

# Implementation of the Online Childhood TB Training for Healthcare Workers Course: A Facilitator's Guide



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## Abbreviations

ART	anti-retroviral therapy
CPT	cotrimoxazole preventive therapy
CXR	chest radiograph
DOT	directly observed therapy
EPTB	extra-pulmonary tuberculosis
FDC	fixed-dose combination
HCW	healthcare worker
HIV	human immunodeficiency virus
IPT	isoniazid preventive therapy
MDR-TB	multi-drug resistant tuberculosis
NTP	national tuberculosis program
PTB	pulmonary tuberculosis
TB	tuberculosis
TBM	tuberculosis meningitis
TST	tuberculin skin test
WHO	World Health Organization

## I. Introduction and Background

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### **The challenge of childhood tuberculosis**

The World Health Organization (WHO) estimated that 1 million or approximately 10% of the 10.4 million cases of tuberculosis (TB) globally in 2015 were in children (<15 years) and that an estimated 210,000 children died due to TB. The true burden of TB in children is unknown due to the well-recognized challenges of accurate diagnosis and under-reporting of TB in children. Over the last decade, there has been increasing attention to the challenge of childhood TB and the post-2015 WHO End TB Strategy includes opportunities to address childhood TB to a far greater extent than previous TB control strategies. The strategy requires early diagnosis and treatment of all persons with TB, including children, as well as the provision of preventive therapy for high-risk groups which includes young child contacts. The End TB strategy also urges greater collaboration with other health sectors, explicitly including the maternal and child health sector, employing innovative and integrated approaches.

Children with TB first present for diagnosis and management to child health services and facilities, not primarily to facilities provided by the National Tuberculosis Programme (NTP). They present to the same child health services as other sick children and, for the majority, this will be to a community-based health provider, first-level (primary healthcare centre) or second-level (district hospital) facility, not initially to a tertiary referral hospital with specialist expertise. Further, the screening of household contacts of a TB case for active case-finding of other TB cases, including children, and the provision of preventive therapy for eligible child contacts that do not have TB is optimally implemented within the context of the community and primary care level. The implementation of contact screening requires strengthening of clinical assessment and diagnosis of TB in symptomatic children that are contacts of TB cases, as well as an understanding of the rationale for preventive therapy. Finally, the most vulnerable age group for developing TB following infection with *Mycobacterium tuberculosis* are infants and young children (<5 years). Diagnosis in this age group relies largely on clinical features as laboratory confirmation

cannot be achieved in the majority, and very rarely at the primary or secondary facility level. Clinical diagnosis is particularly challenging in this age group as there is usually a requirement to detect and diagnose the child with TB from among the large number of children that might present with TB-related symptoms, such as cough or poor weight gain, which may also be seen with other conditions including HIV infection.

Therefore, healthcare workers (HCW) at the primary and secondary facility levels need to have the skills and confidence to detect, diagnose, and manage TB in children. However, many of the same healthcare workers have had limited or no training and experience in the management or prevention of TB in children. There are many misperceptions due to a lack of knowledge of the evidence that supports international and national guidelines. Guidelines and policy are generally consistent, but the challenge is to address the current wide policy-practice gap by implementation of the guidelines.

### **Education and training on childhood TB**

The Union and the World Health Organization have developed a number of clinical aides and training tools to support and train HCWs at the primary and secondary care levels. This includes The Union's **Desk-guide for the Diagnosis and Management of TB in Children** and the **Childhood TB for Healthcare Workers: An Online Course** that are freely available in different languages on the Union's Childhood TB Portal - <https://childhoodtb.theunion.org>. These aim to equip the healthcare worker with the following competencies:

1. To understand the main features of the epidemiology of TB in children, including risk factors for infection and disease.
2. To develop the clinical skills to detect and diagnose TB in children in a resource-limited setting. This includes an understanding of which children might require referral to the next level of care while at the same time recognising the importance of outpatient assessment and follow-up in the diagnostic approach, as most children with TB do not require inpatient management.

3. To have knowledge of the national guidelines for the recommended regimens and dosages for the treatment of TB and for preventive therapy in children.
4. To recognise the importance of registering all children treated for TB with the NTP and to monitor treatment outcomes. To “know your epidemic” is a critical step to identify gaps, for procurement of diagnostics and TB drugs suitable for young children, for effective advocacy, and for investment and support to the health services.
5. To support the implementation of community-based contact screening and management.

International and national guidelines along with the abovementioned tools to support implementation are by necessity generic and yet, there is always a need to adapt these to the local context depending on knowledge of the local epidemiology and available resources (such as human resources and diagnostics).

The online training course can be completed independently by individuals, but also facilitated for a group of learners. This facilitator’s guide for the online course has been developed in recognition of this need, and to strengthen both local relevance as well as knowledge transfer that are pragmatic and locally relevant, with the ultimate aim of improving the management and prevention of TB in children.

Facilitated sessions may be of most value in settings where:

- Participants are doing the course in their second or third language.
- Participants are not comfortable working on computers as “technology-anxiety” may influence their ability to learn to some extent.
- The content of the course may be difficult to apply exactly due to resource constraints.

## **II. Training Goal and Objectives**

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Goal: To apply concepts of the Online Childhood TB Training for Healthcare Workers course to one's work setting in order to improve the care of children with TB.

Objectives:

After completing the course, participants should be able to:

1. Understand and describe the local epidemiology of children with TB and make determinations of which groups to provide more education, outreach, interventions, etc.
2. Identify especially vulnerable groups (e.g., migrants, refugees, HIV-infected individuals) and how the programme can provide appropriate interventions to assist with their care.
3. Discuss TB prevention mechanisms (e.g., infection control, contact tracing, vaccination, preventive therapy, etc.) that are in place in one's programme and how they may be enhanced.
4. Describe what diagnostic and treatment modalities are available in one's programme and how to use them in the care of children of all ages with TB.
5. Discuss TB medication adherence strategies for treatment of TB in children.
6. Effectively communicate with children and their families to provide education about treatment, infection prevention, and for eliciting information for contact tracing.



### **III. Target Audiences**

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The course is designed for HCWs at the primary and secondary level of the system who provide care for children, particularly children at risk of and those with TB disease. To facilitate learning, the course can be conducted with HCWs from the same programme. If there are not enough participants, several programmes can conduct a combined course, as this may promote opportunities for programmes to share ideas and learn from each other. Additionally, mixing different types/levels of HCWs (e.g., doctors and nurses) can also offer valuable, varying perspectives.

#### Points to consider

- When preparing for facilitation, the background training and experience, as well as scope of current practice, and roles and responsibilities of the trainees should be taken into consideration.
- Often the different levels/types of HCWs are unaware about the scope of practice of all the different HCWs within the multidisciplinary team that manages childhood TB. This is often one of the underlying causes of inappropriate management of child TB cases. A chart or diagram showing the various levels of care can be a helpful visual.
- We recommend that the roles and responsibilities of different levels of HCWs in the setting be highlighted and discussed throughout the facilitation process, regardless of the audience, in order to clarify expectations and foster understanding and cooperation between different levels of services.

#### **IV. Conducting the Online and Facilitated Course**

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The online course is a versatile option for training HCWs in a primary healthcare setting on childhood TB. It can be used as part of an official, structured training program, or for individual ad-hoc training. The material is clear, but comprehensive enough to target healthcare professionals at all levels. The course consists of five modules: Epidemiology, Diagnosis, Treatment, Prevention, and TB and HIV, and, also, a 6<sup>th</sup> practical module that combines content from the previous modules into a case study based assessment.

##### Audience numbers:

Small groups of people allow for open communication. Ideally, this course should have no more than 15 persons.

##### Formats:

The course relies on the individual completion of the online course followed by a group-facilitated course. The course is currently available in multiple languages and can be completed in several ways:

1. Ideally the course should be done online (with an active internet connection), as progress measurements were built into all the modules and a certificate of completion can be printed immediately after successful completion of the course. Each module can be worked through on a self-learning basis at any pace, and course progress is saved after each module, giving trainees the flexibility to complete on their own time. The web-based interface requires trainees to actively engage with the content as they navigate through a series of interactive practical case studies illustrating and teaching the important processes of managing childhood TB in a primary healthcare clinical setting. After completion of the online course, participants can take part in the facilitated course.
2. The course is also available as offline software that can be loaded onto a computer, specifically for settings where Internet access and personal email addresses might be obstacles to online training. However, this

version has limitations such as lack of a printable certificate and inability to monitor progress.

3. The facilitated course can also be done virtually, with no face-to-face contact. The learners would complete the course on their own, either online or offline and the facilitated version would be done using a webinar platform (e.g., Adobe Connect, a learning management system (e.g., Blackboard) or an internet-based conferencing system (e.g., Skype). Face-to-face training is ideal but in some settings, may not be possible. Logistics of this virtual form of training will not be covered in this guide as learning management systems can vary. The content, however, can still be used and adapted for these types of e-facilitation.

## **V. Logistical Considerations:**

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This will vary significantly depending on training objectives, the setting, as well as the target population that needs to be reached by the training. Logistics have to be tailored accordingly.

### ***1. Essential Equipment for conducting training***

#### **1.1. Computer hardware and software for both ONLINE AND OFFLINE training:**

- Electricity
- Devices
  - Desktop or laptop computer(s) (PC or Mac) with Adobe Flash® installed. The course will then run in any version of Internet Explorer, Firefox, or Chrome browsers. If Flash is not installed, the system will prompt to download it. However, it is strongly recommended that the installation is done in advance of the course to save time.
  - Tablet or smart device with an Android platform (NOTE: There are limited capabilities with this version and it is recommended that the above computer version be used, if possible)
- Mouse for navigating through the course, especially for people who are not used to working on laptops with touch pads.
- Printer for printing certificates. There is a certificate template available that can be used for centralized printing of certificates if on-site printing is not an option or if the course is done offline.

#### **Additional Information Technology needs for conducting ONLINE training:**

- Computers with Wi-Fi capability or hard-wired connections to an Internet network.

- Stable Internet connection - Consider the numbers of computers that can be connected to your Internet network without losing stability and speed. Depending on the type of network and the network signal (if Wi-Fi) this can range substantially, and, therefore, we recommend testing the exact number of computers that can be connected to your network before conducting the course.
- Registered email account for each trainee. If trainees are not able to create an email account, the training coordinator can do this for them in advance, using a free email provider (e.g., Yahoo!®, Gmail®, etc.). The email is the login name for the user as well as the way one would recover a forgotten password.

## **1.2 Other equipment**

- Calculator
- Ruler
- Participant Workbooks
- Local forms, guideline documents, and other setting specific tools including: TB registers, treatment cards, weight-banded dosing charts, etc. If local TB forms and guidelines are not available, the facilitator can bring general forms found in this guide (attached).
- Medications, if available, as these can be used to assist with explanations around dosing techniques, splitting medications, etc.
- The Union Desk Guide. This is a concise document that will be useful to hand out to participants to refer to. It can be found at:  
<https://www.theunion.org/what-we-do/publications/technical>

## **2. Timeframe**

- Completing a facilitated session after each module is the best way to assist in the understanding and retention of course material; however, this may be logistically difficult to do. It is suggested that if the facilitated session will be done only once, at the end of the full online course completion,

that short activities to engage the participant before that be done. See the Participant Workbook for details.

- Each module of the online course takes an average of 2 hours to complete. However, the exact time for completion varies greatly depending on the HCWs and the level of computer literacy of the trainees.
- Without any facilitation, 2 days (3 modules per day x 2 hours per module) should be adequate for most participants to complete all six modules of the online course at their own pace.
- If facilitation is planned, the course should at least be conducted over 3-1/2 consecutive days or spread over several non-consecutive days. A course over consecutive days might have better results in terms of retaining information for the learner. The dropout rate also tends to be lower for consecutive training days. However, consecutive days involving time from the workplace may pose a burden on the programme. A sample agenda is provided on the next page. The facilitated course can be shortened to 1 day if needed as facilitators can skip selected sections based on the needs and experience of the participants.
- Participants from settings where the course will be completed in a second language could benefit substantially from additional facilitated sessions during or after the course.

