



THE REPUBLIC OF UGANDA

MINISTRY OF HEALTH

# **Uganda National Guidelines for Tuberculosis Infection Control in Health Care Facilities, Congregate Settings and Households.**

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## **Foreword**

In Uganda like the rest of the world, the interaction between TB and HIV has not only increased the burden of both diseases amongst our people but has also led to an urgent need to control the transmission of TB and HIV. The emergence of Multi drug resistant TB complicates the picture further. There are many people at risk of acquiring TB in health care settings especially in HIV care clinics and at out-patient departments. Patients congregate at these points on a daily basis to be served by the health care workers. The mode of transmission of TB (airborne) makes it very difficult to prevent health care workers, children and other patients in these places from acquiring TB.

At present, the knowledge and practice on TB infection control among health workers, health care settings and congregate settings such as prisons is very low. However capacity has been built at the Ministry of Health (National TB and Leprosy Programme and AIDS control Programme). Together with Partners like WHO, TB CAP and RCQHC the Ministry of Health has successfully developed the TB infection control guidelines.

For successful implementation of TB infection control everyone involved will need to be urgently oriented to standard work practices (administrative control measures) and Environmental control Measures and Protective measures. These measures should be applied to complement each other and not as standalone interventions. It should be noted that designs of the old health facilities may pose a challenge to good infection control interventions. However, this will be partially overcome by water tight work practices and being innovative. Health facility structures under construction should always be assessed for adequate ventilation while the old ones can be remodeled to cater for ventilation during renovations and whenever funds to do such allow.

The existence of this TB infection control guidelines is a land mark achievement in the fight against the transmission of TB in health care settings, congregate and at house hold level. It is therefore, my sincere hope that these guidelines will provide invaluable guidance to the Ministry of Health, the districts health managers, facility health workers and all our partners to implement effective TB infection control interventions in health care and congregate settings.

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## List of abbreviations

ACSM	Advocacy, Communication and Social Mobilization
AFB	Acid Fast Bacilli
BSC	Bio-safety Cabinets
DOT	Directly observed therapy
HCWs	Health-care workers
HEPA	High-Efficiency Particulate Air
HCT	HIV Counseling and Testing
IC	Infection Control
ICF	Intensified TB Case Finding Form
IEC	Information, Education and Communication
IPT	Isoniazid Preventive Therapy
MDR-TB	Multi Drug Resistant TB
PLHIV	Persons Living with HIV
TB	Tuberculosis
UVGI	Ultraviolet Germicidal Irradiation
WHO	World Health Organization
XDR-TB	Extensively Drug-Resistant TB
TBIC	Tuberculosis Infection Control

## **The National TB infection control policy guidelines and its structure**

This guideline has primarily been adapted from the 2009 WHO Policy on TB Infection Control in Health-Care Facilities, Congregate Settings and Households, the 2008 Operations Manual for Delivery of HIV Prevention, Care and Treatment at Primary Health Centres in High-Prevalence, Resource-Constrained Settings and the 1999 CDC/WHO TB infection control in the era of expanding HIV care.

The guideline consists of eight chapters structured as follows:

Chapter 1 outlines the context for the development of the TB infection control guidelines.

- a. Outlines why the guideline was produced, who it is intended to benefit, the set of TB control measures and gives the structure of the guideline.

Chapter 2 presents the national and district level TB infection control measures.

- b. This chapter describes the national and district-level TB infection control measures that create an enabling environment for the implementation of TB infection control in health-care facilities, congregate settings and households.
- c. It identifies the specific activities to be carried out at the national and district levels.

Chapter 3 presents the health care facility management roles and responsibilities in TB infection control.

- d. This chapter describes the roles, responsibilities and activities of health care facility management team in TB infection control.
- e. Shows the possible involvement and the roll the willing TB patients and the community can play

Chapter 4 presents the administrative control measures or work practices.

- f. This chapter describes administrative TB infection control measures (work practices) to be carried out by health care workers
- g. It outlines the steps to be taken to effect the control measures.
- h. It details what need be done for the health care facility staff especially those who appear to be having TB signs and symptoms

Chapter 5 presents the environmental control measures.

- i. This chapter describes the different environment systems needed to control TB spread at the health care facilities and other congregate settings
- j. The monitoring and maintenance of the environmental measures put in place
- k. It describes the usefulness and the possible hazards of the ultraviolet germicidal irradiation (UVGI)



Chapter 6 presents the use of personal protective equipment.

- l. This chapter describes the personal protective equipment, where and how it should be used

Chapter 7 presents measures that reduce TB transmission in congregate settings.

- m. This chapter discusses administrative controls (work practices), environmental controls, personal protective equipment
- n. The roles and responsibilities of management in congregate settings.
- o. It describes different types of congregate settings

Chapter 8 presents measures that reduce TB transmission in households.

- p. This Chapter outlines the various activities and measures that reduce TB transmission in households.

## **CHAPTER 1: INTRODUCTION AND BACK GROUND**

### **1.1 Why this Tuberculosis infection control guidelines were developed?**

The goal of this tuberculosis (TB) infection control guidelines is to guide management staff, including health care workers, congregate settings managers and household heads to minimize the risk of TB transmission at Ugandan facilities in particular and the whole country in general. The current national infection control guidelines (2005) is silent on TB infection control measures. This guideline has been designed to address this gap and therefore is an addendum to the 2005 national infection control guideline.

Tuberculosis infection control is growing in importance in Uganda because of the association of TB with HIV and the emergence of multidrug resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB).

This document has been developed in response to demands from various stakeholders for guidance on what to do, and how to prioritize TB infection control measures in Uganda.

This policy guidelines focuses on providing guidance on TB infection control in health care facilities, schools, prisons and other congregate settings because the prevalence of TB among people living or working in these settings exceeds the prevalence found in the general population. The document also provides guidance on preventing TB transmission in households because the TB incidence among the household contacts of TB patients also exceeds the incidence found in the general population.

Special attention is given to HIV care settings because persons living with HIV (PLHIV) and their close contacts, including HIV positive health care workers are particularly vulnerable to developing TB disease if they become infected with *Mycobacterium tuberculosis* (*Mycobacterium tuberculosis* is the germ that causes TB).

### **1.2. Who should use this TB infection control guidelines?**

This document provides current evidence-based guidelines for the implementation of sound TB infection control by all stakeholders. It is for policy makers, health care workers and community volunteers in particular PLHIV, administrators, and stakeholders in the public, private, and Non-governmental health sectors involved in providing care and treatment to persons who may have TB.

It is also helpful for persons or institutions responsible for the health and well-being of large numbers of PLHIV. Such settings include HIV Counseling and Testing (HCT) centers, community-based outreach centers, HIV care clinics malnutrition wards and clinics and general health care facilities.

It is of value too to households with TB patients, prisons, schools and other congregate settings.

### **1.2.1 Composition of Tuberculosis infection control measures**

Tuberculosis infection control is a combination of measures aimed at minimizing the risk of TB transmission within populations. The mainstay of TB infection control is early and rapid diagnosis, and correct management of TB patients and their infected close contacts.

#### **Tuberculosis infection control is:**

1. A subcomponent of the WHO's updated Stop TB strategy, contributing to the strengthening of health systems
2. One element of the collaborative activities for control of TB and HIV in Uganda
3. One of the WHO's Three I's for HIV/TB (the other two being isoniazid preventive therapy [IPT] and intensified case finding)
4. An essential part of sound HIV control programs in Uganda that has a high national HIV prevalence of 6.4%.

Tuberculosis infection control requires and complements the implementation of core interventions in TB control, HIV control and strengthening of health systems. It is important and imperative for national planners to include TB infection control in the national infection prevention and control policies and practices, and should maximize synergies between programs that deal with infection prevention and control, and those focusing on TB and HIV control.

### **1.3. TB infection control measures**

There are three broad categories constituting a set of TB infection control measures:

1. Administrative (work practices),
2. Environmental, and
3. Personal protective equipment.

As will be described below the administrative, environmental and personal protective equipment control measures operate at different points in the TB transmission process. The three categories of TB infection control measures complement each other and where feasible should as much as possible be used as a combination.

#### **1.3.1 Administrative control measures (work practices)**

Administrative control measures (work practices) reduce the amount of TB germs generated into room air by a TB infected patient when she or he coughs. They therefore reduce the exposure of health care workers and other patients to TB germs.

Administrative control measures (work practices) require that people with TB symptoms are promptly identified, separated and treated. Their close contacts should also be traced and screened for TB and receive appropriate treatment if found to be positive. As will be discussed in Chapter 2, the physical separation of TB patients or people suspected of having TB requires rational design, construction or renovation, and use of buildings that can provide effective control.

Administrative control measures (work practices) are a vital part of sound TB infection control practices and are the first and most important TB infection control measures. Theoretically if the risk of exposure can be eliminated, no further controls would be required. However, in reality this cannot be completely achieved and therefore there is a need to have a combination of TB infection control measures. For that reason administrative controls should be complemented by environmental controls and personal protective equipment, because evidence shows that when these measures are used as a combination they contribute to a significant reduction of transmission of TB. In schools personal control protective equipment may be difficult to implement except perhaps in the sick bays.

### **1.3.2 Environmental control measures**

Environmental control measures include methods to reduce the concentration of infectious TB germs in the air, and methods that control the flow direction of infectious air. The choice of environmental controls depends on building design and construction, and must be tailored to local climatic and socioeconomic conditions. Natural ventilation, mixed-mode and mechanical ventilation systems can be used and supplemented with ultraviolet germicidal irradiation (UVGI) in areas where adequate ventilation is difficult to achieve. Where feasible, installation of ventilation systems should be a priority, because ventilation reduces the number of infectious TB germs in the air.

### **1.3.3 Personal protective equipment**

This involves the use of personal protective equipment like particulate respirators. Wearing these respirators prevents health care workers from inhaling TB germs in areas where the concentration of TB germs in the air cannot be adequately reduced by administrative and environmental controls. In situations where there is an increased risk of TB transmission, particulate respirators should be used.

