HOW TO CARE FOR PEOPLE EXPOSED TO DRUG-RESISTANT TUBERCULOSIS:

A PRACTICAL GUIDE

Sentinel Project
on pediatric drug-resistant tuberculosis

Preferred citation: How to care for people exposed to drug-resistant tuberculosis: a practical guide. Boston, USA: The Sentinel Project for Pediatric Drug-Resistant Tuberculosis; 2018, First edition.

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This Guide was developed and written by The Sentinel Project for Pediatric Drug-Resistant Tuberculosis (http://sentinel-project.org/).

The Sentinel Project on Pediatric Drug-Resistant Tuberculosis is a global partnership of researchers, caregivers, and advocates aiming to develop and deploy evidence based strategies to prevent child deaths from this preventable and curable disease. We are a learning network committed to generating and disseminating knowledge and data for immediate action.

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Introduction

Tuberculosis (TB) is the greatest infectious disease killer worldwide. Yet, TB is curable and preventable. This Guide is designed to help bridge this gap and to reduce the devastating effects of TB across the globe. Drug-resistant (DR)-TB is a form of TB that does not respond to the most effective TB drugs. This Guide focuses primarily on DR-TB, as it is more difficult to treat than normal (drug-susceptible) TB.

What is TB?

TB is a disease caused by a contagious bacteria that typically attacks the lungs. TB is spread from person to person through the air. Once a person breathes the TB germ into their lungs there is a chance that they will become infected. People with TB infection continue to be well and may stay well forever. However, some of those infected will progress to TB disease. If not treated properly, TB disease can be fatal.

Some strains of TB are resistant to the commonly used TB drugs. Like normal TB, these strains can also be passed from person to person. For every patient with DR-TB, a number of people are exposed to the bacteria (contacts) and potentially become infected. Persons who live with a DR-TB patient face a particularly high risk of becoming infected and developing TB disease. Preventing the spread of DR-TB requires actively finding people who have been exposed to DR-TB and screening them for DR-TB disease; if they have DR-TB disease, they must receive treatment immediately to ensure no further spread of DR-TB bacteria, and, if they are well, they need to be treated for DR-TB infection with safe and effective drugs to prevent them from becoming sick in the future.

What will this Guide add?

This Guide builds on World Health Organization (WHO) recommendations for the management of individuals who have been exposed to TB and DR-TB,[1] but focuses more on the practical implementation of interventions that should take place in the post-exposure setting. While the WHO policies stress that investigating household contacts of TB patients must be done on an "urgent" basis for all contacts of a patient with DR-TB, there is limited information available on what these evaluations and interventions should include. Furthermore, many of the recommendations and tools that do exist only focus on medical issues, omitting other pressing psychosocial needs that must be routinely assessed as well. DR-TB affects not only individuals but their households as well. Even when only one person has become sick, the whole household requires some intervention to reduce discrimination, improve patient support, and avoid unnecessary morbidity and mortality.[2] This Guide aims to provide a way of thinking about the challenges around those exposed to DR-TB. It also aims to provide guidance on DR-TB prevention and management strategies needed to address the enormous health threat presented by DR-TB, as well as the tools necessary to carry them out.

Terminology

Throughout this Guide, we will refer to post-exposure activities and contact interventions as opposed to contact tracing. This shift in terminology is not meant to dress up old activities in new language, but rather to instill the activities described in this Guide with the sense of urgency they merit.

Table 1 presents standardized definitions for terms that will be used throughout this guide.

[1] World Health Organization. Recommendations for Investigating Contacts of Persons with Infectious Tuberculosis in Low- and Middle-Income Countries. World Health Organization. Geneva. 2012. ISBN 978 92 4 150449 2.

[2] Isaakidis, P., Rangan, S., Pradhan, A., et al. "I cry every day": experience of patients co-infected with HIV and multidrug-resistant tuberculosis. Tropical Medicine and International Health 18(9): 1128-33, 2013.