## Sample Agenda

### Day 1: Online Course

8:00 – 9:00	Welcome, Administration and Registration
9:00 – 10:30	Module 1: Epidemiology (1.5 hours)
10:30 – 10:45	Break
10:45 – 11:45	Module 1: Epidemiology (1 hour)
11:45 – 12:30	Lunch
12:30 – 14:30	Module 2: Diagnosis (2 hours)
14:30 – 14:45	Break
14:45 – 16:45	Module 3: Treatment (2 hours)

### Day 2: Online Course

8:00 – 8:30	Welcome
8:30 – 10:00	Module 4: TB/HIV (1.5 hours)
10:00 – 10:15	Break
10:15 – 10:45	Module 4: TB/HIV (30 minutes)
10:45 – 12:15	Module 5: Prevention (1.5 hours)
12:15 – 13:00	Lunch
13:00 – 13:30	Module 5: Prevention (30 minutes)
13:30 – 14:30	Module 6: Practice (1 hour)
14:30 – 14:45	Break
14:45 – 15:45	Module 6: Practice (1 hour)
15:45 – 16:15	Online Post-test

### Day 3: Facilitated Course

8:00 – 8:30	Welcome
8:30 – 9:00	Review of Post-Test from Online Course
9:00 – 11:00	Module 1: Epidemiology (2 hours)
11:00 – 11:15	Break
11:15 – 12:45	Module 2: Diagnosis (1.5 hours)
12:45 – 13:30	Lunch
13:30 – 15:00	Module 3: Treatment (1.5 hours)
15:00 – 15:15	Break
15:15 – 17:15	Module 4: TB/HIV (2 hours)

### Day 4: Facilitated Course

8:00 – 8:30	Welcome
8:30 – 10:30	Module 5: Prevention (2 hours)
10:30 – 10:45	Break
10:45 – 12:00	Module 6: Practice (1.25 hours)
12:00 – 12:30	Evaluation

### **3. Human Resources**

The human resources required will largely depend on the training strategy as well as the method of implementation. The following are examples of roles and responsibilities of key personnel that might be needed:

- Training Coordinator(s):
  - Definition: A person who can manage logistical considerations of conducting a training session.
  - Roles and responsibilities can include:
    - Recruitment of HCWs for the training session
    - Communication with participants and the programme hosting the training making decisions about the course, logistics and content
    - Registration of participants
    - Logging offline training progress, if applicable
    - Assisting with accreditation processes, if applicable
    - Venue(s) and transportation to course sites
    - Refreshments during a full day course
    - Administering a pre- and post-test, and evaluations especially if the course is offline
- Technical (Computer) Support:
  - Definition and Role: Supporting service to ensure that hardware and software are in workable condition, and to assist with any operational challenges.
  - Able to troubleshoot computer and Internet problems.
  - Very important for both online AND offline training in settings where the target population does not work regularly on computers and may have low levels of computer literacy. This person can orient course participants on how to use the computer and navigate through the course at the start of the training session.



- Facilitator(s):
  - Definition and Role: A person to lead discussions and answer questions around clinical and programmatic content of the course.
  - Ideally on site for the duration of the course to answer questions that participants may have while navigating through the course on their own. If this is not an option, should be available for facilitated sessions in between or after participants complete the course.
  - Must be comfortable and knowledgeable about childhood TB (but does not need to be a trained paediatrician). Specific knowledge with regards to the setting specific context and local guidelines are essential as questions often arise as trainees complete the course. The facilitation should be ideally conducted by someone with experience in both medical and programmatic management of children with TB in the setting where the training is taking place
  - **Preparation ahead of the course is essential. The facilitator should have done the online course, review the Participant Workbook for the facilitated course, and know the training setting in order to contextualize the discussion points.**
  - There could also be a team facilitation approach with one lead person and several others present in the room who may answer questions as appropriate.

#### ***4. Facilitation Skills***

There are some basic principles that one can follow in order to make the training proceed smoothly.

- Know the audience:
  - Demographics  
This will help with logistics of the training as well as for planning for the types of examples to use in the training.
  - Knowledge

Knowing the in-coming knowledge level of the topic will help determine what level of content is needed (i.e., low, medium, or high) and what type of exercises are needed.

- Skills

It is important to know what the in-coming skill level is of the participants so you will know how to plan what skills to teach. It will help determine if the training is to provide new skills or simply a refresher for skills the participants already have.

- Attitudes

Knowing what the attitudes are about the topic of the training can help address fears, concerns, or biases during the training.

- Experience

Knowing the experience level of the participants will help when designing the content and exercises. It will also help in knowing what technical level is required for training. In addition, it can help you to identify those people who have a lot of experience and can contribute to the discussions. Also, for exercises you can pair-up participants who have a lot of experience with those who have less experience.

- Position

Knowing the jobs or positions that the participants have will help you relate the training to their jobs.

- Education

Knowing the education level and, also, the type of education of the participants can help determine what level of language to use, as well as what type of examples to use.

- Training needs
 

Knowing what the training needs are of the participants will help you design your course to provide practical skills that will be used. If participants do not need certain information, it may help you determine what information to avoid or what to cover briefly.
- Ways to Learn about the Audience
  - Conduct a needs assessment
    - Have participants complete a pre-assessment form. It is best to have them complete the form and send it to you before the training, but this may not always be feasible. If so, have them complete it at the beginning of the training.
    - Before the training, talk with participants and other knowledgeable sources (e.g., supervisors)
  - During the training, include a “get-to-know-you” exercise. You can ask people about their experience and what knowledge and skills they hope to attain through the course.

Depending on the setting and the scope of the training session planned, it may or may not be feasible to have one person fill all 3 roles.

## ***5. Venue & transport***

- Consider if centralised or decentralised training sessions will be practical in the target setting.
- Rural areas may have less technology infrastructure available, but training sessions may be more accessible for local healthcare workers if decentralised training sessions are planned.
- Likewise, training sessions conducted within the healthcare facilities during work hours may be an accessible option in high-burden, low-resource settings, but healthcare workers may have difficulty disengaging from work responsibilities to focus on the course.

- For centralised course locations, transport needs to be considered. The traveling distance and availability of public transport may impact attendance.

## ***6. Computer literacy and experience with web-based training in target population***

- In order to register for online training, trainees need an email address. This assists in accessing the course where one has left off if doing the course in more than one sitting, as well as to assist should one's account password be forgotten.

In settings with low rates of computer literacy and low rates of computer access, trainees might not have an email address. Creation of personal online email accounts might not be feasible within specific timeframes, and can reduce feasibility of online training strategies. This task may be left to the training coordinator who can create email addresses using free accounts, but it is strongly recommended that due to the time-consuming nature of such an activity, this should be done beforehand. The coordinator should keep a master list of email accounts and passwords.

- One can do the course offline and use a paper test and evaluation instead (see "Course Materials and Forms").

## ***7. Materials (Can be found in Course Materials and Forms Section)***

- Sample invitation letter
- Post-facilitated course evaluation and assessment of skills (reaction to course and intent to change long-term practice)
- Agenda
  - Sample Course Agenda
  - Detailed Facilitator Agenda for Modules






- Online and facilitated course certificate templates
- Facilitator checklist
- Participant's workbook
  - Follows module outline with prompt questions
  - Asks participants to identify challenges they face in their settings
  - To be provided to each participant prior to the computer course

## VI. Modules:

### Exercises/Facilitation Steps for Each Module:

Each module is organized in a similar way as outlined below.

The facilitator should become familiar with the discussion questions and exercises, as well as prepare alternative responses or modifications based on the specifics of one's setting.

	Learning objectives/expected outcomes for module
	<b>Materials</b> Generally, the participant workbook will be all that is needed for each module. However, for some, there may be additional items needed.
	Discuss Setting Specific Practices
	<b>Practice Cases/Exercises and Discussion Points</b>  Review case questions to stimulate discussion aiming to reinforce knowledge gained through the course and highlight similarities and differences of the course content to participants' local setting  Discussion points to further explore difficulties relating to the cases/exercises (including ethical issues) are included. You may use the flip chart to document the discussion.
	<b>Role-play scenarios to "practice" important skills learned in the module</b> For the role-play scenarios, the facilitator will need to decide the best format to use, based on the number of participants, room set up, and comfort level of participants.  The facilitator can ask two participants to come to the front of the room and act out the role-play or the participants can form groups of three to do the role-play. Three participants are needed per group so that there is a "healthcare worker", "caregiver/adolescent," and "observer" who can each provide feedback. Role plays can take 20-30 minutes.
	<b>Summary of Key Learning points</b> Review these points with the participants. These are also provided in the Participant Workbook

## Module 1: Epidemiology

Purpose: To provide an overview of tuberculosis in children, including risk factors for exposure, infection, and disease in your setting.

### Learning objectives

At the end of this module, participants will be able to:

- Identify and describe risk factors for TB exposure, infection, and disease
- Identify populations at increased risk of TB infection and disease
- Describe the epidemiology of paediatric TB in their setting
- Describe the importance of reporting all TB cases
- Accurately complete a TB register based on local case and outcome definitions, and analyse data from a quarterly TB report

In this module, you will discuss the three epidemiological stages of TB – exposure, infection and disease, as well as specific risk factors that increase the risk in children to progress from each of these stages to the next stage. There are also discussions around routine data and how to apply certain concepts to better understand childhood TB epidemiology in your own setting. Lastly, you will look at global TB epidemiology, and factors that are associated with TB incidence.

### Materials



- Participant Workbook
- TB register
- Calculator

### Discuss setting-specific practices



- Who is responsible for recording and reporting in your setting?
- Are there any challenges faced with regards to reporting?
- Do you have access to your programme data? At which level do you have access: primary healthcare facility, secondary healthcare facility, or the district level?
- Have a look at setting specific tools for TB: patient treatment cards, TB registers, and quarterly reports. Do they take age into account, enabling age disaggregated reporting?
- At what unit/level does reporting occur in your country: only at primary care level, at secondary or tertiary level? Do hospitals function as reporting units? And if not, what

systems are relied upon to capture data from patients who are diagnosed in the hospital?

- Are patients with drug-susceptible TB and drug-resistant TB captured in the same way? Or, are there different reporting mechanisms?
- Facilitator should discuss country-level definitions for diagnoses and treatment outcomes.



Practice Cases/Exercises	
Questions	Answers
Compare risk factors for TB exposure, infection, and disease	
1. Explain how TB is transmitted to children	<ul style="list-style-type: none"> <li>• TB exposure → possible TB infection → possible TB disease → possible severe TB disease</li> <li>• Important to highlight that only a subset of children will progress to the next step: not all children exposed or infected with TB will progress to active TB disease, and not all will develop severe forms of the disease.</li> </ul>
2. Can you describe the community risk factors that affect a child's risk of TB exposure and/or infection?	<ul style="list-style-type: none"> <li>• High TB and HIV rates in the community</li> </ul>
3. Can you describe the factors relating to a TB exposure episode that affect a child's risk of TB infection? Also discuss in which direction the factor will influence the risk of infection.	<ul style="list-style-type: none"> <li>• Duration of exposure to source case: longer duration means higher risk, nature of contact/proximity to source case: closer/more intimate contact means higher risk, and infectiousness of source case: 4+ smear positive has highest risk and smear negative, but culture positive has lower risk.</li> </ul>
4. Can you list the factors that will increase a child's risk of disease progression following TB infection or exposure?	<ul style="list-style-type: none"> <li>• Young age [especially &lt;2 years] – infants have a 50% chance of disease progression following infection in the absence of preventive therapy), nutritional status (malnutrition), other diseases, for example, HIV infection and measles, and other factors that can result in a suppressed immune system for example, immunosuppressive drugs like corticosteroids and congenital immunodeficiency disorders.</li> </ul>
5. What types of TB in children would be recognised as severe forms of TB disease?	<ul style="list-style-type: none"> <li>• TB meningitis, miliary TB, disseminated TB, multi-lobar pulmonary TB with extensive parenchymal involvement, etc.</li> </ul>
6. What factors can increase the risk of a child to develop severe forms of TB disease?	<ul style="list-style-type: none"> <li>• Young age (highest risk in those &lt;1 year of age), not vaccinated with BCG, and HIV co-infection</li> </ul>

7. Can adults with extra-pulmonary TB transmit the disease to others? And do we need to screen their close contacts or start them on preventive therapy if they are eligible?	<ul style="list-style-type: none"> <li>It is much less likely for adults with extra-pulmonary TB to transmit the disease to others. In high-burden and low-resource settings, it makes sense to focus preventive therapy efforts on contacts of cases with PTB, as they are most infectious and their contacts are at highest risk of infection.</li> </ul>
8. Discuss different types of TB and how this will affect the infectiousness of the source case.	<ul style="list-style-type: none"> <li>All pulmonary TB cases are considered infectious, as <i>Mycobacterium tuberculosis</i> theoretically will be present in respiratory fluids to a greater or lesser degree.</li> <li>Bacteriological confirmed cases are more infectious than unconfirmed cases, and the higher the bacterial load (such as 4+ smear positive), the more infectious the case.</li> </ul>
<b>Data Interpretation</b>	
1. What are the three indicators that are useful for evaluating childhood TB data in any setting?	<ul style="list-style-type: none"> <li>The proportion or percentage of children contributing to the total TB case load, the ratio of children 0-4 years of age to children 5-14 years of age, and the proportion of children with extra-pulmonary TB.</li> </ul>
2. In a high burden TB setting, what do you expect these to be?	<ul style="list-style-type: none"> <li>Approximately 10-15% of your total case load can be attributed to children in high-burden settings. One would expect at least the same or more children in the 0-4 years age group than the 5-14 years age group. In young children, approximately 25% can typically have extra-pulmonary disease. This drops to approximately 10% in older children.</li> </ul>
3. If you find unusual or unexpected findings in the reports, what factors should you consider?	<ul style="list-style-type: none"> <li>Firstly, you need to try and understand whether it is a data problem or whether it is a clinical problem. Is the data not captured, or does it perhaps not flow properly into the data system? Or are you under- or over diagnosing children with TB? Depending on which factor is driving the problem, you will need different strategies to address it.</li> </ul>
Evaluation of setting specific routine data – if possible, participants should evaluate most recent available quarterly reports of their own setting for this activity. Participants should also interpret a local TB register or interpret a sample provided in this guide. **	

\*\* If you are unable to find any setting specific routine data, you can either access your local data from the WHO website at the following web link (<http://who.int/tb/country/data/download/en>), or use the following fictitious quarterly reports to answer the questions below. Keep your calculator at hand as you might need to use it for the calculations.

