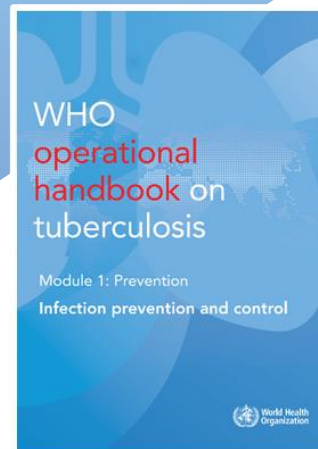
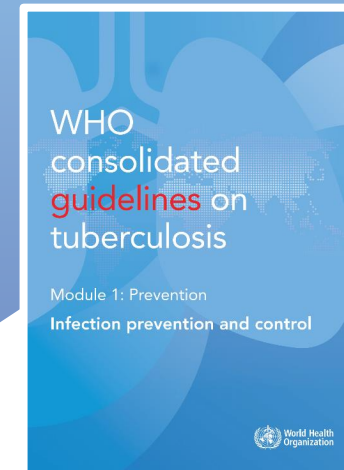




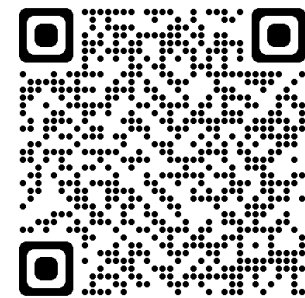
Overview of WHO guideline and handbook on TB IPC

23rd webinar of the Virtual Medical Consilium
WHO Regional Office for Europe 20/10/2023

Dr Avinash Kanchar,
Global Tuberculosis Programme,
World Health Organization
Geneva, Switzerland



Overview of TB IPC guidelines

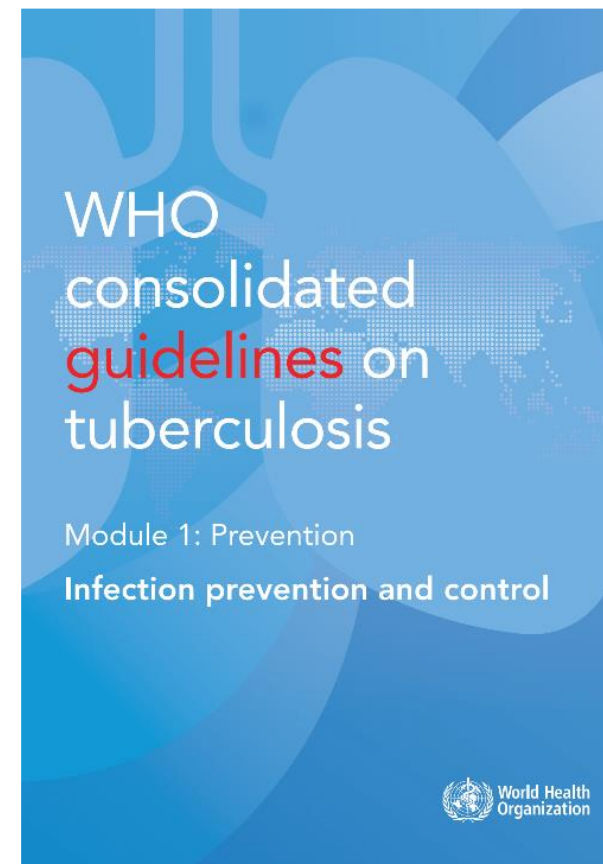


2019

18 recommendations and 3 good practice statements under the key areas of TB infection prevention and control (TB IPC):

1. Administrative controls
2. Environmental controls
3. Respiratory protection
4. Core components of IPC programmes

(Research gaps)



<https://extranet.who.int/tbknowledge/en/node/671>

Background (1)

The End TB Strategy – Pillar 2


“Bold policies and supportive systems”




A. Political commitment with adequate resources for TB care and prevention




B. Engagement of communities, civil society organizations, and all public and private care providers



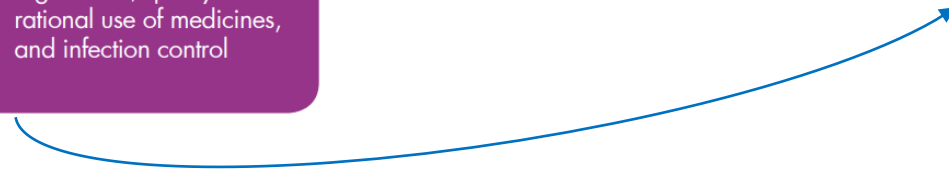
D. Social protection, poverty alleviation and actions on other determinants of TB



C. Universal health coverage policy, and regulatory frameworks for case notification, vital registration, quality and rational use of medicines, and infection control



C. Universal health coverage policy, and regulatory frameworks for case notification, vital registration, quality and rational use of medicines, and infection control



Background (2)

- **Initial** WHO recommendations on TB IPC focused on **decreasing the risk of transmission** in health care facilities in resource-limited settings
- The **2009 guidelines update** expanded its scope and provided guidance on **specific measures for health care facilities, congregate settings and households**
- The **2019 update** aimed to
 - consider **more recent evidence** on TB IPC
 - **integrate** evidence-based recommendations on **general IPC**, developed by WHO in 2016, providing a broader **health systems framework**
 - employ **public health approach** within the domains of both clinical and programmatic management of TB

WHO TB IPC recommendations (1)

Administrative controls (1)

Recommendation 1: Triage of people with TB signs and symptoms, or with TB disease, is recommended to reduce *M. tuberculosis* transmission to health workers (including community health workers), persons attending health care facilities or other persons in settings with a high risk of transmission. *(Conditional recommendation based on very low certainty in the estimates of effects)*

Recommendation 2: Respiratory separation / isolation of people with presumed or demonstrated infectious TB is recommended to reduce *M. tuberculosis* transmission to health workers or other persons attending health care facilities. *(Conditional recommendation based on very low certainty in the estimates of effects)*

WHO TB IPC recommendations (2)

Administrative controls (2)

Recommendation 3: Prompt initiation of effective TB treatment of people with TB disease is recommended to reduce *M. tuberculosis* transmission to health workers, persons attending health care facilities or other persons in settings with a high risk of transmission. *(Strong recommendation based on very low certainty in the estimates of effects)*

Recommendation 4: Respiratory hygiene (including cough etiquette) in people with presumed or confirmed TB is recommended to reduce *M. tuberculosis* transmission to health workers, persons attending health care facilities or other persons in settings with a high risk of transmission. *(Strong recommendation based on low certainty in the estimates of effects)*

WHO TB IPC recommendations (3)

Environmental controls & Respiratory protection

Recommendation 5: Upper-room germicidal ultraviolet (GUV) systems are recommended to reduce *M. tuberculosis* transmission to health workers, persons attending health care facilities or other persons in settings with a high risk of transmission. *(Conditional recommendation based on moderate certainty in the estimates of effects)*

Recommendation 6: Ventilation systems (including natural, mixed-mode, mechanical ventilation and recirculated air through high-efficiency particulate air [HEPA] filters) are recommended to reduce *M. tuberculosis* transmission to health workers, persons attending health care facilities or other persons in settings with a high risk of transmission. *(Conditional recommendation based on very low certainty in the estimates of effects)*

