinic and not demarcated as a separate population. A significant effect on TB notification for the entire population is usually not expected given that in most locations the prison population is relatively small. This makes evaluation of the effect of the screening on notification more difficult. In such cases, it is recommended to ensure that it is possible to identify prisoners in the TB register. In a prison screening project in Tanzania, all patients were notified through the register of a nearby civilian clinic. The project had requested that numbers of notified patients stemming from the prison be marked and reported back to the project; however, when comparing these with the numbers confirmed and referred, the data seemed to be far from complete in four out of five clinics.
- It is good to check where identified TB patients are registered. This may be at the facility where the diagnosis is made or in their original home district, which may make it difficult to track the intervention's impact on TB notifications. An alternative way to track pre-treatment follow-up in such cases is by registering the start date and location of treatment in the screening register.

5.2 Use of process indicators to improve the intervention

While the indicators describing progress and success of screening activities are similar for different screening strategies, there are some specific considerations for how targets are set, as explained in Table 5 below.

Table 5. Setting targets for prison screening programmes, interpreting results and troubleshooting

Indicators	Setting targets	Interpretation
Target population size	<ul style="list-style-type: none"> • For entry screening, the target population equals the number of people entering the prison over a set period of time. • For mass screening, the target population equals the prison population (and prison staff) at the time of screening. • For continuous early detection, the target population equals the average annual prison population plus prison staff and relatives in those places where they make use of the same diagnostic facilities. 	Check variations in average prison population size and turnover (entries and exit). If these have changed substantially since baseline, targets should be adapted.
Number screened	<ul style="list-style-type: none"> • For entry screening, the number planned to be screened equals the number of people entering the prison over a set period of time. • For mass screening, the number to be screened is the total population multiplied by the number of screening rounds planned (once or twice yearly). • For continuous identification and testing of people developing symptoms, it may be difficult to define a number to be screened. If effective peer education and continuous screening take place, for instance as a weekly exercise, the number screened equals the prison population times 52. This type of screening is less formal, and it is usually more difficult to adequately report numbers screened. It may then be more useful to register the number of people (self-)referred for testing. 	If fewer people are screened than targeted for the different screening types, this may either mean that the prison population is smaller than thought (mass screening and enhanced case finding), that not everyone can be reached, or that large numbers refuse to be screened. For entry screening, it may mean that there are fewer people entering the facility or people are entering without being screened.