1. What percent of cases were in children in your setting in the previous quarter?	
2. Does the age ratio between 0-4 and 5-14 years old look acceptable? Why or why not?	
3. What proportion of children in each age category had extra-pulmonary TB?	
4. Do you think your data are accurately reflecting your burden of childhood TB? Or are you possible over or underreporting cases?	
5. Is the uptake of HIV testing acceptable?	

***Fictitious Quarterly Reports for Exercise purposes***  
**Period 1: District health centre in Africa (high incidence of HIV)**  
**Quarterly report for Quarter 3, 2014**

Quarterly report on TB case registration in the basic management unit

Name of BMU: *District Health  
Centre (Africa)*  
 Name of TB Coordinator: *A Nkosisi*

*5 31* |

**Step 1:** Calculate the indicators in the table below from the data in the above report for Quarter 3, 2014.

Questions	Quarter 3 (2014)
1. Total adult TB case load	
2. Total number of children (0-14)	
3. Percentage child TB cases of total cases	
4. Proportion/ratio of children 0-4 vs. 5-15	
5. Percentage of EPTB cases amongst children	
6. Uptake of HIV testing among TB cases	

**Step 2:** Answer the following questions interpreting the indicators you have calculated in the table in step 1:

Questions	Answers
1. Was the percentage of child TB cases in this centre acceptable?	Yes
2. Does the ratio between 0-4 and 5-14 years old look acceptable?	Yes
3. What proportion of children in each age category	The data is not sufficiently structured to answer this question, as the number of EPTB cases has not been reported in age-disaggregated format.
4. Do you think the data is accurately reflecting the burden of childhood TB in this district?	Except for the fact that one cannot evaluate EPTB in children, the other parameters seems reasonable for a high burden TB setting, and we therefore would think that childhood TB is relatively accurately diagnosed and reported in this district.
5. Is the uptake of HIV testing acceptable?	No, always remember that every TB case, whether child or adult, should be tested for HIV.

**Period 2: Same district health centre in Africa (high incidence of HIV)**  
**Quarterly report for quarter 3, 2015**

Quarterly report on TB case registration in the basic management unit

Name of BMU: *District Health Centre  
(Africa)*  
 Name of TB Coordinator: *K Masamane*

*758*

*102*

**Step 3:** Calculate the indicators in the table below from the data in the above report for Quarter 3, 2015.

Questions	Quarter 3 (2015)
1. Total adult TB case load	
2. Total number of children (0-14)	
3. Percentage child TB cases of total cases	
4. Proportion/ratio of children 0-4 vs. 5-15	
5. Percentage of EPTB cases amongst children	
6. Uptake of HIV testing among TB cases	

**Step 4:** Answer the following questions interpreting the indicators you have calculated in the above table:

Questions	Answers
1. Was the percentage of child TB cases in this centre acceptable?	No
2. Does the ratio between 0-4 and 5-14 years old look acceptable?	No
3. What proportion of children in each age category	The data is not sufficiently structured to answer this question, as the number of EPTB cases has not been reported in age-disaggregated format.
4. Do you think the data is accurately reflecting the burden of childhood TB in this district?	This report raises the concern of possible under-diagnosis and under reporting of childhood TB in the district, especially amongst the younger age group (0-4-year olds). This statement is based on the decreased and lower than expected proportion of child TB cases amongst the total case load, as well as the inverted ratio of 0-4 vs. 5-15-year olds).
5. Is the uptake of HIV testing acceptable?	This will depend on the target in the setting – it has however improved substantially from the previous 60% to 70%. It would be interesting to see the age breakdown of patients that were not tested for HIV, to ensure that children were included in the efforts to improve uptake of HIV testing).

**Step 5:** Further questions for discussion

Questions	Answers
1. What do you need to consider when comparing the time periods?	Were there any changes in terms of TB service delivery or management, note that the TB case load increased by 25% - discuss the possible implications of this on the data. One can also highlight the importance of understanding your data, and trying to discern whether this might be a data related problem, or a clinical problem.

Specimen answer for the calculated tables in the exercise:

Questions	Quarter 3 (2014)	Quarter 3 (2015)
1. Total adult TB case load	874	1076
2. Total number of children (0-14)	96	81
3. Percentage child TB cases of total cases	11%	8%
4. Proportion of children 0-4 vs. 5-15	55:41 (1.3:1)	36:45 (1:1.25)
5. Percentage of EPTB cases amongst children	??	??
6. Uptake of HIV testing among TB cases	521/874 (60%)	758/1076 (70%)

### Data Recording and Reporting Discussion Points

(Use as a tool to reinforce material learned through cases/exercises)



- Why is accurate and complete childhood TB data important?
- Who should be responsible to ensure accurate and complete recording and reporting of every TB patient? Can you think of reasons in your setting why people are not recording all the TB cases in the registers? For example, if a patient who was previously lost-to-follow up is started again on treatment, and thus has a higher risk of a poor outcome, the healthcare worker might be inclined to include this patient from the start in the register. Is there any way to change these practices?
- How does the TB program account for children that have been diagnosed in the hospital? Consider especially those with severe disease who might be hospitalised for the entire duration of treatment. Are hospitalised patients reflected in your routine data? Also, consider how children who die from TB in the hospital are reflected and accounted for in your routine data? How does this impact the accuracy of childhood TB estimates from your setting in terms of burden as well as severity of disease?
- How can real-time access to the quarterly reporting data for TB impact clinical care in the facility where you work?



### **Summary of Key Learning Points**

- TB is caused by *Mycobacterium tuberculosis*
- TB can be categorized into three stages: exposure, infection, and disease
- Not everyone who is exposed will become infected, and not everyone who becomes infected will develop disease
- Risk factors for exposure and infection include crowded living conditions, sharing a bed, living in a TB endemic area, poor ventilation, and regular contact with a source case with sputum smear positive pulmonary TB
- Risk factors for disease include recent exposure to TB, young age, and immunocompromising conditions including HIV infection, and malnutrition
- TB in children is an important contributor to the overall burden of TB and it impacts child health and survival
- Children account for approximately 10% of the burden of disease, but there is often under diagnosis and under reporting of childhood TB cases
- It is very important to report all cases of TB to the national TB programme
- Extrapulmonary TB is generally not transmissible to others

## Module 2: Diagnosis

Purpose: To learn how to evaluate a child for TB using setting-specific resources.

### Learning objectives

At the end of this module, participants will be able to:

- Take a thorough history to identify risk factors for TB
- Identify key components of the physical exam when evaluating a child for TB
- Identify children who need to be referred for further evaluation
- Use diagnostic tests as indicated to diagnose TB

### Materials



- Participant Workbook





### Discuss setting-specific practices



- Who usually diagnoses TB in children in your setting? Who starts treatment and who follows up children with TB? Have a discussion of what resources are available in your setting to diagnose and identify children with TB.
- What are the referral pathways in your setting for children with suspected TB?
- Considering your setting and what you have learned from the course, what barriers can you identify that makes the diagnosis of TB in children difficult? What solutions can you think of to resolve some of these issues (writing some of these on flipchart paper or a board may be helpful)?

<b>Practice Case 1: Mia's Case: Unconfirmed TB</b>	
	<p>Mia is a 3-year-old girl who presents with symptoms consistent with acute onset pneumonia. She had a cough and fever for one week. She did not have any weight loss, but she had a history of contact with someone with TB (although not recent). Clinically, she had a high temperature, was breathing quite fast, had slight sub-costal retractions, and had crackles in the left lung base; a typical picture of acute pneumonia.</p>
Questions	Answers
1. How would you manage her treatment and why?	Correct approach was “watch and wait” and re-evaluate after 2 weeks of antibiotics
2. What would you do if she did not respond to antibiotics in 2 weeks' time and why?	Refer for further investigation/ start TB treatment depending on setting
<b>Discussion Points</b> 	<ul style="list-style-type: none"> <li>Advantages and disadvantages of watching and waiting in your setting</li> <li>Advantages and disadvantages of both referring and not referring for special investigations</li> <li>Ethical issues to treat or not to treat unconfirmed TB</li> </ul>

<b>Practice Case 2: Sudeep's Case: TB Meningitis (TBM) and Missed Opportunities for Diagnosis</b>	
	<p>Sudeep is an 8-month-old boy who presents severely ill with a decreased level of consciousness, fever, and a strong TB contact history. Clinically, he has a high temperature, weight loss, and signs of TB meningitis.</p>
Questions	Answers
1. How would you manage Sudeep's treatment and why?	Refer immediately because TB meningitis has high mortality and morbidity
2. In the case study we are not given more information regarding Sudeep's management at hospital level. We presume that the hospital started TBM treatment immediately. What other treatment	<p>Although not part of the course it is important to have a sense of what additional management is required for TBM cases and also what is available in your specific setting</p> <p>Discuss diagnostics: CSF sampling, CT scan Discuss other treatment such as immune modulators</p>


guidelines are important for the hospital management of TBM in your setting?	Discuss paramedical management such as physiotherapy, etc.
3. As the case study unfolds in the course we learn that there was evidence of weight loss at a previous visit to the clinic in Sudeep's case however there is no evidence that a HCW noticed this or acted upon this red-flag finding. What could be done in your setting to ensure that red-flag signs such as weight loss are investigated for TB?	Move from reactive management to pro-active management. In high-burden settings, weight loss in children should always be investigated
4. Could TBM have been prevented in this case?	Possibly if more subtle symptoms, signs and risk factors were identified sooner
5. What are some risk factors for severe disease?	Younger age, HIV coinfection
<b>Discussion Points</b> 	<ul style="list-style-type: none"> <li>Discuss the ethical issues surrounding this case focusing on missed opportunities for prevention as well as missed opportunities for an earlier pulmonary TB (PTB) diagnosis (less serious form of disease).</li> </ul>
	<ul style="list-style-type: none"> <li>Discuss the age-related thresholds for diagnosis – is it more acceptable to have a lower threshold to start treatment due to the high risk of disease progression in children younger than 2 years than in children 2 years and older? Where could you argue for the watch-and-wait approach (as per the previous case)?</li> </ul>
	<ul style="list-style-type: none"> <li>Discuss the importance of a contact history in an infant with suspected TB</li> <li>Highlight the potential missed opportunities for IPT in infants, who often have a positive contact history</li> </ul>

	<ul style="list-style-type: none"> <li>Highlight the significant mortality and morbidity associated with TBM in the world but specifically in your setting</li> </ul>
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### Practice Case 3: Ojore's Case: The Role of TST and Bacteriologic Sampling




Ojore is a 10-year-old boy who presents with the typical signs and symptoms of PTB that are usually seen in adults. His CXR shows cavities and he is able to give sputum for bacteriological testing that is Xpert MDR/RIF positive.