Table 1. Important Definitions

	Term	Definition
Operational definitions	Contact interventions	Interventions taken to prevent TB disease in persons exposed to a TB patient through close and prolonged contact. This term includes "contact tracing" as one component of contact interventions.
	Close Contact	Includes the household members and close social contacts of an index patient. See page 15 for guidance on selecting an operational definition of Close Contact.
	Household	The definition of household will vary based on program capacity. See page 15 for guidance on selecting an operational household definition.
	Young child	<5 years of age*
	Child	5 to <10 years of age*
	Adolescent	10 to <20 years of age*
Epidemiological terms	DR-TB index case	The first confirmed DR-TB case identified during an investigation.
	DR-TB contact	A person exposed to an infectious DR-TB index case.
Drug resistance categories	DS-TB	Drug-Susceptible TB; Disease caused by strains of TB susceptible to isoniazid and rifampin.
	RR-TB	Rifampin-Resistant TB; Disease caused by strains of TB resistant to rifampin but for which resistance to isoniazid is unknown; this is often the case when diagnoses are made using only GeneXpert.
	RMR-TB	Rifampin Mono-Resistant TB; Disease caused by strains of TB resistant to rifampin but proven to be susceptible to isoniazid.
	HMR-TB	Isoniazid Mono-Resistant TB; Disease caused by strains of TB resistant to isoniazid but susceptible to rifampin.
	MDR-TB	Multidrug-Resistant TB; Disease caused by strains of TB resistant to isoniazid and rifampin.
	DR-TB	Drug-Resistant TB; We will use this term to refer to both MDR-TB and RR-TB.
Clinical States	TB exposure	A situation where a person has been exposed to TB disease, often through close and prolonged contact.
	TB infection	A condition where a person has a positive immunological test for TB infection (TST, IGRA), in the absence of symptoms and physical signs of disease (both acute and chronic).
	TB disease	Clinical, radiological, or microbiological pathology consistent with TB.

* Note: these definitions of age may vary by country.
Definitions adapted from: Seddon, J. A., et al. (2013). "Consensus Statement on Research Definitions for Drug-Resistant Tuberculosis in Children." J Pediatric Infect Dis Soc **2**(2): 100-109.

What is the difference between DR-TB infection and DR-TB disease?

It is important to understand the distinction between DR-TB infection and DR-TB disease.

When a person is exposed to DR-TB, several things can happen. In most cases, the DR-TB bacteria are inhaled into the lungs, and a small number infect the lungs or other parts of the body, but this infection is controlled by the person's immune system. When this occurs, a person is said to have DR-TB infection; the person does *not* have DR-TB disease. Characteristics of **DR-TB infection** include:

- a small number of bacteria present in the lungs or other body parts;
- the absence of signs or symptoms of DR-TB disease (the person is well); and
- the inability to spread DR-TB infection to others.

Effective treatment for DR-TB infection to prevent development of DR-TB disease is usually possible with one or two drugs given daily over a 6 month period. In this Guide, we use the term 'treatment of DR-TB infection' instead of 'preventive therapy', 'prophylaxis', or 'treatment of latent DR-TB infection.' 'Treatment of DR-TB infection' more accurately represents this intervention and may help families and health care providers better embrace the importance of this intervention.

Without DR-TB infection treatment, approximately 10% of individuals with DR-TB infection will develop DR-TB disease. This proportion is even higher in young children or in people who have compromised immune systems. Characteristics of **DR-TB disease** include:

- a large number of bacteria in the lungs and/or other body parts;
- signs and symptoms of TB disease that may include cough, fever, weight loss, failure to gain weight, swollen lymph nodes; and
- the ability to spread DR-TB.