#### **Key messages**

- Implementation of infection control measures as a combination reduces the transmission of TB in health care facilities. However, whenever possible administrative control measures should be implemented as the first priority because they have been shown to reduce transmission of TB in health care facilities.
- Administrative controls ensure that people with TB symptoms are rapidly identified and, if infectious separated into an appropriate environment and treated promptly. Their close contacts should be traced and screened and treated if found to be infected.
- Potential exposure to people who are infectious can be minimized by reducing or avoiding unnecessary hospitalizations, reducing the number of outpatient visits, avoiding overcrowding in wards and waiting areas, and prioritizing community-care approaches for TB management.

## CHAPTER 2: THE NATIONAL AND DISTRICT LEVEL TUBERCULOSIS INFECTION CONTROL MEASURES

### 2.0. Introduction

This chapter describes the national and district-level TB infection control measures that create an enabling environment for the implementation of TB infection control in health-care facilities, congregate settings and households. These should be integrated within the existing national and district management structures for general infection prevention and control.

**Table 1 shows the summary of the national and district level TB infection control measures**

1. Establish and strengthen infection control committees
2. Ensure that health care facility buildings are designed appropriately for TB infection control
3. Conduct surveillance of TB disease among health care workers
4. Conduct TB infection control assessment at all levels of the health system and in congregate settings
5. Carry out advocacy, communication and social mobilization (ACSM), engaging civil society to promote TB infection control measures, including BCG immunization in children
6. Train, equip and supervise health workers and committees in TB infection control measures
7. Monitor and evaluate the set of TB infection control measures
8. Enable and conduct operational research on TB infection control

### 2.1 Specific national and district level TB infection control measures

This section describes the specific activities under each of the national and district level TB infection control measure and highlights actions to be undertaken by the different stakeholders at that level.

#### **Activity 1: Identify and strengthen infection control committee(s)**

**Activity 1a** National and district level managers to ensure that specific TB infection control issues are included in the national and district infection control plans.

They should ensure that TB infection control issues are addressed in the respective infection control plans and in the TB and HIV strategic plans. The planned TB infection control activities should be allocated adequate time and resources for implementation.

**Key message**

- National and district level managers should ensure that TB infection control measures are part and parcel of the national, district and health care facility infection control guidelines.

**Activity 1b** Revitalize and strengthen infection control

The national, district and health care facility infection control committees should include a TB infection control focal person. The district infection control committees should be formed where they are not available and they should have a TB infection control focal person. The responsibilities of the TB infection control focal person at the different levels will include, among others, the coordination of TB infection control activities.

**Key messages**

- The national, district and health care facility infection control committees should include a TB infection control focal person.
- The district infection control committees should be formed where they are not available and they should have a TB infection control focal person.

**Activity 1c** – Ensure planning and budgeting

Implementation of a TB infection control plan requires comprehensive planning and integration with other national infection control efforts at all levels. TB infection control activities should be part of the overall national, district and facility plans. Resources required for implementation of TB infection control should be identified and accurately costed.

**Key messages**

- National and district level health managers should ensure that TB infection control activities are planned, costed and budgeted for.
- Health managers should in addition guide health care facilities in planning for TB infection control activities. The plans should be based on TB infection control assessment of the respective facilities.

**Activity 1d** Ensure adequate human resource capacity

Human resource development for TB infection control requires specific planning by the national stakeholders.

The planning should ensure that:

- (i) Health care workers at different levels of the health system have the relevant competencies and skills necessary to successfully implement TB infection control measures.

- (ii) Sufficient numbers of the relevant categories of health care workers are available.
- (iii) There are staffs with architectural and engineering expertise within the health system.
- (iv) The necessary support systems (such as training, supervision, supplying equipment, and disinfectants) are in place to enable and motivate the staffs to use their competencies according to their job descriptions.

### **Key message**

- The human resource requirements of TB infection control should be part of the national district and health care facility human resource development plan.

### **Activity 2-Ensure that health care facility buildings are designed and used appropriately for TB infection control**

Appropriate design, construction, renovation and optimal use of health care facilities are essential for TB infection control. Crowded wards or narrow corridors with no ventilation and poor lighting create conducive environment for transmission of TB. This makes it difficult to effectively implement administrative and environmental control measures.

Therefore it is necessary to provide for adequate ventilation (a room with at least 12 air changes per hour), lighting and space in new constructions, remodeling and renovations particularly in high TB transmission risk areas. Designs should allow for organizing patient flow in a way that minimizes the exposure of non-TB infected patients to TB infected and infectious patients.

It is further necessary to identify and use all available spaces to optimize the implementation of infection control measures.

There are high-risk areas for TB transmission and these include:

- (i) TB and medical wards, including emergency rooms
- (ii) Outpatient departments to which infectious TB patients and people suspected of having infectious TB are referred
- (iii) Aerosol generating procedures in areas such as:
  - sputum induction and collection areas,
  - bronchoscopy rooms and lung surgery theatres,
  - autopsy (post mortem) rooms,
  - sputum culture rooms
  - theatres handling surgery on potentially infectious TB patients
  - spirometry rooms
- (iv) Isolation rooms for patients with TB or MDR-TB

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### **Key messages**

- The high risk areas should have adequate ventilation space and lighting.

- The service areas should be organized to ensure smooth patient flow and minimize the exposure of non infected patients to infected patients.
- Ensure that patient waiting time is minimized at the various service areas.

### **Activity 3 – Conduct surveillance of HIV infection and TB disease among health care workers**

The national, district and health care facility TB infection control sub-committee(s) should ensure that surveillance of HIV infection and TB disease among health care workers is conducted after proper counseling on a five year basis or when indicated and on every new staff. Close contacts and families of the infected staffs should be traced and screened too. Surveillance of TB disease including the trends among health care workers will provide national data that are essential for informing the implementation of TB infection control measures. In addition, surveillance data provides the basis for setting targets and prioritizing interventions.

#### **Key messages**

- Health care facilities should institutionalize TB screening of the new health care workers, five year or more often for selected staffs for TB infection and disease.
- Health care facilities should:
  - Use a standardized TB and HIV screening and reporting tool to promote HIV counseling and testing among health care workers.
- Health care facilities are required to report:
  - New cases of TB disease among health care workers when identified.
  - Overall number of staff including health care workers and support staff working at that facility.
  - Incidence of MDR- TB among health care workers.
  - New HIV infection and disease if the data is available. (optional)

### **4) Conduct assessment of health care facilities for TB infection control**

The national and district infection control committee(s) should:

- Ensure that assessment of health-care facilities to determine the risk for TB transmission is carried out regularly.
- Monitor the status of implementation of TB infection control measures.

Uganda has a high national prevalence of HIV (6.4 %) and a high prevalence of TB (50–70 %) among HIV positive patients. Therefore, special emphasis should be placed on the infection control assessments of health care facilities that provide chronic HIV care.

#### **Key messages**

- Support health care facilities to conduct TB infection control assessment using a standardized TB infection control assessment tool.
- Guide health care facilities to develop TB infection control plans based on the results from the facility assessment.



#### **Activity 4 Carry out advocacy, communication and social mobilization (ACSM), including engagement of civil society to promote TB infection control measures**

Civil society and communities can create demand for TB infection control and help to implement it. It is therefore necessary to include civil society in the design, development, implementation, and monitoring and evaluation of TB infection control interventions. This helps to obtain the support of all involved.

Behaviour-change campaigns should aim at minimizing the stigma that patients feel as a result of triage and separation. In addition, the campaigns should minimize the stigma associated with the use of face/surgical masks by patients and the use of particulate respirators by their health care providers.

Individuals should also be encouraged to rapidly seek care if they have symptoms suggestive of TB and given information about their health care and their close contacts and families.

Implementation plans should include campaigns for behaviour change for the various target audiences including policy makers, patients, health care workers, schools, family members and communities.

The approach to implementing TB infection control should be patient-centred, and community-based. Approaches should be prioritized where possible. They should consider human rights and the dignity of the patient and health care workers, and should balance the interests of individuals and public health. The approaches must constantly remind parents and health care workers to immunize children against TB. This can be achieved by integrating TB control measures in MCH (Maternal and Child Health) ANC and general paediatric clinics.

Civil society should be encouraged and empowered to advocate and mobilize resources for implementation of TB infection control measures.

#### **Key messages**

- Involve civil society and communities in TB infection control because they can create demand for and help to implement it.
- Use Behaviour-change campaigns that aim at minimizing the stigma that patients feel as a result of implementing TB infection control.
- Encourage individuals to rapidly seek care if they have symptoms suggestive of TB.
- TB infection control should be patient-centred, and community-based.
- Integrate in TBIC program into maternal child health clinics, antenatal care clinics and general paediatric clinics in order to ensure wide BCG immunization

### **Activity 5 – Monitor and evaluate the TB infection control measures**

Monitoring and evaluation should be based on an established set of indicators which have been developed for different levels. Measurement of the indicators will require collaboration and sharing of indicators and data collection tools between programs related to TB, HIV, quality assurance, and infection control and the general health system.

#### **Key message**

- Use appropriately established set of indicators to monitor and evaluate progress of TB control measures, this may require utilizing tools already in place for other TB related programs

### **Activity 6 – Enable and conduct operational research**

Research provides an evidence base for development of programs and informing policies to make it easy to scale up appropriate TB infection control activities. It is therefore recommended that research should be an integral component of TB infection control.

## **CHAPTER 3: HEALTH CARE FACILITY MANAGEMENT ROLES AND RESPONSIBILITIES IN TUBERCULOSIS INFECTION CONTROL**

### **3.0 Introduction**

This chapter describes the roles and responsibilities of health care facility management in TB infection control. These roles and responsibilities form the basis for implementing TB infection control activities at this level.

First and foremost managers (in-charges) of health care facilities should nominate a TB infection control focal person on the infection control committee. This is important to ensure commitment and leadership to the implementation of TB infection control. The management roles are intended to support and facilitate the implementation of administrative, including contact tracing, environmental and use of personal protective equipment control activities described in chapters 4, 5 and 6 respectively.

TB infection control activities at health care facilities should complement and be in line with the national and district level activities described in Chapter two.