Questions	Answers
1. The TB contact history in this case is unclear and the clinic did not have TST available to help in the diagnosis. Would it have been helpful to have a TST in this case? Why or why not?	No. Compare to case 4 (Kissa) in module, aged <5 years, where TB contact history was also unclear and a positive TST result was very helpful
2. Would you have collected a sputum specimen for Ojore? Why or why not?	Sputum in older children can and should be collected. It should be prioritized as a positive result provides the diagnosis irrespective of the TST result.
<b>Discussion Points</b> (This should be prepared taking local guidelines and WHO recommendations into consideration)  	Usefulness of TST and bacteriological sampling and their role in the diagnosis of TB in your setting. (Examples: Non-responders, possible MDR-TB). Review algorithms to highlight the role of these special investigations.
	TSTs are important in a younger child with suspected pulmonary TB who cannot provide a sample for bacteriologic testing and who do not have a clear contact history. Obtaining a contact history is critical as a clear and recent contact history provides exactly the same information as a positive TST result- it indicates a high likelihood of being infected with <i>Mycobacterium tuberculosis</i> .
	What reasons might there be for a false negative TST result? It is important to emphasise that a negative TST result does not exclude infection.
	Discuss the advantages, disadvantages and feasibility of smear vs. Xpert MDR/RIF vs. culture

	in your setting taking into account availability, cost, etc. (It may help to write this on a flipchart).
	Specimen collection for bacteriological testing (role and place of gastric aspirates, sputum induction and sputum collection in relation to age). Emphasise importance of collecting samples for testing whenever possible.
	Follow-up of specimens in children with positive bacteriology (use guidelines in local setting).
	What is the availability of X-ray and the quality of films and techniques? What is the comfort level of providers in reading chest films?

<b>Role Play Scenarios</b>  	<b>Role Play 1: Unconfirmed TB in Young Children</b>  <p>The patient is 2 years old, has a clinical picture of TB (weight loss, fever, and cough for 3 weeks), but there is no TB contact history. You did a CXR that looked suggestive of TB but were not able to do a TST. The diagnosis is, therefore, “probable TB.”</p> <p>Potential issues to address:</p> <ul style="list-style-type: none"> <li>• Challenges with bacteriological confirmation of TB in children</li> <li>• Strong clinical suspicion in young children enough to start treatment</li> <li>• Consequences of untreated TB vs. potential side-effects of treatment (risks vs. benefits)</li> <li>• Communication with parents/caregivers regarding risks vs. benefits, and how to address their questions about why treatment is needed if the diagnosis is not confirmed</li> </ul>
<b>Role of Healthcare Worker</b>  	<ul style="list-style-type: none"> <li>• Counsel the caregiver of a patient that you want to start on TB treatment.</li> </ul>
<b>Role of Caregiver</b>  	<ul style="list-style-type: none"> <li>• Ask the healthcare worker why treatment is necessary if the diagnosis is not confirmed.</li> <li>• Ask the healthcare worker to explain the risks and benefits of treatment.</li> </ul>

	<ul style="list-style-type: none"> <li>• Think about how the healthcare worker made you feel. Did you understand everything that was said to you? Did you have any unanswered questions?</li> </ul>
<p>Role of Observer</p> 	<p>Evaluate and provide feedback on how the healthcare worker did the following:</p> <ul style="list-style-type: none"> <li>• Established trust and rapport</li> <li>• Identified and addressed patient's concerns</li> <li>• Exhibited confidence</li> <li>• Demonstrated professionalism</li> <li>• Used simple language and had clear explanations</li> <li>• Listened carefully</li> <li>• Exhibited non-judgmental behaviour</li> </ul>

### Summary of Key Learning Points

- It is possible to make a clinical diagnosis of TB in children in the absence of diagnostic tests
- TST and CXRs can be helpful diagnostic tests, but they are not necessary to make a diagnosis
- The current bacteriologic tests are of limited value in children, and a negative test does not rule out TB. However, samples should be obtained for microbiological testing when possible
- Induced sputum or gastric aspiration/lavage are indicated and safe in younger children
- In older children, follow the adult algorithm for obtaining sputum and testing
- Xpert MTB/RIF can be a useful tool to confirm the diagnosis of TB and provide information about drug resistance

## Module 3: Treatment

Purpose: To learn how to treat and manage paediatric TB using setting specific resources

### Learning objectives

At the end of this module, participants will be able to:

- Identify treatment regimens for TB in children based on the severity of disease in the child, HIV prevalence in their setting, and isoniazid resistance in their setting
- Identify methods to increase adherence to TB treatment
- Communicate effectively with families the side effects of TB medications
- Identify children who need to be referred for further evaluation

### Materials



- Participant Workbook
- List of FDC formulations, if available
- Treatment cards

### Discuss setting-specific practices




- Review local treatment guidelines and compare to current WHO guidelines.
- Review local Fixed Dose Combination (FDC) formulations available for treatment
- Review local weight-banded dosing charts if available
- Discuss roles and responsibilities of different HCW in the follow-up of patients (doctors, nurses, community healthcare workers, like DOTS workers). Focus on who is responsible for doing and documenting all aspects of management.
- Discuss local practices of administering/supervising treatment– by caregiver, DOTS workers in the community, in clinic by pharmacy staff or nursing staff?
- Review local treatment cards and how to fill them in correctly
- Review local recording and reporting practices. Bring a TB register and review how to complete all fields. Who is responsible? How is it monitored?








**Practice Case 1: Weight-banded dosing of FDC formulations and follow-up.**







Chandni is a 2-year-old girl with PTB and weighs 13 kg.





Questions	Answers
1. What factors will you consider when choosing a regimen to start her on treatment?	The regimen you choose needs to be based on severity of disease, HIV prevalence, and drug resistance patterns in your setting.
2. How will you dose her with the available treatment options in your setting?	Work out dose according to local weight-banded dosing charts and available regimen(s)
3. How will you plan to follow her treatment in your setting and how does it differ from the recommended follow-up in the course?	Discuss aspects such as treatment response monitoring, adherence, monitoring for side-effects.
4. How will you know that she is responding to treatment?	Consider weight gain, symptom resolution, CXR
<b>Discussion Points</b> 	<ul style="list-style-type: none"> <li>Physically practice dose calculations and pill division according to local weight banded dosing charts and available drugs (Also consider an example of a drug stock out – i.e. one of the FDC tablets is out of stock, how will you dose now)?</li> </ul>
	<ul style="list-style-type: none"> <li>Treatment response markers, adherence, and side- effects</li> </ul>

Practice Case 2: Challenges with adherence and poor treatment response	
<p><b>?</b> Ojore is 10-year-old boy and weighs 24 kg. He has severe adult type PTB with cavities, and has problems with taking his medicine and is vomiting.</p>	
Questions	Answers
1. Suppose Ojore was adherent to his treatment but still did not improve clinically – how will you evaluate and manage this in your setting?	Reasons for treatment failure: adherence issues, incorrect regimen and dose, side-effects, drug resistance, co-morbid conditions, other diagnosis
2. Ojore is Xpert MDR/RIF positive. Will you repeat bacteriological specimen testing during follow-up to monitor treatment response?	Ideally bacteriologically confirmed disease should be bacteriologically monitored (with the type of test that was used initially – it makes no sense to monitor response of a Xpert MDR/RIF positive, smear negative case with follow-up smear tests) for treatment response. If possible, however clinical improvement remains the most important monitoring tool.
3. What do your local or WHO guidelines say about this?	WHO Xpert MTB/RIF Implementation Manual: Technical and operational 'how-to': practical considerations. World Health Organization, 2014. <a href="http://apps.who.int/iris/bitstream/10665/112469/1/9789241506700_eng.pdf">http://apps.who.int/iris/bitstream/10665/112469/1/9789241506700_eng.pdf</a>
<p><b>Discussion Points</b></p> 	<ul style="list-style-type: none"> <li>Management of vomiting – hepatotoxicity, addressing the nausea and vomiting to improve adherence</li> </ul>
	<ul style="list-style-type: none"> <li>Discuss reasons for not responding to treatment that you need to consider. Possible reasons include: non-adherence, including the accuracy of self-reported adherence, wrong dose, drug-resistant TB, HIV IRIS, other diagnosis. Emphasise importance of knowing drug-susceptibility and resistance status of the TB source case</li> </ul>
	<ul style="list-style-type: none"> <li>Discuss recommendations for follow-up bacteriological specimen collection in your setting. At what time points? Which test(s) to use and why? NOTE: WHO recommendation - to repeat smear until negative)</li> </ul>

<b>Role Play Scenarios</b> 	<b>Role Play 1: Starting Treatment</b>
<b>Role of Healthcare Worker</b> 	<ul style="list-style-type: none"> <li>• Counsel the caregiver of a patient that you want to start on TB treatment.</li> <li>• Explain how to prepare and administer the medications to a small child, explain what to do if the child vomits after the dose, discuss adverse effects, and explain when the caregiver should bring the child in for evaluation.</li> <li>• Bring FDC formulations if feasible, and give practical advice on how to prepare (divide and crush) and give medications and when to repeat dosages if the child vomits.</li> </ul>
<b>Role of Caregiver</b> 	<ul style="list-style-type: none"> <li>• Think about how the healthcare worker made you feel.</li> <li>• Did you understand everything that was said to you?</li> <li>• Did you have any unanswered questions?</li> </ul>
<b>Role of Observer</b> 	<p>Evaluate and provide feedback on how the healthcare worker did the following:</p> <ul style="list-style-type: none"> <li>• Established trust and rapport</li> <li>• Identified and addressed patient's concerns</li> <li>• Exhibited confidence</li> <li>• Demonstrated professionalism</li> <li>• Used simple language and had clear explanations</li> <li>• Listened carefully</li> <li>• Exhibited non-judgmental behaviour</li> </ul>

<b>Role Play Scenarios</b> 	<b>Role Play 2: Adherence Counselling</b> Potential Issues to address: <ul style="list-style-type: none"> <li>• Partnering with patients and caregivers vs. ordering that instructions be followed.</li> <li>• Different needs of patients require different emphasis (teenage patient vs. caregiver)</li> </ul>
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<p>Role of Healthcare Worker</p> 	<ul style="list-style-type: none"> <li>• Counsel an adolescent who refuses to take medication</li> </ul>
<p>Role of Adolescent</p> 	<ul style="list-style-type: none"> <li>• Refuse to take medication because there are too many pills to take and you do not want to waste your time. You also do not like the idea of a healthcare worker watching take your medications.</li> </ul>
<p>Role of Observer</p> 	<p>Evaluate and provide feedback on how the healthcare worker did the following:</p> <ul style="list-style-type: none"> <li>• Established trust and rapport</li> <li>• Identified and addressed patient's concerns</li> <li>• Exhibited confidence</li> <li>• Demonstrated professionalism</li> <li>• Used simple language and had clear explanations</li> <li>• Listened carefully</li> <li>• Exhibited non-judgmental behaviour</li> </ul>

<p><b>Role Play Scenarios</b></p> 	<p><b>Role Play 3: Adherence Counselling</b></p> <p>Potential Issues to address:</p> <ul style="list-style-type: none"> <li>• Partnering with patients and caregivers vs. ordering that instructions be followed.</li> <li>• Different needs of patients require different emphasis (teenage patient vs. caregiver)</li> </ul>
<p>Role of Healthcare Worker</p> 	<ul style="list-style-type: none"> <li>• Counsel a caregiver struggling to give medicines to a young child</li> </ul>
<p>Role of Caregiver</p> 	<ul style="list-style-type: none"> <li>• You are concerned about the medications, how to give them easily, and the side effects.</li> </ul>
<p>Role of Observer</p> 	<p>Evaluate and provide feedback on how the healthcare worker did the following:</p> <ul style="list-style-type: none"> <li>• Established trust and rapport</li> <li>• Identified and addressed patient's concerns</li> <li>• Exhibited confidence</li> <li>• Demonstrated professionalism</li> <li>• Used simple language and had clear explanations</li> <li>• Listened carefully</li> </ul>

	<ul style="list-style-type: none"> <li>• Exhibited non-judgmental behaviour</li> </ul>
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### **Summary of Key Learning Points:**

- Drug dosages are calculated as mg/kg. Children weighing above 25 kg can be treated with adult dosages and formulations
- Once you decide to start TB treatment in a child, it should be continued for the full 6 (or 12) months
- It is important to check the child's weight at each follow-up visit and adjust the drug dosages accordingly
- Make the child and their parents/caregiver your partner in the management of the child. They have to understand the importance of treatment and feel comfortable to ask you any questions or raise any concerns they have
- Make sure to ask about side effects as well as adherence at each follow-up visit, and counsel the child/parent/caregiver at each follow-up visit
- Monitor for signs of treatment response. Any sign of treatment failure should prompt referral for more specialty care
- If you suspect drug-resistant TB, refer the child to the appropriate treatment facility
- All forms of extrapulmonary TB (EPTB) should be treated with 4 drugs during the intensive phase, except for peripheral lymph node TB, which can be treated with three drugs
- In addition to TB meningitis, TB of the joints and bones should also be treated for a total of 12 months
- All other forms of EPTB are treated for 6 months

## Module 4: TB/HIV

Purpose: To learn how to evaluate and treat children for TB in the context of HIV

### Learning objectives

At the end of this module, participants will be able to:

- Diagnose, treat, and manage TB in a child with HIV
- Identify appropriate referral pathways for care in children with HIV
- Recognize IRIS and refer children for further care as indicated

### Materials


- Participant Workbook




### Discuss setting-specific practices



- Are TB and HIV services integrated in your setting? To what extent are the services integrated? Please provide examples of integration. (Possibilities: same healthcare workers providing both services to services provided at different levels of care, i.e., HIV at hospital level and TB at primary care level)
- What is done in your setting if you diagnose HIV and TB at the same time in a child? When do you start HIV treatment?
- Briefly discuss paediatric HIV guidelines in your setting. What do the guidelines say about TB? Do the guidelines differ from what you learned in the course? From WHO guidelines?
- Briefly discuss the prevention of mother-to-child transmission of HIV (PMTCT) guidelines in your setting and the follow up of babies born to HIV- infected women (breastfeeding practices, HIV screening time points, and TB screening of children).
- Briefly discuss TB screening for pregnant women (especially HIV-infected women) in your setting. What are the consequences of TB in pregnancy for the mother and baby?
- Discuss how your setting does TB screening for family members (especially children) of HIV-infected patients.

