Implementing Collaborative TB-HIV Activities

A Programmatic Guide

2012

International Union Against Tuberculosis and Lung Disease

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Preface

In countries with a generalised AIDS epidemic, the human immunodeficiency virus (HIV) infection remains the leading risk factor for the development of tuberculosis (TB) disease. TB is also the foremost cause of death among people living with HIV.[1]

While many countries have made progress in implementing collaborative TB-HIV activities, others still face challenges in institutionalising them within their national TB and AIDS control programmes and general health services. Understanding the health system, as well as staff, patient and community-related factors that hinder the expansion of joint TB-HIV services is important. To mitigate the dual burden of TB and HIV infection in populations affected by both, the World Health Organization released the Interim Policy on Collaborative TB-HIV Activities in 2004 which was updated in 2012.[2]

In spite of the availability of the policy guidance, sharing practical information on how to organise and implement joint TB-HIV activities within the general health services remains necessary.

Predating the above guidance, the International Union Against Tuberculosis and Lung Disease (The Union) developed an approach entitled 'Integrated HIV Care for Tuberculosis Patients Living with HIV/AIDS'. The rationale for this model was rooted both in patient and health system observations:

- TB is frequently the first opportunistic infection in people living with HIV. Thus TB services are an important entry point for HIV diagnosis and care and offer the opportunity to manage both diseases simultaneously, at least for the duration of anti-TB treatment.
- In many countries' health systems, particularly in peripheral areas, the same health worker has the responsibility of providing care for the two diseases.

This guide shares The Union's experience from the point where health services are delivered to the level of the policy-making institutions within a country. Primary health workers will find here practical tips for their

daily work, while managers and policy-makers may find solutions to the constraints they face. Practical suggestions are provided to programme managers and health workers on how to plan, organise and mainstream collaborative TB-HIV activities into their TB and HIV services within the general health system.

The Union hopes that this guide will serve as a resource for scaling up collaborative TB-HIV activities for adults, defined as a package of services to reduce the burden of TB and HIV in populations affected by both diseases. The guide provides practical recommendations in a question-and-answer format for the target audience of health planners, managers and health workers in resource-limited settings.

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The Union's TB-HIV portfolio is also increasingly supported by the contributions of its beneficiary countries through integration of its strategies into national policies. Implementation of The Union model in these countries has led to tremendous improvements in the integration of HIV care and treatment services within TB services. In Uganda, The Union supported operational research that identified the health system, patient and community barriers to integration of TB-HIV activities. The partnership and collaboration of The Union with all of these countries and donors is gratefully acknowledged.

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Abbreviations

3TC	lamivudine
ACSM	advocacy, communication and social mobilisation
ADE	adverse drug event
AFB	acid-fast bacilli
AIDS	acquired immunodeficiency syndrome
ART/ARV	antiretroviral therapy or treatment
AZT	azidothymidine, also known as zidovudine
BCG	bacille Calmette-Guérin
CBO	community-based organisation
CDC	Centers for Disease Control and Prevention
CNHPP	Centre National Hospitalier de Pneumo Physiologie (National Referral Centre for Respiratory Medicine)
CPT	cotrimoxazole preventive therapy
CXR	chest X-ray
DOT	directly observed therapy
DOTS	Directly Observed Therapy, Short-Course
DRC	Democratic Republic of Congo
DST	drug susceptibility testing
EC	European Commission
EFV	efavirenz
EQA	external quality assurance
FDC	fixed-dose combination
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
HEPA	high-efficiency particulate air
HIV	human immunodeficiency virus
HRD	human resource development
IC	infection control
ICF	intensified case finding
IDU	injecting drug user
IEC	information, education and communication
IGRA	interferon gamma release assay

IHC	Integrated HIV Care for Tuberculosis Patients Living with HIV/AIDS
IPT	isoniazid preventive therapy
IRIS	immune reconstitution inflammatory syndrome
LTBI	latent TB infection
MCH	maternal and child health
MDR-TB	multidrug-resistant tuberculosis
MSM	men who have sex with men
NAP	national AIDS control programme
NGO	non-governmental organisation
NNRTI	non-nucleoside reverse transcriptase inhibitor
NTP	national tuberculosis control programme
OI	opportunistic infection
PEP	post-exposure prophylaxis
PEPFAR	President's Emergency Program for AIDS Relief
PITC	provider-initiated testing and counselling (for HIV)
PLH(s)	people/person(s) living with HIV
PPE	personal protective equipment
PPM	public–private mix
PTB	pulmonary tuberculosis
SDC	Swiss Agency for Development and Cooperation
STI	sexually transmitted infection
TB	tuberculosis
The Union	International Union Against Tuberculosis and Lung Disease
TST	tuberculin skin test
USAID	United States Agency for International Development
UVGI	ultraviolet germicidal irradiation
WHO	World Health Organization
XDR-TB	extensively drug-resistant tuberculosis

1
Introduction

1.1. What is The Union's experience in TB-HIV collaboration?

When The Union developed its operational research project 'Integrated HIV Care for Tuberculosis Patients Living with HIV/AIDS' (IHC), the objective was to reduce the burden of the human immunodeficiency virus (HIV) and tuberculosis (TB) for individuals and communities in resource-limited countries and to assist in integrating the care of these patients into the general health services. Specifically, The Union aimed to explore the feasibility of delivering integrated HIV care for adult TB patients living with HIV/AIDS and the usefulness of TB control programmes in the response to HIV/AIDS. The rationale was based on the fact that TB is frequently the first opportunistic infection (OI) in persons living with HIV (PLHs). Therefore national TB programmes can play a significant role in the response to HIV infection, along with other stakeholders.

The Union tested a strong public health approach to HIV care, including antiretroviral treatment (ART), within TB clinics/service points. The package of services proposed by The Union is based on the following pillars, modeled on the Directly Observed Therapy, Short-Course (DOTS) strategy for TB control in use at the time The Union started its work in the area of TB-HIV:

- Political commitment to mobilise resources to implement this package and allocate them in a coherent way within the health system
- Laboratory tests of ensured quality to accurately diagnose patients
- Counselling services made available to individuals and adapted to the TB diagnostic and treatment schedule
- Uninterrupted supply of quality-assured antiretroviral medicines and use of standardised ART regimens with innovative ways to ensure long-term treatment adherence
- Recording and reporting, including cumulative treatment outcome cohort analysis, enabling assessment of patient survival and programme performance.

The Union's approach is based on the following core elements:

- Provision of a basic package of TB-HIV services
- Organisation of TB-HIV care based on:
  - the concept of the 'basic management unit', which was introduced by The Union and greatly contributed to the success of the DOTS strategy in TB control[3]
  - the recognition that, in the field of TB-HIV, there is 'one health system, one patient with two conditions' and the ultimate goal is to have services that decrease the burden of TB and HIV in people affected by both diseases
- 'Learning by doing', that is, capturing lessons from TB-HIV care implementation at the pilot sites, and feeding them back into the planning and management process to ensure that patient needs are addressed.

1.2. Format of the guide

This guide presents questions and answers regarding TB-HIV collaboration for the policy-maker and health worker based on the practical experiences of The Union. They cover HIV diagnosis and care of adult co-infected TB patients and the need for TB screening, treatment and prevention for PLHs. Monitoring of TB-HIV care is discussed, as well as the establishment and role of TB-HIV coordinating bodies, their potential membership and threats to their smooth functioning. The guide concludes with a description of relevant health systems-related topics, such as the importance of well coordinated ordering of medications and commodities, training, supervision and TB-HIV operational research.

Lessons learned through IHC implementation in the partner countries are presented in boxed text throughout the guide.

2
Decreasing the burden of HIV in TB patients

2.1. How to make the diagnosis of HIV infection in TB services

Early access to HIV care, including ART, enhances the survival of PLHs and HIV-infected TB patients and also improves TB treatment outcomes. Health services should provide early access to HIV diagnosis in the general health services and particularly in TB services.

2.1.1. Why should HIV testing and counselling be offered to TB patients, family contacts and persons suspected of having TB?

Knowing one's HIV status is the entry point to HIV care and treatment. Consequently, HIV testing and counselling are an essential part of the services that should be provided to all TB patients who live in countries with generalised HIV epidemics or persons who may practice high-risk behaviours, such as injecting drug users (IDU) who share unclean needles, men who have sex with men (MSM) and sex workers and their clients if condoms are not used.

In countries where HIV is prevalent, it is recommended that those with symptoms suggestive of TB* also be offered HIV testing and counselling, since they have been frequently found to have HIV. In these settings, HIV screening of spouses, other sexual partners and children of HIV-positive TB patients may also be considered (Box 2.1). Ensuring easy access to health services to women is essential.

When persons with suspected TB are investigated for TB and HIV, some will be found not to have TB although they are HIV-infected. These

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*These patients may be called TB 'suspects' by health workers but they do not mean to use the word 'suspect' in a negative way. Patients may also be described as patients with suspected TB.

Box 2.1 HIV testing and counselling for family contacts of HIV-positive TB patients, Zimbabwe

The Union-supported pilot clinics in Harare and Bulawayo, Zimbabwe, offer HIV testing and counselling to family and sexual contacts of HIV-positive TB patients.

Clinic records show that in 2010, 677 index patients had 234 family contacts who wanted to be tested for HIV. Of these tested individuals, 175 (75%) were found to be HIV-positive. Of this group, half were medically eligible for ART and cotrimoxazole preventive therapy (CPT) in their own right.

This example shows that by offering HIV screening to family contacts and sexual partners of HIV-positive TB patients, more individuals in need of ART and HIV care can be reached. In this way, increased coverage of life-saving services can be facilitated.

individuals should be referred to HIV services so that clinical staging can be performed. Those found to be eligible should be started on ART and others should be entered in the pre-ART register, started on cotrimoxazole preventive therapy (CPT) and followed up. All necessary measures should be put in place to ensure that all who need care receive it.

Similarly, family contacts found to be HIV-positive, but who do not have TB, will be at different clinical stages of HIV infection and should be managed accordingly.

2.1.2. What is provider-initiated testing and counselling for HIV?

In settings with high HIV prevalence, health workers should offer an HIV test routinely to all persons who come into contact with the health services and who do not already know their HIV status. If the person's most recent test result is negative and it is more than three months old, the offer should be repeated. This includes TB patients, their partners and patients with suspected TB, as explained above. This is called provider-initiated HIV testing and counselling (PITC).

This approach differs from the traditional voluntary counselling and testing, where the decision to seek HIV testing is left entirely to the patient and the emphasis is on extensive pre-test counselling. With PITC:

- The health worker suggests or requests that the patient take an HIV test.
- There is greater emphasis on 'opting out', which means that patients have an HIV test as part of routine care, unless they refuse it.
- Post-test counselling is emphasised over pre-test counselling.

The patient must always feel free to refuse the test and be reassured that the test result remains confidential.

2.1.3. What does HIV counselling of TB patients and suspects include?

The first step is for the health worker to find out whether patients know their HIV status. If they do not know it, or if a negative result was obtained more than three months previously, HIV testing and counselling should be offered.

The counselling and psychological support around HIV testing should include the following:

- determine the patient's knowledge about HIV and the link between HIV and TB
- provide detailed information about HIV and the link between HIV and TB
- determine whether the individual has any risk factors that are associated with a greater chance of getting HIV infection. They could include having sex without correct and consistent use of condoms, having multiple sexual partners, re-using needles when injecting drugs or a recent blood transfusion in a setting where blood and blood products are not screened for HIV
- describe what is involved in performing the test
- discuss the possible impact of a positive or negative result
- explain what treatment and care are available and how patients can receive it, if they are found to be HIV-infected.

For an individual found to be HIV-negative and confirmed not to be in the window period,* the post-test counselling session should explore how to remain uninfected. For those found to be positive, post-test counselling gives an opportunity to offer support and provide:

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*The period following HIV infection, before antibodies become detectable, is called the 'window period'. It can last from 3 to 6 months.

- available treatment and care options and their results
- key facts about HIV, TB and other HIV-related conditions
- promotion of sexual behaviour that reduces the chance of infecting others and/or contracting other sexually transmitted infections or being re-infected with other HIV strains
- assistance with the disclosure of the patient's HIV-positive status to a trusted relative or friend with the goal of reinforcing the patient's ability to cope with this diagnosis.[4]

2.1.4. When should HIV testing be done?

If the current HIV status is unknown, an HIV test must be offered as soon as the patient is identified as having TB or even before the diagnosis of TB, if possible. If at first the patient declines to be tested, the offer should be repeated at each subsequent clinic visit (Box 2.2).

Box 2.2 Results of repeated offers of HIV testing, Benin

The approach of repeatedly offering HIV testing was adopted in Benin. As a result in the first year of the Union-supported programme, a test uptake of 90% was achieved. Subsequently, 97% of TB patients have been tested every year.

2.1.5. Who should offer and perform HIV counselling and testing?

The best person to offer HIV counselling and carry out the test is the health worker who is attending to the patient with suspected or confirmed TB. This can be a doctor, nurse, clinical officer or counsellor who has established a rapport with the patient, since this increases acceptance of HIV testing and speeds up the patient obtaining the test result. There is no need to refer the patient to another health worker, since that may lead to deferred testing and a missed testing opportunity (Box 2.3).

Anyone, be it a health professional or community health worker, can be trained to carry out rapid HIV testing. All sites where HIV testing is done should participate in an external quality assurance (EQA) programme that is, in many countries, organised by the national AIDS control programme (NAP).

Box 2.3 Provider-initiated testing and counselling for HIV in TB clinics, Benin, the Democratic Republic of Congo and Zimbabwe

In **Benin**, many TB clinics are located in small health centres and are staffed only by a nurse and a laboratory technician. Both types of staff were trained to offer provider-initiated testing and counselling (PITC) to TB patients and excellent results were obtained.

In the **Democratic Republic of Congo** (DRC), counselling is also provided by the health worker attending to the TB patient in facilities supported by The Union. The laboratory staff have also been trained to be tactful with patients who come for HIV testing.

In **Zimbabwe**, the prevalence of HIV infection among TB patients is much higher than in Benin and the DRC. PITC increased the already substantial workload of nurses, so the Ministry of Health and Child Welfare decided to create a new category of health worker, namely, primary care counsellor. Persons who have graduated from secondary school qualify to apply for these positions, which require six months of classroom teaching followed by a six months of practical training period leading to a certificate in HIV counselling. Health institutions can thus relieve some of the pressure on nurses by employing primary care counsellors. Primary care counsellors help to make HIV counselling services more easily accessible, increasing HIV care and ART coverage; and they also aid in achieving good ART retention by playing their part in adherence counselling for PLHs already on ART.

2.1.6. Where should HIV testing and counselling be performed?

Ideally the health worker who is investigating the patient for TB should offer and carry out HIV testing in the **same** room where the TB consultation takes place (Box 2.4). The following should be considered:

- This approach makes HIV testing and counselling easily accessible to patients.
- Patients do not have to look for the testing room, join another queue and meet yet another health worker. This saves time and may reduce the patients' distress.
- In clinics and hospitals, more than one room should be set up for conducting rapid HIV tests. These rooms should provide adequate privacy.

- Counselling, particularly post-test counselling, may take a longer time than an ordinary clinic visit for an acute complaint. Therefore counselling rooms should be located away from the busiest areas, if possible.
- TB infection control (IC) measures must be taken into account, and the available clinic/hospital space put to the best possible use.

Box 2.4 Improved uptake of HIV testing in TB clinic when performed by TB nurses, Zimbabwe

In Zimbabwe, the programme to prevent mother-to-child HIV transmission was the first programme to offer HIV testing at the primary health care level. Therefore, the HIV testing room was frequently situated near the antenatal care rooms.

At the start of the Union-supported TB-HIV activities in Harare and Bulawayo, the HIV testing uptake ranged from 65% to 76%, and staff working in the TB rooms at the pilot sites wanted to find ways to make testing universal. They observed that male TB patients were hesitant about visiting the antenatal care wing and mixing with pregnant women, even if they wished to get tested. Consequently, the team decided that all TB patients should be tested by the TB nurses in the TB rooms. This simple change resulted in an increase in the HIV testing uptake to 95–100% of these patients.

2.1.7. Which type of HIV tests should be used?

The NAP chooses the tests to be used in that country, and the national testing policy should be followed.

Rapid HIV tests are generally used. These tests have several advantages:

- They are simple to perform and do not require a highly trained laboratory professional or even a laboratory.
- They are done using whole blood obtained through a finger prick, and specimens do not need to be processed.
- The results are available in 15–30 minutes, which means that patients who consent to testing can be informed of their result and receive the first post-test counselling on the same day.
- They are less expensive than enzyme immunoassay tests.

For the HIV test result to be considered positive, it must be positive on two tests that use different test principles. One sample is collected and tested first and, if it is found to be positive, a second sample is collected and tested. The test results, like all medical information, are confidential, and precautions must be taken to ensure the safekeeping of patient records.