Treatment of DR-TB disease requires multiple drugs to be taken over a 9-24 month period. Current regimens for those with DR-TB disease produce cure rates as low as 50% and are associated with severe and often permanent side effects. This is a key rationale for treating DR-TB infection in people who have been exposed at home to DR-TB: to prevent people with DR-TB infection from developing a disease that is curable only about half of the time and one that they can pass on to others.

Overview

What is this Guide?	This Guide provides a detailed description of a set of activities that can prevent TB disease and death in those individuals who have been in close contact with a newly identified patient with DR-TB.
What is included in the Guide?	The Guide includes: 1) guidance; 2) algorithms; 3) sample forms, tools, timelines and tips; and 4) other resources that can be readily deployed.
Who should use the Guide?	The Guide is designed for use by front-line workers who look after patients who are sick with DR-TB and their close contacts.
What is the starting point for the Guide?	The Guide is used when a child or adult has been diagnosed with DR-TB disease: this is the index patient. The identification of this sick person "activates" the activities in this Guide.
What is the target care population for the Guide?	The Guide defines an intervention that targets all the people who have been in close contact with the index patient for a prolonged duration— this includes members of the DR-TB-exposed household as well as close social contacts.
Why did we develop this Guide?	Exposure to a deadly infectious disease like DR-TB should quickly trigger a concerted set of actions by health care providers to protect the health of those who have been exposed to DR-TB. We developed this Guide because we found no other resource specifically designed to manage close contacts exposed to DR-TB.
What is the goal of the Guide?	The goal is to prevent DR-TB disease and death in those who have been in close contact with the index patient. Once the close contacts of the index patient are identified, they should be assessed to determine who needs treatment for DR-TB disease, who needs treatment for DR-TB infection, and who would benefit from other interventions.
Who developed this Guide?	A group of expert clinicians, researchers, and front-line practitioners from the network called the Sentinel Project on Pediatric Drug-Resistant Tuberculosis (sentinel-project.org).
How did we develop this Guide?	This is the collective work of many individuals and results from the use of multiple methods. First, we conducted an extensive review of existing data, both from published sources and program materials, including the recommended clinical guides listed under 'External Resources' in the Implementation Tools booklet. Second, we sought and received input on the document from a large group of stakeholders. Finally, an expert group based at the Sentinel Project on Pediatric Drug-Resistant Tuberculosis reviewed this material in light of their collective experiences to create this document.