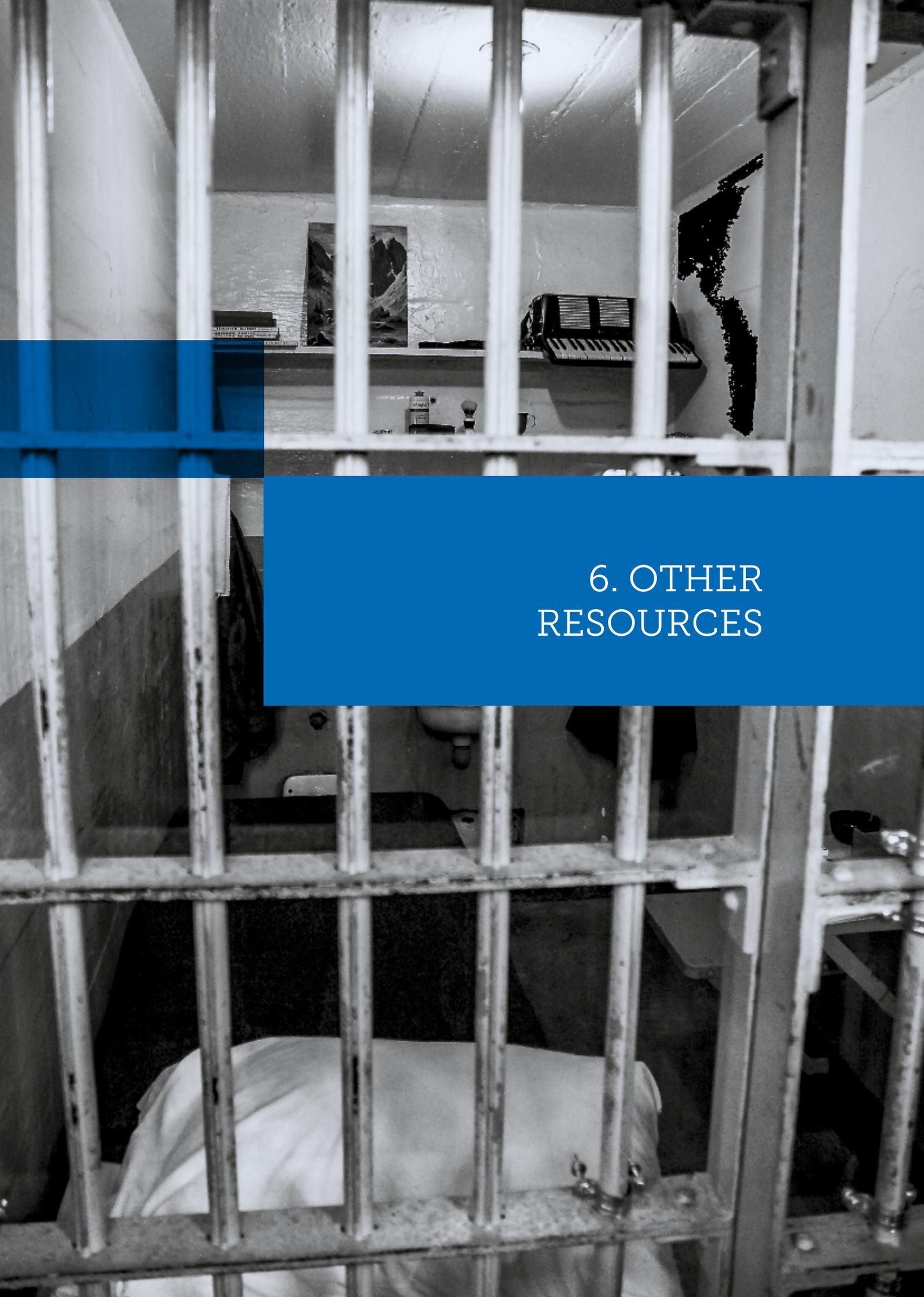
Indicators	Setting targets	Interpretation
Number of people with presumptive TB	<ul style="list-style-type: none"> The expected number of presumptive TB cases identified depends on the expected prevalence in the population to be screened. Prison projects under TB REACH found between 29% and 55% presumptive TB at entry screening and between 30% and 68% during a first mass screening and enhanced case finding. Once entry screening and continuous enhanced case finding are established, repeated mass screening is expected to yield less than the yield at entry (<10% presumptive). 	<p>If screening includes different steps, e.g. symptom screening and CXR, it may be wise to split this indicator into a) the number identified with TB symptoms; b) the number with abnormal CXR; c) the number identified as presumptive TB by symptom screen and/or by CXR. (There will be partial overlap between a and b; therefore, c combines a and b, but does not equal a+b.)</p>
Number referred for testing	<ul style="list-style-type: none"> All presumptive TB should be referred for testing. If sample collection is done during the screening (no referral), this indicator can be skipped. 	<p>The numbers equal all presumptive TB identified. In some programmes, it was decided during mass screening to collect sputum for testing from all individuals regardless of having symptoms. In this case, the numbers should be close to the number screened.</p>
Number of sputum samples collected and sent to laboratory	<ul style="list-style-type: none"> All people with presumptive TB should be asked for a sputum sample for testing. Clear instructions can help all individuals produce a valid sample. 	<p>If lower numbers are found, it means that individuals either are not able to access the place where sputum is collected or are not able to produce a sample. Check for barriers in accessing services.</p>
Number tested	<ul style="list-style-type: none"> All samples collected should be tested. If different tests are done (e.g. smear, Xpert, culture), it is good to collect numbers tested and numbers found positive, disaggregated by test. 	<p>If a drop is found between samples collected and tests done, check if the sputum transport system is functioning well. Check capacity of the laboratory, availability of reagents, cartridges and other supplies, and the reliability of the power supply.</p>
Number confirmed B+	<ul style="list-style-type: none"> Indicate the test used to confirm B+. If GeneXpert is used, a 10–15% positivity rate is expected. This proportion may be lower if a very inclusive definition of presumptive TB is used. 	<p>If the proportion B+ is much lower than expected, check the quality of sputum, transport and laboratory, and check the definition used for presumptive TB.</p>
Number confirmed MDR	<ul style="list-style-type: none"> Expected % MDR among confirmed TB cases depends on the prevalence of MDR-TB in the general population; but, it can be expected to be slightly higher in the prison population. 	<p>This can be compiled as “presumptive MDR-TB” (if only GeneXpert is used) or confirmed MDR-TB if DST is also performed.</p>

Indicators	Setting targets	Interpretation
Number confirmed all forms	<ul style="list-style-type: none"> • These include B+ and B-, pulmonary and extra-pulmonary TB. • Usually this is around twice the number of B+ TB. Numbers of B- pulmonary TB diagnosed may depend on the availability of CXR. 	Usually this is around twice the number of B+ TB. Numbers of B- pulmonary TB diagnosed may depend on the availability of CXR.
Number linked to treatment B+	<ul style="list-style-type: none"> • All identified patients should start treatment as soon as possible after diagnosis. 	If pre-treatment loss to follow-up is substantial, check for barriers in communication of test results, and check for transfer or release before treatment initiation.
Number linked to treatment (MDR-TB)	<ul style="list-style-type: none"> • Same as above. 	If numbers started on second-line treatment are lower than the number of MDR-TB cases identified, check for major delays and barriers in accessing second-line treatment. Also check where and how patients on second-line treatment are notified.
Number linked to treatment (all forms)	<ul style="list-style-type: none"> • Same as above. 	If pre-treatment loss to follow-up is substantial, check for barriers in the communication of test results.

Box 6.

Monitoring treatment outcomes

Treatment Outcomes	<ul style="list-style-type: none"> • Death rate and treatment failure may be slightly higher than under normal circumstances at the start of a TB programme in a prison due to finding many patients with advanced disease and in a generally poor health condition. • Once effective screening and early diagnosis are established, treatment outcomes should improve and get closer to normal acceptable levels. • Persistent high proportions of treatment failures could be a sign of high prevalence of DR-TB. • If many patients are not evaluated for treatment outcomes due to transfers or release, greater effort should be put into tracking whether patients effectively continue their treatment after transfer.
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6. OTHER RESOURCES

A number of good resources exist for advanced guidance:

- European Centre for Disease Prevention and Control (ECDC) (2017). Scientific Advice: [Systematic review on the diagnosis, treatment, care and prevention of tuberculosis in prison settings](#)
- World Health Organization Regional Office for Europe (2014). [Prisons and health](#)
- TB CAP, USAID (2009). [Guidelines for Control of Tuberculosis in Prisons](#)
- World Health Organization (2013). [Systematic screening for active tuberculosis, Principles and recommendations](#)
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