### **3.1 Roles and responsibilities of health care facility management in TB infection control**

Health care facility managers (in-charges) should:

1. Strengthen the implementation of TB infection control by designating a TB infection control focal person to oversee the implementation of the activities. This TB infection control focal person should be part of the overall infection control committee of the health care facility.
2. Conduct or ensure that an on-site surveillance and assessment of health care facility for TB transmission is undertaken. Every health care facility should conduct initial and ongoing evaluations of the risk for transmission of TB germs, regardless of whether patients with suspected or confirmed TB disease are expected to be encountered in the facility or not. The TB risk assessment determines the types of administrative, environmental, and personal protection equipment controls needed for the facility. It also serves as an ongoing evaluation tool of the quality of TB infection control and for the identification of needed improvements in infection control measures.
3. Develop a facility TB infection control implementation plan. The plan should be based on the findings from the facility TB infection control assessment. The plan should also include standard operating procedures to ensure proper implementation of the administrative, environmental and use of personal protective equipment control measures.

**Table 2 showing the Sample of TB infection control plan at a health care facility**

The plan will include, but not be limited to, the following areas:	
<b>i</b>	Assessment of patients using the intensified case finding form (see annex 1) to identify persons with symptoms of TB disease or who report being under investigation or treatment for TB disease.
<b>ii</b>	Providing face masks or tissues to persons with symptoms of TB disease (persons suspected to be TB infected) or who report being under investigation or treatment for TB disease (persons suspected or proven to be TB infected), and providing waste containers for disposal of tissues and masks.
<b>iii</b>	Placing persons suspected or proven to be TB infected in a separate waiting area.
<b>iv</b>	Ensuring that persons suspected or proven to be TB infected receive services faster.
<b>v</b>	Carrying out laboratory investigation where facilities exist or immediately referring persons suspected to be infected with TB to TB diagnostic services.
<b>vi</b>	Ensuring that close contacts and families of patients with TB are traced, screened and treated if infected.
<b>vii</b>	Ensuring that patients with TB are adhering to treatment.
<b>viii</b>	Using and maintaining environmental control measures such as ensuring adequate ventilation and natural lighting.
<b>ix</b>	Periodically educating staff on signs and symptoms of TB disease, specific risks of TB in HIV-infected persons, and need for diagnostic investigation for those with signs or symptoms of TB.
<b>x</b>	Training staff in TB, TB control, and the TB infection control plan.
<b>xi</b>	Monitoring the implementation of TB infection control plan including BCG administration to children who need it.

**Key messages**

- |   |
|---|
| <ul style="list-style-type: none"> <li>• Each health care facility should have a TB infection control plan based on the TB infection control assessment findings.</li> <li>• Each health care facility should have a focal person or sub-committee responsible for TB infection control.</li> </ul> |
|---|

4. Reorganize the use of available spaces to optimize the implementation of TB infection control activities.

5. Ensure that advocacy, communication and social mobilization for patients, staff and visitors is carried out.

Include willing patients and the community in advocacy campaigns. The community needs to be well educated about TB infection, prevention and control. Patients need to understand that they will be better off if they know their HIV status because they may be eligible for isoniazid preventive therapy (IPT), and have a right to rapid TB diagnosis and treatment.

People need to know that TB can be spread by coughing and/or sneezing, and to expect health settings and community services to require people who are coughing and/or sneezing to cover their mouths when doing so. They need to understand that health care workers may wear personal protective equipment (respirators) sometimes, or that patients may be asked to wear a mask in order to protect others. Safety without stigma should be the goal. A request to wear a mask or provide sputum outside the health care facility or in a well-ventilated room should not be stigmatizing, but is part of a safer clinic for everyone. Patient and health care worker safety may include receiving health care in the community to avoid unnecessary admissions to health care facilities. Information, Education, and Communication (IEC) campaigns need to include themes such as “Our community is TB-safe”, or “Our health care facilities are stopping TB”.

6. Ensure that on-site monitoring and evaluation of TB infection control activities and practices is carried out regularly.

Overseeing infection control practices should be a part of all supervision activities. This should include a facility tour to check that:

- TB Infection control is being implemented
- All essential TB infection control supplies (respirators, sputum mugs and disinfectants) are available.
- At the very least, the facility has a TB infection control plan.
- Monitoring annually TB disease among health care workers is carried out. This provides useful information on transmission of TB in the facility. Surveillance of TB disease among health care workers is another means of evaluation of TBIC implementation.

Additional on-site measures include examining medical records of a sample of TB patients, looking at:

- the time interval from admission to suspicion of TB,
- the time to ordering sputum for AFB,
- the time from ordering to collection of sputum,
- the time interval from collection of sputum to reporting of results, to initiation of TB treatment

As part of monitoring it is necessary to interview patients to discuss their understanding of infection control, safety and stigma.

7. Participate in research efforts, in line with the national research agenda.

Managers (in-charges) of health care facilities should use the information generated from the facility assessment and records review to identify local challenges in the implementation of TBIC. They should then carry out operational research to get answers to the identified challenges. The findings from the operational research should be documented and best practices shared with all health care workers in the facility and beyond.

## Key messages

- Operational research findings guide the formulation of successful strategies in TB infection control.
- Operational research findings should be shared by all staff at the facility and beyond.

8. Provide a package of prevention and care interventions for health care workers including HIV prevention, antiretroviral therapy and isoniazid preventive therapy for those who are HIV positive.

Health care workers should know the symptoms of TB and seek a health assessment including screening for TB when they suspect that they have the symptoms. In addition all health care workers should be encouraged to know their HIV status, and those who are HIV positive should be given the opportunity to minimize exposure to persons with TB, by offering them a change of duties. Health care workers living with HIV should be screened for isoniazid preventive therapy as part of basic HIV care and treatment.

## Key message

- Health care facility managers should put in place a conducive environment that ensures that health care workers:
  - (1) Are assessed for TB signs and symptoms
  - (2) Are encouraged to know their HIV status
  - (3) Who are HIV positive are given the opportunity to minimize exposure to persons with TB by offering them a change of duties.
  - (4) Who are HIV positive are screened for isoniazid preventive therapy as part of basic HIV care and treatment.

## **CHAPTER 4: ADMINISTRATIVE CONTROL MEASURES (WORK PRACTICES)**

### **4.0. Introduction**

This chapter describes administrative TB infection control measures (work practices) to be carried out by health care workers. The measures described in this chapter can be applied to congregate settings with some changes as will be discussed in chapter 6. The administrative control measures (work practices) reduce the amount of TB germs released into room air by a TB patient when he or she coughs, sneezes, laughs or spits. Such controls are a vital part of sound infection control practices. It requires that patients suspected of having TB infection are promptly identified, separated and treated and that their close contacts and family members are traced, screened and offered appropriate health care services. The patients should be counselled to spend as little time as possible in congregate settings or in public transport.

### **4.1. Steps in administrative TB infection control measures (work practices)**

These steps prevent transmission of TB in health care facilities.

#### **Step 1: Promptly identify people with TB symptoms**

Promptly identify people with TB symptoms and TB patients using the ICF form (see Annex 1).

#### **Key message**

- All health care facility staff should identify patients with cough of 2 or more weeks immediately after they arrive at the health care facility and refer them to a staff assigned to TB infection control.
- The identified patients should be assessed for TB symptoms and served quickly without them waiting in a group with others.

#### **Step 2. Separate persons suspected to be TB infected and or infectious patients**

It is crucial to separate infectious patients after triaging. People suspected of having TB must be separated from other patients, placed in adequately ventilated areas, educated on cough etiquette and respiratory hygiene, and diagnosed as quickly as possible.

In particular, patients living with HIV or with strong clinical evidence of HIV/AIDS infection, or with other forms of immune-suppression, should be physically separated from those with suspected or confirmed infectious TB. People suspected of having drug-resistant TB or patients with confirmed MDR and XDR-TB should be isolated from other patients, including other TB patients.

In addition overcrowding in health care facilities should be minimized as much as possible.

## Key messages

- After triage and separation, patients should be placed in areas where they do not mix with other patients.
- Minimize overcrowding in health facilities as much as possible.
- Give more protection to PLWA or those suspected of having HIV/AIDS or other forms of immune-suppression.

### **Step 3. Control the release of TB germs into the air through educating patients on cough etiquette and respiratory hygiene**

Patients with cough (with or suspected of having TB) should be educated in cough etiquette and respiratory hygiene. Cough etiquette reduces the release of TB germs into the air and contributes to control of TB and other respiratory infections. Such etiquette also applies to health care workers, visitors and families. All staffs are responsible for the safety of the health care facility and are advised to work together to help patients, fellow staffs and visitors adhere to this practice.

A coughing patient should cover his or her nose and mouth with a piece of cloth, handkerchiefs a tissue paper or a surgical mask. Such items minimize the amount of TB germs that a coughing patient releases into the surrounding air when he or she coughs. This is achieved by capturing the TB germs near the nose and mouth of the patient. Surgical masks may be used by patients who are unable to cover their mouths for any reason. Patients wearing surgical masks can wrongly be labeled as patients with TB infection. This increases the risk of stigma. It is therefore necessary to educate patients and communities against stigmatizing patients wearing masks.

It is necessary to properly dispose of used items as part of respiratory hygiene practice. No-touch waste bins for disposal of used tissues and masks should be available in the waiting areas.

When tissues, cloths or surgical masks are not available, patients need to be instructed to lift their arm up and cover their noses and mouths with the inner surface of the arm or forearm when they cough or sneeze.

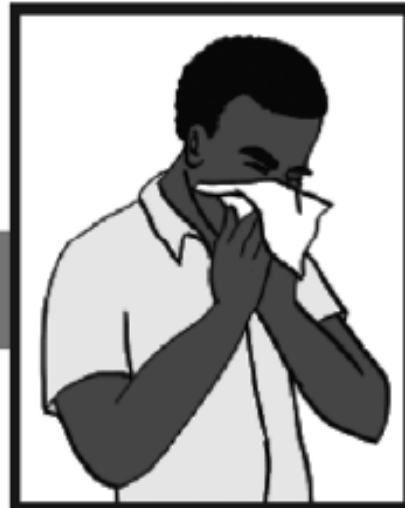


# Cover your cough or sneeze.



Cough or sneeze into your arm.

or



Use a tissue and then throw away...



Picture 2: A face mask worn by this patient is recommended for use by patients who are suspected of having or have TB. A face mask has large pores and lacks air tight seal around the edges.