Recommendation 7: Particulate respirators, within the framework of a respiratory protection programme, are recommended to reduce *M. tuberculosis* transmission to health workers, persons attending health care facilities or other persons in settings with a high risk of transmission. *(Conditional recommendation based on very low certainty in the estimates of effects)*

WHO recommendations on core components of IPC (4)

- **2016-WHO Department of Service Delivery and Safety issued evidence-based guidelines on core components of IPC programmes**
- **8 core components combine 11 recommendations and 3 good practice statements**
- **Recommendations for national level and health facility level**
- **Aim being addressing current and preventing future threats, strengthening health service resilience and helping to combat AMR**
- **Aim also to support countries develop own national protocols for IPC and AMR action plans**

Core component 1. Infection prevention and control programmes

1a. Health care facility level

The panel recommends that an IPC programme with a dedicated, trained team should be in place in each acute health care facility for the purpose of preventing HAIs and combating AMR through IPC good practices.
(Strong recommendation, very low quality of evidence)

1b. National level

Active, stand-alone, national IPC programmes with clearly defined objectives, functions and activities should be established for the purpose of preventing HAIs and combating AMR through IPC good practices. National IPC programmes should be linked with other relevant national and professional organizations.
(Good practice statement)

Core component 2. National and facility level infection prevention and control guidelines

The panel recommends that evidence-based guidelines should be developed and implemented for the purpose of reducing HAI and AMR. The education and training of relevant health care workers on the guideline recommendations and the monitoring of adherence with guideline recommendations should be undertaken to achieve successful implementation.
(Strong recommendation, very low quality of evidence)

Core component 3. Infection prevention and control education and training

3a. Health care facility level

The panel recommends that IPC education should be in place for all health care workers by utilizing team- and task-based strategies that are participatory and include bedside and simulation training to reduce the risk of HAI and AMR.
(Strong recommendation, very low quality of evidence)

3b. National level

The national IPC programme should support the education and training of the health workforce as one of its core functions.
(Good practice statement)

Core component 4. Health care-associated infection surveillance

4a. Health care facility level

The panel recommends that facility-based HAI surveillance should be performed to guide IPC interventions and detect outbreaks, including AMR surveillance with timely feedback of results to health care workers and stakeholders is essential and should be carried out through national networks.
(Strong recommendation, very low quality of evidence)

4b. National level

The panel recommends that national HAI surveillance programmes and networks that include mechanisms for timely data feedback and with the potential to be used for benchmarking purposes, should be established to reduce HAI and AMR.
(Strong recommendation, very low quality of evidence)

Core component 5. Multimodal strategies for implementing infection prevention and control activities

5a. Health care facility level

The panel recommends that IPC activities using multimodal strategies should be implemented to improve practices and reduce HAIs and AMR.
(Strong recommendation, low quality of evidence)

5b. National level

The panel recommends that national IPC programmes should coordinate and facilitate the implementation of IPC activities through multimodal strategies on a nationwide or subnational level.
(Strong recommendation, low quality of evidence)

Core component 6. Monitoring/audit of IPC practices and feedback and control activities

6a. Health care facility level

The panel recommends that regular monitoring/audit and timely feedback of health care practices, according to IPC standards should be performed to prevent and control HAI and AMR at the health care facility level. Feedback should be provided to all audited persons and relevant staff.
(Strong recommendation, low quality of evidence)

6b. National level

The panel recommends that a national IPC monitoring and evaluation programme should be established to assess the extent to which standards are being met and activities are being performed according to the programme's goals and objectives. Hand hygiene monitoring with feedback should be considered as a key performance indicator at the national level.
(Strong recommendation, moderate quality of evidence)

Core component 7. Workload, staffing and bed occupancy at the facility level

The panel recommends that the following elements should be adhered to in order to reduce the risk of HAI and the spread of AMR: (1) bed occupancy should not exceed the standard capacity of the facility; (2) health care worker staffing levels should be adequately assigned according to patient workload.
(Strong recommendation, very low quality of evidence)

Core component 8. Built Environment, materials and equipment for IPC at the facility level

8a. General principles

Patient care activities should be undertaken in a clean and/or hygienic environment that facilitates practices related to the prevention and control of HAI, as well as AMR, including all elements around the WASH infrastructure and services and the availability of appropriate IPC materials and equipment.
(Good practice statement)

8b. Materials, equipment and ergonomics for appropriate hand hygiene

The panel recommends that materials and equipment to perform appropriate hand hygiene should be readily available at the point of care.
(Strong recommendation, very low quality of evidence)

AMR: antimicrobial resistance; HAI: health care-associated infection; IPC: infection prevention and control; WASH: water, sanitation and hygiene.

IPC programme

- 1a. **Health facility:** IPC programmes with a **dedicated trained team** should be in place in each acute health care facility
- 1b. **National:** Established active, stand-alone, national IPC programmes with defined objectives, functions and activities

IPC Guidelines

- 2. **Evidence-based guidelines** should be developed and implemented and undertaken education and training of health workers and monitoring of adherence to guidelines

Education and training

- 3a. **Health facility:** IPC education should be in place for all health workers utilizing **team and task-based strategies**
- 3b. **National:** The national IPC programme should **support the education and training** of the health workforce

HAI Surveillance

- 4a. **Health facility:** HAI surveillance should be performed to guide IPC interventions and detect outbreaks
- 4b. **National:** establish HAI surveillance programmes and mechanisms for timely data feedback

Multimodal strategies

- 5a. **Health facility:** IPC activities using multimodal strategies should be **implemented**
- 5b. **National:** national IPC programmes should **coordinate and facilitate** the implementation of multimodal strategies

Monitoring-audit and feedback

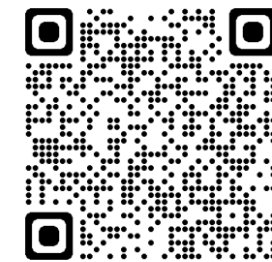
- 6a. **Health facility:** regular monitoring and timely feedback of health care practices
- 6b. **National:** Establish national IPC M&E programme including hand hygiene and feedback

Workload, staffing, bed occupancy

- 7. Following elements should be adhered to: (1) **bed occupancy** should not exceed capacity; (2) **staffing levels** should be adequately assigned according to workload

Built environment, materials and equipment

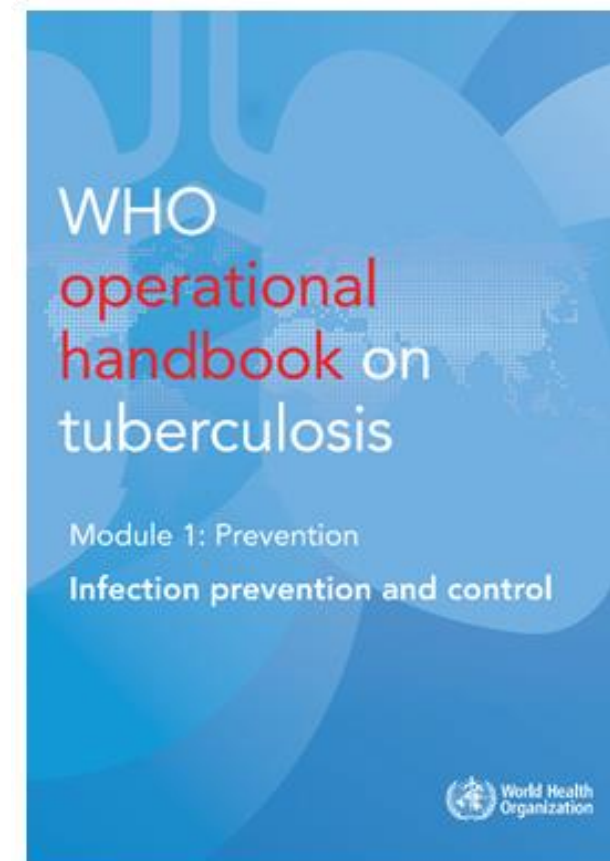
- 8a. **General principles:** patient care should be in hygienic environment, including WASH infrastructure and IPC
- 8b. **Materials, equipment and ergonomics** for hand hygiene should be readily available at point of care



2023

The handbook provides **practical advice, best practices, checklists and other job aids** on how to implement WHO recommendations on TB IPC within the clinical and programmatic contexts, using a public health approach with multisectoral actions across relevant settings.