Rapid HIV test results can also be confirmed using other tests, such as enzyme immunoassay. Enzyme immunoassay tests can also be used for EQA. For example, in the centres supported by The Union in the Democratic Republic of Congo (DRC), all positive and 10% of negative HIV test specimens are sampled on filter paper. These dried blood spot specimens are then collected during supervisory visits and taken to the national HIV/AIDS reference laboratory for enzyme immunoassay testing for quality assurance.

2.2. Providing cotrimoxazole preventive therapy for HIV-positive TB patients

Cotrimoxazole preventive therapy (CPT) is a simple and inexpensive intervention that greatly enhances the survival of symptomatic PLHs.

2.2.1. What is cotrimoxazole preventive therapy?

Cotrimoxazole is a fixed-dose combination of two medicines: sulfamethoxazole and trimethoprim. When given in a daily adult dose of 960 mg (that is, sulfamethoxazole 800 mg and trimethoprim 160 mg), it effectively protects against several disease-causing organisms, such as *Pneumocystis jirovecii* (formerly *P. carinii*), *Toxoplasma gondii* and *Isospora belli*, as well as many common pathogens causing pneumonia, diarrhoea and malaria. This treatment is referred to as cotrimoxazole preventive therapy. Regular use of CPT leads to reduced illness and death from the above conditions in HIV-infected persons.

CPT is recommended to all symptomatic PLHs, if there are no contraindications. Its use should be continued until further notice or until the person's immune defence mechanisms have improved and a certain level of CD4 cell count has been reached for a minimum period of six months. The exact CD4 count required varies according to national guidelines, which should be followed.

2.2.2. Why do HIV-positive TB patients need cotrimoxazole preventive therapy?

HIV-positive individuals with pulmonary and extra-pulmonary TB belong to the World Health Organization's (WHO) Clinical Stage 3 and 4 of HIV infection, respectively. CPT is an integral part of the management of these patients to prevent ill-health and death from above-mentioned conditions.

2.2.3. When should cotrimoxazole preventive therapy be started in HIV-positive TB patients?

CPT can be started at the same time as TB treatment or within a day or two.

2.2.4. Where should cotrimoxazole be dispensed to HIV-positive TB patients?

Counselling on the benefits of CPT and the medication itself can be given to HIV-positive TB patients by the TB nurse in the TB room so that patients do not need to visit another room. The TB nurse monitors CPT administration and records it on the TB and HIV cards. The TB and ART registers should indicate i) whether the patient is taking CPT (a few patients may have contraindications, such as allergy to sulfa-containing medicines) and ii) the CPT start and end dates.

Usually, the patient is given a supply of cotrimoxazole for one or two months. If the patient receives anti-TB medications as part of clinic-based directly observed TB treatment during the intensive phase of TB treatment, cotrimoxazole can be included. However, in many settings, cotrimoxazole is taken independently at home with support from a treatment buddy who also oversees the patient taking antiretroviral (ARV) medicines.

If the TB patient has already attended HIV care and had been started on CPT before TB diagnosis, the nurse, together with the patient, is advised to identify the most convenient place for the patient to continue receiving cotrimoxazole, in order not to dispense the medicine twice to the same patient.

Once the patient has completed TB treatment, arrangements for continued CPT should be discussed. Usually, patients will receive CPT from the clinic or room where they are receiving their ARV medicines. Care should be taken to ensure that patients understand that CPT is part of HIV care and should not be stopped just because TB treatment has been completed.

2.3. Starting antiretroviral treatment for HIV-positive TB patients

Thanks to antiretroviral treatment, HIV infection has become a manageable chronic condition in PLHs.

2.3.1. What is antiretroviral treatment?

Antiretroviral treatment (ART) is a combination of at least three medicines that suppress the growth of HIV. Its goal is to restore and maintain the immune defence mechanisms by slowing down the replication of HIV in the body as indicated by an increasing CD4 cell count, or a decreased viral load, where this can be tested. ART reduces the occurrence of opportunistic infections and cancers, improves quality of life and increases survival. By reducing the HIV load in the blood and other body fluids, ART can reduce the risk of HIV transmission to a sexual partner and/or from a mother to her baby during pregnancy, childbirth and breastfeeding.

2.3.2. Why do HIV-positive TB patients need antiretroviral treatment?

HIV-positive TB patients need ART because their survival is at risk. Starting ART will improve their TB treatment outcomes. In the long term, taking ART as advised also decreases the risk of recurrent TB by 50%.

2.3.3. When should antiretroviral treatment be started in HIV-positive TB patients?

Deciding when PLHs who have TB should start ART requires a careful balancing act between the use of early ART to prevent the development of AIDS and to reduce deaths and the management of anti-TB treatment adherence. Several factors need to be considered, including:

- drug-drug interactions
- overlapping drug toxicities
- the occurrence of immune reconstitution inflammatory syndrome (IRIS; see Section 2.3.4)
- the large number of medicines that an HIV-positive TB patient on ART needs to take

According to the current international recommendations:[5]

- HIV-positive TB patients are eligible for ART **irrespective** of their CD4 cell count
- Anti-TB treatment should be started first, followed by ART as soon as possible and within the first eight weeks.

However, three recent studies[6–8] suggest that it is advisable to start ART **about two weeks** after the start of anti-TB treatment, rather than postponing it until later, especially for patients with advanced immune suppression. These studies indicate that starting ART at this point i) did not lead to more toxic effects from the medications and ii) reduced mortality or development of AIDS by 34–68% in TB patients with CD4 cell counts of less than 50 cells/mm^3.

Unfortunately, all studies reported that the occurrence of IRIS increased by a factor of 2.5 to 4.7 in the patients who started ART at about two weeks after beginning anti-TB treatment as compared to those who started ART after 8 to 12 weeks.

The international guidelines may be revised in the light of this emerging evidence.

2.3.4. What are the basic facts about TB-associated immune reconstitution inflammatory syndrome?

TB-associated IRIS can occur when patients' weakened immune defence mechanisms begin to recover. At this stage their TB symptoms actually worsen. The incidence of IRIS is particularly high, up to 10%, in the first three to six months of ART. Risk factors include i) starting anti-TB and antiretroviral treatment at the same time and ii) baseline CD4 cell counts of $<$50 cells/mm^3. Symptoms may be systemic and severe. Some patients may require hospital admission and continued anti-TB and ARV treatment with the addition of non-steroidal anti-inflammatory drugs or steroids to reduce inflammation.

2.3.5. What are the steps to consider in starting antiretroviral treatment for HIV-positive TB patients?

A step-wise approach for initiating ART in HIV-infected individuals, including TB patients, is proposed in The Union's *Management of Tuberculosis: A Guide to the Essentials of Good Practice*.[9] This approach has been followed at the Union-supported pilot sites with success.

A step-wise approach for starting ART in HIV-positive TB patients:

- assess the clinical stage of the HIV infection to determine if it is
  - —WHO Clinical Stage 3 in adult patients with pulmonary TB in the absence of WHO Stage 4 conditions, such as, *Pneumocystis jirovecii* pneumonia, oesophageal candidosis, Kaposi's sarcoma
  - —WHO Clinical Stage 4 in adult patients with extra-pulmonary TB
- start CPT
- treat other existing opportunistic diseases, such as pneumonia, diarrhoea, candidiasis
- counsel patients and their treatment supporters about ART; symptoms of possible adverse medication effects, including IRIS; how to take the medications and the importance of taking them regularly to prevent development of drug resistance
- start ART about two weeks after anti-TB treatment rather than postpone it until later
  - —this is particularly important in severely immune suppressed patients
- efavirenz (EFV) is the preferred non-nucleoside reverse transcriptase inhibitor (NNRTI) for patients on TB treatment, because rifampicin does not interfere with its metabolism as much as it does with nevirapine metabolism
- in patients who do not tolerate EFV, consider either a triple NNRTI (zidovudine and lamivudine with either abacavir or tenofovir) or a nevirapine-containing regimen. National guidelines should be followed.

2.3.6. Who can start antiretroviral treatment in HIV-positive TB patients?

Although it is generally recommended that doctors prescribe ART, in countries with a limited number of medically trained staff and low ART enrolment, other clinical staff, such as clinical officers and nurses, may be considered to start the first-line ART regimen for patients with uncomplicated cases (Box 2.5). A doctor with sufficient experience in the management of patients taking ART should be available for advice and the management of:

- possible IRIS
- drug-drug interactions
- adverse drug events.

Box 2.5 Nurses starting and following up antiretroviral treatment, Zimbabwe and the Democratic Republic of Congo

Experience in the urban pilot sites in Zimbabwe and both urban and rural clinics in the DRC has demonstrated that nurses who have received both classroom and in-service training in basic HIV medicine and ART are able to start and follow up patients on first-line ART, if they are appropriately supported and supervised.

Among the TB patients who were initiated on ART in 2008 in the pilot sites in Bulawayo, Zimbabwe, 74% were alive and taking ART at 24 months of follow-up; 13% had died; and 8% had been lost to follow-up. The remaining 5% had transferred to a different ART site. No patient stopped treatment.

In the 13 sites in the DRC, survival at 24 months for patients registered in 2008 was 64%; 14% had died; 8% had been lost to follow-up; and 15% had been transferred to another ART site.

A doctor should also be available to carry out medication substitutions and to switch a patient from the first-line to the second-line ART regimen, when necessary.

2.3.7. Where should antiretroviral treatment be given to an HIV-positive TB patient?

Choosing the location where ART will be administered, both during and after TB treatment, is an important decision. Should ART be available in the TB clinic or in the ART clinic, in both, or in a combined clinic? This choice may determine the number of HIV-positive TB patients who are able to access ART and workload of health staff. Health teams in different parts of the world, including those working with The Union are collecting answers to these questions (Boxes 2.6 and 2.7).

In a large TB unit in Benin, TB-HIV care was largely non-integrated; and, in Zimbabwe, it was partially integrated and co-located, though not provided in the same room by the same health workers. A fully integrated approach to TB-HIV care was adopted in the Union-supported IHC sites in the DRC where the same health worker provided TB patients with all TB-HIV services under one roof (not illustrated).

Box 2.6 Providing antiretroviral treatment to HIV-positive TB patients at CNHPP, Benin

The National Referral Centre for Respiratory Medicine (Centre National Hospitalier de Pneumo Physiologie, or CNHPP) in Cotonou is one of the main lung disease hospitals in Benin. Every year, approximately one-third of the country's TB patients are managed at this centre.

The CNHPP is accredited to provide ART to HIV-positive TB patients. However, due to the facility's highly specialised mission and the fast-increasing ART patient load, HIV-positive TB patients (whether already on ART or not yet commenced) are referred to sites closer to their homes for ART.

An evaluation assessing whether patients reached the receiving ART centres concluded that patients not yet on ART at the completion of anti-TB treatment* were unlikely to have started follow-up at the 'new' ART site. Some patients indicated that they did not seek further care because they felt better; others reported difficulties in accessing care, such as costly registration fees at private sites, requests for additional laboratory tests and delays in getting an appointment. Patients already on ART were more likely to have reached the receiving ART sites, although they also reported some challenges.

Subsequently, the referral process was strengthened to include the following steps:

- make phone calls to the receiving ART site to announce patients' arrival and confirm that they presented
- provide patients with a copy of their treatment record
- order all laboratory tests that the ART site might require in advance and make the results available for the patients' first visit
- refer patients primarily to government clinics that do not require payment.

Ultimately, a referral register for patients on ART was also added to the recording system.

*This practice was based on the international and national guidelines at the time.

Box 2.7 Coordinating the clinical care of TB-HIV patients: an experience from Zimbabwe

In Zimbabwe, HIV prevalence among adult TB patients ranges from 70% to 85%, and the number of co-infected patients is enormous. To meet their needs, the teams at the urban pilot sites in Bulawayo, Zimbabwe discussed various options for integrated care.

Decentralised TB services already existed, and the clinics had a designated TB room staffed by a TB nurse who rotated quarterly. The nurse's main duties included patient care and maintaining TB records.

Recognising the risk of overwhelming this well-functioning service, the team decided to offer HIV testing and CPT, but not ART, in the TB room; ART rooms were arranged in the vicinity of the TB rooms. This ensured that patients knew exactly where the services they required were available. HIV care, including ART, was provided by nurses who were trained in ART and rotated quarterly. These nurses may have worked in the TB room during previous quarters. They were able to screen patients on ART for symptoms of TB and refer them back to the TB room for evaluation to prevent a prolongation of waiting times in the ART service.

Upon completion of their TB treatment, patients taking ART stop visiting the TB nurse and attend only the ART clinic.

Following are key lessons learned in Zimbabwe:

- Multi-skilled staff are necessary to provide TB-HIV services. This means that all health workers must master the management of patients with both TB and HIV/AIDS.
- Regular support supervision of health personnel is vital.
- Local use of information recorded in the TB and ART registers ensures that service quality is continuously monitored and improved.
- Community participation in the follow-up of patients reduces the number of patients who are at risk of treatment interruption.
- Arrangements for co-managing patients with TB and HIV should be simple and flexible so that adjustments can be made when necessary.

There has been much debate about having a 'one-stop shop' where both TB and HIV services are available. This means that patients do not need to move away from the facility where they are on ART if they develop TB, nor present themselves at a new facility as TB patients when they are already receiving ART elsewhere. It is frequently difficult to co-locate TB and HIV services because the number of TB diagnostic and treatment sites exceeds that of ART/HIV care sites. The solution may be to decentralise ART from hospitals to primary health care facilities—a promising approach developed in the Union-supported city clinics in Zimbabwe and described in many examples in this guide.

There are several considerations when planning how to implement collaborative TB-HIV services. Programmatic, medical and staffing issues must be taken into account. Often financial resources determine, for example, the speed of service expansion. Every country needs to develop the best approaches for its own circumstances—an exercise that is bound to involve 'learning by doing'. The plan should be based on operational research findings, such as treatment outcomes and improved cost-effectiveness. Consultation between health professionals working at different levels of health care, as well as patients and communities, is also recommended.

Table 2.1 summarises key advantages and disadvantages of integrated and non-integrated TB-HIV services.

2.3.8. Where and how can HIV-positive TB patients continue their antiretroviral treatment after completing TB treatment?

Procedures need to be developed to ensure that HIV-positive patients who need to continue their CPT, ART and other HIV care can do so easily after they complete TB treatment. This is essential to decrease the risk of loss to follow-up and treatment interruption. In most settings, patients stop attending the TB clinic after their treatment is completed. If during their TB treatment, they also attended the HIV clinic for CPT and ART, they then continue to attend only this clinic. However, if HIV care and ART were provided by TB services during TB treatment, smooth and efficient referral to the HIV clinic is necessary. This requires good communication between TB and HIV clinics, patients and their treatment supporters. If services are not co-located, it is important to monitor the referral system to ensure that patients reach the receiving centres.

Table 2.1 Summary of pros and cons of integrated and non-integrated TB-HIV services

Integrated TB-HIV clinics: 'one-stop shop' approach		*Non-integrated or parallel TB and HIV services: 'two-stop shop' approach*	
Pros	*Cons*	*Pros*	*Cons*
Patients receive comprehensive care: • one visit at a time is sufficient: all necessary tests can be carried out, results are available to both patient and health workers, are recorded in one patient record, all medicines are dispensed • no risk of loss to follow-up • shorter waiting time • one health worker: easier diagnosis and management of ADEs and IRIS • better communication with patient, better treatment adherence support • no need for referral: high CPT and ART uptake and less ill-health and deaths	Requires management of change: **coordination** and **collaboration** between TB and HIV services, especially at national and regional/ provincial levels of health care: • in many countries, services are provided by same health workers In high HIV prevalence countries, lifelong HIV care and ART may overwhelm TB services	'**Status quo**' is maintained: • TB clinics provide TB services only • HIV clinics provide HIV services only No need to manage change!	**Patients** have to attend more than one clinic, which: • often takes more time and costs more money (in transport and fees) • can result in delays in reaching the receiving clinic and may lead to treatment interruption and development of drug resistance • may lead to a decision not to travel to another facility due to stigma • creates missed opportunities: lower CPT/ART uptake, delays in starting TB treatment
Health services • need to spend fewer resources on management of referrals • integrated patient records and registers available at one facility • health worker job satisfaction: can follow up patients over time	Ensuring **TB infection control** is a **priority**: • adequate, spacious waiting areas and rooms with good ventilation and sunlight are required • need infection control policy and procedures and staff training and supervision Health workers need to be '**cross-trained**' or '**multi-skilled**' and possess basic understanding of the management of both TB and HIV infection	**TB infection control** may be less of an issue because there is 'less mixing' between PLHs and persons with suspected TB	**Health services**: fragmented care that may adversely affect: • quality of care and patient follow-up • diagnosis and management of ADEs and IRIS • coordination of laboratory and other investigations • recording and reporting of TB-HIV care Need for meticulous **referral procedures and practices** to ensure that patients access planned care: • dedicated staff • paperwork and telephone follow-up

2.3.9. How is the response to antiretroviral treatment monitored?

The progress of smear-positive TB patients during treatment is monitored by re-examining sputum smear specimens at specific intervals. Their response to ART should also be monitored. Unless they are severely ill and require weekly visits or hospitalisation, patients who begin ART are usually monitored at biweekly (every two weeks) or monthly intervals for the first three months after ART initiation. Thereafter, the frequency can be decreased if the patient seems to tolerate ARV medicines. National guidelines determine the recommended period for which ARV medicines and cotrimoxazole are dispensed at a time—usually every two to three months.