## Key messages

- Promote cough etiquette and respiratory hygiene. In at least the waiting area, every health centre should have a poster on TB infection control and cough etiquette. (See figure 3)
- When coughing, patients should be instructed to cover their mouths and nose with a cloth such as a handkerchief, a clean rag, tissues, paper masks or with the inner surface of the arm or forearm.
- All staff are responsible for safety and are advised to work together to help patients adhere to this practice.
- In health care facilities where it is feasible, face masks (disposable or non disposable) should be provided and worn by patients suspected of having TB, patients on TB treatment who are still coughing and confirmed infectious TB patients. Masks should be worn by all patients leaving isolation rooms for other medical procedures in the health care facility.
- Educate patients and communities against stigmatizing those wearing masks
- Health care workers should conduct behavior-change campaigns to avoid the stigma associated with wearing face masks.

## Step 4. Minimize time spent in health care facilities

To avoid health care facility acquired transmission of TB, as little time as possible should be spent in health-care facilities, including clinics; this can be achieved by reducing admissions, and diagnostic delays. Health care facility admission is not recommended for the investigation of patients suspected of having TB except in cases that are complicated or have concurrent medical conditions that require admission.

If admitted, patients with TB symptoms should not be placed in the same area with other patients or infectious TB patients. Community-based approaches for management of TB patients should be prioritized, and should be complemented by education of household members and other close contacts on TB infection control (see Chapter 4). Health care workers should ensure that quality clinical care is provided to infectious patients, and minimize the time spent with such patients in areas that are overcrowded or poorly ventilated.

## Key messages

- Health care facility admission should be minimized to complicated or patients having concurrent medical conditions that require admission.
- There is need to speed up management of TB patients and those suspected of having TB so that they spend as little time as possible at the health care facility.
- It is advisable that attendants in TB wards should spend minimal time on the ward to minimize exposure to TB germs.
- Prioritize Community-based approaches for management of TB patients complement them with education of household members and other close contacts on TB infection control

### **Step 5. Investigate for TB or refer**

Patients suspected of having TB should be promptly investigated for TB. If TB diagnostic services are not available on site, the facility should establish a link with a diagnostic centre to which TB symptomatic patients can be referred or their sputum samples can be sent.

Sputum should be collected in a designated area with a lot of air circulation for example in open space. It should be away from other people. It should not be collected in small rooms such as toilet rooms or other closed areas.

#### **Key messages**

- Ensure that patients suspected of having TB are investigated for TB either on site or referral.
- Sputum should be collected in an open space. Sputum should never be collected in small rooms such as toilet rooms or closed areas.

### **Step 6. Reduce the time taken to diagnose TB and initiate treatment**

The time taken to confirm the diagnosis of TB disease should not be more than 24 hours for sputum smear microscopy results and 2-6 weeks for culture. This will be achieved by reducing the time it takes to carry out sputum testing and culture, carrying out investigations in parallel (together) rather than in sequence (one after another). Patients diagnosed with TB should be immediately started on anti-TB treatment and supported to adhere to the treatment by counselors and treatment supporters. The close contacts and family members of these patients must be traced screened and brought into care if found TB infected.

#### **Key messages**

- Patients with TB symptoms who receive health care should access diagnostic facilities as soon as possible.
- It is necessary to promptly initiate adequate TB treatment and support adherence education to ensure completion of treatment for persons diagnosed with TB disease.

#### **Note: Trace contacts and family members of TB infected or infectious patients**

It is important to send health visitors to homes of TB infected or infectious patients to trace and screen the contacts, especially children below five years and PLHIV, and bring into care those found to be TB infected.

**Table 3 Showing steps of the administrative TB infection control measures (work practices) to prevent TB transmission in health care facilities.**

Step	Action	Description
1.	Assess - promptly identify people with TB symptoms (triage)	<p>Early recognition of patients with suspected or confirmed TB disease is the first step in the protocol.</p> <ul style="list-style-type: none"> <li>• Assign a staff member to assess patients for prolonged duration of cough immediately after they arrive at the facility.</li> <li>• Patients with cough of two or more weeks of duration should not be allowed to wait in the line with other patients.</li> <li>• Such patients should be managed as per the Uganda national treatment guidelines.</li> </ul>
2.	Separate infectious patients	<p>Patients who are identified as suspected of having TB patients by the assessment tool (ICF form) must be:</p> <ul style="list-style-type: none"> <li>• Separated from other patients.</li> <li>• Where feasible should be requested to wait in a separate well-ventilated waiting area.</li> </ul>
3.	Control the release of TB germs into the air through educating on cough etiquette and respiratory hygiene	<ul style="list-style-type: none"> <li>• Instruct the patients identified as suspected of having TB or patients on cough etiquette and respiratory hygiene. This includes instructing them to cover their noses and mouths when coughing or sneezing.</li> <li>• Where possible provide face masks or tissues to enable them to cover their mouths and noses.</li> </ul>
4.	Minimize time spent in health-care facilities	<ul style="list-style-type: none"> <li>• Triage symptomatic patients to the front of the line for the services they are seeking (e.g. HIV counseling and testing, medication refills). This helps to quickly provide care and reduces the amount of time that others are exposed to them.</li> <li>• As much as possible patients should first receive the health care services they came to seek before the TB investigation is done.</li> </ul>
5.	Investigate for TB or Refer	<ul style="list-style-type: none"> <li>• TB diagnostic tests should be done on site and if not available on site, the facility should have an established link with a TB diagnostic center to which symptomatic patients can be referred.</li> <li>• In addition, each facility should have a linkage with a TB treatment center to which those who are diagnosed with TB can be referred.</li> </ul>
6	Reduce the time taken to diagnose TB and initiate treatment	<ul style="list-style-type: none"> <li>• The time taken to confirm the diagnosis of TB disease should not be more than 24 hours for sputum smear microscopy results and 2-8 weeks for culture. This will be achieved by reducing the time it takes to carry out sputum testing and culture, carrying out investigations in parallel (together) rather than in sequence (one after another).</li> </ul>
7	Trace close contacts of the identified TB patients	<ul style="list-style-type: none"> <li>• Health visitors or staff assigned to TB infection control committee should bring in the patient's close contacts and family members for screening and treatment if found TB infected</li> </ul>

#### **4.2. Increasing awareness of TB in health care workers and staff**

All health care workers including staffs, cleaners, drivers, gate keepers, peer educators, adherence supporters, and volunteers working as counselors who have contact with TB patients need to be educated about the risk of TB transmission in health care facilities and should be oriented in TB infection control measures. This training should be combined with other infection control trainings.

##### **Key messages**

- All health care workers should receive TB infection control training, and be engaged in improving their own and patient safety.
- This training should be combined with other infection control trainings.

#### **4.3. Health care workers with signs and symptoms suggestive of TB**

All health care workers should be given appropriate information and encouraged to undergo TB diagnostic investigation by the TB infection control focal person, if they have signs and symptoms suggestive of TB. Based on the evaluation, health care workers should be put on either isoniazid preventive therapy (IPT) or a full regimen of anti-TB treatment, should they be diagnosed with active TB.

Similarly, all health care workers should be given appropriate information and encouraged to undergo counseling and testing for HIV infection. If diagnosed with HIV, they should be offered a package of prevention, treatment and care that includes regular screening for active TB and access to antiretroviral therapy when eligible.

HIV-positive health care workers should not be working with patients with known or suspected TB (in particular, they should not be working with patients with MDR-TB and XDR-TB). HIV-positive health care workers should be relocated from positions where exposure to untreated TB is high, to a lower risk area.

##### **Key messages**

- Health care workers should know the symptoms of TB and be given a health assessment including screening for TB every year or when indicated.
- All health care workers should be encouraged to know their HIV status, and those who are HIV positive should be given the opportunity to minimize exposure to persons with TB particularly patients with MDR and XDR-TB. This can be done by offering them a change of duties.
- Health care workers are more exposed to TB than the general population and therefore HIV-positive health care workers are a priority group for isoniazid preventive therapy.

## CHAPTER 5: ENVIRONMENTAL CONTROL MEASURES

### 5.0. Introduction

Environmental TB infection control measures decrease the concentration of the TB germs in the room. They include methods to control air movement in and out of a health care facility room. These measures can be used in high-risk areas to reduce the concentration of TB germs in the air.

Environmental control measures complement administrative control measures. If administrative control measures are not well implemented environmental control measures **will not** reduce the risk of TB transmission. When used together, the two measures can effectively reduce the amount of infectious TB germs in a room. This prevents health care workers, patients, attendants and visitors at the health care facilities from inhaling air contaminated with TB germs.

**Figure 1: shows a storm of aerosol (air spray) from the lungs on coughing.**



When a patient with TB disease of lungs coughs, she or he releases droplet nuclei (aerosols/air sprays) containing TB germs in the air. These germs can remain floating in the air of a poorly ventilated room for 24 hours or more.

### 5.1. Types of environmental control measures

Environmental control measures include ventilation (natural and mechanical), High Efficiency Particulate Air (HEPA) filtration and use of ultraviolet germicidal irradiation. The choice of the environmental control measure used depends on the level of the health care facility and the resources available.

Ventilation is the movement or supply of fresh air in a building resulting in replacement of inside air with air from the outside. As seen in the table below, there are two types of ventilation namely: natural and mechanical ventilation.

**Table 4 showing TB environmental control measures**

1. Natural ventilation (supply of fresh air)	Natural ventilation (supply of fresh air) relies on open doors and windows to bring in air from the outside and ventilators to remove air from the inside. Natural ventilation is optimized by fully opening the doors and windows. Fans may also assist in this process and in distributing the air. Natural ventilation and fans remove and dilute TB germ containing air in the room.
2. Mechanical ventilation	Mechanical ventilation refers to the use of mechanical air-moving equipment that circulates air in a building. It is achieved by use of window fans and exhaust ventilation systems in special areas such as isolation rooms, laboratories handling sputum culture and sensitivity. These produce a negative pressure which prevents TB germ contaminated air from escaping into corridors and other surrounding areas. Mechanical ventilation systems may or may not bring in air from the outside.
3. HEPA (High-Efficiency Particulate Air) filters	These filters are used in bio-safety cabinets.
4. Ultraviolet germicidal irradiation (UVGI)	UVGI uses a type of radiation that has been shown to kill or inactivate TB germs in air.

### **5.1.1. Natural Ventilation**

Natural ventilation refers to natural air movement through open windows, ventilators and doors. This leads to free-flow of air that helps to achieve dilution and air exchange in an area.