It targets **policy-makers** at national and subnational levels, programme managers for TB, HIV and noncommunicable disease programmes; **managers and clinicians** at inpatient and outpatient health care facilities; managers at congregate settings, **occupational health officials**; engineers; **frontline health care workers**; and other key stakeholders in the public and private sectors.



<https://apps.who.int/iris/bitstream/handle/10665/372738/9789240078154-eng.pdf>



Integrated package of TB IPC

Three-level hierarchy of TB IPC

Administrative controls



Triage of people with TB signs and symptoms, or with TB disease



Respiratory separation



Prompt **initiation of effective TB treatment** of people with TB disease



Respiratory hygiene

Environmental controls



Ventilation systems



Upper-room germicidal ultraviolet (**GUUV**) systems

Respiratory protection



Particulate respirators, within the framework of a **respiratory protection programme**

IPC: infection prevention and control; TB: tuberculosis.

National IPC focal person

- national TB IPC plan
- national norms and regulations
- fund and resource mobilization from government and donors
- develop and disseminate educational and advocacy material
- coordinate implementation of TB IPC activities
- facilitate recording and reporting of TB IPC

Subnational and facility-level IPC focal person

- A HCW employed full time for oversight of TB IPC implementation
- ensure TB screening, training and education of HCWs at risk are performed regularly

Coordination and planning

IPC committee at facility level

- develop a TB IPC implementation plan
- advise facility administration on the choice of IPC tools (respirators, UGV, ventilation)
- ensure availability of above
- review implementation
- organize initial and regular refresher training
- ensure the availability and use of SOPs

TB IPC facility risk assessment

- review patient flow
- location and scheduling of TB services
- Identify high-risk areas, congregation and waiting areas
- status of environmental controls and respiratory protection measures

Annex 3. Example of an outline of facility tuberculosis infection prevention and control plan

The facility tuberculosis (TB) infection prevention and control (IPC) plan given in this annex is based on a publication from the United States Centers for Disease Control and Prevention (CDC) (7).

- Name of facility:
- TB IPC committee chair:
- TB IPC focal person:
- IPC committee members (e.g. nursing services, radiology, laboratory, medical records, community representative, TB clinical lead and HIV clinical lead):
- Schedule of IPC committee meetings (e.g. first Wednesday of each month), updates on TB IPC will be a standing agenda item:

Background

- Type of health facility:
- Patient visits per year (outpatients, inpatients):
- Type of health services available (e.g. outpatient, HIV and anti-retroviral therapy [ART], TB screening and follow-up, prenatal, maternity, paediatric and laboratory services including rapid TB diagnostics and X-ray):
- Estimated TB burden in the catchment area of the health facility:
- Type of TB services available (e.g. screening, diagnosis, treatment and TB preventive treatment [TPT]):

Purpose

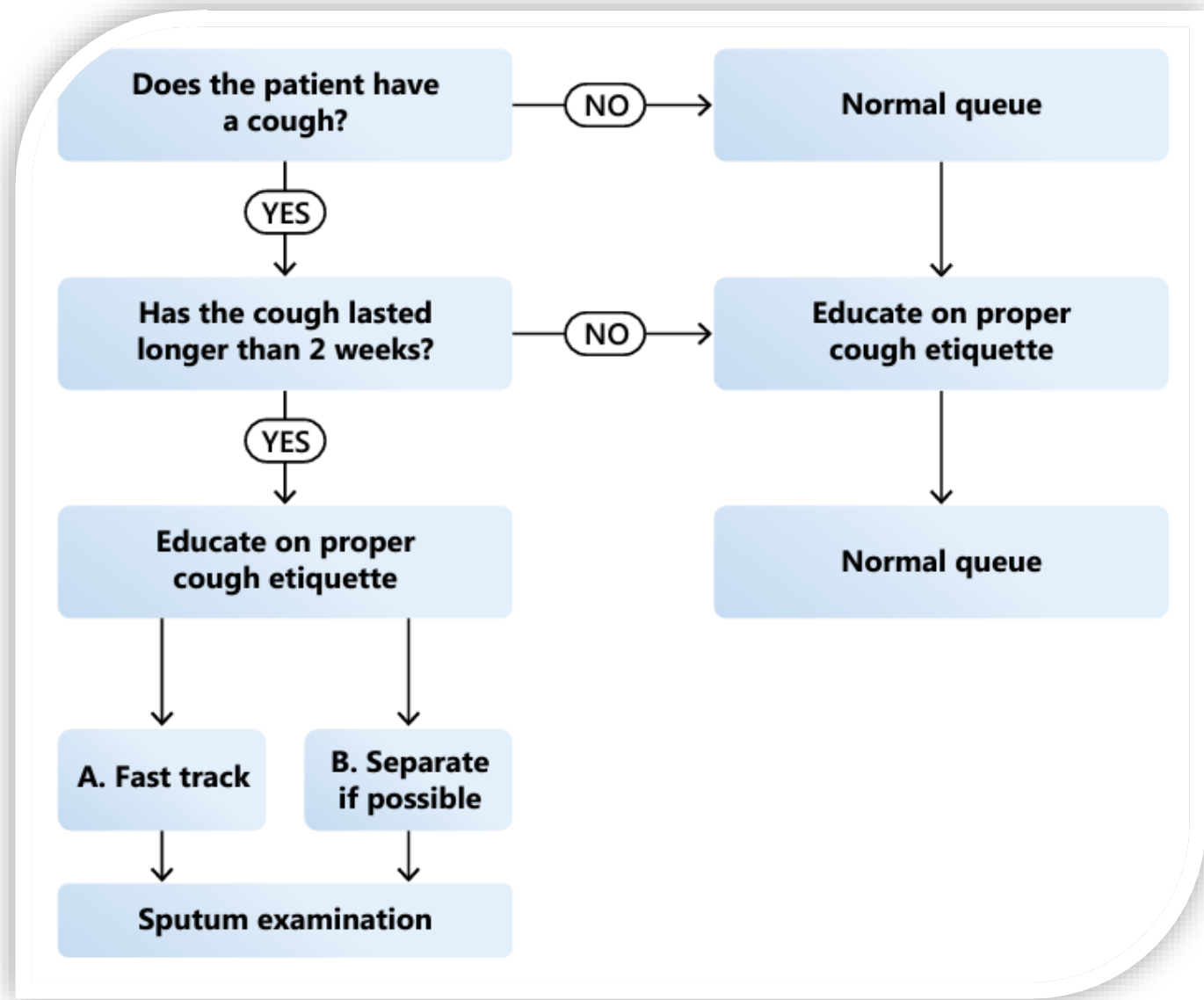
An infection prevention and control programme requires a plan for identifying and separating patients, providing appropriate treatment and other measures to reduce the risk for TB transmission to patients and health care workers. The plan should be based on the findings from the facility risk assessment and be consistent with the national TB IPC policy and latest guidelines from the World Health Organization (WHO).