Patient monitoring visits should include the following steps:

- Patients are asked if they have any complaints, and a clinical examination is carried out. Peripheral neuropathy is a frequent adverse effect of both isoniazid and certain ARV medicines, so it is important to ask patients if they have experienced 'pins and needles' in their lower limbs.
- Patients who have completed TB treatment are asked the questions listed in the TB symptomatic screening tool (see Box 3.2 on page 33). If necessary, TB investigations are re-started.
- Patients' ART adherence is discussed: Since the previous clinic visit, did they forget any ARV medicine doses? If yes, why did this happen and what can be done to prevent missing doses in the future?
- Patients are weighed, and their performance scale is assessed.
- Laboratory tests, such as haemoglobin, full blood count, lactate, alanine amino transferase and creatinine, are generally not done routinely, but are offered to patients who need further investigations.[10]
- In settings where CD4 cell count measurements are available, these can be done every six months or yearly.
- Viral load measurement provides the best information about the suppression of the HIV replication and a patient's treatment adherence. Due to its high cost, viral load testing is frequently unavailable in resource-limited settings. However, it is anticipated that, in the future, dried blood spots will be increasingly used to assess patients' viral load at regular intervals.
- Patients' questions are answered, and relevant HIV-related information is provided.

Table 2.2 Main roles and responsibilities of stakeholders in supporting good treatment adherence

Stakeholder	*Main role/responsibility*
National programmes, health services planners and managers	• Organise services so that they are patient-centred and patient-friendly • Organise services to maximise adherence (integrated services, synchronised visits, convenient opening hours, etc.) • Select treatment regimens that are available as fixed-dose combination medicines and in simple dosing (preferably once a day) • Provide regular and sufficient stocks of quality-assured medicines, available at all times and in all treatment sites • Ensure that anti-TB treatment is free of charge to the patient and ART is either free of charge or very affordable • Develop innovative ways to support adherence (e.g., use treatment calendars where patients and/or their treatment supporters can mark the doses that have been taken on time; use cellular phones to send patients reminders by text messages or to alert patients using the telephone alarm function; count remaining pills at clinic visits)
Health workers	• Provide patients with good-quality medical care, including directly observed administration of anti-TB treatment during the intensive phase • Inform and educate patients and their treatment buddies about the importance of treatment adherence • Provide adherence counselling and help to identify past situations that have led to patients forgetting their daily medications with the goal of preventing a re-occurrence • Prescribe and dispense the correct medicines in correct doses • Provide timely diagnosis and management of adverse medication effects and overlapping toxicities • Nurture good communication skills • Establish an enabling and supportive environment for patient care
Patients	• Be motivated to take charge of their own health • Be willing to learn basic facts about their conditions and their management • Commit to take medicines, even for life; carry a patient card; attend clinic reviews; practice safer sex; and lead a positive and healthy life • Be willing to disclose their positive HIV status, seek and accept social support through, for example, joining a support group
Treatment supporters/ buddies	• Show interest in providing patients with long-term support to take their medicines as prescribed • Be willing to attend counselling and training sessions and receive supervision

2.3.10. How can antiretroviral treatment adherence be supported in HIV-positive TB patients?

Although the duration of treatment for drug-susceptible TB is only six or eight months, treatment adherence may already pose challenges to TB patients, and the health workers who support them. When TB treatment is combined with ART, which is lifelong, most patients face periods when they need support and help to ensure good treatment adherence.

Good treatment adherence is achieved through the joint efforts of the health services, health workers and patients themselves. Table 2.2 summarises the fundamental roles and responsibilities of those supporting treatment adherence.

2.3.11. What HIV prevention measures could TB services provide?

HIV prevention is an important service to be provided by the general health services. Wherever health services, and particularly HIV care and treatment, are available, HIV prevention measures should also be promoted (Table 2.3).

Table 2.3 HIV prevention methods for HIV-negative and HIV-positive persons

HIV prevention method	*HIV-negative persons*	*HIV-positive persons*
Information, education and communication	X	X
Safe blood products	X	X
Needle exchange programmes	X	X
Female and male condoms	X	X
Management of sexually transmitted infections	X	X
Male circumcision	X	—
Vaginal microbicides	X	—
Prevention of mother-to-child HIV transmission	X*	X
Pre-exposure prophylaxis (still being developed)	X	—
Post-exposure prophylaxis (e.g., after a needle-stick injury)	X	—

*Prevention of mother-to-child HIV transmission guidelines include administering nevirapine to exposed infants.

It is recommended that TB services provide patients with suspected and confirmed TB with a basic package of preventive measures that could include:

- training in safe injection practices for patients who require any injectable medications, such as streptomycin
- information, education and communication about HIV and its prevention
- promotion of male and female condoms and emphasis on their correct and consistent use
- referral of patients who may have a sexually transmitted infection (STI) to an STI clinic
- harm-reduction measures for patients who are IDUs.

2.3.12. What is the relationship between multidrug-resistant TB and HIV?

Many outbreaks of multidrug-resistant TB (MDR-TB)* have been reported among PLHs. They are both more likely to become infected with *Mycobacterium tuberculosis* and to develop active disease. For them, the treatment of MDR-TB is especially difficult because it currently lasts 18–24 months, involves more toxic and expensive medications and complicates their treatment of HIV due to potential drug-drug interactions and an increased pill burden.

These facts highlight the need for good airborne infection control (IC) measures in *any* setting serving infectious TB patients, but especially in clinics where PLHs are seen. Whenever possible, persons with any form of TB should be treated in the community to prevent transmission within the health care facility.

The ultimate goal is to prevent drug-resistant TB strains from developing in the first place. This necessitates a well-run TB control programme that ensures clinicians prescribe appropriate TB treatment and patients who take their medications faithfully and under direct observation during the intensive phase of treatment.

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*Multidrug-resistant TB is defined as TB that is resistant to at least rifampicin and isoniazid.

3
Decreasing the burden of TB in people living with HIV

Without treatment, HIV infection leads to destruction of the immune defence mechanisms of the body. As a result, PLHs become ill with severe and often deadly infections to which HIV-negative persons are not usually susceptible. These conditions are called opportunistic infections (OIs). TB is a major OI frequently affecting PLHs and leading to their premature death.[11] This section discusses key measures to reduce the burden of TB among PLHs.

3.1. The role of infection control in making health facilities safe

Health facilities should be safe for both patients and health workers. The opportunities for microorganisms to spread from patients or health workers to others should be minimised. An infection occurring in a health facility is called a nosocomial infection. Nosocomial infections can be prevented through IC. In the context of TB and HIV, both blood-borne and airborne IC must be considered.

3.1.1. What does blood-borne infection control consist of?

Universal precautions must be followed to prevent blood-borne transmission of HIV and other micro-organisms in health facilities. To prevent cross-infections from patient to patient, all injections should be given using disposable syringes and needles that are only used once. The most common cause of a blood-borne nosocomial infection among health and auxiliary workers is a needle-stick injury. A needle-stick injury may occur when a person recaps a needle after its use or when sharps are not disposed of safely. If an injury takes places, the person should be offered post-exposure prophylaxis (PEP), which is outlined in Appendix 1. Table 3.1 summarises important precautions to protect health workers.

Table 3.1 Key universal precautions to protect health workers from blood-borne nosocomial infections

Universal precaution	*Personal/additional protective measure*
Do not recap needles	• Provide pre-service/undergraduate and in-service training for health workers • If a needle-stick injury occurs, provide PEP (see Appendix 1)
Provide sharp boxes	• Develop a health facility IC plan that determines practices for the collection of sharps and the location of boxes • Appoint an IC focal person to ensure sufficient supply of boxes
Dispose of clinical waste safely	• Develop a health facility IC plan to determine procedures for disposal of sharps, contaminated materials and clinical waste • Appoint an IC focal person/committee to ensure that planned procedures are followed
Cover cuts and abrasions on hands	• Build awareness among health workers
Wash hands after direct contact with a patient	• Provide pre-service/undergraduate and in-service training for health workers and supervision
Wear gloves if in contact with body fluids	• Provide a sufficient supply of gloves • Offer pre-service/undergraduate and in-service training and supervision • Provide hepatitis B vaccinations to all persons working in health facilities
Clean up spills of blood and body fluids	• Appoint an IC focal person to ensure supply of disinfectants and other essential commodities
Wear mask, eye protection and gown to protect against splashes of blood and body fluids when carrying out invasive procedures	• Provide supply of personal protective equipment (PPE) • Provide staff training and supervision

3.1.2. What does airborne infection control consist of?

Airborne IC is a combination of measures aimed at minimising the risk of transmitting microorganisms through the air within populations.[12] The spread of TB bacilli can be increased if IC measures are poor, especially in congested, badly ventilated health facilities in settings with high TB prevalence. The possibility of transmitting multidrug-resistant (MDR) or

extensively drug-resistant (XDR) TB further underlines the urgent need for strong IC.

3.1.3. What is meant by a hierarchy of TB infection control measures?

The hierarchy of TB IC measures refers to the order in which the recommended activities should be carried out.

- **Administrative controls** are the **first priority**. They aim to reduce the risk of patients' and health workers' exposure to TB bacilli. They consist of managerial and work practices.
- **Environmental controls** are the **second priority**. They aim at reducing the concentration of TB bacilli in the air space shared by patients and health workers. Options include ventilation, use of fans, filters and ultraviolet germicidal irradiation (UVGI).
- **Personal respiratory protection** refers to the use of personal protection equipment (PPE) to protect health workers in high-risk areas for TB transmission. It is the **lowest** priority in the hierarchy of TB IC measures.

3.1.4. What do administrative controls consist of?

Undiagnosed and/or untreated individuals with infectious TB can cause TB bacilli to spread to others in a community. Administrative controls include the following:

- practices to identify patients with cough, separate them from other people, fast-track their investigations and start treatment of confirmed TB promptly
- a health facility IC plan
- an IC committee
- IC training for health staff and ongoing supervision
- monitoring of the implementation of IC measures
- screening and protecting health workers, especially those who are HIV-positive, from exposure to TB bacilli
- educating patients and increasing community awareness.

Undiagnosed and untreated persons with TB pose a great risk: they spread TB bacilli until they are diagnosed and started on TB treatment.

What steps are involved in identifying patients with cough and separating them from others?

The identification of patients who may have TB begins as soon as they enter the health facility. This is also called 'triaging'. Clerks registering patients should be trained to ask two simple questions:

- 'Do you cough?'
- And if the response is yes, then 'For how long have you been coughing?'

Patients should be investigated for TB if they have had a cough for two to three weeks or longer (sometimes in addition to other complaints). They should be referred immediately to a health worker who can take a full history, carry out a physical examination, collect sputum microscopy specimens and follow up the results. These patients should wait to be served in an area that is well ventilated and separated from other patients. All patients with cough should also be advised to cover their mouths and noses with a handkerchief or tissue paper when coughing or sneezing. This is called **cough hygiene** or **cough etiquette**. Sputum specimens should be collected outdoors in a designated spot, weather permitting, or in another place that is very well ventilated.

The HIV status of all patients suspected of having TB should also be ascertained. In HIV-positive persons, especially if they are in an advanced stage of HIV disease, typical symptoms of TB, such as a chronic cough, may be absent. In these patients, any (current) cough should be noted and arrangements made for sputum collection and other investigations as recommended in the national guidelines.

It is important for the health worker to ensure that the results of sputum smear microscopy and other diagnostic tests are received and that patients are informed whether they have TB or not. If TB is diagnosed, correct TB treatment should be commenced without delay. This will rapidly reduce the infectiousness of the patient. Arrangements for TB treatment to be directly observed during the initial intensive phase should be made with the patient.

What should a health facility TB infection control plan include?

Each health facility should have a TB IC plan that guides the work of the IC focal person. In hospitals, it may be necessary to have an IC committee. A facility IC risk assessment should be done before a plan is written to guide the actions to be taken.

The IC plan should outline:

- how to identify, investigate and separate patients suspected of having TB from other patients
- how to start TB treatment for individuals with confirmed TB diagnosis
- how to implement and monitor environmental controls
- how to train staff on TB symptoms and signs, management and TB IC
- how to protect employees from exposure to TB bacilli and how to screen them for TB and HIV
- how to monitor TB IC measures
- how to provide and dispose of tissues, face masks or respirators, when and if applicable.

How should TB infection control interventions be monitored?

The TB IC plan is the basis for monitoring interventions. Its implementation is monitored on a daily basis by the IC focal person and/or the members of the committee. Each planned activity should have a staff member assigned to monitor its implementation and a simple 'IC duty roster' can be developed. An example is presented below (Box 3.1).

Box 3.1 Example of clinic TB infection control plan and duty roster, Uganda

IC activity	*Person responsible*	*How often activity is performed*
Health education for clinic patients	A. Mubako	Daily
Opening clinic windows	A. Latif	Daily
Separating coughing patients from other patients	L. Ogang	Daily
Using intensified case-finding tool	D. Kibuka	Daily
Putting out information, education, and communication (IEC) materials	A. Mubako	Monthly
Using standard operating procedures in the laboratory	F. Salem	Daily

How should TB surveillance among health workers be handled?

TB surveillance among health staff is an internationally recommended way to monitor TB IC.[13] However, because of the fear of stigmatisation, health workers may not be willing to have their medical needs addressed at their place of employment. The following should be part of good clinical and public health practice:

- In high-burden settings, all health workers should be educated about TB symptoms and be encouraged to seek help without delay if they experience them.
- All health workers should be screened for TB symptoms at the time they are recruited and at least once a year thereafter; appropriate records should be kept.
- Health workers who have symptoms of TB should be investigated using tests recommended in national guidelines.
- Health workers diagnosed with TB should be started on TB treatment according to the national guidelines, and supported to adhere to the treatment.
- Health workers need to know their HIV status, because, if they are HIV-positive, it is important to consider:
  - —Transferring them to work stations where exposure to TB bacilli is unlikely
  - —Supporting their access to ART and CPT
  - —Helping them access isoniazid preventive therapy (IPT).

3.1.5. What do environmental controls consist of?

Environmental controls for TB include:

- Proper ventilation, natural and mechanical
- Filtration
- Ultraviolet germicidal irradiation.

It is important to recognise that if administrative controls are inadequate, environmental controls will not eliminate the risk of transmitting TB bacilli.

How does good ventilation reduce the risk of transmitting TB bacilli?

Ventilation, whether natural or mechanical, allows fresh air to enter a room. The fresh air then dilutes the concentration of airborne particles, including droplet nuclei that may carry TB bacilli. Dilution reduces the

likelihood that a person in the room will breathe in air that contains infectious droplet nuclei.

In resource-limited settings, especially in warm climates, **natural** ventilation is the best and the least expensive option to enhance air mixing.

How can natural ventilation be ensured?

Natural ventilation may be ensured by keeping the doors and windows open. Since the doors for consultation rooms are usually closed to maintain privacy, the windows should be open. To ensure adequate natural ventilation, the total area of the windows that are opened should represent the equivalent of 20% of the floor area. If natural ventilation is not adequate, propeller fans can be used to mix the air.

Health facilities have different designs, and sometimes the windows are small. If resources allow, such facilities should be renovated to enlarge the windows and/or add more windows. Waiting areas for patients, especially those with a cough, should be as well ventilated as possible. Verandas and structures with only three walls or even partial walls and a roof to protect patients against sun and rain are ideal. Designing hospitals with adequate natural ventilation requires the expertise of specialised architects. How the furniture used by health workers and patients is arranged in relation to the sources of natural ventilation also makes a difference. For more information, the reader is referred to the section on Further Reading.

What is the role of filtration in environmental controls?

High-efficiency particulate air (HEPA) filter units can be considered for use in small rooms with a limited number of patients. They may be an alternative and addition to mechanical ventilation or ultraviolet germicidal irradiation. However, they require regular maintenance and monitoring.

What is the role of ultraviolet germicidal irradiation in environmental controls?

Ultraviolet germicidal irradiation (UVGI) uses a type of radiation that kills TB bacilli in the air. It can be used as a supplementary measure to ventilation. Although upper-air UVGI helps to dilute the overall room concentration of TB bacilli, it offers **little benefit** to the health worker who is in close proximity with the patient, especially in rooms with high ceilings. In addition, UVGI equipment requires regular cleaning and maintenance to function appropriately.

In most of the resource-limited settings where The Union works, the use of UVGI is not a viable option because of its cost. Since the **sun** is a

good source of ultraviolet light, removing curtains to let the sunshine in can be helpful, although this benefit has to be balanced against the need for patient privacy.