**Figure 2: TB ward with the windows fully opened**



As seen in figure 2 above, fully open windows in outpatient departments (OPDs), TB wards, general medical wards or other areas of health care facilities promote natural ventilation. This removes contaminated air and therefore reduces the concentration of TB germs in the room and the risk of TB transmission.

In order to maximize natural ventilation, it is recommended that whenever possible: waiting areas, examination rooms, and wards should be “opened” to the environment. One way of doing this is to have a roof without walls as in figure 3 below.

**Figure 3: Example of a good waiting area for patients**





Buildings should have openings (windows, doors and ventilators) on opposite sides of their outer walls such that natural air moves through the room to the outside.

In addition openings (windows, doors and ventilators) **should not** be placed in such a way that air moves from high risk areas such as TB wards into other wards or waiting areas.

When using ceiling fans, windows should be left open. This ensures proper dilution and exchange of air. In order to improve air circulation, windows that are opposite to each other should be opened. This improves the dilution of air in the room.

Where isolation of TB patients is not possible, it is necessary to position patients in such a way that minimizes the risk of TB transmission to other patients. One way of doing this is to place the TB patients in the rooms which receive air flows from areas with non infectious patients.

### **Key messages**

- Patient waiting areas, outpatient departments, HIV counseling rooms, general medical wards and TB wards should be opened to the environment. This includes opening all windows and doors when possible to maximize cross ventilation.
- When weather permits, open-air shelters with a roof to protect patients from the sun and rain are recommended as waiting areas
- Patients should not wait for services in narrow, poorly ventilated corridors.
- When health centre renovations are being carried out, the management teams should consider TB infection control as an important part of building plans.

### **5.1.2. Mechanical ventilation**

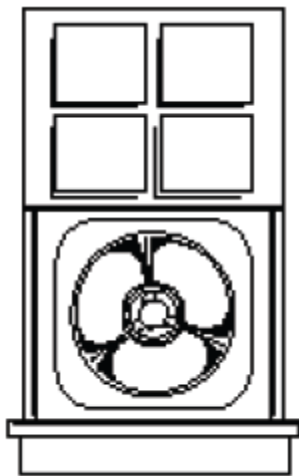
Mechanical ventilation can be used to reduce the concentration of TB germs in the room where natural ventilation is not feasible or is inadequate.

Mechanical ventilation is particularly useful in high risk areas such X-ray rooms and laboratories handling highly infectious material. It is important to use equipment with sufficient power to facilitate air movement into and out of the room. Window fans are a cheap and feasible method of providing mechanical ventilation.

## Key messages

- Mechanical ventilation can be used where natural ventilation is not feasible
- Mechanical ventilation is particularly useful in high risk areas such as laboratories where highly infectious materials are handled
- Window fans are cheap and feasible methods of providing mechanical ventilation

**Figure 4: Window fan**



In order to achieve adequate mechanical ventilation it is important that the equipment:

- Moves air across the room (for example, in a closed room, air should flow-in under a door and out of an opposite window, and not in and out of the same window or vent)
- Directs air movement so that TB germs produced by coughing patients are removed **away** from other people.

Additional methods of mechanical ventilation, which require more resources and considerable maintenance include:

- i. Mechanical exhaust systems that pump clean air from outside into the room and then remove the contaminated air from a room to the outside.
- ii. Closed recirculation filtration systems, which take room air, filter it to remove infectious TB germs, and then bring it back into the room.

High risk areas for TB transmission such as TB isolation rooms, TB wards, intensive care units where TB patients may be housed, sputum induction rooms, bronchoscopy rooms, operating rooms, X-ray rooms, laboratories handling highly infectious materials and autopsy (postmortem) rooms are a priority for mechanical ventilation. In these areas mechanical ventilation with window fans to generate directional air flow should be strongly considered unless natural ventilation is excellent.

### **Key messages**

- Mechanical ventilation such as appropriately placed simple fans can be used to reduce the concentration of TB germs in a room where natural ventilation is not feasible or is inadequate.
- High risk areas for TB transmission such as TB isolation rooms are a priority for mechanical ventilation. In these areas mechanical ventilation with window fans to generate directional air flow should be strongly considered unless natural ventilation is excellent.

#### **5.1.2.1. Monitoring of ventilation and ventilation systems**

Ventilation systems should be checked regularly to determine if they are functioning properly. The simplest test is the use of smoke (smoke test) to monitor airflow and ensure that it flows in the desired direction. If window fans are being used to produce negative pressure in a room, they should be checked frequently to ensure that air movement is in one direction and adequate.

**Figure 5: Smoke Test**



The findings of such tests should be documented in a maintenance record book that can easily be accessed by facility managers/in charges and other supervisors. The record book should include the date, test done, the person doing the test, the findings and recommendations.

### Key message

- Ventilation system must be checked regularly to ensure that they are functioning well

### 5.1.3. Ultraviolet germicidal irradiation (UVGI)



**Source:** From Wikipedia, the free encyclopedia

**Ultraviolet germicidal irradiation (UVGI)** is a sterilization method that uses ultraviolet (UV) light at sufficiently short wavelength to break down microorganisms. In high-risk areas of a facility such as mentioned above, use of natural and mechanical ventilation may not be feasible. In such situations, ultraviolet germicidal irradiation (UVGI) may provide a less expensive alternative to more expensive environmental control measures that require structural changes of a facility. These measures may be particularly useful in larger wards, TB clinic waiting areas or inpatient areas such as television or recreation rooms where TB patients gather together. TB germs are killed when exposed sufficiently to UVGI.

UVGI should be properly installed and maintained if it is to serve the intended purpose. Care should be taken when using UVGI to avoid adverse reactions (acute and chronic cutaneous and ocular changes) in health care workers from overexposure if the UVGI is not designed, installed and maintained properly.

In addition, exposure to the natural sun light rays for 12 hours or more kills the TB germs.

### Key message

- In high-risk areas of a facility where use of natural and mechanical ventilation may not be feasible, ultraviolet germicidal irradiation (UVGI) may provide a less expensive alternative to more expensive environmental control measures.

## Chapter 6: Personal Protective Equipment

### 6.0 Introduction

Personal protective equipment (particulate respirators) complements the administrative and environmental TB infection control measures. Personal protective equipment measures protect health care workers and others against health care facility acquired TB infection. Where feasible personal protective equipment should be implemented in settings where adequate administrative (work practices) and environment control measures are in place.

### 6.1 Personal protective equipment- particulate respirators

Personal protective equipment used to protect health care workers from inhaling TB germs is called particulate respirator. A respirator is a special type of closely-fitted mask with the capacity to filter very small particles the size of TB germs. Respirators are designed to fit over the mouth and nose and filter out TB germs from the air breathed in by the wearer. They provide protection to health care workers by minimizing the amount of TB germs inhaled. NB: If the respirator is not fitted correctly TB germs will enter the wearer's airways and potentially result in infection.

The particulate respirators used should meet or exceed the N95 or the FFP2 standards standard. The N 95 have 95% filter efficiency for particles of 0.3 micron in diameter while the FFP2 have 94 % filter efficiency.

Respirators are available in different sizes. It is recommended that health care workers should be “fit tested” to ensure selection of the appropriate size and shape for each health care worker.

Surgical masks **do not** protect health care workers or other wearers from inhalation of air contaminated with TB germs and should not be used for that purpose.

#### Key messages

- A particulate respirator is a special type of closely-fitted mask with the capacity to filter very small particles the size of TB germs. Respirators are designed to fit over the mouth and nose and filter out TB germs from the air breathed in by the wearer.
- To be effective particulate respirators must be fitted properly
- Surgical masks **do not** protect health care workers or other wearers from inhalation of air contaminated with TB germs and should not be used for that purpose

## 6.2. High risk areas for TB transmission

Table 5 showing examples of high risk areas for TB transmission include:

Isolation rooms for patients with TB or MDR-TB
Collection and sputum induction rooms
X-ray rooms
Bronchoscopy rooms
Mortuaries
Spirometry rooms
Theatres handling surgery on potentially infectious TB patients

## 6.3. Protection in high risk areas

Although respirators are expensive, they are the most appropriate for use by health care workers working in high risk areas. The high risk areas are found mostly in the referral hospital settings. Only authorized personnel should be allowed to enter high risk areas. Respirators should be worn by all personnel entering the high risk areas. In addition movement of health care workers and patients in high risk areas should be limited.



Picture 2: A perforate respirator worn by this health care worker is recommended for use by those working in high-risk settings mentioned above. A respirator has tiny pores which block TB germs. It relies on air tight seal around the entire edge.

## Key messages

- Health care workers in high risk settings should wear perforate respirators to prevent inhalation of the TB germs in the air.
- Surgical masks **do not** protect health care workers or other wearers from inhalation of air contaminated with TB germs and should not be used for that purpose

#### **6.4. TB infection control in the laboratory-Laboratory safety**

Laboratories that perform only sputum smear microscopy (level 1 and 2 laboratories) and do not use a centrifuge have a low risk of TB transmission. In such laboratories the greatest threat to laboratory personnel is contact with coughing patients. In such situations administrative control measures (work practices) are adequate and should be used to control TB transmission.

Laboratories that process liquid materials that contain TB germs (level 3 laboratories) have a high risk for TB transmission to the laboratory workers and other persons in the laboratories. Safety in these laboratories can be improved by:

- i. Enhancing ventilation in areas where culture and sensitivity testing of materials containing TB germs is performed
- ii. Reducing the number of laboratory staff that handle specimens containing concentrated TB germs
- iii. Only allowing laboratories with certified appropriate bio-safety cabinets (BSC) to handle TB germ containing liquid materials. BSCs are designed to contain airborne microorganisms in laboratories working with liquid suspensions containing TB germs. When used appropriately, BSCs minimize the spread of TB germs.
- iv. Only allowing trained and experienced staff to work with liquid materials containing TB germs

#### **Key messages**

- Environmental control measures greatly reduce the risk of TB transmission in laboratories conducting sputum microscopy (level 1 and 2 laboratories).
- Laboratories handling concentrated TB germs (level 3 laboratories) containing specimens need certified appropriate bio-safety cabinets to reduce the risk of TB transmission to laboratory personnel.