Practice Case 1: TB and HIV diagnosed at the same time	
 <p>Beko is a 4-year-old who was diagnosed with TB and HIV at the same time. Initially Beko responded well to treatment, but then started to deteriorate again.</p>	
Questions	Answers
1. The WHO guidelines recommend that in cases where TB and HIV are diagnosed simultaneously, that TB treatment should be started first and the ARV treatment only after 2 weeks. Why is this recommended?	Toxicity of medicines and IRIS
2. Would you do the same in your setting (i.e. not start TB treatment and ARV's together)? Also refer to the additional medications that were started in this case study – pyridoxine and cotrimoxazole preventive therapy. Do you do the same in your setting?	
3. What anti-retroviral therapy (ART) regimen would be used in your setting and why?	
4. How does the follow-up of HIV-infected TB patients differ from HIV uninfected TB patients?	Essentially it is the same, but we expect more problems with all aspects of management in the co-infected patient (higher risk, more complicated).
5. Beko was treated for drug susceptible TB but did not improve – Discuss the different reasons for not responding to treatment.	Discuss in terms of adherence monitoring, treatment response, and side effect

6. How will you systematically go about confirming or ruling out these different diagnoses/reasons responsible for poor treatment response in a HIV infected TB patient, specifically focusing on referral and the role of special investigations	Discuss adherence, side-effects, IRIS, other diagnoses, MDR-TB
7. What is IRIS?	Sometimes when a child has HIV and severe immunosuppression, they may have TB bacteria in their body, but their immune system does not recognize it. But when HIV treatment is started, the HIV is killed and the immune system starts to recover. The immune system then recognizes the TB bacteria and mounts an immune response. This can take the form of fever, worsening symptoms like sweating, cough, breathlessness, rash, confusion, and enlarging lymph nodes. IRIS usually occurs between 2 and 6 weeks after starting HIV treatment.
8. What are two kinds of IRIS?	<ol style="list-style-type: none"> <li>1. The TB treatment is going well, but TB symptoms get worse when the HIV treatment begins.</li> <li>2. Unmasking IRIS-this occurs when you diagnose HIV in a child and do not detect TB on initial screening, but the TB becomes apparent after starting HIV treatment.</li> </ol>
<b>Discussion Points</b>  	<ul style="list-style-type: none"> <li>• Guidelines for starting TB and HIV treatment at the same time</li> </ul>
	<ul style="list-style-type: none"> <li>• ART regimens compatible and not compatible with TB treatment</li> </ul>
	<ul style="list-style-type: none"> <li>• Other treatment guidelines, for example nutritional support, role of other medications including pyridoxine and cotrimoxazole preventive therapy</li> </ul>
	<ul style="list-style-type: none"> <li>• Follow up of HIV-infected children with TB is according to the same principles as the HIV uninfected child with TB, but need to address adherence issues, side-effects, pill burden, and also additional risk of IRIS</li> </ul>








## Practice Case 2: Complicated HIV and disseminated TB






Imani is a two-year-old HIV-infected child already receiving ART that presents severely ill with possible miliary TB.

Questions	Answers
1. This case was referred for further investigation and management at a higher level of care. What do you think would happen at the referral hospital if the referral hospital were in your setting?	
2. Would there be an opportunity to refer this patient back to a primary care setting? How would this work in your area?	The management of complicated cases is mostly done at the secondary and tertiary levels of care. Many primary level health care workers may not be aware of what happens in the hospitals, but they are often the ones who have to explain the next level of care to caregivers and family members. Increasing their knowledge may lead to earlier/more appropriate referrals and improved communication between different levels of care.
3. Do you need to stop ARV treatment when starting TB treatment in a patient already known to have HIV and on ARV treatment? Do we need to change the regimen? **  **The facilitator can include this question if participants in the course do treat TB in the context of HIV, and based on knowledge and experience of participants.	No, we generally do not need to stop. Depending on the ARV regimen, the dose of medication may need adjusting (i.e., lopinavir/ritonavir) or in certain cases we may need to change the ARV regimen (i.e., stavudine) to one less toxic in combination with TB medication. This will depend on the ARV regimens commonly available in your setting and we recommend referring to your setting specific ARV guidelines for more details.
4. There were some indications that Imani may not have received adequate treatment for	Counselling Involve all members of the multidisciplinary team e.g. counsellor, community health worker, social worker, etc.

<p>HIV potentially due to missed visits at the HIV clinic. (There may be poor adherence of ART for extended periods of time, or failure of the regimen). How would you explore and manage this in your setting? What other people should ideally be involved in her care?</p>	
<p>5. What multidisciplinary resources do you have in your setting? And how can you utilize other members of the team better to help with difficult cases such as this one?</p>	
<p><b>Discussion Points</b></p> 	<ul style="list-style-type: none"> <li>• Diagnostic difficulty in HIV infected children (e.g., miliary TB vs. lymphocytic interstitial pneumonitis (LIP) in this case)</li> </ul>
	<ul style="list-style-type: none"> <li>• The role and need for higher levels of care and referral to manage ill patients</li> </ul>
	<ul style="list-style-type: none"> <li>• The specific role and availability of special investigations (radiologic, bacteriologic, CSF, abdominal ultrasound, lymph node biopsies – depending on your setting)</li> </ul>
	<ul style="list-style-type: none"> <li>• The need to involve other disciplines – nutrition, social services, etc. in the care of HIV-infected patients</li> </ul>

<b>Role Play Scenarios</b> 	<b>Role Play 1: TB and HIV Diagnosed Simultaneously</b>
<b>Role of Healthcare Worker</b> 	<ul style="list-style-type: none"> <li>• Counsel a caregiver of a child who just had both TB and HIV diagnosed at the same time. Discuss pill burden, toxicity, IRIS and also HIV and TB screening for the rest of the family.</li> </ul>
<b>Role of Caregiver</b> 	<ul style="list-style-type: none"> <li>• Think about how the healthcare worker made you feel.</li> <li>• Did you understand everything that was said to you?</li> <li>• Did you have any unanswered questions?</li> </ul>
<b>Role of Observer</b> 	<p>Evaluate and provide feedback on how the healthcare worker did the following:</p> <ul style="list-style-type: none"> <li>• Established trust and rapport</li> <li>• Identified and addressed patient's concerns</li> <li>• Exhibited confidence</li> <li>• Demonstrated professionalism</li> <li>• Used simple language and had clear explanations</li> <li>• Listened carefully</li> <li>• Exhibited non-judgmental behaviour</li> </ul>

<b>Role Play Scenarios</b> 	<b>Role Play 2: Repeat HIV PCR Testing in a Young Child</b>
<b>Role of Healthcare Worker</b> 	<ul style="list-style-type: none"> <li>• Counsel caregiver about doing a follow-up PCR test on a young child with possible TB, who previously tested negative for HIV at birth.</li> </ul>
<b>Role of Caregiver</b> 	<ul style="list-style-type: none"> <li>• Think about how the healthcare worker made you feel.</li> <li>• Did you understand everything that was said to you?</li> <li>• Did you have any unanswered questions?</li> </ul>
<b>Role of Observer</b>	<p>Evaluate and provide feedback on how the healthcare worker did the following:</p> <ul style="list-style-type: none"> <li>• Established trust and rapport</li> </ul>



- Identified and addressed patient's concerns
- Exhibited confidence
- Demonstrated professionalism
- Used simple language and had clear explanations
- Listened carefully
- Exhibited non-judgmental behaviour

**Summary of Key Learning Points:**

- If a child is diagnosed with both TB and HIV at the same time, TB treatment should be started immediately. HIV treatment should then be started approximately two weeks later
- All children with HIV and TB should start on cotrimoxazole preventive therapy
- It may be necessary to refer a child with HIV to a higher level of care if:
  1. There is diagnostic doubt about TB
  2. The child is very unwell
  3. The treatment regimen for either HIV or TB is complicated
  4. The child cannot tolerate treatment for HIV or TB
  5. The child is not responding to TB treatment
  6. There is any suspicion of drug-resistant TB or there is confirmed drug-resistant TB
  7. The child develops IRIS

## Module 5: Prevention

Purpose: To learn about methods to prevent the development of TB in children through vaccination, preventive therapy, and infection control.

### Learning objectives

At the end of this module, participants will be able to:

- Describe the methods used to prevent TB in children
- List the potential adverse effects associated with BCG vaccination
- Identify groups for which preventive therapy is recommended
- Identify methods used to prevent the spread of TB

### Materials



- Participant Workbook
- Forms
  1. Algorithm for screening contacts of TB cases
  2. Algorithm for management of close contact with a case of TB
  3. TB Index Case Contact Screening Form
  4. Referral Form for Symptomatic TB Contact
  5. Isoniazid Preventive Therapy Register
  6. Register for Referred TB Cases
  7. Quarterly Data Collection Form on TB Contact Investigation

### Discuss setting-specific practices for prevention



- How are contacts of TB patients currently being identified in your setting – are you using an active or a passive contact tracing model? Are contacts identified at the household level, or only through questions to the TB case? And how do you currently ensure that all contacts are informed and screened for TB?
- Are there other preventive therapy regimens besides 6 months of IPT that are being used in your setting?
- Are there clear guidelines in your setting to explain roles and responsibilities related to tracing, screening and follow up of child TB contacts?
- What definition of a household contact is used in your setting? How common is it that multiple unrelated families might share a house or a plot? And if it is common, are questions asked to identify children outside of the immediate family of the TB case who might be in close contact with the case?
- Is BCG immunisation used as a strategy to prevent childhood TB in your setting? What is vaccine coverage? At what age is the BCG vaccine usually given?

- If there is a high burden of adult MDR-TB cases in your setting, are there any guidelines on how to manage children exposed to MDR TB?
- How is contact management and preventive therapy documented in your setting? Do you have any structured tools in place to record preventive therapy delivery? How is this process monitored and reported?

**Discuss  
setting-  
specific  
practices  
for  
infection  
control**



- Are basic infection control measures implemented in healthcare facilities in your setting and if so, what are they? What facilities or clinical settings are regarded as settings where children might have a high risk of exposure to TB? Discuss firstly how patients and their children are protected, and then how healthcare workers are protected.
- Which children with TB that require hospitalisation are at particular risk of transmitting TB to other children in the hospital ward? What do you do to reduce this risk?
- A mother with TB has a sick newborn or infant who requires inpatient care. How do you reduce the risk of that mother transmitting TB to other sick infants while caring for her baby?
- Are TB patients informed about basic infection control principles that they could implement at home? Is there any opportunity (for example, home visits) where the messages about infection control could be reinforced, and the entire household could be educated?

### Practice Case 1: Contact Screening



Lamin is a 33-year-old male patient diagnosed with sputum smear positive TB at his local clinic. Trainees were presented with all the people Lamin is regularly in contact with, and decisions had to be made based on assessing the individual scenario of each contact.