Authority statement

The designated TB IPC focal person should have the authority to assess, implement and ensure compliance with this plan, including the authority to use measures to minimize the risk of TB transmission to patients, visitors and health care workers.

Responsibilities

The facility IPC committee has the authority to adapt the plan as needed to maintain the safety and health of patients, visitors and staff members. The TB IPC focal person, with the support of the facility administration and IPC committee, will ensure implementation of the plan as outlined in the following sections for administrative and environmental controls, and respiratory protection.



Programmatic alignment of core components of IPC and TB IPC

Core components of IPC and TB IPC (1)

Core Components 1 and 2 - IPC programmes and guidelines

- Ministry of health should ensure that
 - **Existing** IPC committees incorporate TB IPC into their **mandate and prioritize** TB IPC implementation
 - A **TB focal person** is included on IPC committees at all levels of health system
- Ministry of health should ensure that TB IPC recommendations are incorporated within
 - national IPC **guidelines**
 - implementation **protocols** and
 - standard operating procedures (**SOPs**)

Core components of IPC and TB IPC (2)

Core Components 3 and 4 – Education, training and HAI surveillance

Facility IPC focal person should ensure that

- IPC training and on-the-job education of health care workers should **include TB IPC** recommendations
- Standard **communication tools** (e.g., posters and flow charts targeting staff, patients and visitors) include actions for TB IPC

Health care associated infection surveillance

- Surveillance is key to successful implementation of IPC
- **TB among health workers** may be a proxy indicator for quality of TB IPC actions in health facility or congregate setting
- a **programme for periodic TB screening** should be established for health workers and staff including access to rapid diagnostics, chest X-ray, and prompt start of TB treatment or TB preventive treatment

Core components of IPC and TB IPC (3)

Core Components 5 and 6 - Multimodal strategies, monitoring and feedback on IPC implementation

Effective integration of TB IPC into WHO recommended **multi-modal IPC strategies**

- **system change** –availability of infrastructure and supplies to implement IPC
- **culture change** through leadership engagement and positive reinforcement to promote best practices
- **education and training**
- **reminders** at workplace; and

Monitoring and feedback:

- TB IPC should be regularly monitored along with other IPC interventions at the **national and local levels**
- **feedback** should be provided to the staff for **quality improvement**
- **Periodic surveys** may be undertaken data not routinely collected and to understand adherence to national IPC protocols and SOPs.

Core components of IPC and TB IPC (4)

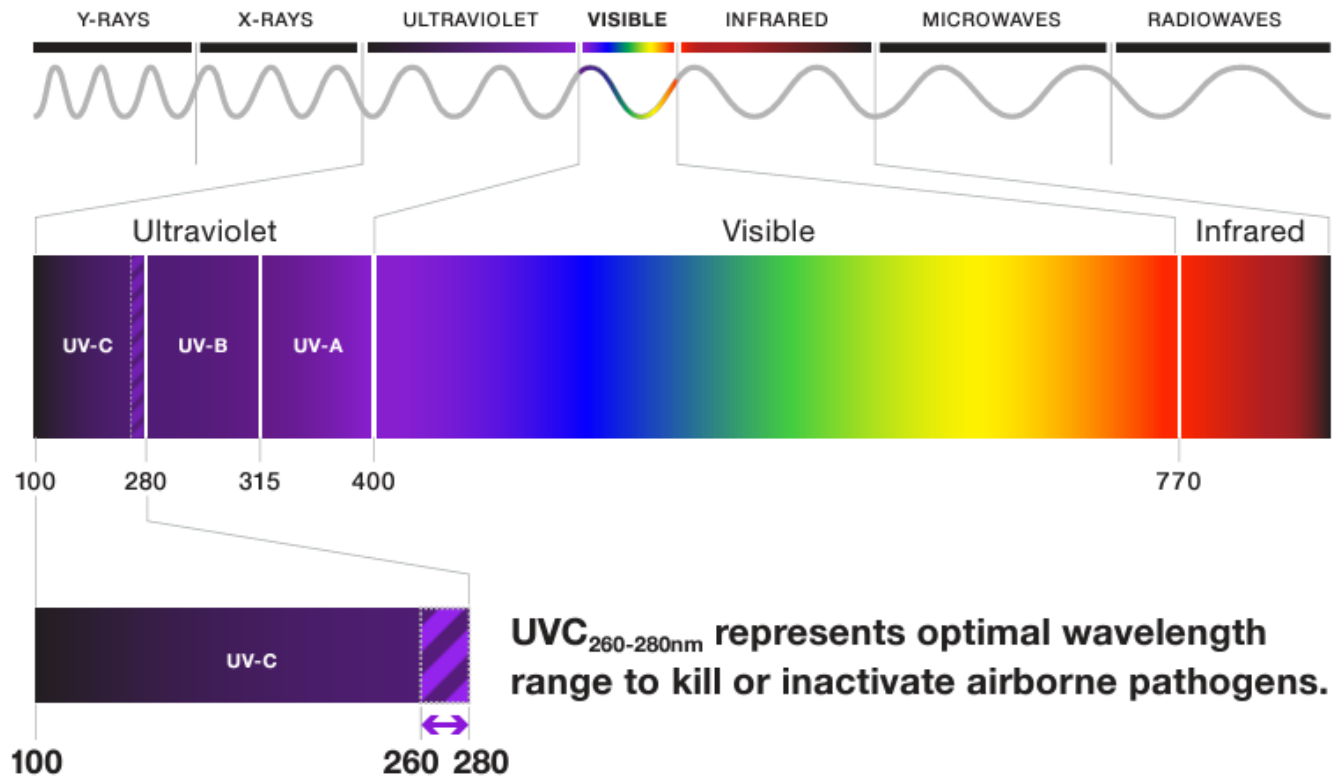
Core Components 7 and 8 - **Workload, staffing, bed occupancy, infrastructure and equipment**

For effective TB IPC

- WHO encourages **ambulatory or home-based treatment** over inpatient care or isolation
- **limit hospital admission** to those with severe TB (e.g., life-threatening, adverse events, comorbidities)
- **Sufficient staff** should be available to serve number of patients cared for by health facility
- **respiratory protection** equipment should be made available to both staff and visitors
- **Equipment and tools** for disinfection and dilution of ambient air through effective ventilation systems