3.1.6. What is the role of personal protective equipment in the hierarchy of TB infection control?

Use of personal protective equipment (PPE) is the lowest priority in the hierarchy of TB IC measures. No matter how good it may be, PPE cannot undo deficiencies in administrative and environmental controls. Also, this equipment cannot protect staff who have acquired latent TB infection in high TB burden settings in the community—that is, outside their work setting.

When should personal protective equipment be used?

PPE is recommended for situations where administrative and environmental control measures are not sufficient to protect staff from exposure to TB bacilli. Examples of such situations are wards for patients with suspected and confirmed drug-resistant TB; intensive care units; and autopsy, spirometry and bronchoscopy examination rooms. Staff who work in areas with low (or lower) risk of transmission of TB bacilli do not need to use PPE. These areas include clinic/hospital administration offices, in-service training offices, pharmacies and TB clinics for patients already on effective TB treatment.

The correct PPE for preventing exposure to TB bacilli is a **respirator** that can filter TB bacilli that are five microns in size. There are many different types and sizes of respirators. It is important to buy high-quality respirators and conduct a fit test on the health workers who will use them before issuing them.

In practice, respirators are not as effective as expected because they are expensive, difficult to procure in sufficient quantities, hard to fit correctly and quite uncomfortable to wear.

Can surgical masks replace respirators?

Surgical (face) masks cannot replace respirators. An **infectious** person should wear a mask to prevent respiratory secretions from becoming airborne, that is, to ensure cough hygiene. Health workers should not wear surgical masks to protect them from exposure to TB bacilli, because they do not protect them from inhaling aerosolised droplet nuclei.

3.2. What are the basic TB infection control issues in the laboratory?

3.2.1. Are respirators needed when performing smear microscopy?

Smear microscopy very rarely leads to the aerosolisation of respiratory secretions and is considered a low-risk procedure. Therefore it follows that respirators are not required when performing smear microscopy; however, emphasis should be placed on adequate ventilation, natural if possible, in microscopy laboratories.

3.2.2. What is a ventilated workstation and when should it be used in the laboratory?

A ventilated workstation is a cabinet with a fan extracting air to the outside, away from people and without filtration. It is recommended when smears are prepared in a space with **insufficient** natural ventilation, that is, when natural ventilation is absent or inadequate or when the staff are reluctant to perform microscopy in a well-ventilated space without a biosafety cabinet.

3.2.3. What kind of protection is needed when using Xpert® MTB/RIF?

Xpert® MTB/RIF machines are increasingly available. The risk they present to the user is low, as TB bacilli in the specimen is killed in the first step and the system is fully closed after the sample has been added to the cartridge. As for microscopy, in the absence of adequate natural ventilation, a ventilated workstation should be provided for specimen handling and cartridge loading. The used cartridges should be handled as medical waste. Since the Xpert procedure kills TB bacilli, as mentioned above, no sterilisation prior to incineration is required.

3.2.4. What kind of protection is needed in laboratories performing *Mycobacterium tuberculosis* culture and susceptibility testing?

Ventilated workstations and respirators offer inadequate protection when performing cultures or drug susceptibility testing (DST). At minimum, a biosafety cabinet is required when manipulating solid cultures. When manipulating liquid cultures, in addition to the biosafety cabinet and a number of other safety measures, the air in the room must be exchanged frequently, flowing in only one direction, away from the bacteriologically clean areas surrounding the culture room ('negative pressure'). Wherever cultures are undertaken, precautions to prevent infection must be followed

as outlined in the soon-to-be published WHO *Tuberculosis Laboratory Biosafety Manual*.

3.3. Role of intensified TB case-finding in reducing TB burden in people with HIV

3.3.1. What is intensified case-finding for TB?

Intensified case-finding (ICF) for TB is a screening activity that focuses on searching for TB cases among specific groups of people who are more likely to have TB than the general population, such as HIV-positive individuals and children younger than five years of age who have been in contact with infectious TB patients. It requires that i) health workers caring for PLHs and young children (whether HIV-infected or not) be on the alert for symptoms of TB at all times, ii) diagnostic and treatment services for TB be easily available and iii) these services lead to good TB treatment results, that is, curing TB.

3.3.2. Why is intensified TB case-finding important for people living with HIV?

Since TB is one of the most frequent OIs and a leading cause of death among PLHs, screening for TB should be offered to these patients at every contact with the health services.

3.3.3. Why is TB contact tracing among children important?

Children, especially young children, are most at risk of being infected by a TB source case in their close environment. Every newly diagnosed TB patient should therefore be asked about children in the household, and these children should be assessed for TB. This activity is known as TB contact tracing, and is a form of intensified TB case-finding. If the TB source case is an HIV-infected parent, all children should be tested for HIV. Children under five years of age and HIV-infected children of any age without any clinical symptoms and signs for TB should receive isoniazid preventive therapy (IPT). Children with symptoms should be investigated for active TB.

Evaluating children for TB, whether or not they are HIV-infected, is different from evaluating adults. The clinical presentation in children is often non-specific, and the majority of children, especially those younger than five years of age, frequently do not produce sputum. The final diagnosis is often based on a combination of findings from the patient history and clinical, microbiological and radiological examinations. More information is available in the section on Further Reading.

3.3.4. How is intensified case-finding for TB performed?

TB can occur at any stage of HIV infection. Its clinical presentation depends on the extent to which the immune defence mechanisms of the body have been destroyed, and it follows that the symptoms and signs suggestive of TB differ, depending on whether the person is in an early or late stage of the HIV infection. This fact makes TB case-finding in PLHs a difficult task: some present with 'classical' symptoms that are similar to those in HIV-negative persons with suspected TB, and others may have atypical or hardly any symptoms.

Consequently the symptomatic screening tools currently used in many countries are likely to have different levels of sensitivity or ability to detect TB disease, depending on how common TB is in the community and the expertise of the individual using the tools.

Most tools developed for TB screening (Box 3.2) in adults and adolescents include checking for symptoms of a cough lasting for two to three weeks or longer or a current cough (of any duration), fever, weight loss and night sweats.

Box 3.2 Symptomatic screening tool for TB, Uganda

This questionnaire will help to identify people who may have active TB and may need further evaluation for TB and other diseases.

History/symptoms	*Yes*	*No*	*Don't know*
1. Do you have a (current) cough? 2. Do you have fever? 3. Have you lost weight? 4. Have you had night sweats?			

Action to be taken:

1. Patients with *any* of the symptoms above may have active TB and need further evaluation for TB and other diseases. They should be prioritised for rapid assessment by the clinician.
2. Patients identified with a cough should be educated to cover their mouths and noses when they cough or sneeze and to use a handkerchief or tissue. They should also be separated from other patients until a clinician has evaluated them.

In some countries, registers are kept of 'patients with chronic cough' or 'patients with suspected TB'. One purpose of this register is to ensure that the results of diagnostic tests have been received and acted upon. These registers should also have a column that indicates the conclusion of the investigation: was the person who was identified through ICF found to have TB or not? If TB was confirmed, when TB did treatment begin? Since screening for TB may take place in several sections of the health facility, multiple registers may be needed.

What investigations are carried out as a follow-up to the symptomatic TB screening tool?

A patient who gives a positive answer to any of the questions on the symptomatic TB screening tool needs to be investigated according to the national guidelines. The following investigations are frequently recommended:

1. Take a medical history and do a physical examination to determine the patient's symptoms and signs. These are usually performed by a clinician who also requests two diagnostic sputum specimens for microscopy.
2. If one or both specimens are positive for acid-fast bacilli (AFB) on microscopy, the patient has smear-positive TB and should be started on TB treatment without delay. The type of anti-TB treatment depends on whether the patient is a new or retreatment case. The anti-TB treatment is the same whether the patient is HIV-infected or not. Arrangements for direct observation of TB treatment during the intensive phase (the first two months) need to be discussed with the patient. If the patient is already on a nevirapine-containing ART, the regimen should be reviewed with a view of substituting nevirapine with efavirenz (EFV).
3. If the two sputum smears are negative, request a rapid diagnostic test or molecular test, such as Xpert® MTB/RIF or line probe assay, if they are part of the national policy and are available. If the test confirms a TB diagnosis, treatment should be started.
4. In the absence of the above tests, a chest radiograph is recommended, and a culture for *Mycobacterium tuberculosis* may also be considered. If the chest radiograph shows lung fields consistent with pulmonary infectious disease, a course of broad-spectrum antibiotics may be prescribed.

5. If the patient does not improve after taking antibiotics, two sputum-smear examinations should be repeated. If the results are still negative, but the patient continues to have symptoms and signs suggestive of TB, the patient should be registered as a smear-negative pulmonary TB patient and started on anti-TB treatment.

What should be considered when a person taking antiretroviral treatment develops TB?

Although ART reduces the occurrence of TB significantly, PLHs still have a five to ten times higher risk of TB compared to HIV-negative individuals.[14] Depending on when they develop TB, in relation to the duration of their ART, the following treatment approaches should be considered.

TB develops within three to six months of starting ART:

- Developing active TB at this point may indicate the presence of immune reconstitution inflammatory syndrome (IRIS). At the time of starting ART, the patient may have had active TB, although it was not diagnosed. As ARV medicines begin to improve a patient's immune defence mechanisms, previously asymptomatic or sub-clinical TB disease worsens, and this leads to the appearance of symptoms and signs of TB. It is important that such a patient is investigated and commenced on TB treatment promptly if active disease is diagnosed. If the patient becomes severely sick, hospital admission and steroid treatment can be considered, in addition to continued TB and antiretroviral treatment.
- The development of active TB as described above may also be called 'unmasking TB IRIS'. It is frequent in high TB burden settings and, unfortunately, it may lead to death.

TB develops after six months of ART:

- At this point, TB IRIS is less frequent.
- The challenge faced by the clinician is to decide whether i) the patient has developed TB as a result of ART failure, or ii) the ART is working well, but the patient has developed TB as a result of new exposure and infection from the community or reactivation of latent TB infection.
- ART failure can be confirmed by a detectable viral load. Measuring the CD4 cell count is less helpful because the count is likely to drop due to the current TB.

- ART failure arises due either to poor treatment adherence or resistance to ARV medicines.
- It is important to ask patients whether they have experienced any difficulties in taking their daily ARV medications. Adverse drug events are a common reason for not taking ART. This may cause ART failure and impaired immunity, which in turn leads to development of active TB. The health worker should also check the ART cards for delayed or missed ARV medicine collection dates. These patients may continue their first-line ART regimen, but they need careful follow-up, adherence counselling and support, for example, from a community health worker who can ensure that daily medications, including TB medicines, are taken as prescribed.
- If the patients' ART adherence has been satisfactory, ARV resistance may have occurred. These patients require assessment by an experienced HIV physician, so that a decision can be made regarding when to start the second-line ART regimen in view of the drug-drug-interactions between rifampicin and protease inhibitors.
- A patient whose viral load result remains undetectable may still develop TB as a result of a re-infection or re-activation. This situation is frequently the explanation for an episode of TB among PLHs on ART in high TB-prevalence settings. Even though well-functioning ART restores the person's immune defence mechanisms to a large extent, PLHs remain at a higher risk of developing TB than HIV-negative persons.

3.3.5. Who should perform intensified case-finding for TB?

The clinician attending the HIV-positive patient should initiate ICF. However, due to the large number of patients in some countries, and the limited number of health workers in most resource-limited settings, this service can be delegated to nurses or lay providers who have been trained to use the symptomatic screening tool.

3.3.6. When should intensified case-finding for TB be done?

Ideally, ICF should be conducted each time PLHs are in contact with health services, even if they meet any of the following criteria:

- have already received IPT
- are receiving it at the time of evaluation
- are taking ART.

3.3.7. Where in a health facility can intensified case-finding for TB be conducted?

Screening for TB in PLHs should be done in every section of the health facility where they are seen so that no referral is necessary. This includes out-patient departments, HIV care/ART clinics, in-patient wards, maternity and child health departments and client-initiated testing and counselling centres.

3.4. Role of isoniazid preventive therapy for people living with HIV

Two important strategies for preventing active TB disease in PLHs are early initiation of ART and IPT. The individual risk of developing TB is reduced by 70–90%[15] when PLHs are taking ART. The risk of recurrent TB decreases by 50%.[16] Antiretroviral and isoniazid preventive therapies, when used together, may have an additive effect and decrease TB incidence by 50–80%.[17,18]

3.4.1. What is isoniazid preventive therapy and what does it do?

IPT is one of the treatments that can be used to prevent the development of active TB disease in persons who have latent infection with *Mycobacterium tuberculosis*. It is the most frequently used TB preventive treatment. It requires self-administration of isoniazid for a minimum period of six months at an adult dose of 5 mg/day (maximum adult daily dose 300 mg).

3.4.2. For whom was isoniazid preventive therapy recommended before the HIV-era?

For many decades, in most high TB burden countries, national TB programme guidelines have recommended IPT to healthy under-five-year-old contacts of smear-positive TB cases, even if they have previously received a bacille Calmette-Guérin (BCG) vaccination. This recommendation is based on the fact that young children who have been exposed to TB bacilli have a high chance of becoming infected and developing active TB disease, including severe forms, such as TB meningitis and miliary TB.

3.4.3. How has HIV changed the role of isoniazid preventive therapy?

Infection with TB bacilli can usually be identified in healthy persons using a tuberculin skin test (TST). For most of those who have a positive TST, the

risk of developing TB is low unless the person is a young child, the infection has been acquired relatively recently or the person is HIV-positive. IPT can substantially reduce the chance of TB developing in such persons. Studies have shown that a completed course of IPT in PLHs with a positive TST prevents up to 60–70% of active TB disease cases for a period that ranges from 6 to 18 months.[19] IPT has no protective effect in PLHs who have a negative TST.[20]

3.4.4. What are the current international recommendations on isoniazid preventive therapy?

In 2010, WHO published guidelines for ICF and IPT for PLHs in resource-limited settings.[21] The key recommendations for adult and adolescent PLHs include the following:

- IPT should be offered to persons who are screened with a clinical algorithm and do not have current cough, fever, weight loss or night sweats.
- Chest radiography is not required as an investigation before starting IPT.
- TST is not a requirement for initiating IPT. Where feasible, a TST test can be used, since persons with a positive test benefit more from IPT than those with a negative test.
- PLHs should receive at least 6 months of IPT.
- In settings with the highest rates of prevalence and transmission of TB, IPT for at least 36 months could be considered (36 months being a proxy for lifelong treatment).
- Providing IPT to PLHs does not increase the risk of developing isoniazid-resistant TB. It follows that concerns regarding the development of isoniazid resistance should not be a barrier to providing IPT.

3.4.5. What must be considered when deciding to initiate an isoniazid preventive therapy programme in a country?

Ministries of health and national AIDS and TB control programmes should consider both technical and programmatic issues when assessing their readiness to implement and monitor an IPT programme in a country.[22] These points include:

- How well does the proposed clinical, symptom-based algorithm in the country predict TB disease? Is it possible that persons with active TB disease are missed and, if so, how many are there? What is the role of chest radiography in finding persons with active TB disease who would have otherwise been missed? The answers to these questions are essential in order to minimise the number of persons with active TB disease in whom isoniazid monotherapy may lead to the development of isoniazid resistance.
- Even in high TB burden settings, not everyone has latent TB infection. In this country, is it appropriate to start IPT (in all age groups) without a TST?
- A positive TST indicates infection with *Mycobacterium tuberculosis* but does not differentiate between infection and active disease. A false-positive TST could result from previous BCG vaccination or exposure to environmental mycobacteria. A negative TST result does not exclude TB disease. Persons with severe immune suppression from HIV may not react to a TST even if they do have TB. Interferon-gamma release assays (IGRAs) cannot differentiate between TB disease and latent infection either and are not recommended due to lack of data.
- In deciding the optimal duration of IPT, there should be a grasp of the relative importance of re-infection versus re-activation among TB cases. If the former is responsible for the majority of cases, lifelong IPT may become a consideration. On the other hand, lifelong and even shorter IPT courses pose several challenges regarding treatment adherence among PLHs who are well and have no symptoms of TB disease.
- Does the TB or HIV programme take responsibility for IPT implementation? The current WHO recommendation is that national AIDS control programmes (NAPs) manage IPT as one aspect of the HIV care package that is provided in HIV care sites. However, NAPs should coordinate closely with the national TB control programmes (NTPs) for the procurement of isoniazid, because of its use for preventing TB in close contacts of persons with TB, especially children under the age of five years (an activity that is an NTP responsibility).
- Does the country have the human and logistical resources to embark on developing and scaling up an IPT programme, especially if

i) the cure rate for TB cases has not yet reached international targets and/or if ii) ART coverage is not yet universal?

- Is there a budget for isoniazid? Who will order it and ensure that adequate stocks of single-dose isoniazid are available? In addition, pyridoxine (vitamin B_6) should also be stocked for persons taking IPT.
- Does the country have a recording and reporting system for an IPT programme?