## **CHAPTER 7: REDUCING TB TRANSMISSION IN CONGREGATE SETTINGS**

### **7.0. Introduction**

This chapter discusses administrative controls (work practices), environmental controls, personal protective equipment and the roles and responsibilities of management in relation to congregate settings. The recommendations for congregate settings are less specific than those for health-care facilities, because congregate settings are so diverse. Congregate settings include prisons, detention centers (police cells, jails, and remand homes), refugee camps, school dormitories and classes, military barracks, police barracks. Other congregate settings include HIV social network groups, and nursing homes, religious establishments, day cares and nursery schools.

This chapter focuses particularly on prisons because they are often crowded and are often poorly ventilated leading to a high-risk for the spread of pulmonary tuberculosis (TB). Prisoners already have elevated risk for TB because of their lifestyles, inadequate pre-incarceration healthcare, and increased risk for HIV infection.

There is evidence from a number of studies done around the world that clearly shows incidences of TB infection and TB disease among individuals in prisons and other congregate places, like primary schools, exceeds the incidence among the general population. Furthermore, the association of HIV and TB together with the emergence of MDR-TB and XDR-TB increase the need to give urgent and appropriate attention to implementation of TB infection control in congregate settings.

Congregate settings differ in the type and duration of stay of the inhabitants; which in turn affect the risk of TB transmission. For the purpose of this policy guideline, congregate settings are divided into two categories:

1. Long term such as prisons and
2. Short term such as police cells and religious establishments

These two categories reflect the different duration of stay of the inhabitants. The longer the duration of stay by the inhabitants the higher the risk of possible TB transmission and infection. In these settings, there is a need for managers to put in place appropriate TB infection control measures.

Health-care facilities within congregate settings should be considered as any other health-care facility and the set of health-care facility TB infection control measures should be implemented.

### **7.1 Roles and responsibilities of management in congregate settings**

The full set of health care facility management roles in TB infection control described in chapter 3 can also apply to congregate settings with some modifications.

As a first step, policy makers responsible for congregate settings should be made part of the national TBIC sub-committee for planning and implementation of TB infection control measures in the country. In



particular, the medical service of the Ministry of Justice, Internal Affairs and Education and Sports facilities should be fully engaged and encouraged to implement TB infection control. In any congregate setting, overcrowding should be avoided because it can lead to non-infected individuals being exposed to TB.

Congregate settings should be part of the country surveillance activities, and should be included in facility assessment for TB infection control. Such assessment will be useful in determining the level of risk of TB transmission.

Advocacy and information, education and communication material should include a specific focus on congregate settings. In addition TBIC monitoring and evaluation activities should include congregate settings.

### **Key messages**

- Managers of congregate settings should take responsibility of ensuring that customized advocacy and information, education and communication (IEC) in their areas of control is carried out.
- They should ensure that effective monitoring and evaluation of TB infection control activities regularly take place.

Health care facility management roles described in chapter 3 with some modification also apply to congregate settings. These activities facilitate the implementation of the different types of TBIC measures described below.

### **7.2. Administrative controls in congregate settings**

To decrease TB transmission in congregate settings, cough etiquette and early identification, followed by separation and proper treatment of infectious patients as well as tracing and screening of their close contacts and family members should be implemented (Chapter 4).

### **7.3. Long term congregate settings**

In particular, all inmates of long term stay facilities such as prisons, primary schools and inhabitants of other congregate settings should be:

- Assessed for TB before entry into the facility.
- People suspected of having TB should be investigated as quickly as possible and treatment started on diagnosis.
- Those suspected of TB infection and infectious TB patients should always be separated and, if possible, isolated from other inmates to an adequately ventilated area, until they are non infectious. Directly observed therapy (DOT) while a patient is on treatment is also recommended. There should be a proper referral system on release and transfer of inmates within prisons.

- Patients having, or suspected of having, drug-resistant TB, should be separated from other patients (including other TB patients), and should be referred for proper treatment.
- Families of staff, inmates and persons residing in these settings diagnosed with TB should be visited for contact tracing
- All staff, inmates and persons residing in these settings should be given information and offered HIV counselling and testing services. If diagnosed with HIV, they should be offered a package of prevention and care including regular screening for TB.
- All staff, inmates and persons residing in these settings should be given information on TB transmission and prevention.

### **Key messages**

- All inmates of long-term stay facilities and inhabitants of other congregate settings should be screened for TB before entry into the facility. People suspected of having TB should be diagnosed as quickly as possible.
- People suspected of having TB and infectious TB patients should always be separated and, if possible, isolated in an adequately ventilated area, until they are non infectious.
- Directly observed therapy (DOT) while a patient is on treatment is recommended.
- Families of staff, inmates and persons residing in these settings diagnosed with TB should be visited for contact tracing.
- All members of a congregate setting should be screened for HIV and the infected individuals should receive full services including TB prevention services
- All staff, inmates and persons residing in these settings should be given information on TB transmission and prevention.

### **7.4 Short term congregate settings**

Managers of short-term congregate settings, such as police cells should make sure that:

- Persons with signs and symptoms of TB are referred to facilities that provide the necessary investigations and treatment.
- Patients living with HIV and other forms of immune-suppression are separated from those with suspected or confirmed infectious TB.
- All staff and persons residing in these settings should be offered HIV counselling and testing services. Those diagnosed with HIV, should be offered a package of prevention and care including regular screening for active TB.
- Patients having, or persons suspected of having drug-resistant TB, should be separated from other patients (including other TB patients) and should be referred for proper treatment.

- Upon release persons diagnosed with TB should be linked to the health care facilities in their location for further management and care. The health care facility to which the patient has been referred is responsible for contacting his or her family for contact tracing.

Due to the high HIV prevalence in Uganda, congregate setting must ensure that patients living with HIV and other forms of immune-suppression should be separated from those with suspected or confirmed infectious TB.

### **Key messages**

- All staff and other persons residing in congregate settings should be given information and encouraged to undergo HIV counseling and testing. If diagnosed with HIV, they should be offered a package of prevention and care that includes regular screening for TB.
- In congregate settings with patients having, or suspected of having, drug-resistant TB, such patients should be separated from other people and patients (including other TB patients), and referred for proper treatment.

## **7.5. Environmental controls in congregate settings**

As much as possible buildings in congregate settings should be designed to cater for TBIC. The building should comply with national norms and regulations for ventilation in public buildings and specific norms and regulations for the institution.

In congregate settings such as prisons and schools where there is a high risk of TB transmission and inadequate ventilation due to design constraints, the use of UVGI should be highly considered. When using UVGI it is important to design fixtures so as to prevent injury that may result from improper use or tampering with the device. It is important to carry out regular maintenance and the design should allow for easy maintenance. If it is not regularly maintained even when the light is on, it might not be working and thus give a false impression of protection.

## **7.6. Personal protective equipment in congregate settings**

When a person residing in a long-term stay congregate setting is suspected or diagnosed as having MDR TB, then the prison staff attending to him or her should wear personal protective equipment- particulate respirators as they organise to transfer them to the national designated MDR TB treatment centres. Other TB infection control measures discussed in chapter 6 should apply here as well.

### **Key messages**

- In congregate settings such as prisons and primary schools, improving ventilation and reductions of overcrowding are the most important strategies to reduce TB transmission.

## CHAPTER 8: REDUCING TB TRANSMISSION IN HOUSEHOLDS

### 8.0. Introduction

This Chapter outlines the various activities that reduce TB transmission in households. Household members of patients with sputum positive pulmonary TB (infectious TB) are at high risk of becoming infected with TB and consequently developing the disease. Close contacts (exposure) with untreated infectious TB patient stand a major risk for TB infection.

However, once a patient with infectious TB is started on effective anti TB treatment and is adherent, she or he stops being infectious after two weeks.

Basics on TB infection control measures should be part of all community information, education and communication messages. Community awareness has the benefit of getting social support to decrease TB transmission in the community. However, awareness of TB infection control in the community may increase stigma attached to having TB. Therefore it is important to have anti-stigma messages when conducting such awareness. Behaviour-change campaigns for family members of smear-positive TB patients and health care workers should aim at minimizing stigma and the exposure of non-infected persons to those who are infected.

Early diagnosis of TB together with effective anti-TB treatment remains the most important intervention for reducing the risk of TB transmission in the household. All family members and visitors must be screened and offered ITP (especially the under fives and PLWHA) or anti TB treatment if indicated. To minimize stigma household members may be invited to the health care facility and investigated in privacy.

TB infection control messages should promote the importance of early identification of TB cases, adherence to treatment and implementation of proper TB infection control measures such as cough etiquette for TB patients in the household. Emphasis must be put on screening all members, especially children below five and household members living with HIV/AIDS, to further limit the spread of TB in the community.

#### Key messages

- Any household member with cough for 2 or more weeks should be suspected to have TB disease.
- Such a person should be sent to a health care facility for TB investigations (sputum examination).
- Those found to have TB disease should be treated immediately.
- There is no need for isolating a TB patient after two weeks of effective anti- TB treatment.
- All household members where an infectious TB patient has been identified should be screened for TB

## 8.1. Measures to reduce TB in households

To reduce TB exposure in households:

- Houses should be adequately ventilated, particularly where a household member with infectious TB will be isolated and spend considerable amount of time. In Uganda we should aim at making use of natural ventilation by opening the windows fully.
- Anyone with cough should be educated on cough etiquette and respiratory hygiene, and should follow such practices at all times.
- Smear positive TB patients should:
  - Spend as much time as possible outdoors.
  - Sleep alone in a separate, adequately ventilated and well lit room, if possible.
  - Be counselled to limit his or her movements especially before completing at least two weeks of effective treatment.

All members of the household, including visitors, where an infectious TB patient has been identified must be screened for TB and given appropriate treatment if found TB infected.

It is important to note that patients with drug-resistant TB remain infectious for much longer period even if treatment is initiated. This prolongs the risk of TB transmission in the household. MDR-TB increases the risk of morbidity and mortality, particularly in people living with HIV. Therefore additional infection control measures must be implemented while managing MDR-TB patients. It is therefore necessary to take patients with MDR-TB for admission and treatment at specialised health care facilities.