Contact	Age	Relationship to Index Case	TB Symptoms	HIV Status
<b>Adama</b>	32 years	Wife	No	Infected
<b>Backary</b>	8 years	Son	Yes	Uninfected
<b>Bai</b>	4 years	Daughter	No	Uninfected
<b>Ebrima</b>	8 months	Daughter	No	Uninfected
<b>Loli</b>	8 years	Resides in same building, Cared for by index case	No	Infected
<b>Sainey</b>	2 years	Resides in same building, Cared for by index case	Yes	Uninfected
<b>Foday</b>	7 years	Visitor	No	Uninfected

#### Questions

#### Answers

1. What are the four key things that you need to consider when evaluating all contacts exposed to a person with infectious TB?

Age, HIV status, degree of exposure, and clinical evaluation to determine the presence of TB symptoms

2. What factors do you need to consider when assessing the degree of exposure and therefore risk of TB infection for the contacts?


Proximity to TB case, duration of exposure, and infectiousness of TB case, i.e., a smear positive case is more infectious than a smear negative culture, positive case

3. How will your approach differ between 4-year-old, asymptomatic, and HIV negative Bai and 2-year-old Sainey, who is also HIV negative but presented with possible TB symptoms?

Bai can start IPT immediately, WITHOUT any further investigations, whereas you first need to exclude TB disease in Sainey before you can initiate IPT.

4. Sainey was treated at the clinic with antibiotics, and returned to you for follow up one week later. All his symptoms resolved, and he is clinically asymptomatic at this visit. What would your next action be in terms of Sainey's health care?	He should start IPT – just because he does not have active TB disease at the moment, this does not decrease his risk of being infected with TB and because he is only 2 years old, he needs preventive therapy
5. How will your approach differ between Foday (7-years-old, HIV uninfected, and asymptomatic) and Loli (8-years-old, HIV-infected, and asymptomatic)?	Foday does not need any treatment at this time, but his parents should be educated on possible TB symptoms, and alerted to bring him to the clinic if he does develop any symptoms. Despite her age, Loli will need IPT due to her HIV status.
6. At the first follow up visit, 8-month-old Ebrima's mother reported that she (Ebrima) developed possible TB symptoms. What action would you take?	Refer for investigation while continuing with IPT
7. After 2 months of IPT, Loli's family move to another house, and she is no longer in contact with Lamin. Her mother asks you whether she needs to continue or stop IPT. What would you tell her?	She needs to continue IPT, even though she is not exposed anymore. Six months of IPT is needed to protect her from the exposure episode, even though the exposure is not ongoing,
8. After you have discussed the implications of TB exposure in children, Lamin tells you that his cousin and her 10-month-old baby girl stayed with them for the preceding 6 months. They moved out of the household into	This baby definitely needs to be screened for TB, and if she does not have TB, she needs to receive IPT as she is very likely to have been exposed to TB whilst they were living in the household. Important to discuss here that IPT is needed for any substantial exposure within the preceding 12 months that a child might have experienced, even if is not ongoing. For any infant (<12 months of age), any previous exposure in the past 12 months is relevant. The risk of disease in the first year following exposure is high in young




<p>their own house two weeks before the TB diagnosis. While they were staying with them, Lamin was looking after the baby during the day as her mother was working. What do you need to tell Lamin about the risk for this child? Does this baby still need to be screened and given IPT, as they did not stay in the household anymore when Lamin was diagnosed with TB?</p>	<p>children and ongoing exposure is not a prerequisite for preventive therapy.</p>
<p>9. What would you do if Adama (Bai's mother) tells you that they do not want their child to start/continue IPT?</p>	<p>Explain that the risk of disease following exposure is high in young children. Discuss the risks of TB disease and explain the benefits of prevention with IPT.</p>
<p>10. What questions should we ask to make sure we identify all at risk contacts after diagnosing an infectious TB case? If they are a teacher, or working at a school for young children, what should you advise them? And what further steps need to be taken if a TB patient is working with or around young children?</p>	<p>Ask the person to identify all household contacts, particularly young children. Also, ask if they work since they might spend substantial time with colleagues, who might be at risk. Persons with TB should not attend work or school until after they have been on treatment for at least 2 weeks.</p> <p>If they work as a teacher, at a school, or with young children, the children with whom they have had contact should be screened for TB.</p> <p>Ask patients to cover their mouth with a tissue when they cough, sneeze, or laugh.</p>
<p><b>Discussion Points</b></p> 	<p>Stress the importance of contact tracing for TB cases</p>





## Practice Case 2: Infection Control Counselling







Lily has just been diagnosed with sputum smear-positive TB, and has four children living with her. She also has a 9-month old daughter that she is still breastfeeding.

Questions	Answers
1. Can Lily continue breastfeeding? What would you advise her?	To continue breastfeeding and to use a mask when breastfeeding or try to avoid coughing on the baby whilst breastfeeding.
2. What can Lily do in her household to reduce the risk of transmission to the other household members?	Open the windows, cover her mouth with a mask or her arm when coughing, sleep in a separate bed and/or room if possible for at least two weeks
3. Relating to infection control, what are the important principles of TB that you need to educate Lily about?	Consider transmission, symptoms and prevention of TB
4. As Lily is still infectious at the moment, what factors inside the clinic can help reducing the chance of her infecting other patients or health care workers inside the clinic?	Outside or well-ventilated waiting areas, early identification and separation of patients presenting with cough, personal protective equipment for the staff (N95 respirators), open windows to optimise air flow and ventilation
<b>Discussion Points</b> 	<ul style="list-style-type: none"> <li>• What can you do as healthcare worker if Lily does not want to disclose her TB status to the rest of the household? How do you protect her patient confidentiality, but also ensure adequate protection of the rest of the household?</li> <li>• Has stigma related to TB been adequately addressed in your community, or is it still a reality for patients? What steps has been taken to remove stigma, and what more can be done?</li> <li>• Healthcare workers are at much higher risk of developing TB than the general population. How well are infection control measures currently implemented and monitored in your clinic? Are N95 respirators readily available? What can you</li> </ul>

	do to improve infection control in your work place?
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<b>Role Play Scenarios</b> 	<b>Role Play 1: Explanation of preventive therapy to a mother whose child you are starting on IPT following household TB exposure</b> <p>Bai is the 4-year-old daughter of Lamin, who has been diagnosed with smear positive TB the previous week. She is HIV negative, has no symptoms or signs of TB on history or clinical examination, but due to her close contact with Lamin you would like to start her on IPT.</p>
<b>Role of Healthcare Worker</b> 	<p>Counsel Bai's mother regarding Bai's risk for TB, explaining the need for preventive therapy, as well as treatment considerations and follow up.</p> <ul style="list-style-type: none"> <li>• Risk of disease following exposure</li> <li>• Duration of treatment</li> <li>• How to give medication, and when to repeat dosages if Bai has vomited</li> <li>• Explain side effects of the drugs, and also important side effect symptoms that parents need to be aware of to identify early complications (specifically relating to hepatotoxicity)</li> <li>• Follow up – adherence and duration</li> </ul>
<b>Role of Caregiver</b> 	<ul style="list-style-type: none"> <li>• Ask the provider why your child needs medication since she does not have TB</li> <li>• Ask about the risks and benefits of preventive therapy</li> <li>• Ask about treatment duration, and side effects</li> </ul>
<b>Role of Observer</b> 	<p>Evaluate and provide feedback on how the healthcare worker did the following:</p> <ul style="list-style-type: none"> <li>• Established trust and rapport</li> <li>• Identified and addressed patient's concerns</li> <li>• Exhibited confidence</li> <li>• Demonstrated professionalism</li> <li>• Used simple language and had clear explanations</li> <li>• Listened carefully</li> <li>• Exhibited non-judgmental behaviour</li> </ul>

<b>Role Play Scenarios</b> 	<b>Role Play 2: Essential components that need to be addressed at follow-up visits of patients on preventive therapy</b>
<b>Role of Healthcare Worker</b> 	<p>Adama and Bai are returning for Bai's first follow up visit, 4 weeks after you started her on IPT.</p> <ul style="list-style-type: none"> <li>• What do you need to ask Adama at this visit?</li> <li>• Has Bai developed any symptoms of TB?</li> <li>• Have they been experiencing any problems relating to administration of the medication?</li> <li>• Is she experiencing any side effects of the medication?</li> <li>• Participants need to be specific – not ask just about side effects, but ask about nausea, vomiting and abdominal pain.</li> <li>• Infection control also needs to be addressed. Counselling of a TB case about infection control measures in the household</li> </ul>
<b>Role of Caregiver</b> 	<ul style="list-style-type: none"> <li>• Answer the healthcare worker's questions and respond with concerns if the answers give reason to do so.</li> </ul>
<b>Role of Observer</b> 	<p>Evaluate and provide feedback on how the healthcare worker did the following:</p> <ul style="list-style-type: none"> <li>• Established trust and rapport</li> <li>• Identified and addressed patient's concerns</li> <li>• Exhibited confidence</li> <li>• Demonstrated professionalism</li> <li>• Used simple language and had clear explanations</li> <li>• Listened carefully</li> <li>• Exhibited non-judgmental behaviour</li> </ul>

**Summary of Key Learning Points:**

This module covered a wide spectrum of TB prevention activities including BCG vaccination and isoniazid preventive therapy (IPT), as well as infection control measures in the household and the clinic.

- BCG vaccination can protect young children from the most severe forms of TB
- The BCG vaccine should be given to babies at birth. It is very safe, but in some rare situations can cause minor side effects
- After someone is diagnosed with TB, contact tracing should be carried out
- Contact tracing identifies family members/contacts that have already developed active TB and it identifies family members/contacts that would benefit from IPT, which significantly reduces the risk of developing TB disease
- Any contact who has symptoms or signs of TB should be referred for evaluation at the clinic
- Well contacts who are less than 5 years of age or any contacts who are HIV-infected, regardless of age are eligible for IPT
- After a patient has been diagnosed with TB disease, it is important to educate the family on infection control in the house. This includes keeping windows open as much as possible, sleeping in a separate bed for the first two weeks of treatment and avoiding crowded places
- Infection control in the clinic is also important and includes opening windows, having outdoor waiting areas, separating people coughing from other people waiting for treatment (especially people who are very vulnerable to TB such as young children and HIV-infected persons), and wearing an N95 respirator when seeing patients who are coughing
- Patients with EPTB should may also have PTB and should be evaluated for this

## Module 6: Practice/Conclusion

Purpose: To review and apply what you have learned in the previous modules to diagnose, treat, and prevent TB in children.



- Participant Workbook

### Practice Cases



- Ask participants if they had any questions about the cases from Module 6 in the online course
- Discuss setting specific practices in relation to those cases

## **VII. Resources**

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### **1. The Union Childhood TB Learning Portal**

<https://childhoodtb.theunion.org/>

- Desk-guide for the diagnosis and management of TB in children (The Union. S. Graham et al. 3rd edition, 2016) (Available in English and French)
- Guidance for national tuberculosis programmes on the management of tuberculosis in children (World Health Organization. Second edition. 2014)

## **VIII. Course Materials and Forms (see below)**

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## Sample Invitation Letter

*Print on letterhead*

<Date>

<Name of Delegate>

<Address>

Dear \_\_\_\_\_

I am pleased to confirm your enrolment in the training course, 'Childhood TB for Healthcare Workers', which will be held on <day/date> from <start time> to <end time> in <city, province/state>. Directions (transportation details) to the course site are enclosed.

The objectives of the 'Childhood TB Training for Healthcare Workers' Training Course are for the delegate to be able to:

- Understand and describe the epidemiology of TB in children in their setting, including risk factors for infection and disease
- Identify especially vulnerable groups at risk of TB infection and disease
- Develop the clinical skills to detect and diagnose TB in children in a resource-limited setting, and discuss TB prevention mechanisms
- Develop plans of care for a variety of family circumstances and age groups
- Develop adherence strategies for treatment with medications in children
- Effectively communicate with children and their families to provide education about treatment, infection prevention, and for eliciting information for contact tracing
- Describe the national guidelines for the recommended regimens and dosages for the treatment of TB and for preventive therapy in children
- Describe the importance of registering all children treated for TB with the national TB program and to monitor treatment outcomes
- Support the implementation of community-based contact screening and management

Please note that at the start of the course, we will ask you to complete the 'Childhood TB for Healthcare Workers: An Online Course' prior to the facilitated course. This course was created by The Union in collaboration with the World Health Organization. The course consists of an interactive six-module curriculum designed for healthcare workers at the primary and secondary level of the healthcare system and covers how to diagnose, treat, and prevent childhood TB.