In many countries, operational research is needed to answer these and other relevant questions so that IPT can be implemented in a structured way.

4
Monitoring TB-HIV care

4.1. Why is it important to monitor TB-HIV care?

Monitoring of TB-HIV care is necessary to assess programme performance and progress towards objectives. Activities should include reviews of the existing NTP and NAP records and registers and periodic evaluation of collaborative TB-HIV activities. Through this process, strengths and weaknesses are identified in the implementation of joint TB-HIV activities at the national, provincial/regional and district level. Evaluation also shows when planned objectives have been reached.

4.2. Is a new recording and reporting system needed to monitor TB-HIV care?

There is no need for a new, parallel recording and reporting system for collaborative TB-HIV activities. TB-HIV care should be monitored using the forms and information systems that **already exist** for TB and HIV. It is sufficient to modify certain forms so that they include the information that is required. Examples of forms that should be adapted are the patient treatment card, laboratory test request form, TB register and pre-ART and ART registers.

4.3. How should the monitoring of TB-HIV care be organised?

First, the national programmes and the TB-HIV coordinating body must select the indicators that will be used for monitoring joint TB-HIV care. International guidance is available.[23] Second, based on the selected indicators, the list of data required from the recording and reporting system must be established. For example, if the indicator of interest is the percentage of registered TB patients who were tested for HIV during a given period, the data needed include the number of TB patients registered and the number, among them, who were tested for HIV. Third, the

routine recording and reporting systems for TB and HIV should be adjusted to ensure that they capture the information required to calculate the indicators.

A recording and reporting system comprises several tools (patient treatment card, laboratory test request form, laboratory register, TB register, pre-ART and ART registers, etc.). It is essential to structure the system so that individual patients can be tracked from one register to another and from one information system to another, using a unique patient identity number (and possibly name, age and sex). For example, when TB patients accept HIV testing, the health worker should be able to look for them in the HIV testing register to verify whether they have indeed been tested and the HIV test result. The health worker should then be able to verify, by referring to the ART register, whether any patients found to be HIV-infected had started on ART.

When changes are introduced to the recording and reporting system, they should first be piloted to allow for corrections before a countrywide roll out. Health workers should be trained to use the modified tools to ensure accurate recordkeeping and reporting.

It is essential to keep recording and reporting requirements as **simple** as possible. Recordkeeping should not distract health workers from their main responsibility, which is providing patient care. If clinic staff feel that the 'paperwork' is a burden and requires too much time and effort, the quality of records and reports is likely to decline. If additional information is needed, surveys and epidemiologic or operational research studies can be conducted.

4.4. Who should perform TB-HIV recording and reporting?

At health facilities, one staff member should be assigned the responsibility of ensuring that the recording and reporting tools, particularly the TB and ART registers, are filled in correctly, completely and in a timely manner (Box 4.1). This person will also be responsible for preparing periodic reports. Although the focal person is likely to develop a strong sense of ownership of these duties, all staff involved in providing TB and/or HIV care should be familiar with the recording and reporting system. They should be trained in its use and retrained when revisions are made. Supervision also plays an important role in ensuring that the registers are well maintained and contain accurate information.

Alternatively, periodic reports may be prepared by a person external to the facility, such as a district TB or HIV coordinator or a health information

Box 4.1 Designating focal points for TB and HIV, Zimbabwe

At the Union-supported pilot sites in Bulawayo and Harare, nurses are designated as 'focal points' for TB and HIV for a period of three months at a time. In addition to patient care, one of their main duties is to fill in the registers and ensure that they are up-to-date at all times. At the end of each three-month period, other nurses take up these designated duties. There is also a rotation for 'acting' focal points in case the primary person falls sick or needs to take emergency leave. Within the course of two to three years, depending on the total number of staff at the pilot site, all staff will thus have rotated through these assignments. This type of arrangement facilitates efficient management of TB-HIV services, including recording and reporting.

officer. No matter what the arrangement is, the clinic staff, who are most familiar with the patients and unit registers should be involved, since they are best able to provide clarifications.

4.5. Which HIV-related data should be included in the TB recording and reporting system to monitor TB-HIV care?

Although the data recorded will be determined by the choice of indicators, certain basic information is likely to be required (Table 4.1).

Table 4.1 HIV-related data to be included in the TB recording system to facilitate monitoring of TB-HIV care

TB treatment card	*Unit TB register*
• HIV status (positive, negative, indeterminate or test not done) and test date • For HIV-positive patients: — Result(s) and date(s) of CD4 count, if available — Result(s) and date(s) of viral load measurement, if available — Date CPT started — Date ART started and names and doses of the medications	• HIV status (positive, negative, indeterminate or test not done) and test date • CPT (yes, no, date started) • ART (yes, no, date started) • ART number or ART site to which patient was referred (for cross-referencing purposes)

This information should be collected for each registered patient and is useful not only for recording and reporting but also for management of patients.

The way that the Benin NTP adapted its TB registers to include HIV data is described in Box 4.2.

Box 4.2 How the TB register was modified to include HIV-related indicators, Benin

In Benin, the TB register was modified to include three additional columns to record i) HIV testing (yes/no and results), ii) CPT (yes/no) and iii) ART (yes/no). TB clinics were only required to report whether the patient had started or continued on CPT and ART. However, TB nurses frequently used these column spaces to record the date when CPT or ART started and the ART regimen. Thus, the TB register provided an at-a-glance summary of the patient's HIV care history.

4.6. Which TB-related data should be included in the HIV recording and reporting system to monitor TB-HIV care?

The TB data listed in Table 4.2 are likely to be required for HIV recording systems, depending on the choice of the indicators. The information should be collected for each registered patient, and, again, it is useful for both recording and reporting purposes and the management of patients.

Table 4.2 TB-related data to be included in the HIV recording system to facilitate monitoring of TB-HIV care

HIV treatment card	*Unit pre-ART/ART register*
• Dates patient screened for TB and results • If TB confirmed: — TB registration number (for tracking and cross-referencing purposes) — Date anti-TB treatment started, treatment category and type of TB — Anti-TB treatment outcome and date • If latent TB infection: — Date IPT started and IPT number — IPT outcome and date	• Dates patient screened for TB (which should ideally be done at every clinic visit) and results • TB registration number (if TB confirmed) • Date patient started on anti-TB treatment • Anti-TB treatment outcome and date • Date patient with latent TB infection started on IPT • IPT outcome and date

Table 4.3 Key TB-HIV indicators

HIV services for TB patients	*TB services for PLHs*
• Number/percent of registered TB patients whose HIV status is recorded in TB register • Number/percent of TB patients whose HIV status is recorded in TB register and who are HIV-positive • Number/percent of HIV-positive TB patients who are on CPT during anti-TB treatment • Number/percent of HIV-positive TB patients who start or continue taking ART during anti-TB treatment	• Number/percent of PLHs who were screened for TB during their last visit in reporting period • Number/percent of PLHs started on anti-TB treatment • Number/percent of PLHs started on IPT

Elements used to report on TB-HIV integrated care are shown in Table 4.3. An explanation of how the various indicators are calculated can be found in the references mentioned earlier.

4.7. What is the importance of anti-TB and antiretroviral treatment outcome analysis in monitoring TB-HIV care?

NTPs prepare quarterly and annual reports on both TB case-finding and the results of TB treatment. These reports are standardised using internationally recommended tools that have been adapted for use in many countries.

NAPs have also begun ART outcome reporting, although this is a complex task since ART is a lifelong treatment. This means that patients on ART may have several outcomes at different times over the course of their treatment, whereas a TB patient has only one outcome (for one episode of TB). In spite of this challenge, periodic assessment of ART outcomes is essential in order to assess the quality of patient care and programme performance. Depending on the national guidelines, ART outcomes are usually reported after 6 and 12 months and then annually.

The national programmes and the TB-HIV coordinating bodies may examine ART outcomes among TB patients and compare them with the outcomes among all PLHs; they may also compare TB treatment outcomes among HIV-positive and -negative patients.

4.8. How can antiretroviral treatment outcome analysis be done?

First, definitions for the standardised ART outcomes must be agreed. Table 4.4 summarises the internationally recommended definitions for the TB[24] and ART outcomes.[25]

Second, it is necessary to determine whether ART outcome analysis is conducted quarterly or at another frequency. Quarterly analysis fits well with the quarterly supervision timetable used in many places. The analysis is often carried out in a cumulative manner: outcomes for all patients ever started on ART in a site, district, province/region and country are assessed for the nationally recommended milestones that they have reached.

Third, a schedule must be established for reporting ART results from the health facilities through the district and provincial/regional levels to the national offices. Appendix 2 presents a list of steps to be taken when performing ART outcome analysis.

Table 4.4 Standard definitions for anti-TB and antiretroviral treatment outcomes

Anti-TB treatment outcome	*Antiretroviral treatment outcome*
Cured A sputum-smear positive patient who was smear-negative at the last month of treatment and on at least one previous occasion	**Alive and on ART** A patient is alive, continues to attend HIV care and to take ARV medicines
Treatment completed A patient who completed treatment, but for whom smear examination results are not complete enough to classify the patient as cured	
Failure A patient who is smear-positive (and confirmed by second specimen) at five months or later during treatment	**Stopped** A patient whose ART is stopped either because of adverse drug effects or for other reasons
Died A patient who dies for any reason after the diagnosis and before the end of treatment	**Died** A patient who dies for any reason after ART has been started
Defaulted A patient who did not collect medicines for two or more consecutive months	**Lost to follow-up** A patient who did not collect medicines for three or more consecutive months
Transfer out A patient who was transferred to another basic management unit to continue treatment and for whom treatment outcome is not known	**Transfer out** A patient who was transferred to another ART site to continue treatment

4.9. How can information contained in the TB and HIV recording and reporting systems be used within a health facility and/or district to improve programme performance?

Data are collected from health facilities and then compiled into periodic district reports that in turn are collated into provincial/regional summaries before they are forwarded to the national level. It is important that i) the reports are prepared according to the nationally agreed timelines and ii) the data are verified before being sent forward so that errors are corrected. These reports form the basis for assessing the country's TB control and HIV/AIDS care.

To complete the cycle of health information, it is necessary that the national, provincial/regional and district levels provide periodic feedback to the lower levels of health care. These feedback reports should summarise the highlights of the information; for example, knowing the proportion of suspected TB patients and patients who were tested for HIV and started on ART in each area can enable districts and provinces/regions to compare their performance with that of other areas.

The forms, registers and periodic reports should also be used within health facilities, districts and provinces/regions to continuously assess the coverage and quality of services provided to patients. The TB and ART registers, if filled out appropriately, provide a condensed but complete picture of a patient's progress. For example:

- Any missing or non-matching information should offer an opportunity for the supervisor to correct information and clarify whether staff adhered to the national guidelines and proper care was given.
- The registers should be used to identify potential treatment defaulters and ensure that patients are brought back to treatment.

To encourage and ensure local use of TB-HIV data, it is important to i) to review the reports during supervision visits and ii) make the monthly or quarterly reports a regular item on the agenda of meetings that are held in a health facility, district and province/region, including meetings of the coordinating bodies (Box 4.3). If performance appears to be lagging in one area, possible reasons and solutions should be sought. This information becomes an important source in setting priorities for operational research within the services. Positive results, such as an increase over several quarters in the proportion of TB patients tested for HIV, should also be highlighted and positive feedback given. Trends in key indicators could be plotted on handmade posters and displayed.

Box 4.3 Regular review of quarterly TB-HIV reports leads to strengthened performance, Zimbabwe

TB diagnostic and treatment services, including recording and reporting, were decentralised to the primary health care clinics of the Health Services Department in the City of Bulawayo in the mid-1990s as a response to an increased caseload due to the HIV-fuelled TB epidemic. Each clinic maintains the registers and prepares the quarterly reports according to the national TB control guidelines. The health information officers are then responsible for compiling city-wide reports and sending them to the NTP.

The relevant clinic staff meet quarterly to finalise the previous quarter's case notification and treatment outcome reports. The reports are then entered into a computerised database and graphs summarising each clinic's performance are produced. Graphs for the previous reporting periods are reviewed to facilitate comparison over time.

In the 2000s, the Ministry of Health and Child Welfare revised the tools to add i) HIV-related indicators to the TB registers and ii) TB-related indicators to the pre-ART and ART registers. They are now part of the quarterly data review meeting agenda in Bulawayo.

This approach has resulted in:

- Clinic staff, as well as designated health information personnel, have learned to check and tabulate TB-HIV data and perform simple calculations.
- Health workers have learned to interpret information presented in tables and graphs.
- Clinic teams are able to compare their clinic's performance over several years and with the performance of neighbouring clinics.
- Clinic teams are able to see their strengths and weaknesses.
- The performance of the city's TB, HIV/AIDS and TB-HIV services has improved. For example, default among TB patients has been less than 5% for several years; HIV testing among TB patients is almost 100%; CPT uptake has reached 95% among HIV-positive TB patients; and enrolment into ART is at 68% among these patients.
- Clinic teams take ownership of collaborative TB-HIV services.

4.10. What are the pros and cons of an electronic register for monitoring TB-HIV care?

Because of the high burden of TB and HIV cases in some countries, an electronic register is seen as a possible alternative to a paper-based system. While there may be advantages to the use of this type of register, some potential negative consequences must be considered.

In favour of an electronic register is the greater ease in summarising or aggregating large quantities of data and the ability to produce standardised reports, tables and graphs. However, caveats remain. Unless data entry is done at the point of care, information to be entered in an electronic register must still be recorded elsewhere before it is put into the system. Since electronic registry information is most often kept in a common computer, rather than in a computer dedicated for this purpose, the computer may be co-opted for other uses in the health facility, and there is a risk that it could be stolen. Sufficient funds are needed not only for the purchase but also the maintenance of computer hardware; staff must be trained to use the machine itself as well as the registry; a reliable electrical supply must be available; and a regular secure back-up system must be in place to prevent loss of data in the event of a computer crash.

5

Financing and technical support of collaborative TB-HIV services

TB and HIV collaboration requires financial, technical support and other resources so that services ranging from diagnosis and counselling to treatment and patient support can be provided. In view of the fact that the duration of drug-susceptible TB treatment ranges from six to eight months, while ART is lifelong, financing of these services needs to focus on long-term funding mechanisms. Interruptions in funding can lead to problems, such as stockouts of medicines, which may in turn lead to the development of drug-resistant strains, and should be prevented. Managing patients with drug-resistant TB or providing PLHs with second-line ART is more expensive and more difficult.

5.1. What is the role of the national government in financing TB-HIV collaboration?

It is the responsibility of a national government to provide the funding needed to ensure that collaborative TB-HIV activities can be implemented well. As explained elsewhere in this guide, when a national government pays for laboratory tests, medications, various essential consumables, as well as the staff providing the services, it is a concrete sign of its political will and commitment to the health of its people. By making this commitment, the country avoids placing the TB and HIV programmes and patients' lives at the mercy of fluctuating international or private health funding. The national government can seek help and additional support from partners, but it should not rely entirely on them.

5.2. Does a country need a separate funding mechanism for collaborative TB-HIV activities?

TB and HIV are two diseases that affect one individual within one health system. It follows that it is **not** necessary to have a separate funding

mechanism for collaborative TB-HIV activities. Financing of these services should be included in a country's national health budget as part of the funding made available for TB and HIV/AIDS services.

5.3. What could be additional sources of funding and technical support for collaborative TB-HIV activities?

The Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) supports the implementation of joint TB-HIV activities in many countries. Global Fund applications require countries to incorporate HIV activities into their TB proposals and TB activities into their HIV/AIDS proposals. However, the GFATM derives its funding from international community contributions, and it is not guaranteed to last forever. To mitigate the risk, it is recommended that countries include funding from this source in their national strategic health plans, but consider increasing their national commitment as well and gradually build up their own support.

There are several development agencies that provide significant amounts of funding and technical support for TB-HIV activities. These include the United States Agency for International Development (USAID), the President's Emergency Program for AIDS Relief (PEPFAR), the US Centers for Disease Control and Prevention (CDC) and the GFATM. The development agencies established by other countries, including France, Switzerland and Canada, also fund TB and/or HIV activities.

Foundations, such as the Bill and Melinda Gates Foundation and the William J. Clinton Foundation, can also be sources of funding for collaborative TB-HIV activities. Like the GFATM and the bilateral agencies, these donors require sound work plans and budgets before they offer funding for any activities.

Other sources of support and technical expertise come from community and private organisations, including corporations, religious bodies and non-governmental organisations (NGOs). These funding partners can function as service 'extenders' for the NTP and NAP (Box 5.1). Such partnerships should be welcomed, as they can be 'profitable' for all parties—the patients and their communities, as well as the health care system. In the case of companies, support for health care can also be good business: employers help to keep their workforce healthy and productive, and the company also benefits from good public relations.