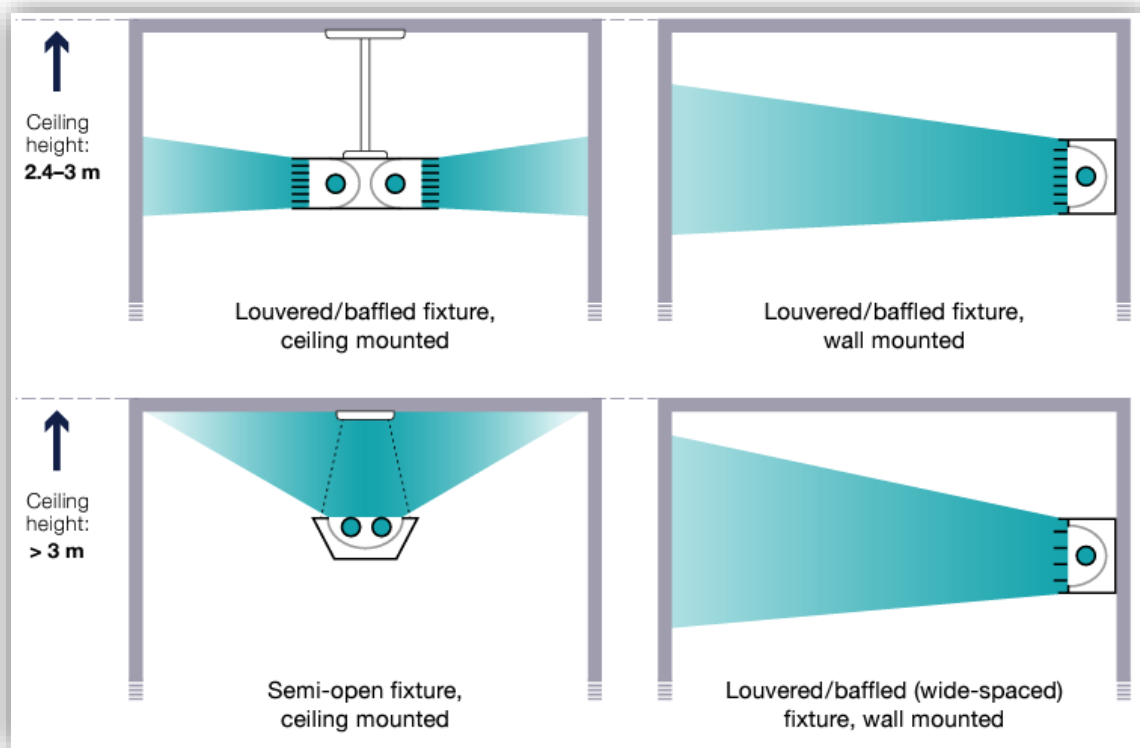
- ➔ Why triage? Principles underlying triage and practical aspects of its organization.
- ➔ Steps to take once individuals with signs and symptoms suggestive of TB are identified:
 - education on cough etiquette;
 - promotion of the use of medical masks;
 - respiratory separation and evaluation for TB; and
 - prompt TB treatment if TB disease is detected.
- ➔ Personal protection for health workers and staff:
 - education on how to wear a particulate respirator correctly;
 - the importance of continued use of masks or respirators;
 - how to avoid contamination during use, removal and disposal of medical masks and respirators; and
 - when to change the medical mask or respirator (e.g. when it gets wet or dirty with secretions).

Operational handbook (5): Environmental control (Upper-room GUV systems)



GUV systems should be installed as part of the **package of IPC interventions**, not standalone, to avoid giving a false sense of security when administrative controls and respiratory protection measures are lacking, particularly in settings with **high TB transmission**.

Types of upper-room UV fixtures-different room heights



- Type of UV fixtures
- Factors influencing the effectiveness of UV fixtures
- Deployment of UV systems in programmatic settings
 - suitability of a room for installation
 - placement and number of fixtures
- Exposure, safety and maintenance of upper-room UV fixtures
- Cost considerations

Upper-room UV systems rely on effective air mixing, adequate resources necessary for installation and maintenance

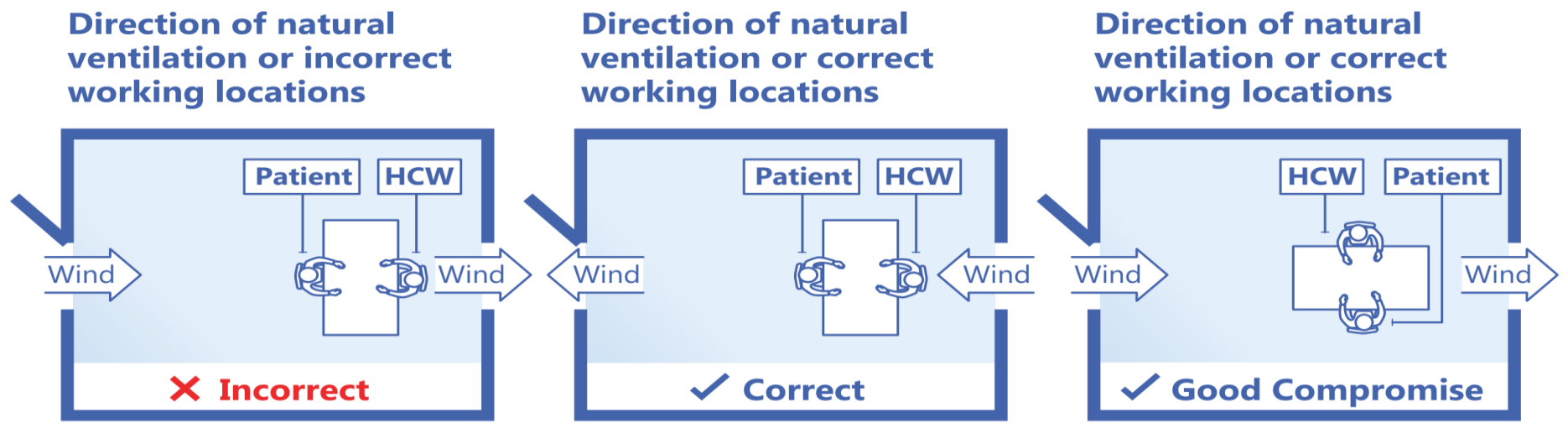
ACH (numbers)	Minutes required for 99% removal of particles	Minutes required for 99.9% removal of particles
2	138	207
4	69	104
6	46	69
12	23	35
15	18	28
20	14	21
50	6	8
400	<1	1

- Removal of stale air and infusion of fresh air dilutes the concentration of infectious airborne organisms
- Number of times that the total air volume in a room or space is completely removed and replaced in an hour
- ACH is a key consideration in determining the effectiveness of ventilation systems

Choice of ventilation systems

	Mechanical ventilation	Natural ventilation	Hybrid (mixed mode) ventilation
Advantages	Suitable for all climates and weather	Suitable for warm and temperate climates	Suitable for most climates and weather
	More controlled and comfortable environment	Lower capital, operational, maintenance costs for simple implementations	Energy saving, relative to mechanical ventilation
	Occupants have limited control to affect ventilation	Capable of achieving very high ventilation rates	More flexible
Disadvantages	Expensive to install and maintain	Easily affected by outdoor climate and occupant's behavior	May be more costly or difficult to design
	Can fail to deliver required ventilation rates through faulty design, maintenance or operation	May be difficult to plan, design, and predict performance	
	Noise from equipment	Reduced comfort level of occupants in extreme weather	
		Cannot achieve directional control of airflow, if required	