<Provide instructions for completion of the course on one's own or at a computer site with dates and deadlines. If the course is being completed on one's own, provide a copy of the Participant Workbook with instructions for completion during the online course.>

<The remainder of the letter can be devoted to other appropriate matters such as: lodging, travel, expense reimbursement, dietary requirements or special needs, emergency message telephone number at course site, parking, etc.>

If you have any questions regarding the course, please feel free to call me at <telephone number> or contact me by email at \_\_\_\_@\_\_\_\_\_. I look forward to your participation in the course.

Sincerely,

<Course Facilitator> OR <Course Coordinator> OR <Programme Manager>

## Evaluation Form

### Childhood TB for Health Care Workers

<DATES>

<LOCATION>

### Course Evaluation

Please check (✓) the box that best describes your rating.

1. To what extent were the following course objectives met:	Well met 5	Somewhat met 4	Met 3	Not well met 2	Not met at all 1
a. Understand and describe the local epidemiology of children with TB and make determinations of which groups to provide more education, outreach, interventions, etc.					
b. Identify especially vulnerable groups and how the programme can provide appropriate interventions to assist with their care.					
c. Discuss TB prevention mechanisms that are in place in one's programme and how they may be enhanced.					
d. Describe what diagnostic and treatment modalities are available in one's programme and how to use them in the care of children with TB.					
e. Develop plans of care for a variety of family circumstances and age groups.					
f. Develop adherence strategies for treatment with TB medications in children.					
g. Effectively communicate with children and their families to provide education about treatment, infection prevention, and for eliciting information for contact tracing.					
h. Assess gaps in reporting and make decisions about how to resolve these.					
Comments on the learning objectives and what made you rate something very high or low.					

2. How has your knowledge in the following areas improved since you attended this training?	Greatly improved 5	Somewhat improved 4	Improved 3	Not well improved 2	Not improved at all 1
a. Local epidemiology of children with TB					
b. TB diagnostic modalities for children					
c. TB treatment management in children					
d. Effective communication techniques with children and their families					
e. Development of adherence strategies for treatment with TB medications in children					
f. Assessment of gaps in reporting and how to resolve these gaps					
Comments on the learning objectives and what made you rate something very high or low.					
3. Please comment on the course facilitator(s).	Excellent 5	Very Good 4	Good 3	Fair 2	Poor 1
<NAME>					
Clarity of explanations					
Ability to answer questions					
Comments:					
4. How were the logistics prior to coming to the course?	Excellent 5	Very Good 4	Good 3	Fair 2	Poor 1
Comments:					
5. How were the logistics during the course?	Excellent 5	Very Good 4	Good 3	Fair 2	Poor 1
Comments:					
6. How was the course classroom setting?	Excellent	Very Good	Good	Fair	Poor

	5	4	3	2	1
Comments:					
7. How was the hotel accommodation?	Excellent	Very Good	Good	Fair	Poor
	5	4	3	2	1
Comments:					

9. Do you plan to make any changes to your practice as a result of attending this course? These may be related to diagnosis, treatment, contact tracing, recording and reporting, patient communication, etc.

☐ Yes – Please specifically state what changes you will make.

☐ No – I am already implementing what was shared in this course

☐ No - System or other barriers will prevent me from making changes to my practice

☐ No - Course content is not relevant to my practice or setting

Other comments on changes to your practice or please expand on any of your above responses.

4. What did you like most about this course?

5. What changes to this course might you suggest?

6. Other comments:

*Note that we may contact you in a few months to find out how you may be implementing this course content in your work. We appreciate your feedback.*

## Sample Agenda

### Day 1: Online Course

8:00 – 9:00	Welcome, Administration and Registration
9:00 – 10:30	Module 1: Epidemiology (1.5 hours)
10:30 – 10:45	Break
10:45 – 11:45	Module 1: Epidemiology (1 hour)
11:45 – 12:30	Lunch
12:30 – 14:30	Module 2: Diagnosis (2 hours)
14:30 – 14:45	Break
14:45 – 16:45	Module 3: Treatment (2 hours)

### Day 2: Online Course

8:00 – 8:30	Welcome
8:30 – 10:00	Module 4: TB/HIV (1.5 hours)
10:00 – 10:15	Break
10:15 – 10:45	Module 4: TB/HIV (30 minutes)
10:45 – 12:15	Module 5: Prevention (1.5 hours)
12:15 – 13:00	Lunch
13:00 – 13:30	Module 5: Prevention (30 minutes)
13:30 – 14:30	Module 6: Practice (1 hour)
14:30 – 14:45	Break
14:45 – 15:45	Module 6: Practice (1 hour)
15:45 – 16:15	Online Post-test

### Day 3: Facilitated Course

8:00 – 8:30	Welcome
8:30 – 9:00	Review of Post-Test from Online Course
9:00 – 11:00	Module 1: Epidemiology (2 hours)
11:00 – 11:15	Break
11:15 – 12:45	Module 2: Diagnosis (1.5 hours)
12:45 – 13:30	Lunch
13:30 – 15:00	Module 3: Treatment (1.5 hours)
15:00 – 15:15	Break
15:15 – 17:15	Module 4: TB/HIV (2hours)

### Day 4: Facilitated Course

8:00 – 8:30	Welcome
8:30 – 10:30	Module 5: Prevention (2 hours)
10:30 – 10:45	Break
10:45 – 12:00	Module 6: Practice (1.25 hours)
12:00 – 12:30	Evaluation

## Detailed Facilitator Agenda for Modules

### Module 1: Epidemiology

Activity	Tips	Materials
Learning Objectives	<ul style="list-style-type: none"> <li>Be familiar with learning objectives</li> </ul>	<ul style="list-style-type: none"> <li>Participant Workbook</li> <li>Calculator</li> <li>White Board/Poster Board</li> <li>Marker/Pens</li> <li>TB register or sample data provided in guide</li> </ul>
Discuss setting specific practices	<ul style="list-style-type: none"> <li>Engage participants by asking them questions provided in the guide</li> </ul>	
Review cases/exercises	<ul style="list-style-type: none"> <li>Engage participants by asking them questions provided in the guide</li> <li>Ask participants to review their local quarterly TB data or the fictitious data provided in the guide</li> </ul>	
Summary of Key Learning Points	<ul style="list-style-type: none"> <li>Review key learning points</li> </ul>	

### Module 2: Diagnosis

Activity	Tips	Materials
Learning Objectives	<ul style="list-style-type: none"> <li>Be familiar with learning objectives</li> </ul>	<ul style="list-style-type: none"> <li>Participant Workbook</li> <li>White Board/Poster Board</li> <li>Marker/Pens</li> </ul>
Discuss setting specific practices	<ul style="list-style-type: none"> <li>Engage participants by asking them questions provided in the guide</li> </ul>	
Review cases/exercises	<ul style="list-style-type: none"> <li>Engage participants by asking them questions provided in the guide</li> </ul>	
Role Play Scenarios	<ul style="list-style-type: none"> <li>Options for the Role-Play (will depend on classroom set up, and number of participants)</li> <li>1. Choose two participants to come to the front of the class to act out the role-play. One person is the HCW and the other is the caregiver/patient. The other participants will be observers.</li> <li>2. Have the participants count off in groups of 3. For each group of three, one person will be the HCW, one will be the caregiver/patient, and the third will be the observer.</li> </ul>	
Summary of Key Learning Points	<ul style="list-style-type: none"> <li>Review key learning points</li> </ul>	

### Module 3: Treatment

Activity	Tips	Materials
Learning Objectives	<ul style="list-style-type: none"> <li>• Be familiar with learning objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Participant Workbook</li> <li>• White Board/Poster Board</li> <li>• Marker/Pens</li> <li>• List of medications</li> <li>• Medications (if available)</li> </ul>
Discuss setting specific practices	<ul style="list-style-type: none"> <li>• Engage participants by asking them questions provided in the guide</li> </ul>	
Review cases/exercises	<ul style="list-style-type: none"> <li>• Engage participants by asking them questions provided in the guide</li> </ul>	
Role Play Scenarios	<ul style="list-style-type: none"> <li>• Options for the Role-Play (will depend on classroom set up, and number of participants)</li> </ul> <ol style="list-style-type: none"> <li>1. Choose two participants to come to the front of the class to act out the role-play. One person is the HCW and the other is the caregiver/patient. The other participants will be observers.</li> <li>2. Have the participants count off in groups of 3. For each group of three, one person will be the HCW, one will be the caregiver/patient, and the third will be the observer.</li> </ol>	
Summary of Key Learning Points	<ul style="list-style-type: none"> <li>• Review key learning points</li> </ul>	

### Module 4: TB/HIV

Activity	Tips	Materials
Learning Objectives	<ul style="list-style-type: none"> <li>• Be familiar with learning objectives</li> </ul>	<ul style="list-style-type: none"> <li>• Participant Workbook</li> <li>• White Board/Poster Board</li> <li>• Marker/Pens</li> </ul>
Discuss setting specific practices	<ul style="list-style-type: none"> <li>• Engage participants by asking them questions provided in the guide</li> </ul>	
Review cases/exercises	<ul style="list-style-type: none"> <li>• Engage participants by asking them questions provided in the guide</li> </ul>	
Role Play Scenarios	<ul style="list-style-type: none"> <li>• Options for the Role-Play (will depend on classroom set up, and number of participants)</li> </ul> <ol style="list-style-type: none"> <li>1. Choose two participants to come to the front of the class to act out the role-play. One person is the HCW and the other is the caregiver/patient. The other participants will be observers.</li> <li>2. Have the participants count off in groups of 3. For each group of three, one person will be the HCW, one will be the caregiver/patient, and the third will be the observer.</li> </ol>	
Summary of Key Learning Points	<ul style="list-style-type: none"> <li>• Review key learning points</li> </ul>	



## Module 5: Prevention

Activity	Tips	Materials
Learning Objectives	<ul style="list-style-type: none"> <li>Be familiar with learning objectives</li> </ul>	<ul style="list-style-type: none"> <li>Participant Workbook</li> <li>White Board/Poster Board</li> <li>Marker/Pens</li> <li>Forms</li> </ul> <ol style="list-style-type: none"> <li>Algorithm for screening contacts of TB cases</li> <li>Algorithm for management of close contact with a case of TB</li> <li>TB Index Case Contact Screening Form</li> <li>Referral Form for Symptomatic TB Contact</li> <li>Isoniazid Preventive Therapy Register</li> <li>Register for Referred TB Cases</li> <li>Quarterly Data Collection Form on TB Contact Investigation</li> </ol>
Discuss setting specific practices	<ul style="list-style-type: none"> <li>Engage participants by asking them questions provided in the guide</li> </ul>	
Review cases/exercises	<ul style="list-style-type: none"> <li>Engage participants by asking them questions provided in the guide</li> </ul>	
Role Play Scenarios	<ol style="list-style-type: none"> <li>Options for the Role-Play (will depend on classroom set up, and number of participants)</li> <li>Choose two participants to come to the front of the class to act out the role-play. One person is the HCW and the other is the caregiver/patient. The other participants will be observers.</li> <li>Have the participants count off in groups of 3. For each group of three, one person will be the HCW, one will be the caregiver/patient, and the third will be the observer.</li> </ol>	
Summary of Key Learning Points	<ul style="list-style-type: none"> <li>Review key learning points</li> </ul>	

## Module 6: Practice

Activity	Tips	Materials
Review cases/exercises		<ul style="list-style-type: none"> <li>Participant Workbook</li> <li>White Board/Poster Board</li> <li>Marker/Pens</li> </ul>

**Online Course Certificate:** To be used for participants who are not completing the course with a live internet connection

The Union

International Union Against  
Tuberculosis and Lung Disease  
*Health solutions for the poor*

Name of participant

has successfully completed the course

## Childhood TB for Healthcare Workers: An Online Course

Developed by The Union and WHO

This course includes completion of the following modules:

Module 1 - **Epidemiology**

Module 2 - **Diagnosis**

Module 3 - **Treatment**

Module 4 - **TB-HIV**

Module 5 - **Prevention**

Module 6 - **Practice**

Organisation Logo



# Name of participant

has successfully completed the course

Childhood TB for Healthcare Workers: A Practical  
Course

On

<Date(s) of course>

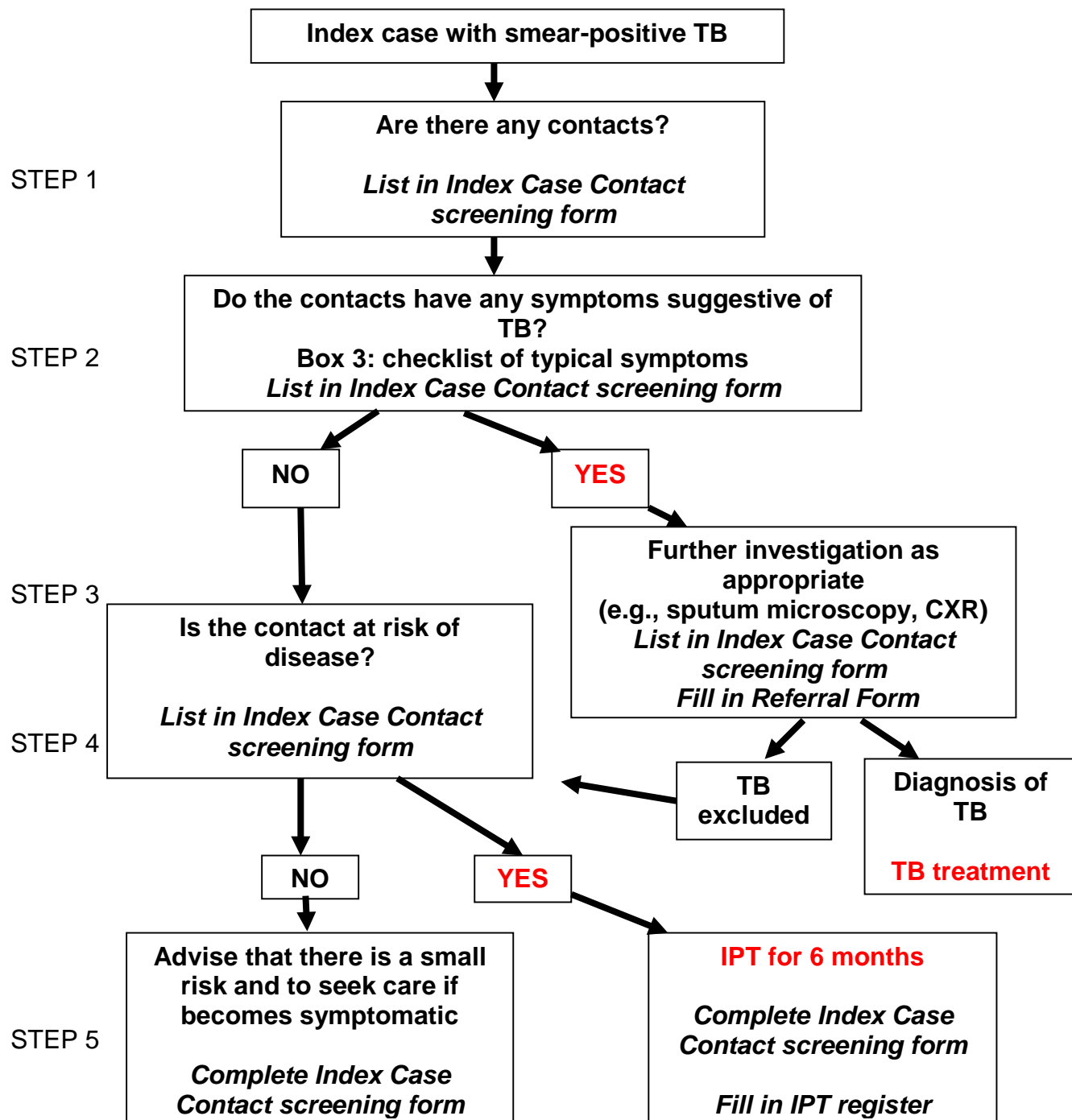
\_\_\_\_\_  
<Course Facilitator's name>

\_\_\_\_\_  
<Programme Director's Name>

## Facilitator Checklist

✓	<b>Materials and Supplies</b>
	<b>Materials and Supplies for Facilitator</b>
	Facilitator Guide
	Participant Workbook
	White Board/ Dry Erase Board / Poster Paper
	Markers
	Pens/Pencils
	Paper
	Calculator
	Name Tags
	Attendance Sheet
	Agenda
	The Union Desk-guide
	WHO and/or National/Local TB Guidelines
	Computer
	Projector
	Printer for Certificates
	Online and facilitated course certificates
	Pre- and Post-Test for online course if cannot be completed online
	Course Evaluations
	Forms
	<ul style="list-style-type: none"> <li>• Algorithm for screening of close contacts</li> <li>• Algorithm for management of close contacts</li> <li>• TB index case contact screening form</li> <li>• Referral form for symptomatic TB contact</li> <li>• IPT Register</li> <li>• Register of Referred TB Cases</li> <li>• Quarterly data collection form on TB contact investigation</li> <li>• TB Register</li> <li>• TB Treatment card</li> <li>• Quarterly report form for all TB cases</li> </ul>
	<b>Materials and Supplies for Participants</b>
	Participant Workbook
	Pens/Pencils
	Paper
	Calculator
	Course Evaluations
	Pre- and Post-Test for online course if cannot be completed online

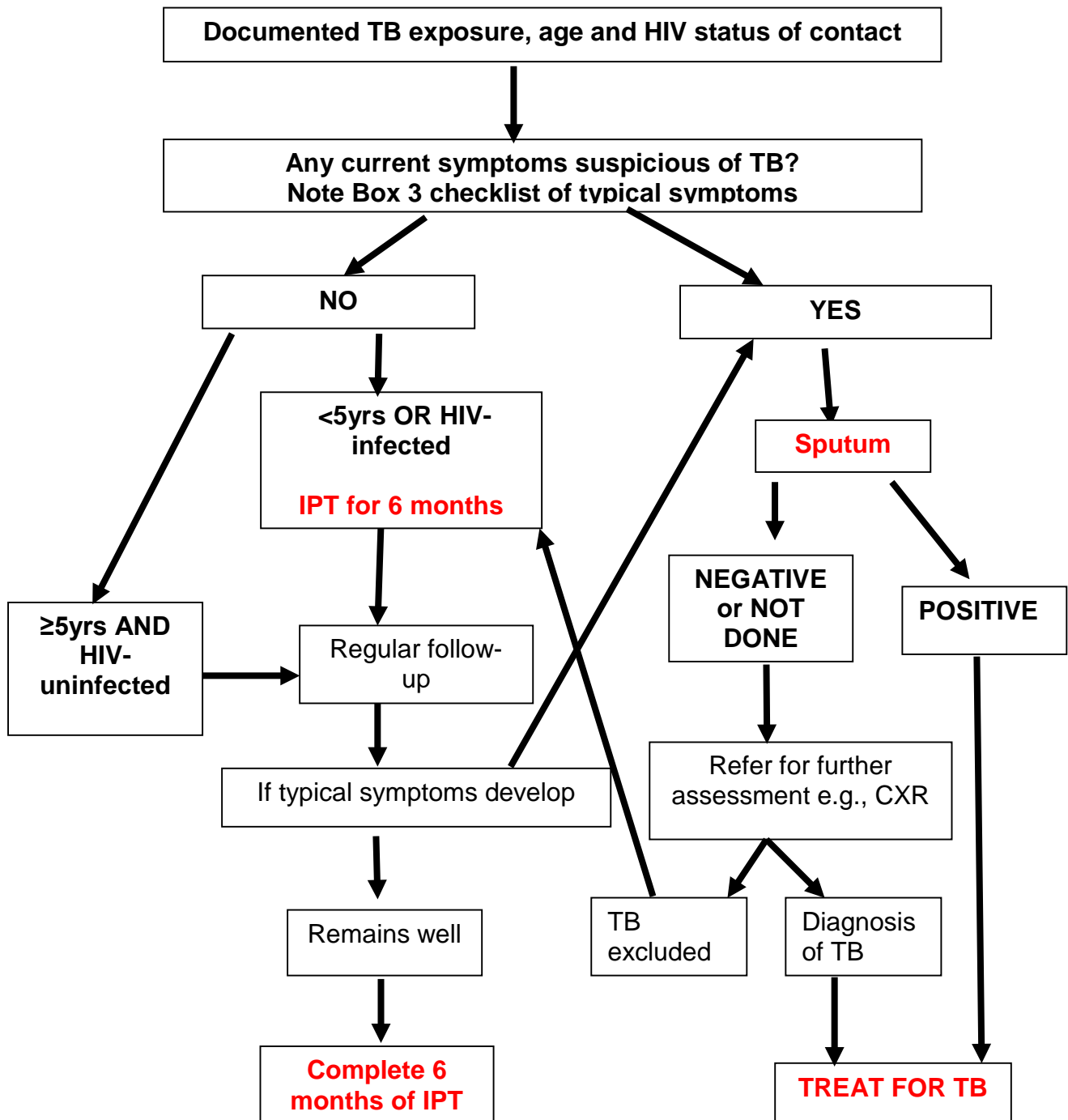
# **ALGORITHM FOR THE SCREENING OF CLOSE CONTACT\* WITH A CASE OF SMEAR-POSITIVE TB**



\* **Close contact** is defined as living in the same household as, or in frequent contact with (e.g. child minder, school staff), a source case with PTB.

# Acute cough and fever are common in young children but is “suggestive” of TB when and if symptoms are persistent and not improving despite other treatment (e.g. antibiotics – IMCI approach)

# ALGORITHM FOR MANAGEMENT OF CLOSE CONTACT\* WITH A CASE OF TB



\***Close contact** is defined as living in the same household as, or in frequent contact with (e.g., child minder, school staff), a source case with PTB

## TB Index Case Contact Screening Form

Health district: \_\_\_\_\_ PHC centre/Hospital TB control unit: \_\_\_\_\_

Date of screening:     /     /

Index case

Name: \_\_\_\_\_

Age: \_\_\_\_\_

Type of TB: \_\_\_\_\_

TB registration number: \_\_\_\_\_

Contact information: \_\_\_\_\_

#	Name	Age	Sex	Symptoms present <sup>1</sup> (Y/N)	Risk factors for disease <sup>2</sup> (Y/N)	If symptoms, then sputum microscopy (Y/N)	Sputum microscopy result (POS/NEG)	If symptoms, then referred <sup>3</sup> (Y/N)	If no symptoms, eligible for IPT <sup>4</sup> (Y/N)	Final management 1. TB treatment 2. IPT 3. Nil
1										
2										
3										
4										
5										
6										
7										
8										

1. Possible symptoms: cough, fever, weight loss, night sweats, lethargy or fatigue, chest pain, neck swelling. The presence of any symptom (one or more) requires further assessment for possible TB disease. Acute cough and fever are common in young children but is “suggestive” of TB if persistent and not improving despite other treatment (e.g., antibiotics or anti-malarials – IMCI approach)
2. Risk factors for disease include young child (<5 years of age) or HIV-infected of any age.
3. Fill in **Referral Form for symptomatic TB contact** and **Referral register**
4. Fill in **IPT register** if eligible for IPT

# Referral Form for Symptomatic TB Contact

Health district:

PHC centre/Hospital TB control Unit:

## Index case:

Name:

Age:

Sex: M F

Type of TB:

TB registration number:

## Contact:

Name:

Age:

Identification number (from Referral register):

Previous TB treatment: Y N if yes, details:

## Symptoms present (tick all that are present)

Cough		Weight loss		Chest pain	
Haemoptysis		Malnourished		Persistent wheeze	
Fever		Lethargy		Neck swelling	
Night sweats		Fatigue		Other	

## Underlying risk factors for disease (tick all that are present)

< 5 years of age	
HIV-infected	
Other	

Sputum samples taken from the TB contact: Y N

If yes, result:

TB contact referred to (please, specify the place of referral):

Date of the referral:

Name of community health worker:



## Isoniazid Preventive Treatment (IPT) Register

PHC centre/Hospital TB control Unit:

Year:

No.	Name of TB contact treated with IPT	Age	Sex	HIV-infected (Y/N)	IPT started on (Date)	IPT completed (Y/N)

## Register of Referred TB Cases

Health district:

PHC centre/Hospital TB control Unit:

Year:

[illegible]

## Quarterly Data Collection Form on TB Contact Investigation

Index case: patient with smear-positive pulmonary TB

Activities		0-4 years		5-14 years		≥15 years	
		M	F	M	F	M	F
Number of TB contacts identified							
Number of TB contacts screened for TB							
Total number of detected TB cases	Sputum smear-positive						
	Other forms						
Number of TB contacts who were prescribed IPT							

IPT: isoniazid preventive treatment.