Box 5.1 Examples of private organisations and communities that fund collaborative TB-HIV services, the Democratic Republic of Congo and Myanmar

In the **DRC**, a mining company funds TB-HIV care and treatment services for its employees and their family members.

In **Myanmar**, a private consortium of oil companies, working with the government and through technical support from The Union, is financing care and treatment for 2,000 HIV-infected patients, including those who are not their employees. In addition, the PLHs Network of Mandalay, a community-based organisation, carries out income-generating projects that provide funds for its activities designed to increase awareness, reach more patients and ensure adherence to treatment.

6
Coordination of collaborative TB-HIV services

Collaborative TB-HIV activities present an opportunity to strengthen TB and HIV services as well as the **entire health system**, in terms of service provision, procurement and distribution of medications and supplies. They help to develop multi-skilled staff who benefit from periodic re-training and regular supervision, and they strengthen the recording and reporting on TB, HIV/AIDS and TB-HIV. National governments, however, need to play a robust role in providing TB-HIV services and coordinating efforts to manage them.

6.1. What is the role of the national government in TB-HIV collaboration?

The national government provides leadership and political will to ensure that all relevant stakeholders accept and implement the agreed collaborative activities. Ideally, the government should fund this mandate to ensure a sense of ownership. If this is not possible, funding partners may be asked to support the activity, based on a sound national strategic plan.

6.2. Does a country need a separate strategic plan for collaborative TB-HIV activities?

TB and HIV are two diseases that affect one individual within one health system.

Therefore, the strategic plan that guides the provision and management of collaborative TB-HIV services is not a stand-alone document, but forms a chapter in the national strategic plan for TB on the one hand and HIV/AIDS on the other.

6.3. What is a TB-HIV coordinating body?

In view of the fact that most countries and ministries of health have separate national TB and AIDS programmes, a coordinating body needs to be established and supported. This body addresses aspects of both programmes' work pertaining to the diagnosis and management of patients with these two conditions. A well-functioning coordinating body ensures that there is no need to create a third programme to address TB-HIV co-infection.

6.4. Why is a TB-HIV coordinating body needed?

A national or central level TB-HIV coordinating body is required for several key functions, such as developing a national TB-HIV policy and guidelines and ensuring that such policies and guidelines are integrated into other relevant documents. This body can also plan collaborative activities; oversee, monitor and evaluate their implementation; and identify the resources required for joint TB-HIV services.

It is not sufficient to have only a national level coordinating body. Management of TB-HIV services is needed at all levels of health care to ensure accessible and efficient services for co-infected patients. This means that functional coordinating bodies should also be established at the provincial/regional and district levels of health care.

6.5. What are the main tasks and responsibilities of a TB-HIV coordinating body?

The main tasks and responsibilities of a TB-HIV coordinating body depend on the level of health care at which it functions; for a summary, see Appendix 3. Responsibilities may range from policy setting and establishing guidelines to the actual provision of patient services. They may also include ensuring that TB-HIV services reach the entire population and that no discrimination exists.

6.6. Why is the role of a TB-HIV coordinating body in reducing TB-HIV discrimination important?

It is in the interest of the national programmes for a country to have health services, including TB-HIV services, provide as high coverage as possible. It follows that it is essential to identify the most vulnerable populations and ensure that individuals belonging to these groups can access

services and that they are not discriminated against. These populations include sex workers, injecting drug users (IDUs), men who have sex with men (MSM), transgender persons, migrants (both legal and undocumented), ethnic minorities and sometimes the PLHs themselves. If discrimination and stigma are not fought against, health services are unable to reach the vulnerable populations. Consequences of this failure can include:

- HIV-infected individuals with or without TB remain undiagnosed.
- These undiagnosed individuals may spread HIV and TB in the community.
- Stigma and discrimination may have an adverse effect on treatment adherence.
- TB-HIV prevention campaigns may not reach members of vulnerable populations.
- HIV- and TB-related mortality may remain high due to late presentation and diagnosis.

6.7. Who should be the members of a TB-HIV coordinating body?

The members of a TB-HIV coordinating body should include all relevant stakeholders, such as:

- officials of the independent national AIDS council, if applicable
- officials of national AIDS and TB control programmes
- other ministries that support or provide health services
- representatives of civil society
- non-governmental and community-based organisations, including patient organisations
- private health sector representatives
- funding partners.

There needs to be a balance between inclusiveness and the size of the body, since a large group may have difficulty convening and reaching consensus within a desirable timeframe. In certain settings, the coordinating bodies call upon experts and other key informants who are not regular members, when required.

6.8. How can community-based organisations be represented on a TB-HIV coordinating body?

Representatives of various community-based organisations (CBOs) should be included in the planning, implementation and evaluation of TB-HIV

services at all levels of health care. The advantages of this involvement have been demonstrated by NAPs in several settings.

These advantages include the following:

- Health professionals shift from a mindset where they consider patients as 'recipients or consumers of services' to one where they see them as 'expert patients in charge of their own health'.
- Meaningful partnership develops between patients, their families and communities and health services, which can help to ensure provision of TB-HIV services that accommodates the views of all parties.
- Good communication is facilitated and builds a bridge between health services and communities strengthening efforts to reduce stigma and discrimination that may be associated with TB and HIV infection, as well as certain high-risk groups.

CBOs may include HIV patient support groups, treatment activists and their umbrella organisations, community-based home care groups and civic organisations that are active in health and particularly in TB-HIV.

6.9. What are some practical hints to ensure efficient functioning of a TB-HIV coordinating body?

It is not enough to merely establish a coordinating body. It should work efficiently to ensure fulfilment of its responsibilities and tasks. The lessons learned in the Union-supported sites include:

- In one of the partner countries, the TB-HIV coordinating body meetings were initially convened by the NTP. However they were poorly attended, especially by the NAP staff. Then the responsibility of convening meetings was given to the Director of Disease Control, an office to whom both the NAP and NTP directors report. After that, the body began to function, and the meetings were well attended.
- TB-HIV coordinating bodies at all levels of health care require a focal person or a coordinator whose main duty is to ensure efficient functioning of the bodies.

  - A focal person is rarely a full-time job, and the duties can be carried out on a rotational basis by, for example, the NTP's TB-HIV focal person and the NAP's HIV/TB focal person.
  - The major tasks of this person are to:
    - convene meetings
    - prepare meeting agendas in consultation with the relevant persons
    - prepare documents, such as TB-HIV reports, that are to be discussed in the meeting
    - make arrangements for paying allowances, where applicable
    - write and circulate the minutes of the meeting
    - ensure that agreed action points are followed up by responsible persons within the agreed timeframe.
- TB-HIV coordinating bodies at all levels benefit from having a chairperson who is able to conduct meetings professionally.
  - Well-run meetings have these characteristics:
    - They start and end at the planned times.
    - Participants all have the right to express their views and be listened to.
    - The chairperson is able to summarise differing opinions and guide the body to a decision that receives support from the majority of members.
    - Minutes of the meeting are taken.
    - Participants leave the meeting with a commitment to carry out the tasks that they agreed to take on (which are listed in the minutes) and to attend the subsequent meeting.
- The frequency of the meetings needs to be agreed by the members, and a balance should be sought between holding meetings too infrequently, which may lead to delays, versus holding meetings too often, which may result in poor attendance and 'meeting fatigue' among members. In some settings, recently convened TB-HIV coordinating bodies have decided to meet monthly for an initial six-month period and then quarterly. A plan for calling urgent meetings can also be made.
- To ensure good attendance at every meeting, it is advisable to i) set a yearly schedule of the meeting dates at the beginning of the year and adhere to it as much as possible; and ii) invite guest speakers to

present on a topical TB-HIV issue, recent research finding or other issue, as a way of keeping members' interest in attending the meetings high.

6.10. What are some of the key TB-HIV messages to be disseminated by TB-HIV coordinating bodies?

TB-HIV coordinating bodies at all levels of health care have an important role in developing and disseminating key TB-HIV messages to the communities. Some of these messages could include the following:

- While patient information on TB and HIV should explain the association between the two diseases, it should also be made clear that having one infection does not automatically lead to having the other. For example, in most Asian and several sub-Saharan African countries, the majority of TB patients are HIV-negative. Half of TB patients in Uganda are not HIV-infected, and the proportion of dually infected patients is even lower in Western Africa.
- It should be highlighted that TB can be cured even in patients who are HIV-positive.
- It is important to encourage communities to participate in TB contact tracing and prevention efforts, especially in children.
- Ideally, when a community with high levels of TB and HIV is informed about available services, its members will respond by seeking care, thus reducing the diagnostic delay. Communication also plays an important role in improving treatment adherence, which is important to prevent drug resistance. However, advocacy, communication and social mobilisation (ACSM) campaigns for any condition should not be started if the health system is not ready to meet the demand for services. It is important to prevent creating a situation where the community becomes disappointed with the health services. This can compromise the success of future campaigns.

ACSM programmes can enable people affected by TB or HIV to have their voices heard and respond constructively to the crisis. For example, in the DRC, former TB patients support treatment adherence of current TB patients. In Uganda, persons in some communities provide simple companionship at home to PLHs who are physically and/or socially isolated.

6.11. What bottlenecks need to be overcome to effectively coordinate and implement collaborative TB-HIV activities?

Because of the vertical structure of the national AIDS and TB control programmes in many countries, setting up effective coordinating mechanisms between the two programmes can be a challenge. Various types of bottlenecks may develop. Good communication is the underlying principle to address them. Experiences from the Union-supported sites are summarised in Appendix 4.

7

Role of collaborative TB-HIV activities in strengthening the general health system

By strengthening various aspects of the general health system, TB-HIV collaborative activities can have a broad beneficial impact beyond improving services for patients with TB and HIV. Examples of areas that may be positively affected are supply management and procurement, training, supervision and operational research.

7.1. Role of supply management in collaborative TB-HIV services

Medications for patient treatment form the cornerstone of all health programmes, including the TB and HIV services. Without uninterrupted and sufficient stocks of medicines, it is impossible to manage patients with any chronic condition or demand that patients adhere to their treatment.

7.1.1. What is the role of the national government in ensuring effective supply management in collaborative TB-HIV services?

The role of the national government is to demonstrate its commitment to the health of its citizens by budgeting funds to pay for essential TB and HIV medicines and consumables. This responsibility also applies to the country's other critical health problems.

7.1.2. Why is efficient supply management essential?

Uninterrupted and quality-assured supplies of medicines and consumables are **vital** for the diagnosis and treatment of patients who need to adhere to their prescribed medications for a long period of time. Management of ARV medicines is further complicated by their relatively short shelf life, and the fact that ART is life long. As more and more patients are

enrolled into care, the number of patients requiring medicines and the quantity of medicines needed continue to increase cumulatively, even taking into account medicines not used by patients who die or who are lost to follow-up.

7.1.3. What supplies are needed for collaborative TB-HIV services?

Collaborative TB-HIV services require that each programme use commodities that are traditionally utilised by the other programme. Table 7.1 lists the essential supplies each programme should ensure are regularly distributed in sufficient quantities to health facilities that manage TB-HIV patients. Actual needs will vary depending on how responsibilities for service delivery are assigned (e.g., TB clinics will need to stock ARV medicines only if they are charged with providing patients with these medicines).

7.1.4. Who is responsible for supply management in collaborative TB-HIV services?

The national TB and AIDS programmes and provincial/regional health offices should ensure that required consumables are available and distributed to the facilities at all levels of the health care system in a timely manner. Checking on stock levels, stock management and control are also important aspects of supervision. Good communication and close collaboration between the different levels of health care and the managers of the national procurement agency are required. Appendix 5 presents the components of a good supply management system for medicines.

Table 7.1 Supplies required for management of patients with TB and HIV infection

Supplies required to manage TB patients	*Supplies required to manage HIV-infected patients*
• Laboratory supplies: reagents, slides and sputum containers • Anti-TB medicines, pyridoxine, cotrimoxazole • National TB programme forms and stationery for patient management and reports[26]	• Minimum of two types of rapid HIV test kits • Cotrimoxazole, antiretroviral medicines and medicines for treating opportunistic infections and adverse effects of ARV medicines • Isoniazid for TB prevention and pyridoxine • Female and male condoms (for both HIV-positive and HIV-negative patients) • National AIDS programme forms and stationery for patient management and reports

7.1.5. Should a country merge the supply chains for TB and HIV medications and commodities?

In some countries, the purchase of commodities is conducted through governmental medical stores, an approach that offers the possibility of an integrated system. In other countries, medications and supplies for the TB and HIV programmes are ordered and distributed separately. Some of the reasons for this may include:

- The creation of TB programmes predated the emergence of HIV, and some of these programmes developed standardised procedures that linked the ordering and distribution of medications and supplies to patient registration on a quarterly cycle. AIDS programmes, which originally focused on prevention, put in place their own procurement and distribution systems when medications became available.
- Because of the priority given to AIDS by donors and governments, some AIDS programmes may be favoured with a specific budget line for medications and supplies and their distribution. TB programmes are less likely to be budgeted in this way.
- Certain commodities, such as isoniazid for prevention of TB or HIV test kits, have the mandate of one programme but not the other.

If the systems are separate, a country needs to analyse the advantages and disadvantages of merging the supply chains from the point of view of cost-effectiveness, convenience and donors' requirements. What remains vital is the need for good coordination and communication so that consumables that are required by both programmes, such as rapid HIV test kits, cotrimoxazole and isoniazid, are available in the required quantities.

7.2. Role of training in collaborative TB-HIV services

7.2.1. How can TB-HIV training be arranged?

The concept of collaborative TB-HIV services was introduced in 2004. This means that many experienced health professionals were trained at a time when their curricula did not contain much information on this issue. As a result, they need in-service training to cover gaps and bring their knowledge and skills up to date.

When planning a training programme, it is important to first identify the needs of the health staff so that they are adequately cross-trained to address both diseases. Depending on the cadre of staff, they may need

clinical care skills, health education and/or counselling skills. Appendix 6 presents a list of training needs that have been identified at the Union-supported sites.

National programmes should develop a training plan that will determine how many staff will be trained each year, who will be responsible for the training, the type of training to be carried out, where and when it will take place and how it will be financed, monitored and evaluated.

In some settings, the initial focus is on disease-specific training. For example, TB clinic staff may benefit from participating in a training session focused solely on HIV diagnosis and management, as they will already be well versed in all aspects of TB care. Over time, TB-HIV-related topics can be integrated into the programme's routine training courses at all levels of the health service. This will reinforce the idea that management of HIV infection is part and parcel of providing comprehensive TB care and that conversely, diagnosis and management of TB is crucial to HIV care in settings with HIV-driven TB epidemics.

Another challenge that can arise when introducing joint TB-HIV services is the fact that the entire health team requires training in the management of co-infected patients. How best to organise training depends on the setting, the number of staff involved and the available resources (Box 7.1).

Box 7.1 TB-HIV training, Benin

When provider initiated testing and counselling (PITC) and HIV care were integrated into TB services in Benin, the initial training strategy relied on a team approach to prepare TB clinic staff for their new responsibilities. A nurse, laboratory technician and medical officer from each TB clinic in a province were invited to attend a training session on HIV diagnosis and management, including the performance of rapid HIV testing. While this approach seemed to bolster a sense of common purpose within the teams, it also became clear to the trainers that nurses and laboratory technicians tended to be less active participants when doctors were present, because the latter were more assertive and continued to behave as their team's hierarchical superiors during the training. Drawing lessons from these observations, the NTP began organising training sessions for specific cadres of staff to ensure that participants would feel free to express their questions and concerns and would derive maximum benefit from the training.

Training facilitators should respect the principles of adult learning and recognise the fact that adults learn best when new content is related to the information and experience that they already possess. Participatory training techniques, rather than lectures, ensure better learning. Classroom training alone may also be insufficient, and mentorship to translate didactic knowledge into correct action may be necessary (Box 7.2).

Box 7.2 Attachment system provides hands-on learning in TB-HIV services, Zimbabwe

In Harare and Bulawayo, Zimbabwe, nurses gain practical experience in managing co-infected patients through an 'attachment' system. After they have completed the traditional in-class course on managing TB-HIV, they are assigned to work for four weeks at a facility that is already implementing collaborative TB-HIV activities. They work together with the nurses to learn progressively but quickly all aspects of the programme. For the receiving facility, the 'attached' nurses represent a welcome, if temporary, addition to the labour force. At the end of their attachment, they return to their clinic of origin and are able to perform and share with their colleagues what they have learned on the job.

7.2.2. What should be included in undergraduate/pre-service TB-HIV curricula?

Undergraduate/pre-service curricula for all health professionals should include not only clinical, but also ethical and programmatic information on TB, HIV and their relationship. In The Union's experience, undergraduate medical education often concentrates on the clinical aspects of disease management, without linking it to the public health agenda. This is particularly true in the area of recording, reporting and analysing data to improve programme performance. Stronger teaching content in these areas would better prepare newly qualified health professionals and lighten the burden of extensive induction and in-service training.