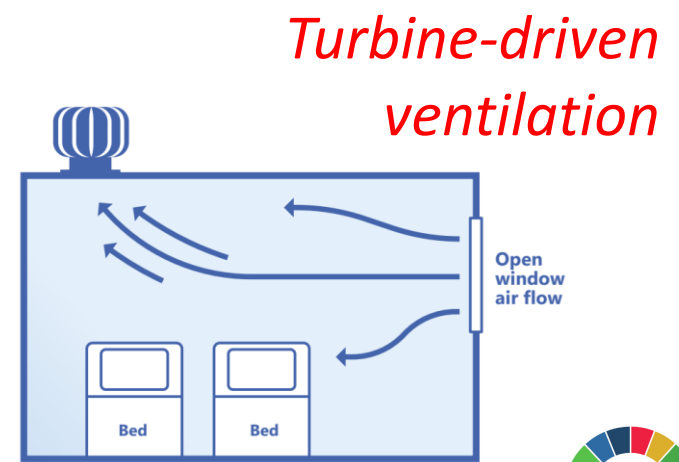
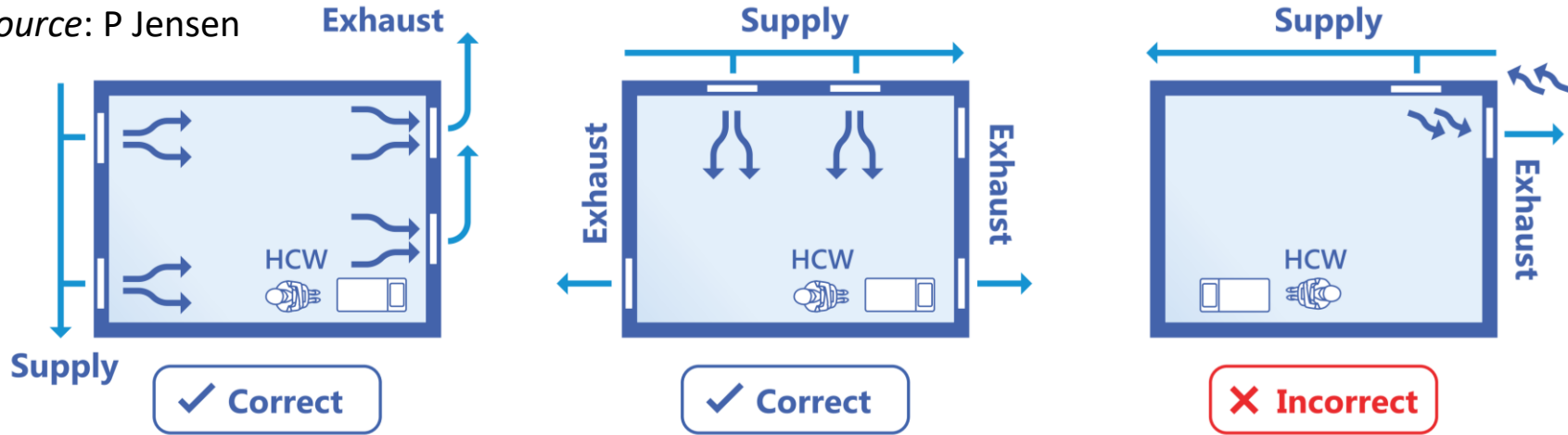
Examples of room ventilation in patient care



HCW: health care worker.

Source: Stop TB Partnership

Source: P Jensen



- **TB IPC focal person** at the site responsible for respiratory protection
- written **SOPs**
- dedicated **funding** and for medical masks, respirators and education material and **human resources for training** of staff
- Ensure availability of respirators of **different sizes** that **meet global standards** for protection
- Ensure **fit-testing** for all users and a practice to “**seal check**” before wearing a respirator
- Ensure **appropriate respirators use** by all staff in high-risk situations (e.g., infectious TB patients, staff with HIV)
- Facilitate **general health screening** of those using respirators regularly

Respiratory protection

Particulate respirators



- Respirators **protect healthcare workers and contacts** from inhaling infectious particles that are small enough for airborne transmission
- Some respirators have valves, and some do not
- Their coding refers to filtering capacity when used correctly (e.g, **N95 filters 95%+ of particles 0.3µm in size**)

Medical Masks

- Masks can protect from infection via droplets but offer minimal protection against airborne transmitted *M. tuberculosis*
- Masks can be made of gauze or tissue, without a filter
- They are **best suited for use by people with infectious TB** to reduce the release of infectious particles into a space



Photo credit: WHO / Blink Media – Ricci Shryock.

Respirator fit-testing



Qualitative respirator fit-testing kit



Fit-testing using a test hood



Step 1

- Cup the respirator in your hand with the nosepiece at your fingertips allowing the headbands to hang freely below your hand.



Step 2

- Position the respirator under your chin with the nosepiece up.



Step 3

- Pull the top strap over your head resting it high at the back of your head. Pull the bottom strap over your head and position it around the neck below the ears.



Step 4

- Place fingertips of both hands at the top of the metal nosepiece. Mould the nosepiece (USING TWO FINGERS OF EACH HAND) to the shape of your nose. Pinching the nosepiece using one hand may result in less effective respirator performance.



Step 5

- Cover the front of the respirator with both hands, being careful not to disturb the position of the respirator.

Step 5a: Positive seal check

- Exhale sharply. A positive pressure inside the respirator = no leakage. If leakage, adjust the position and/or tension straps. Retest the seal. Repeat the steps until the respirator is secured properly.

Step 5b: Negative seal check

- Inhale deeply. If no leakage, negative pressure will make respirator cling to your face.
- Leakage will result in loss of negative pressure in the respirator due to air entering through gaps in the seal.

Seal check on a particulate respirator

Key indicators for routine reporting	Source of information
1. Proportion of health facilities that have a valid and updated TB IPC plan	Policy document from the NTP, field visits and survey data
2. Proportion of health facilities that have appointed a TB IPC focal person as a part of facility IPC committee	Policy document from the NTP, field visits and survey data
3. Time from diagnosis to start of appropriate TB treatment	Surveillance data (should be available in most case-based records)
4. Proportion of health care workers involved in the care of DS-TB or MDR-TB, or in the collection of sputum samples, who are provided with at least one respirator per week	Supervisory visits
5. Relative risk of TB disease among health care workers compared with the TB notification rate in the adult population of the same area in the same year	Surveillance data

Monitoring and evaluation...Cont (1)

Annex 1. Data elements for monitoring implementation of tuberculosis infection prevention and control

This annex provides two tables:

- Table A1.1 lists indicative data elements that may be monitored using periodic surveys or through implementation research studies, to complement the indicators that are routinely collected indicators (described in **Chapter 6**), and
- Table A1.2 provides an example of country evaluation of the tuberculosis (TB) infection prevention and control (IPC) activities at 6 months compared with baseline.

Table A1.1. Data elements that may be monitored using periodic surveys or implementation research studies

Recommendations	Indicative data elements
Administrative controls	
Recommendation 1: Triage of people with TB signs and symptoms, or with TB disease, is recommended to reduce <i>M. tuberculosis</i> transmission to health workers (including community health workers), persons attending health care facilities or other persons in settings with a high risk of transmission.	<ul style="list-style-type: none"> • Number of outpatients, inpatients or individuals attending the health facility or living in a congregate setting. • Number of individuals identified as having cough at the reception or in the waiting areas among those attending the health facility or the congregate setting.
Recommendation 2: Respiratory separation / isolation of people with presumed or demonstrated infectious TB is recommended to reduce <i>M. tuberculosis</i> transmission to health workers or other persons attending health care facilities.	<ul style="list-style-type: none"> • Number of individuals having cough fast-tracked for TB evaluation. • Number of individuals having cough placed in isolation area for evaluation or admitted for care and treatment.
Recommendation 3: Prompt initiation of effective TB treatment of people with TB disease is recommended to reduce <i>M. tuberculosis</i> transmission to health workers, persons attending health care facilities or other persons in settings with a high risk of transmission.	<ul style="list-style-type: none"> • Number of individuals having cough who were evaluated for TB and diagnosed with TB disease. • Number of individuals diagnosed with TB disease who started TB treatment within 7 days.