### Key messages

- Patients with infectious TB and MDR-TB who cough should always practice cough etiquette (including use of masks) and respiratory hygiene when in contact with other people.
- Family members living with HIV, or those with strong clinical evidence of HIV infection, **should not provide care** for patients with infectious TB and MDR/XDR-TB. If there is no alternative, HIV-positive family members should wear respirators.
- Children below five years of age should not be allowed to come into contact with infectious TB and MDR-TB patients.
- All household members who have been in contact, with infectious TB and MDR/XDR-TB, especially children should be followed up regularly with TB screening. If found positive drug-susceptibility testing and treatment should be carried out.

## Glossary

**Adequately ventilated room:** A room with at least 12 air changes per hour.

**Administrative control measures or work practice:** these are measures which guide work practices to reduce significantly the risk of TB transmission by preventing the generation of TB germs. These include early diagnosis, prompt isolation or separation of infectious TB patients, prompt initiation of appropriate anti-tuberculosis treatment.

**Advocacy communication and social mobilization:** In the context of TB infection control, the aim of advocacy is to secure financial resources and to change policies, guidelines or procedures by influencing groups such as politicians, decision makers and journalists. The aim of communication is to increase awareness, influence social norms, change behaviour (in individuals or subpopulations) and improve communication and counseling between people with TB, their families and providers. The aim of social mobilization is to change norms, improve services, expand community support and solve social problems, often by bringing groups together to act at the community level.

**Community involvement:** In the context of TB infection control, the involvement of people with TB and their communities in the design, implementation, monitoring and evaluation of health promotion, and TB preventive and curative services. Home-based care and community-based approaches for management of TB are part of community involvement in TB control.

**Congregate settings:** A mix of institutional settings where people live in close proximity to each other. For the purpose of this policy, congregate settings are divided into two categories – long term (e.g. prisons) and short term (e.g. homeless shelters, jails) – to reflect the different duration of stay of the inhabitants. Health-care facilities are considered separately, even though these are settings where people congregate.

**Control:** Measures used to minimize the risk of spreading TB within populations

**Extensively Drug-Resistant (XDR-TB):** is a form of TB caused by bacteria that are resistant to the most effective anti-TB drugs. Some contend that XDR-TB strains have emerged from the mismanagement of multidrug-resistant TB (MDR-TB) and once created, can spread from one person to another. The exact nature of this mismanagement is not yet known, but origin of XDR-TB may coincide with the institution of new policies to promote drug compliance, such as DOTS

**Face mask:** cloth or paper mask (e.g., surgical mask) that prevents the spread of micro-organisms from the wearer to others by capturing the large wet particles near the source (mouth); it does not provide sufficient protection from inhaling TB germs through.

**Health care workers (HCWs):** group of people that includes nurses, physicians, nursing and medical students, laboratory workers and others who work in health care facilities and may be exposed to patients with communicable diseases.

**HIV:** Human immunodeficiency virus, the causative agent of the acquired immunodeficiency syndrome (AIDS).

**Infection control assessment:** An assessment of the implementation of managerial activities (including risk assessment), administrative controls, environmental controls, and respiratory protective equipment in a setting, in the context of local epidemiological, climatic and socioeconomic conditions.

**Health-care facility:** Any establishment that is engaged in direct patient care on site.

**Health-care workers:** All those in public and in private services, in the health sector and other sectors, whose main activities are aimed at improving health. They include health service providers – for example, doctors, nurses, pharmacists and laboratory technicians – and health management and support workers – for example, financial officers, cooks, drivers and cleaners.

**Infection control assessment:** An assessment of the implementation of managerial activities (including risk assessment), administrative controls, environmental controls, and respiratory protective equipment in a setting, in the context of local epidemiological, climatic and socioeconomic conditions.

**Infectious case:** Smear-positive cases are the most infectious and most likely to transmit TB. Smear-negative but culture-positive cases can also transmit TB.

**Mechanical ventilation:** methods used to direct airflow to dilute and remove air, and to produce negative pressure in isolation rooms (e.g., window fan, exhaust ventilation systems, etc).

**Multidrug-resistant tuberculosis (MDR-TB):** TB caused by strains of *M. tuberculosis* which are resistant to both isoniazid and rifampicin with or without resistance to other drugs.

**Mycobacterium tuberculosis:** the bacterium that causes TB.

**Natural ventilation:** Ventilation created by the use of external natural forces such as wind and temperature. Control of airflow direction cannot be achieved by simple natural ventilation – it depends on sufficient wind speed or direction, or temperature differential.

**Negative pressure ventilation:** ventilation system which permits the control of the air-flow direction in isolation or procedure rooms. So the room with negative pressure has a lower pressure than adjacent areas, which keeps air from flowing out of the room and into adjacent rooms or areas. It is the relative air pressure difference between two areas in a health-care facility.

**Nosocomial infection:** An infection occurring in a patient in a hospital or other health-care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections acquired by staff as a result of working at the facility.

**Particulate respirators:** Special type of closely fitted face mask with the capacity to filter particles to protect against inhaling infectious droplet nuclei. The N95 respirator has a filter efficiency level of 95% or more against particulate aerosols free of oil when tested against 0.3 µm particles. The “N” denotes that the mask is not resistant to oil; the “95” refers to a 95% filter efficiency. The FFP2 respirator has a filter efficiency level of 94% or more against 0.4 µm particles and is tested against both an oil and a non-oil aerosol.

**Respirators:** special type of closely-fitted mask with the capacity to filter particles 1 micron in size to protect from inhaling TB germs.

**Risk assessment:** Includes analysis, collection and review of surveillance data and in-depth description of a facility.

**Separation:** Placing patients infected or colonized with the same known pathogen in a designated unit (i.e. one that has the same space and staff), to which patients without the pathogens are not admitted.

**Ultraviolet germicidal irradiation (UVGI):** an environmental control measure used to kill or inactivate micro-organisms like TB germs through exposure to UVGI.





## **TB Infection Control Assessment forms (Annex 2- Annex 5)**

### **Annex 2: INFECTION CONTROL ASSESSMENT OF HEALTH FACILITY**

#### ***Goal***

To conduct a TB IC assessment of Health facility

Questions to be answered

- Are they adequately controlling the risk?
- What are your recommendations?

## Infection Control Assessment of the Health Facility

Date: \_\_\_\_\_

Name of District: \_\_\_\_\_

Name of Health Facility: Name: \_\_\_\_\_

Level of Health Facility (HC) (HC III, IV, V, VI VII): \_\_\_\_\_

### General background information:

1. How many full time staffs work at this health facility? (Clinicians, nurses, counselors, dispenser/pharmacists, cleaners etc)? \_\_\_\_\_
2. How many part time staffs work at this health facility? \_\_\_\_\_
3. In the past one year, how many staff members have suffered from TB? \_\_\_\_\_
4. If any health worker suffered from tuberculosis, ask in which setting of the health worker (s) spent most time before knowing that he/she/they had tuberculosis?
  1. OPD/triage
  2. Inpatient Ward
  3. Laboratory
  4. Clinician consultation room
  5. Treatment room
  6. Other, specify \_\_\_\_\_
  9. No answer
5. Does this facility have a designated infection control officer?
  1. Yes
  2. No
  3. Don't know
  4. No answer
6. Has the setting undertaken a TB IC assessment?
  1. Yes
  2. No
  3. Don't know
  4. No answer
7. Does this facility have a written infection control plan?
  1. Yes
  2. No
  3. Don't know
  4. No answer
8. If facility has infection control plan, does this plan include TB?
  1. Yes
  2. No
  3. Don't know
  4. No answer

**If answer 2/3/4 go to Ques. 11**

1. Yes      2. No      3. Don't know      4. No answer

9. If facility has infection control plan, does this plan include HIV?

1. Yes      2. No      3. Don't know      4. No answer

10. If facility has infection control plan, does this plan include TB/HIV?

1. Yes      2. No      3. Don't know      4. No answer

11 Describe education procedures in-place for cough etiquette and respiratory hygiene for TB suspects/patient

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12. Are posters displaying cough etiquette and respiratory hygiene prominently displayed?

1. Yes      2. No      3. Don't know      4. No answer

**Thank the respondent for his or her time**

### **Annex 3: TUBERCULOSIS INFECTION CONTROL ASSESSMENT TOOL FOR THE OPD AT HEALTH FACILITY**

#### ***Goal***

To conduct a TB IC assessment of OPD at Health facility

#### **Questions to be answered**

- Are they adequately controlling the risk of tuberculosis in the OPD?
- What are your recommendations?

**TUBERCULOSIS INFECTION CONTROL ASSESSMENT TOOL FOR OUTPATIENT DEPARTMENT (OPD)**

Name of District: \_\_\_\_\_ Date: \_\_\_\_\_

Name & level of Health Facility: Name: \_\_\_\_\_ Level (HC III, IV, V): \_\_\_\_\_

How many patients on average are registered at the OPD per day? \_\_\_\_\_

1. In the past three months, what was the average number of patients registered at this health facility (OPD)?

Feb \_\_\_\_\_ March \_\_\_\_\_ April \_\_\_\_\_

2. How many of those registered patients' at the Health facility had a cough as a presenting symptom?

Feb \_\_\_\_\_ March \_\_\_\_\_ April \_\_\_\_\_

3. Of those who had a cough per month how many were TB suspects (lab register)?

Feb \_\_\_\_\_ March \_\_\_\_\_ April \_\_\_\_\_

**Chronic cough among staff**

4. In the past one year, is there any health worker working in the OPD that had a cough lasting 2 or more weeks?

1. Yes                      2. No                      3. Don't know

If yes, how many health workers working in the OPD had a cough lasting 2 or more weeks in the past one year? \_\_\_\_\_

**Incidence of tuberculosis among staff**

5. In the past one year, is there any health worker working in the OPD who suffered from tuberculosis?

1. Yes                      2. No                      3. Don't know

6. If yes, how many health workers working in the OPD suffered from tuberculosis in the past one year? \_\_\_\_\_

7. Do you think there is a chance of getting infected with tuberculosis while working in the OPD?

1. Yes 2. No                      3. Don't Know

**At the busiest time, describe the waiting area in terms of patient load and mix.**

8. Patient load

1. Not congested      2. Congested      3. Very congested

10. Patient Mix

1. Patients coughing sharing same area with other patients
2. Patients coughing separated from other patients

What is the estimated waiting time to?