7.3. Role of supervision in collaborative TB-HIV services

7.3.1. Why is supervision important in collaborative TB-HIV services and how is it handled?

Supervision has two main functions. First, it provides an opportunity to reinforce classroom training, adherence to the national guidelines and good practice. Second, it is a tool for assessing progress towards programmatic goals, linked to the indicators used to monitor TB-HIV care.

Key components to be reviewed in general supervision, which also apply to supervision of joint TB-HIV services, include the following:

- Supervision should be data-driven and based on TB and TB-HIV reports made by the district or province/region.
- All areas providing and supporting TB-HIV services should be assessed:
  - —onsite patient management, including waiting areas (triage and IC)
  - —laboratory (diagnosis)
  - —consultation rooms and wards (patient care)
  - —pharmacy (stock management).
- Tools, such as standardised checklists and/or questionnaires and patient exit interviews, can also be reviewed.
- On-site feedback at the end of the supervisory visit should be given to the person(s) in charge of the facility and the staff. This feedback should always be constructive and balanced, pointing out both strengths and weaknesses.
- Under-performance should be noted and a plan of action for correction devised.
- A summary of the findings should be written during the visit and left at the facility, with a copy retained by the supervisor for reference during subsequent follow-up and supervision visits.

In many countries, the TB-HIV coordinating bodies are exploring ways to perform joint supervision. This means that if dedicated TB officer and HIV/AIDS officer positions exist—which is frequently the case at the national and provincial/regional levels of health care—these officers could weigh the advantages and disadvantages of combined supervision visits. In Benin, when collaborative TB-HIV activities were introduced, NTP and NAP staff performed a joint TB-HIV supervision once a year. At the provincial/regional level in certain countries, one officer is responsible for

both TB and HIV and, therefore, supervision automatically becomes integrated. There is no need for a specific body that carries out only TB-HIV supervision—supervision of these services should always be an essential part of the responsibilities of existing supervisory staff.

In most countries, at sub-district and district levels of health care, most health personnel are 'generalists' and do not represent any programme as such. This may also lead to supervision where one person or a team consisting of various health staff assesses progress made in providing joint TB-HIV activities and services.

7.4. Role of operational research in effective TB-HIV services

7.4.1. What is operational research and why is it important in collaborative TB-HIV activities?

The Union defines operational research as 'research into strategies, interventions, tools or knowledge that can enhance the quality, coverage, effectiveness or performance of the health system or programmes in which the research is being conducted'.[27] The development of TB-HIV research priorities is guided by two principles:

- A country's collaborative TB-HIV activities are based on well-defined goals and objectives. Constraints that preclude reaching the objectives must be determined and prioritised.
- Research questions are developed to address these constraints. For example, are they due to a gap in knowledge or are the tools and strategies to reach the objectives being poorly utilised?

7.4.2. What topics are appropriate for TB-HIV operational research?

National programmes should identify priority operational research questions to evaluate programme operations with the aim of improving them. The studies can be performed via descriptive, case control or cohort analysis methodologies. Data for studies can be obtained from routine monitoring and evaluation systems, which are the mainstay of TB and ART programmes. Some potential research areas include:

- How long does it take to start ART in HIV-positive TB patients?
- How does the time to start of ART in these patients affect mortality?

- What factors (patient, health worker and health system) influence uptake of TB screening for PLHs?
- What is the best mechanism to ensure that HIV-positive TB patients are referred to continue ART after completion of TB treatment?
- Is it possible to implement and monitor IPT in PLHs in order to reduce their burden of TB?
- What are the best operational models to implement and monitor IC measures in health facilities?
- Does HIV testing and referral to HIV care of those found to be HIV-positive improve the outcomes of patients with suspected TB?

7.4.3. Who should engage in operational research in TB-HIV?

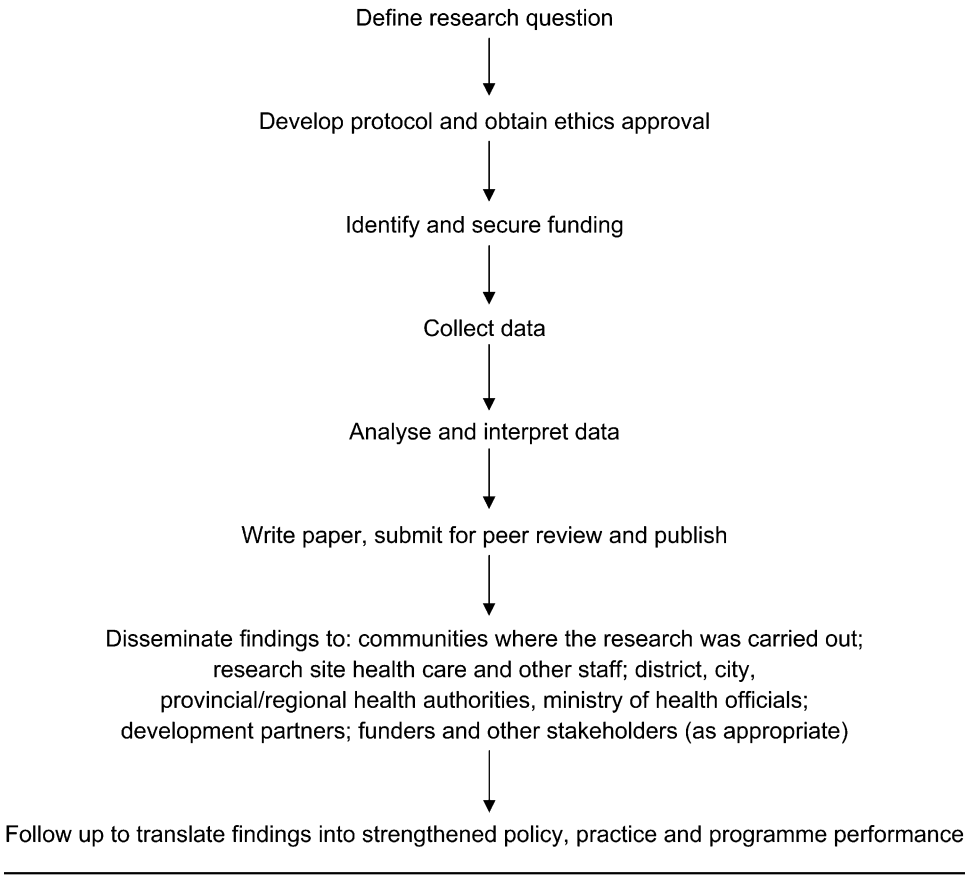
National programmes can form partnerships with researchers from academic and other institutions within or outside of the country to lead or support relevant operational research on their behalf. Researchers should be encouraged to train and mentor the officers within the NTPs and NAPs to design and implement operational research.

7.4.4. How should operational research results be used and disseminated?

Ideally, operational research results should be used to improve the design and operation of the health system so as to improve the quality and efficiency of TB-HIV service delivery. These results can be disseminated through in-country stakeholder meetings, publications in journals and presentations in national and international forums. Figure 7.1 illustrates the steps from research question to dissemination and the translation of findings into policy, practice and performance.

Examples that illustrate how these steps were implemented in Uganda, and short summaries of the operational research carried out at the Union-supported sites are presented in Appendices 7–9.

Figure 7.1 Steps from research question to translation of findings into strengthened policy and practice[28]



Appendices

Appendix 1
Post-exposure HIV prophylaxis

Post-exposure prophylaxis (PEP) should be provided for persons who have been accidentally exposed to patients' blood and/or body fluids through a needle-stick inoculation or contamination of mucous membranes. If ART is initiated within 72 hours of the exposure and continued for one month, the likelihood of the person becoming HIV-infected is reduced. Examples of a PEP treatment regimen are zidovudine and lamivudine with or without lopinavir/ritonavir. It is important to follow national guidelines.

The recommended steps for an injury with a sharp object (needle, scalpel) or splash of blood to the eyes or mouth of a health worker are:[29,30]

1. Wash exposed hands with plenty of water and soap without delay; rinse exposed eye(s) or mouth with plenty of water without delay.
2. Injury should be reported to a supervisory member of staff who will then manage PEP for the affected staff person.
3. The ARV medicines recommended in the national guidelines should be started as soon as possible, preferably **within 1 hour** and, at the latest, within 72 hours of exposure.
4. HIV status of i) the source patient and ii) the exposed staff member should be ascertained (through history taking, record review, or testing, if necessary). Appropriate counselling should be provided.
   - If the HIV status of the source patient cannot be determined, it should be assumed to be positive.
   - If the exposed health worker refuses to be tested, the person may be unable to make a claim for compensation in the future.
5. **Subsequent actions** depend on the HIV test results:
   5.1 Source patient is HIV-negative:
      - PEP is not necessary and can be stopped.
   5.2 Exposed health worker is HIV-positive:
      - PEP is not necessary and can be stopped, but it is important to ensure that the health worker is receiving appropriate HIV care and counselling.

5.3 Exposed health worker is HIV-negative, but the source patient is HIV-positive:

- ARVs should be continued for one month.
- HIV testing should be repeated at six weeks, three and six months after exposure
- Counselling and psycho-social support should be provided.
- Health worker should be advised to practice safer sex.
- If sero-conversion occurs, the person should be referred for expert opinion and long-term treatment.

Appendix 2
Practical steps for health-facility level antiretroviral treatment outcome analysis

1. **Deciding which ART cohort and which milestone ART outcomes should be analysed**. This decision is usually determined by the national reporting procedure. It could be, for example, outcomes for patients started on ART during the 1st quarter of 2010 who have had 12 months of ART. Enough time must have elapsed for all patients in the cohort to reach the treatment milestone. In the above example, the last patient belonging to this cohort would have had a chance to complete 12 months of treatment on 31 March 2011. The decision regarding what to analyse may also need to take into account the schedule for distributing ARV medicine supplies: if patients attend the clinic every two or three months, rather than monthly, the 12-month visit may actually occur during month 13 or 14.
2. **Determining the number of patients in the treatment cohort of interest.** The unit ART register is used to document the number of patients. This number will serve as the denominator when the outcomes are presented as percentages. It includes:
   — all patients initiated on ART during the period (for example, 1st quarter of 2010)
   — minus the patients who belonged to this cohort, but who have since transferred out of the facility
   — plus the 'transfer-in' patients initiated on ART at another site during the same period.*
3. In preparing the report, the ART focal nurse must ensure that **complete information is recorded** in the unit ART register for all patients in the cohort of interest and for the milestone being assessed.
4. The number of patients who have a certain ART outcome at the agreed milestone are counted from the unit ART register. For example, for the outcome 'Alive and on ART at 12 months', the number of patients with an appropriate notation in the column for attendance at 12 months is

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* Anti-TB treatment outcome analysis excludes transferred-in patients (whose treatment outcomes are reported by the centre that originally registered them), while ARV treatment outcome analysis for transferred-in patients counts them at the receiving centre, in accordance with WHO guidelines. These guidelines also explain how to record transferred-in patients into the receiving facility's ART register. See World Health Organization, *Patient Monitoring Guidelines for HIV Care and Antiretroviral Therapy (ART)*.[31]

noted. This is repeated for all ARV treatment outcomes (Died, Lost to Follow-up and Stopped).

— Depending on the notation system adopted by the country, the outcome category 'Alive and on ART' may correspond to a performance scale notation, such as 'Working', 'Ambulatory' and 'Bedridden'.

— In the case of deaths, it is important to remember to count all patients in the cohort who have died since they initiated ART and not only the patients who died since the previous review. Otherwise, the number of evaluated patients will not add up to the total that was obtained in Step 2.

— In the case of patients who are lost to follow-up or stopped treatment, only those patients who were lost or stopped at the time they

Example of a '12-month ARV treatment outcome analysis' for the 1st quarter of 2010, carried out on 14 April 2011 (2 weeks after the end of the 12-month period) at an African clinic[32]

Number of patients in this cohort	
Number of patients started on ART at clinic (from 1 January to 31 March 2010)	76
Number of patients transferred out	2
Number of patients transferred in	4
Number of patients in this cohort	78
ART outcomes	
Alive and on ART	67 (86%)
On 1st line ART	64
On 1st line ART with substitution	3
On 2nd line ART	0
Stopped ART	0
Died	9 (12%)
Lost to follow up	2 (2%)
Other information	
Of those alive and on ART	
Number working	60 (90%)
Number ambulatory	6 (9%)
Number bedridden	1 (1%)
Of those who died	
Number who died in 1st month (of ART)	4
Number who died in 2nd month	3
Number who died in 3rd month	1
Number who died after 3rd month	1

should have reached the milestone (based on their ART start date) should be counted. If they stopped or were lost at some point in the past and then resumed treatment, they should be considered as 'Alive and on ART' for the milestone of interest.

5. By dividing the count for each treatment outcome by the total size of the cohort, the outcomes can be expressed as percentages.
   — The percentages should add up to 100%, and the sum of the counts for all outcomes should add up to the total number of patients in the cohort.
6. To assess other aspects of the therapeutic response to ART, the cohort analysis can also include the following calculations:
   — the percentage of patients recorded as 'Working'
   — the median and/or mean body weight
   — the median and/or mean CD4 lymphocyte count
   — analysis of the number (and percentage) of patients who are alive and on ART and who are on i) first-line ART, ii) first-line ART with a substitution of a medicine and iii) on second-line ART
   — analysis of the number (and percentage) of patients who died by time of death (as measured from the start of ART).

Appendix 3
Main tasks and responsibilities of TB-HIV coordinating bodies

National coordinating body	*Provincial/regional coordinating body*	*District coordinating body*
Ensure that i) TB-HIV strategy, policy and guidelines are an integral part of national health strategy and health system and ii) implementation of the planned strategies is carried out and iii) objectives are achieved.	Plan and facilitate accreditation of TB and HIV/ART sites and ensure equitable access to services in all districts in the province/region.	Prepare health facilities in the district for accreditation to become ART initiation and follow-up sites.
Identify, mobilise and equitably distribute resources for collaborative TB-HIV activities. Support efforts to decrease stigma and discrimination associated with TB-HIV, including criminalisation of vulnerable groups.	Facilitate efficient management of TB-HIV services by i) ensuring sufficient and regular supplies of all essential medicines and commodities required for TB-HIV services, and ii) monitoring TB-HIV care, for example, by reviewing periodic reports and discussing them in programme performance review meetings.	Identify special, hard-to-reach groups, such as prisoners, internally displaced persons and refugees, and ensure that they have access to TB-HIV services.
Support human resource development for TB-HIV: pre- and post-service training, planning of in-service training.	Provide in-service training for health workers and ensure staff are multi-skilled, if prevailing TB-HIV situation so demands.	Provide in-service training for health workers in the district and oversee provision of services for TB-HIV patients.
Supervise all provinces/ regions.	Supervise all districts in the province.	Supervise all health facilities in the district, including validation of TB-HIV reports and compilation of district summary reports.
Ensure that high priority is given to TB-HIV monitoring and evaluation activities.	Use local TB-HIV data to identify weaknesses and take action in order to strengthen both coverage and quality of services.	Use local TB-HIV data to identify weaknesses and take action in order to strengthen both coverage and quality of services.
Provide enabling environment for operational research, guidance on priority research questions and translation of research findings into policy, practice and programme performance.	Define research questions on TB-HIV patient management and programme aspects to improve services and treatment outcomes; support and carry out operational research.	Conduct and participate in operational research.

Appendix 4
Bottlenecks and potential solutions: lessons learnt from the Union-supported sites

TB-HIV coordination bottleneck	*Potential solution*
Political, legal and/or administrative delays in the adoption of policies that reinforce coordination between the two programmes	Commitment and political will of ministry officials who supervise national TB and AIDS control programmes
Resistance to change when change leads to modifications in the power or authority of some individuals	National interest comes always first, but job descriptions may be revised and affected officials assured of the continuing importance of their roles.
Delays in coordination caused by different perceptions about collaboration and integration	Standard operating procedures defining responsibilities of each programme should be in place; periodic meetings should be held to review areas of concern and clarify concerns.
Separate procurement, storage and distribution systems for medicines and other essential consumables	While a country needs to decide whether to merge or keep separate all or part of the procurement systems, at a minimum, a mechanism is needed to ensure that ARVs, HIV test kits and other supplies used by the TB programme, and TB medications, sputum cups and other supplies used by the AIDS programme are included when procurement, storage and distribution plans are made.
Perceptions among health workers that collaborative TB-HIV services are 'additional' to their duties. This notion may lead to the expectation of allowances when TB-HIV duties are carried out and resistance to providing them when no payment is received.	The following fact should be communicated to health personnel and their supervisors: Collaborative TB-HIV activities are contained in the national health, TB and HIV/AIDS policies and are part of routine services in most countries (with HIV-fuelled TB epidemics).
Staff shortages or high turnover resulting in increased workload	Solutions should be devised after an analysis of the causes for the shortages and turnover. Patients seek comprehensive care for all their health needs, whether the problem is diabetes, hypertension, an injury, TB or HIV, and services should be integrated to address them. Ideally, health workers should have pre-service and on-the-job training that prepares them for a wide variety of tasks. In many settings, a **multi-skilled** health worker is necessary to provide integrated services for prevalent conditions. Task-shifting—whereby tasks performed by one cadre are transferred to a lesser-trained one—has been used to cover gaps in services. Some examples include training nurses to initiate and monitor TB treatment and ART in uncomplicated patients; and training auxiliary staff to perform sputum-smear microscopy and rapid HIV tests, where laboratory technicians are not available.