Annex 2. Facility tuberculosis risk assessment tool

This annex is based on a tool produced by Médecins Sans Frontières (MSF) (1).

Instructions: This tool helps to give an idea of the risk of transmission of *Mycobacterium tuberculosis* in health care facility or congregate settings. The results should be completed by the infection prevention and control (IPC) focal person and interpreted by the IPC committee. For the Yes/No questions, a Yes answer indicates good tuberculosis (TB) IPC practices. Any pertinent information on No answers is noted in the Comments section below each table.

Overview of the facility (interview with the health facility manager)

Name, address and telephone number of the facility	
Name of assessor	
Name of facility manager	
Date of current TB IPC assessment	
Date of last TB IPC assessment	
Type of facility (e.g. primary health care or prison)	
Medical services offered (e.g. OPD consultation, VCT or antenatal care)	
Size of the population served by this facility	
Facility TB case notification rate per 100 000 per year	
National TB case notification rate per 100 000 per year	
Number of DR-TB patients in care	
Number of people living with HIV in care	
Average number of cases of TB reported per month in the facility	
Is there a functional IPC committee in the facility or a committee at which TB IPC is discussed?	
Is there a written facility-specific infection prevention and control plan (that includes TB IPC)? ^a	
Is there a budget allocated for TB IPC activities?	
Is there a person in charge or a focal person for TB?	
Is the TB focal person a member of the facility IPC committee?	
How often does IPC committee meet? ^a	
Did all the clinical staff receive documented TB IPC training or refresher training within the past 2 years? ^b	

^a If possible, obtain a copy of the minutes of the last IPC meeting and TB IPC plan.

^b Review and note number (%).

Comments:

Annex 9. Checklist for the review of programmatic implementation of tuberculosis infection prevention and control

This checklist was prepared for the express purpose of national tuberculosis (TB) programme reviews for TB infection prevention and control (IPC) (1, 2). Such reviews typically consider multiple programmatic components; thus, a checklist helps the reviewer to focus on the critical areas of any particular component.

Objectives

By the end of the review, experts should be able to comment on how TB IPC measures are implemented at different levels of the health services (with the measures being administrative controls, environmental controls, respiratory protection and the core components of IPC as they apply to TB).

Note: TB laboratory biosafety is generally dealt with separately from TB IPC, and this review needs to be coordinated with the experts reviewing the laboratory services.

Background

The End TB Strategy calls for a 90% reduction in TB deaths and an 80% decrease in the TB incidence rate by 2030. The strategy emphasizes the need for prevention across all approaches, including TB IPC at health care facilities and other settings where the risk of *Mycobacterium tuberculosis* transmission is high. TB IPC measures and practices are vital to reduce the risk of transmission, by reducing the concentration of infectious particles in the air and the exposure of susceptible individuals to such particles.

Stakeholders

Various personnel are involved in implementation of TB IPC and may be encountered as part of the programme review.

- managerial staff at national, subnational and health facility level contributing to the national TB programme (NTP) and national HIV/AIDS programme; and other individuals such as engineers, managers at hospitals and primary health care facilities and at long-term residential facilities, prison health services and migrant facilities; and
- health care workers and community health workers involved in TB and HIV care; evaluations of household contacts; implementation of IPC; diagnostic services in health care facilities, both in public and private primary and secondary health sectors; and other services



Operational handbook (9): Tools/ job aides

Health care worker tuberculosis screening form

Demographics

Date: _____ ID: _____ Age: _____ Sex: Male Female

Occupational category: _____ Department: _____

TB symptom screening

Do you have any of the following symptoms or risk factors? (Check if present)

General symptom screen (people without HIV)	Four-symptom screen (people with HIV)
<input type="checkbox"/> Cough >2 weeks	<input type="checkbox"/> Cough (any duration)
<input type="checkbox"/> Fever >2 weeks	<input type="checkbox"/> Fever (any duration)
<input type="checkbox"/> Loss of weight in last 3 months	<input type="checkbox"/> Loss of weight in last 3 months
<input type="checkbox"/> Drenching night sweats	<input type="checkbox"/> Drenching night sweats
<input type="checkbox"/> Sputum production	
<input type="checkbox"/> Coughing up blood	
<input type="checkbox"/> Lymphadenopathy (e.g. neck swelling)	
<input type="checkbox"/> TB contact in the past year	

Is there a X-ray chest result? Yes No Abnormality detected: Yes No

TB screening result Positive Negative

Referred for TB diagnosis? Yes No If yes, referred where? _____

Referred for test for TB infection? (TB negative) Yes No If yes, referred where? _____

Started TB preventive treatment? (TB negative) Yes No Date of start of TPT: _____

Health care worker TB screening register

No	Demography					TB screening				TB preventive treatment (TPT)			TB diagnosis and treatment				Comments		
	Health care worker identity no.	Date	Age	Sex	Occupational category	Department	Date	Screening result	Referred for TB diagnosis	Referral location	Chest X-ray result	TPT start date	TPT regimen	TPT outcome	Diagnostic test	Test date		Test result	TB Treatment start date
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			

TB: tuberculosis; TPT: TB preventive treatment.

Tools/job aides ...cont (1)

Annex 6. Sample posters for health education

This annex provides sample posters for health education from different countries.

TB Infection Control in HIV Clinics and Out-Patient Settings: a Team Approach*

Every Person Counts

- Clinic Administrator**
 - Endorse and fund a written TB infection control plan
 - Appoint an Infection Control Focal Person
 - Ensure supplies and equipment are available and maintained
 - Arrange facility space to reduce TB transmission
- Infection Control Focal Person**
 - Develop a TB infection control plan
 - Ensure exam and waiting rooms are well-ventilated
 - Conduct on-site staff training
 - Keep a record of health care workers who develop TB
 - Monitor infection control practices daily
- Administrations Clerk**
 - Give coughing patients tissues, cloths, or surgical masks
 - Send coughing patients to a separate waiting area
 - Practice TB suspects to see a clinician quickly
- Clinicians and Nurses**
 - Screen patients for TB symptoms
 - Evaluate and treat patients as soon as possible
 - Wear respirators (N95/FFP2 when caring for patients with suspected or proven TB) (especially N95 or KN95)
 - Collect sputum in a well-ventilated area
- Patients**
 - Cover mouth and nose when coughing
 - Put used tissue in the wastebasket
 - Wear a face mask if asked by clinic staff
 - Take TB medication as prescribed
- Laboratory Staff**
 - Implement laboratory infection control procedures
 - Ensure that results are returned to clinic/lens quickly
- Centre Team**
 - Seek care promptly if you think you may be infected
 - Discuss ways to improve TB infection control procedures in your clinic
 - Think TB Infection Control!