- |      |   |       |         |
|------|---|-------|---------|
| i)   | Pre-Registration                          | _____ | Minutes |
| ii)  | Registration - examination                | _____ | Minutes |
| iii) | Examination - laboratory investigation    | _____ | Minutes |
| iv)  | Laboratory investigation – Treatment (TB) | _____ | Days    |

**Sketch room:** Include main room, hallway, windows, doors, and major furniture.

**Observe path of patient through OPD:**

Create flowchart of the path of patients in the OPD on the sketch above

**Room dimensions:** Length \_\_\_\_\_ms Width \_\_\_\_\_ms Height \_\_\_\_\_ms

**(List all dimensions on drawing)**

Area room (ARM) Area (L • W): \_\_\_\_\_ m<sup>2</sup>

Window dimensions: Width \_\_\_\_\_ms Height \_\_\_\_\_ms

Width \_\_\_\_\_ms Height \_\_\_\_\_ms

Width \_\_\_\_\_ms Height \_\_\_\_\_ms

**Dimensions of Window openings:**

W1=Width (W) \_\_\_\_m Height (H) \_\_\_\_m

W2=Width (W) \_\_\_\_m Height (H) \_\_\_\_m

W3=Width (W) \_\_\_\_m Height (H) \_\_\_\_m

W1=Area (W • H): \_\_\_\_\_ m<sup>2</sup>

W2=Area (W • H): \_\_\_\_\_ m<sup>2</sup>

W3=Area (W • H): \_\_\_\_\_ m<sup>2</sup>

Area Window openings (ARW) = W1 + W2 + W3: \_\_\_\_\_ m<sup>2</sup>

ARW/ARM x 100% ≥ **20%**

Describe the natural ventilation in the OPD ward in terms of flow of air (tick appropriate category)?

**Adequate ventilation if ARW ≥ 20% of which 50% should be on two sides of the room**

1. Adequate ventilation
2. Inadequate ventilation of the room

Describe the natural ventilation in the consultation room in terms of flow of air (tick appropriate category)?

**Adequate ventilation if ARW ≥ 20% of which 50% should be on opposite sides of the room**

1. Adequate ventilation
2. Inadequate ventilation of the room

**Thank the respondent for his or her time**



**Annex 4: TUBERCULOSIS INFECTION CONTROL ASSESSMENT TOOL FOR THE IN-PATIENT WARDS AT HEALTH FACILITY**

-

***Goal***

To conduct a TB IC assessment of selected in-patient settings at Health facilities

**Questions to be answered**

- Are they adequately controlling the risk?
- What are your recommendations?

**Infection Control Assessment of Inpatient Ward**

Date: \_\_\_\_\_ Name of Health Facility \_\_\_\_\_

Name of District \_\_\_\_\_

Level of Health Facility (HC III, IV, V, Regional, National referral): \_\_\_\_\_

- 1. HC IV                      2. HC V 3. Regional Hosp.                      4. National Referral
- 5. Other, specify, \_\_\_\_\_                      9. No answer

Type of inpatient TB ward

- 1. Male                      2. Female                      3. Other, Specify \_\_\_\_\_

**General background information:**

Capacity:

Number of patients (planned) \_\_\_\_\_

Currently on average per day how many patients are on the ward? \_\_\_\_\_

**Composition of disease categories for admitted patients:**

What is the composition of patients admitted in the ward? (Outline the disease categories)

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_
- 4. \_\_\_\_\_
- 5. \_\_\_\_\_
- 6. \_\_\_\_\_

In the past three months, what was the average number of patients admitted to this ward per day?

Nov \_\_\_\_\_ Dec \_\_\_\_\_ Jan \_\_\_\_\_

In the past three months, how many of the patients admitted to this ward had tuberculosis

Nov \_\_\_\_\_ Dec \_\_\_\_\_ Jan \_\_\_\_\_

Do you think there is a chance of getting infected with tuberculosis in this ward?

- 1. Yes                      2. No                      3. Don't Know                      4. No answer

In the past one year, how many staffs working (who worked) in this ward suffered from tuberculosis?

---

**Infection Control Procedures**

Are IC procedures and policies in place?

1. Yes 2. No 3. Don't Know 4. No answer

If IC procedures and policies are in place, are the IC procedures and policies adequately displayed?

1. Yes 2. No 4. No answer

If IC procedures and/or policies are in place, are TB – IC control procedures clearly outlined?

1. Yes 2. No 4. No answer

**Sketch room:** Include main room, hallway, windows, doors, bed, and major furniture.

**Observe path of patient through ward:**

Indicate on the sketch above the position of patient beds with the disease categories outline above

**Room dimensions:** Length \_\_\_\_\_ms Width \_\_\_\_\_ms Height \_\_\_\_\_ms

**(List all dimensions on drawing)**

Area room (ARM) Area (L • W): \_\_\_\_\_ m<sup>2</sup>

Window dimensions: Width \_\_\_\_\_ms Height \_\_\_\_\_ms

Width \_\_\_\_\_ms Height \_\_\_\_\_ms

Width \_\_\_\_\_ms Height \_\_\_\_\_ms

**Dimensions of Window openings:**

W1=Width (W) \_\_\_\_m Height (H) \_\_\_\_m

W2=Width (W) \_\_\_\_m Height (H) \_\_\_\_m

W3=Width (W) \_\_\_\_m Height (H) \_\_\_\_m

W1=Area (W • H): \_\_\_\_\_ m<sup>2</sup>

W2=Area (W • H): \_\_\_\_\_ m<sup>2</sup>

W3=Area (W • H): \_\_\_\_\_ m<sup>2</sup>

Area Window (ARW) = W1 + W2 + W3: \_\_\_\_\_ m<sup>2</sup>

ARW/ARM x 100% ≥ **20%**

Describe the natural ventilation in the in-patient ward in terms of flow of air (tick appropriate category)?

**Adequate ventilation if ARW ≥ 20% of ARM of which 50% should be on two sides of the room**

**NB: Consider patients and health workers in the room (s) when assessing ventilation adequacy.**

Is the ventilation adequate?

3. Adequate ventilation
4. Inadequate ventilation of the room

**Thank the respondent for his or her time**

## **Annex 5: TUBERCULOSIS INFECTION CONTROL ASSESSMENT TOOL FOR THE LABORATORY AT HEALTH FACILITY**

### ***Goal***

To conduct a TB IC assessment of the laboratory at the Health facility

### **Questions to be answered**

- Are they adequately controlling the risk of tuberculosis in the laboratory?
- What are your recommendations?

Tuberculosis Infection Control Assessment tool for the **Laboratory**

Name of District: \_\_\_\_\_ Date: \_\_\_\_\_

Name & level of Health Facility: Name: \_\_\_\_\_ Level (HC III, IV, V,VI,VII): \_\_\_\_\_

Lab level \_\_\_\_\_ (I, II, III)

**General background information:**

In the past three months, how many sputum specimens were received by the laboratory?

Feb \_\_\_\_\_ March \_\_\_\_\_ April \_\_\_\_\_

Of the sputum specimens received in the past three months, how many were smear positive for tuberculosis?

Feb \_\_\_\_\_ March \_\_\_\_\_ April \_\_\_\_\_

Number and types of procedures (TB procedures)

1. Type of procedure \_\_\_\_\_ Number/month \_\_\_\_\_
2. Type of procedure \_\_\_\_\_ Number/month \_\_\_\_\_
3. Type of procedure \_\_\_\_\_ Number/month \_\_\_\_\_
4. Type of procedure \_\_\_\_\_ Number/month \_\_\_\_\_

Are protective gears available and used for lab staff? Ask and observe (gloves, clinical coats, masks, N95)

How are medical wastes managed in the lab? (Segregation, predisposal treatment and disposal)

**Chronic cough among staff**

In the past one year, is there any health worker at this laboratory that had a cough lasting 2 or more weeks?

2. Yes                      2. No                      3. Don't know                      4. No answer

If yes, how many health workers at this laboratory had a cough lasting 2 or more weeks in the past one year? \_\_\_\_\_

**Incidence among staff**

In the past one year, is there any health worker who suffered from tuberculosis?

2. Yes                      2. No                      3. Don't know                      4. No answer

If yes, how many health workers at this laboratory suffered from tuberculosis in the past one year?

\_\_\_\_\_

Do you think there is a chance of getting infected with tuberculosis in this laboratory?

2. Yes 2. No                      3. Don't Know                      4. No answer

### **Infection Control Procedures**

Are IC procedures and/or policies in place?

1. Yes 2. No                      3. Don't Know                      4. No answer

### **Sketch laboratory (including locations of various procedures and major equipment)**

Create a sketch of flow of sputum specimen through the laboratory (smear – receipt through disposal):

**Room dimensions:** Length \_\_\_\_\_ms Width \_\_\_\_\_ms Height \_\_\_\_\_ms

**(List all dimensions on drawing)**

Area room (ARM) Area (L • W): \_\_\_\_\_ m<sup>2</sup>

Window dimensions: Width \_\_\_\_\_ms Height \_\_\_\_\_ms

Width \_\_\_\_\_ms Height \_\_\_\_\_ms

Width \_\_\_\_\_ms Height \_\_\_\_\_ms

**Dimensions of Window openings:**

W1=Width (W) \_\_\_\_m Height (H) \_\_\_\_m

W2=Width (W) \_\_\_\_m Height (H) \_\_\_\_m

W3=Width (W) \_\_\_\_m Height (H) \_\_\_\_m

W1=Area (W • H): \_\_\_\_\_ m<sup>2</sup>

W2=Area (W • H): \_\_\_\_\_ m<sup>2</sup>

W3=Area (W • H): \_\_\_\_\_ m<sup>2</sup>

Area Window (ARW) = W1 + W2 + W3: \_\_\_\_\_ m<sup>2</sup>

ARW/ARM  $\geq$  20%

Describe the natural ventilation in the Laboratory in terms of flow of air (tick appropriate category)?

**Adequate ventilation if ARW  $\geq$  20% of which 50% should be on opposite sides of the room**

**NB: Consider number of staffs in the room (s) when assessing ventilation adequacy.**

Is the ventilation adequate?

- 5. Adequate ventilation
- 6. Inadequate ventilation of the room

**Thank the respondent for his or her time**