Appendix 5
Components of a good supply management system for medicines

The following are the major components of a good supply management system for all essential supplies, including commodities for TB-HIV services.

- Ordering should be done at regular intervals, for example, quarterly.
- Ordering and maintenance of supplies should be based on expected needs, which are best estimated based on recent diagnosis and treatment activity reports, as well as the stock available when the order is placed.
- Orders should include a reserve stock to ensure availability of supplies in case of delays in deliveries.
- The reserve stock should be equivalent to the requirements for the period between deliveries.
- The quantity of medicines dispensed from the storerooms should be compared with the number of patients reported to prevent loss of medicines.
- Secure, dry and adequately ventilated storage conditions are essential at all levels of the health care system.
- Stocks should be kept according to the expiry date of each batch of medicine or reagent. Medicines and reagents that expire first should always come out of stock first. Expired medicines should not be dispensed to patients, and expired reagents should not be used in the laboratory.

Appendix 6
Training needs for implementing collaborative TB-HIV activities

For TB staff, training on HIV should highlight:

- National guidelines on HIV prevention and care
- Modes of HIV transmission (unprotected sex, from an infected woman to her unborn or newborn baby and unsafe blood products)
- HIV diagnosis using rapid HIV tests (including practical training on how to perform the tests)
- Standardised ART regimen and need to adjust regimen when TB patient is taking rifampicin
- Adverse effects associated with ART medications and their management
- Role of CPT
- Universal IC
- Role of ICF among PLHs
- Value of isoniazid to prevent TB in PLHs
- Recording and reporting in HIV
- Key HIV education messages for patients and the community, the link with TB
- Non-judgmental attitude towards PLHs and vulnerable population groups

For HIV staff, training on TB should highlight:

- National guidelines on TB control and TB patient management
- Mode of transmitting TB bacilli (through air)
- TB diagnostic algorithms that start with a symptom screening, followed by sputum-smear microscopy. They include other investigations, such as chest radiography, rapid molecular diagnostic, culture and susceptibility testing.
- Standardised anti-TB treatment regimens and need to adjust nevirapine-containing regimens if TB patient is also taking rifampicin
- Adverse effects associated with TB medicines and their management
- Role of ICF among PLHs
- Value of isoniazid to prevent TB in PLHs
- Universal IC, including airborne IC
- Recording and reporting in TB
- Key TB education messages for patients and the community, the link with HIV
- Recognition of stigma attached to TB and importance of patient-centred care

Appendix 7
From defining a research question to translating the findings into policy and practice in Uganda

In Uganda, The Union provided training to the national TB and AIDS programme and senior district health officials on how to conduct operational research and use its findings to change policy and practice. The officials weighed several possible research questions and then focused on the questions that would help the country to address the challenges it faced in scaling up collaborative TB-HIV activities. They decided to carry out operational research on the health system barriers that affected the implementation of collaborative TB-HIV services.

National experts and The Union team collaborated on developing the research protocol. Funding was secured from USAID by The Union on behalf of the Ministry of Health. The national programme and district staff carried out the data collection, analysis and interpretation with technical assistance from The Union.

The key findings revealed that the districts required more support in planning and implementing joint TB-HIV services and that the national programmes needed to ensure more training in TB-HIV and wider distribution of the national guidelines.

These findings were disseminated widely in Uganda through stakeholder meetings and were published in international journals.[33,34] They have helped the Ministry of Health and its partners to address the barriers to TB-HIV collaborative services. In 2010,[35] 81% of TB patients in Uganda had been tested for HIV, and 90% of the patients found to be positive had been started on CPT, though ART was started in only 24% of these patients.

Appendix 8
Using operational research to evaluate and improve practice for collaborative TB-HIV services in Benin

The Centre National Hospitalier de Pneumo Physiologie (National Referral Centre for Respiratory Medicine; CNHPP) in Cotonou, Benin is accredited to provide ART to HIV-positive TB patients. However, to keep the number of patients on ART follow-up at the facility manageable, HIV-positive patients are referred to other HIV care sites when they have completed their anti-TB treatment.

In 2008, CNHPP staff used operational research to assess whether former TB patients who had been advised to present to another HIV care site had done so. A sample of HIV-positive TB patients was randomly selected from the TB register. These patients were then contacted by a CNHPP staff member, who asked them a series of questions about their care history after the completion of the anti-TB treatment. The study assessed the proportion of patients who had continued HIV care and the types of barriers that patients had encountered in accessing care.

As a result of the study, the referral mechanisms were strengthened to include:

- telephone calls to the receiving HIV care site to announce patients' arrival and confirm that they had presented
- providing patients with a copy of their treatment record
- ordering all laboratory tests that the ART site might require in advance to ensure that test results are already available for the patient's first visit
- referring patients primarily to government clinics that would not charge for registration
- a referral register for patients on ART was also added to the recording system.

In addition, the research included an intervention component: patients who reported that they did not have any means of HIV care follow-up at the time of the study were invited to the CNHPP for a clinical evaluation. Medical care (for opportunistic infections, for instance) was provided as needed. A CD4 count was ordered. Further education and information about the benefits of HIV care, including ART, were provided.

Appendix 9
Using operational research to discover patients' views on improving collaborative TB-HIV services in Zimbabwe

The overall objective of this operational research was to evaluate the quality of collaborative TB-HIV services provided by the municipal clinics in Bulawayo, Zimbabwe.[36] The study conducted in the 1st quarter of 2010 used the clinics' ART registers to randomly select 197 HIV-positive TB patients who had received TB-HIV care for three months or longer. These patients were then interviewed using a questionnaire that showed that:

- 156 (79%) of the interviewed patients considered the overall quality of the services good
- 186 (94%) found the communication between them and the health workers good
- 164 (84%) were satisfied with the duration of the interaction with the health workers
- 150 (76%) rated the availability of medicines, degree of assistance by staff and their problem-solving skills as good
- 99 (50%) reported that the clinics offering collaborative TB-HIV services were too far from their homes, which meant that their travelling expenses were high
- 99 (50%) stated that clinic opening hours were inconvenient
- 59 (30%) complained about long waiting times of four hours and more at the clinics.

As a response to these findings, and in order to improve the quality of the collaborative TB-HIV services, the Health Services Department of the City of Bulawayo took the following actions:

- obtained ART initiation accreditation at five additional clinics bringing the number of ART start-up and joint TB-HIV service sites from four to nine (out of a total of 19 primary health care clinics) in January 2011
- since October 2010, ART initiation and follow-up sites have provided ART services on Saturdays to improve access for patients who are at work during weekdays
- since mid-2010, the department has been piloting innovative ways to reduce waiting times at the clinics, for example, by setting up an appointment system
- in order to monitor patient satisfaction about service quality, the department decided to add a section for patient exit interviews into the questionnaire that is used for integrated TB-HIV supervision.

References

1 World Health Organization. Interim policy on collaborative TB/HIV activities. Geneva, Switzerland: WHO, 2004.
2 World Health Organization. Policy on collaborative TB/HIV activities—Guidelines for national programmes and other stakeholders. Geneva, Switzerland: WHO, 2012.
3 Aït-Khaled N, Alarcón E, Armengol R, Bissell K, Boillot F, Caminero CA, CY Chiang, Clevenbergh P, Dlodlo R, Enarson DA, Enarson P, Fujiwara PI, Harries AD, Heldal E, Hinderaker SG, Monedero I, Rieder HL, Rusen ID, Trébucq A, Van Deun A, Wilson N. Management of tuberculosis: a guide to the essentials of good practice. 6th ed. Paris, France: International Union Against Tuberculosis and Lung Disease, 2010.
4 *Ibid*., pages 20–21.
5 World Health Organization. Antiretroviral therapy for HIV infection in adults and adolescents. Recommendations for public health approach. 2010 revision. Geneva, Switzerland: WHO, 2010.
6 Abdool Karim SS, Naidoo K, Grobler A, et al. Integration of antiretroviral therapy with tuberculosis treatment. N Eng J Med 2011; 365: 1492–1501.
7 Blanc F-X, Sok T, Laureillard D, et al. Earlier versus later start of antiretroviral therapy in HIV-infected adults with tuberculosis. N Eng J Med 2011; 365: 1471–1481.
8 Havlir D, Kendall MA, Ive P, et al. Timing of antiretroviral therapy in HIV-1 infection and tuberculosis. N Engl J Med 2011; 365: 1482–1491.
9 Aït-Khaled, *op.cit*., pages 24–25.
10 Fujiwara PI, Clevenbergh P, Dlodlo RA. Management of adults living with HIV/AIDS in low-income countries, with special reference to persons with tuberculosis. Int J Tuberc Lung Dis 2005; 9: 946–958.
11 Aït-Khaled, *op.cit*., page 7.
12 World Health Organization. WHO policy on TB infection control in health-care settings, congregate settings and households. Geneva, Switzerland: WHO, 2009.
13 World Health Organization. A guide to monitoring and evaluation for collaborative TB/HIV activities. 2009 revision. Geneva, Switzerland: WHO, 2009, page 30.
14 Lawn SD, Myer L, Bekker L-G, Wood R. Burden of tuberculosis in an antiretroviral treatment programme in sub-Saharan Africa: impact on treatment outcomes and implications for tuberculosis control. AIDS 2006; 20: 1605–1612.
15 Lawn SD, Churchyard G. Epidemiology of HIV-associated tuberculosis. Curr Opin HIV AIDS; 2009 Jul; 4(4): 325–333.
16 Golub JE, Durovni B, King BS, et al. Recurrent tuberculosis in HIV-infected patients in Rio de Janeiro, Brazil. AIDS 2008; 22: 2527–2533.
17 Golub JE, Saraceni V, Cavalcante SC, et al. The impact of antiretroviral therapy and isoniazid preventive therapy on tuberculosis incidence in HIV-infected patients in Rio de Janeiro, Brazil. AIDS 2007; 21: 1441–1448.

18 Samandari T, Agizew TB, Nyirenda S, et al. 6-month versus 36-month isoniazid preventive treatment for tuberculosis in adults with HIV infection in Botswana: a randomised, double blind, placebo-controlled trial. Lancet 2011; 377: 1588–1598.
19 Quigley MA, Mwinga A, Hosp M, et al. Long-term effect of preventive therapy for tuberculosis in a cohort of HIV-infected Zambian adults. AIDS 2001; 15: 215–222.
20 Akolo C, Adetifa I, Shepperd S, Volmink J. Treatment of latent tuberculosis infection in HIV infected persons. Cochrane Database Syst Rev 2010; 1: CD000171.
21 World Health Organization. Guidelines for intensified case-finding and isoniazid preventive therapy for people living with HIV in resource-constrained settings. Geneva, Switzerland: WHO, 2010.
22 Aït-Khaled N, Alarcon E, Bissell K, et al. Isoniazid preventive therapy for people living with HIV: public health challenges and implementation issues. Int J Tuber Lung Dis 2009; 13: 927–935.
23 A guide to monitoring and evaluation for collaborative TB/HIV activities, 2009 revision, *op.cit.*
24 Aït-Khaled 2010, *op.cit.*, pages 63–64.
25 World Health Organization. WHO monograph on integrated monitoring of tuberculosis and human deficiency virus. A case study from Malawi. Geneva, Switzerland: WHO, 2009: page 17.
26 Aït-Khaled 2010, *op.cit.*, pages 68–73.
27 Zachariah R, Harries AD, Ishikawa N, Rieder HL, et al. Operational research in low-income countries: what, why and how? Lancet Infect Dis 2009; 9: 711–717.
28 Harries AD, Rusen ID, Reid T, Detjen AK, et al. The Union and Médecins Sans Frontières approach to operational research. Int J Tuberc Lung Dis 2011; 15: 144–154.
29 National Drug and Therapeutics Policy Advisory Committee and the AIDS and TB Unit. Guidelines for antiretroviral therapy in Zimbabwe. Ministry of Health and Child Welfare, Zimbabwe, May 2010.
30 Centers for Disease Control and Prevention. Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis, CDC, MMWR, June 29, 2001/50(RR11); 1–42.
31 World Health Organization. Patient monitoring guidelines for HIV care and antiretroviral therapy (ART). Geneva, Switzerland: WHO, 2006.
32 World Health Organization. WHO monograph on integrated monitoring of tuberculosis and human deficiency virus. A case study from Malawi. Geneva, Switzerland: WHO, 2009: page 49.
33 Okot-Chono R, Mugisha F, Adatu F, et al. Health system barriers affecting the implementation of collaborative TB-HIV services in Uganda. Int J Tuberc Lung Dis 2009; 13: 955–961.
34 Nabbuye-Sekandi J, Okot-Chono R, Rusen ID, et al. Factors associated with human immunodeficiency virus testing among tuberculosis patients receiving treatment at health facilities in Uganda. Int J Tuberc Lung Dis 2010; 14: 896–902.
35 World Health Organization. Global tuberculosis control 2011. Geneva, Switzerland: WHO, 2011.
36 Hove S, Hwalima ZE, Dlodlo RA. Quality of TB-HIV care as perceived by patients in municipal clinics in Bulawayo, Zimbabwe. Abstract number PO-925-28. Int J Tuberc Lung Dis 2011; 15: 576.

Further Reading

Tuberculosis and HIV

Arnadottir T. Tuberculosis and public health. Policy and principles in tuberculosis control. Paris, France: The International Union Against Tuberculosis and Lung Disease, 2009.

Toman K. Toman's tuberculosis: case detection, treatment, and monitoring. Questions and answers. 2nd ed. Geneva, Switzerland: World Health Organization, 2004.

Williams G, et al. Best practice for the care of patients with tuberculosis. A guide for low-income countries. Paris, France: The International Union Against Tuberculosis and Lung Disease, 2007.

World Health Organization. TB/HIV: a clinical manual. 2nd ed. Geneva, Switzerland: WHO, 2004.

Childhood tuberculosis

Cotton M, et al. Guidance for national tuberculosis and HIV programmes on the management of tuberculosis in HIV-infected children: recommendations for a public health approach. Paris, France: The International Union Against Tuberculosis and Lung Disease and the World Health Organization, 2010.

Tuberculosis infection control

World Health Organization. WHO policy on TB infection control in health-care facilities, congregate settings and households. Geneva, Switzerland: WHO, 2009.

U.S. Centers for Disease Control and Prevention, et al. Tuberculosis infection control in the era of expanding HIV care and treatment. Addendum to WHO guidelines for the prevention of tuberculosis in health care facilities in resource-limited settings, 1999. CDC, WHO and The Union, 2007.

World Health Organization. Guidelines for the prevention of tuberculosis in health care facilities in resource-limited settings. Geneva, Switzerland: WHO, 1999.

Laboratory services

Fujiki A. AFB microscopy training. A good quality smear examination makes a good quality TB control programme. Tokyo, Japan: Research Institute of Tuberculosis, 2005.

Rieder HL, et al. Priorities for tuberculosis bacteriology services in low-income countries. 2nd ed. Paris, France: The International Union Against Tuberculosis and Lung Disease, 2007.

Radiological services

Gie R. Diagnostic atlas of intrathoracic tuberculosis in children. A guide for low-income countries. Paris, France: The International Union Against Tuberculosis and Lung Disease, 2003.

Tuberculosis Coalition for Technical Assistance. Handbook for district hospitals in resource-constrained settings on quality assurance of chest radiography: for better TB control and health system strengthening. TBCTA, 2008.

Operational research

Enarson D. Research methods for promotion of lung health. A guide for protocol development for low-income countries. Paris, France: The International Union Against Tuberculosis and Lung Disease, 2001.

TREAT TB. Operational research. A guide to country-level implementation and programme support. Paris, France: The International Union Against Tuberculosis and Lung Disease, 2011.

Health system strengthening

World Health Organization. Stop TB policy paper: Contributing to health system strengthening: guiding principles for national tuberculosis programmes. Geneva, Switzerland: WHO, 2008.

About The Union

Founded in 1920, the International Union Against Tuberculosis and Lung Disease (The Union) is dedicated to bringing innovation, solutions and support to address health challenges in low- and middle-income populations. With nearly 10,000 members and subscribers from over 150 countries, The Union has its headquarters in Paris and offices serving the Africa, Asia Pacific, Europe, Latin America, Middle East, North America and South-East Asia regions. Its scientific departments focus on tuberculosis, HIV, lung health and non-communicable diseases, tobacco control and operational research. Each department engages in research, provides technical assistance and offers training and other capacity-building activities leading to health solutions for the poor.

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