Keep this Door Open
STOP THE SPREAD OF TB

Keep this Window Open
STOP THE SPREAD OF TB

Source: CDC, TB BASICS toolkit (7)

Annex 7. How to choose upper-room germicidal ultraviolet light fixtures

The scenarios in this annex are designed to aid in choosing the most appropriate and cost-effective germicidal ultraviolet light fixtures; that is, features using ultraviolet C (UVC) to create an effective upper-room UVC₂₅₄ system. The effectiveness of the system depends on room shape and dimensions, type of fixtures available and how occupants will use the space. The three examples given demonstrate how these factors can influence final fixture choices for upper-room UVC (7).

Scenario	Room Description	Height	Width	Length
A. Low-ceiling room	Floor-to-ceiling height is too low to safely install upper-room UVC ₂₅₄	2.3 m	3 m	3 m
B. Standard office or examination room	<ol style="list-style-type: none"> Floor-to-ceiling height is sufficient for upper-room UVC₂₅₄ Calculate room volume: $(V) = (h) \times (w) \times (l)$ Calculate required room UVC₂₅₄ output (mW): Required UVC₂₅₄ dose = $V (m^3) \times 1$ Calculate type and number of UVC₂₅₄ fixtures: <ol style="list-style-type: none"> If ceiling height is 2.4–3.0 m, use a louvered or baffled style fixture (ceiling not high enough to safely use an open design fixture). A manufacturer has louvered or baffled UVC₂₅₄ fixtures with six different levels of UVC output. The goal is to have enough fixtures (based on UVC₂₅₄ output) to meet the required UVC₂₅₄ dose for adequate disinfection for the room size. Here the goal would be room UVC dose of 280–290 mW. 			

Cost consideration: In general, the cost of a UVC₂₅₄ fixture with an output of 400 mW is double the cost of a UVC₂₅₄ fixture with an output of 200 mW. The cost of replacement is nearly identical. In general, the greater the number of units, the greater is the UVC efficacy because it ensures coverage of a broader area from the source; however, multiple units are more.

Annex 8. Choosing a radiometer for measurement of ultraviolet C irradiation

The manufacturer's specifications should be checked to determine whether the radiometer has the appropriate characteristics for wavelength, irradiance measurement and accuracy, based on the ultraviolet C (UVC) source being used (7).

Wavelength range

The radiometer chosen should be able to measure wavelengths of 220–280 nm with a peak response at 254 nm for standard UVC₂₅₄ low-pressure mercury lamps.

- If measuring sources other than UVC₂₅₄ low-pressure mercury lamps, look for a radiometer calibrated to the peak output of the concerned source.
- If using more than one type of UVC fixture with different wavelengths, consider purchasing a radiometer that can be programmed to measure multiple wavelengths (rather than using radiometers specific for individual wavelengths).

Irradiance measurement range

The radiometer chosen should be able to measure effective⁽⁸⁾ irradiance within a recommended range of at least **0.1–2000 μW/cm²** for standard UVC₂₅₄ low-pressure mercury lamps.

- The upper end of the range may need to be increased if high-output, unbaffled UVC fixtures are used.
- For wavelengths other than 254 nm, the range may need to be shifted up or down based on the peak output of the lamp (depending on the manufacturer's specifications).

Accuracy

Accuracy may be referred to as "measurement uncertainty" under specifications. The radiometer should have an accuracy (measurement uncertainty) for both of the following criteria:

- Accuracy for measurements of UV irradiance of more than 1 to 2000 μW/cm² should be ±10% of the reading (not ±10% of the upper end of the radiometer range), to measure irradiance and confirm performance of the source or lamp.
- Accuracy for measurements of UV irradiance of 0.05–1 μW/cm² should be ±0.05 μW/cm², to measure safety levels for occupants.

Some radiometers meet both of the accuracy criteria required; however, if a radiometer meets only one of the two criteria, a second radiometer that meets the other criterion will be needed. Reputable

⁽⁸⁾ Safety and performance standards presume that dose measurements are calculated using effective irradiance. Most UVC₂₅₄ radiometers measure total irradiance; total irradiance results should be multiplied by two (to convert to effective irradiance).

Annex 10. Country example: education messages for tuberculosis and for tuberculosis infection prevention and control

This annex provides examples of posters from Myanmar with educational messages for tuberculosis (TB) and TB infection prevention and control (IPC) for community members.

Health education message for TB patients and families
By National Tuberculosis Programme, Department of Public Health, Ministry of Health and World Health Organization, Country Office, Myanmar

အမျိုးသားတို့အတွက် အထူးသတိပြုရန်
ပြည်သူ့ကျန်းမာရေးဦးစီးဌာန
ကျန်းမာရေးနှင့် အားကစားဝန်ကြီးဌာန
နှင့်
ကမ္ဘာ့ကျန်းမာရေးအဖွဲ့တို့၏ ပူးပေါင်းစီမံခန့်ခွဲခြင်း ဖြစ်ပေသည်

တီဘီရောဂါနှင့် မိသားစုများအတွက် ကျန်းမာရေး ပညာပေးသတင်းစကား
(တီဘီ/ဆေးယဉ်းတီဘီရောဂါများအတွက် အား ပြန်လာအောင်)

76 WHO operational handbook on tuberculosis: Module 1: Prevention - infection prevention and control





WHO TB KNOWLEDGE SHARING PLATFORM

Access the modular WHO guidelines on tuberculosis, with corresponding handbooks and training materials.

Consolidated Guidelines



WHO guidelines provide the latest evidence-

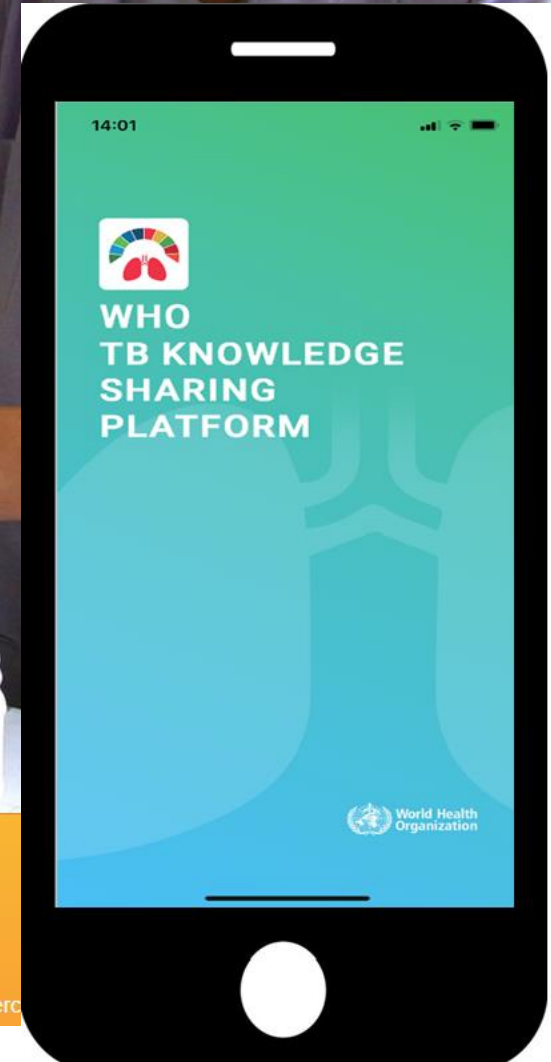
Operational Handbooks



The WHO Operational Handbooks on tuberculosis

Training Catalogue

The WHO Training Catalogue on tuberc



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