Framework for Action: Triage Phase and Support Phase

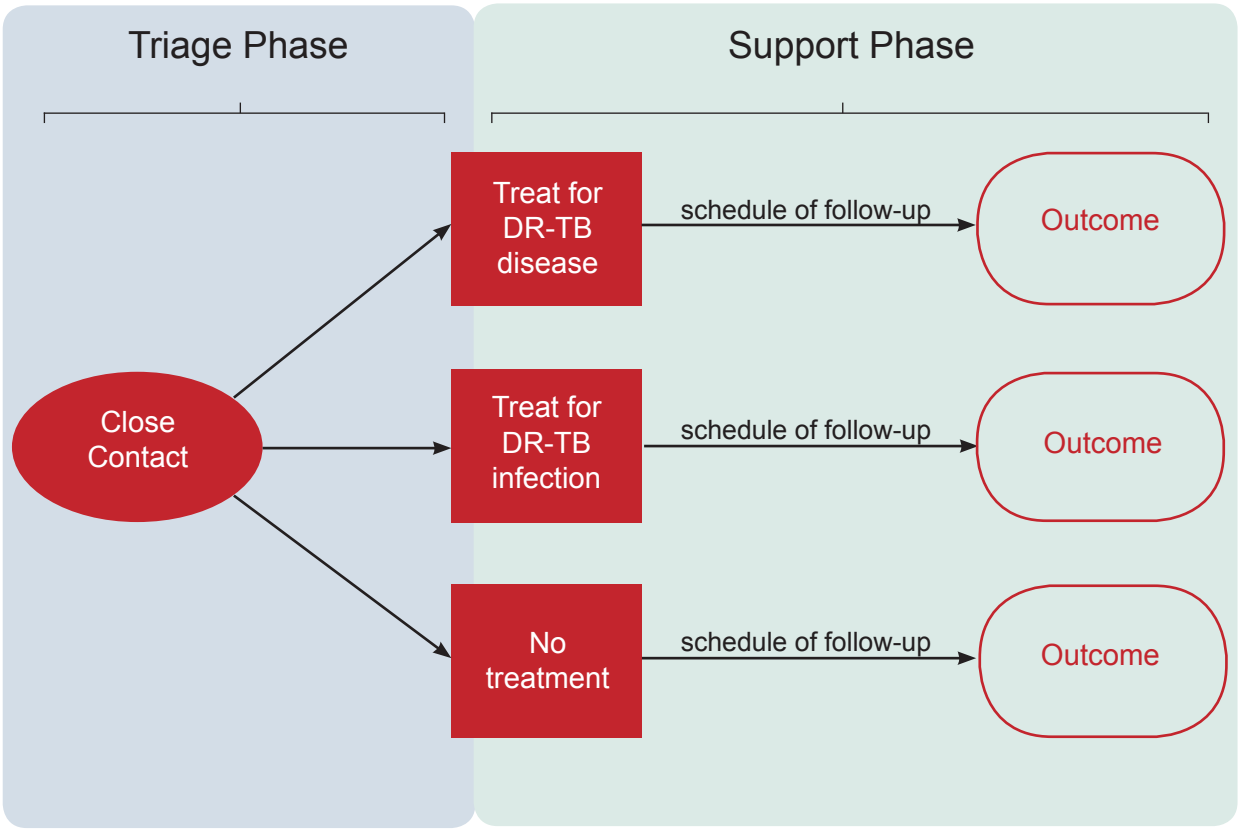
The Guide consists of two phases: the **Triage Phase** and the **Support Phase** (see Figure 1).

In the **Triage Phase,** workers use **triage tools** to identify and evaluate each member of a household. This phase concludes with the assignment of all household members and close social contacts (from now on household members and close social contacts will be referred to as "Close Contacts") to one of three treatment groups: Triage Group 1: refer for DR-TB disease treatment, Triage Group 2: treat for DR-TB infection, or Triage Group 3: no DR-TB treatment. This phase lasts approximately two to four weeks. Detailed guidance is provided on pages [19-28].

Note that if your program decides not to treat for DR-TB infection, you will only have Triage Group 1 and Triage Group 3. Regardless of whether you treat for DR-TB infection, the activities outlined here will still be beneficial.

In the **Support Phase,** workers follow the Close Contacts to monitor for adverse events, assess for symptoms of DR-TB disease, ensure adherence to treatment, and provide additional support to households. Workers use **support tools** to assess household needs and help each Close Contact adhere to a follow-up treatment or observation schedule. This phase lasts at least one year. Detailed guidance is provided on pages [29-33].

Figure 1. Framework of the post-exposure activities in Close Contacts of patients with DR-TB



A Note to Implementers

Get started, even if your program capacity is not perfect. You opened this Guide because you are concerned about the Close Contacts of patients who are sick with DR-TB. The decision to integrate a post-exposure intervention for these individuals is a rational expansion for a program that is already treating those sick with DR-TB. In the following pages, this Guide will assist you to consider how you can implement a post-exposure program.

Some programs may lack the resources, both human and financial, to implement all of the interventions described here. In these settings, interventions may need to be prioritized and choices made to tailor these broad recommendations. As you consider how to implement these activities, do not be discouraged if your program's current capacity is less than ideal. Getting started is vital for learning what resources it will take to integrate these activities in your setting; it is the first step in creating a robust and effective post-exposure management program.

Your efforts will help improve the next version of these resources. This Guide (version 1.0) was designed for front-line workers to pilot this approach to better serve vulnerable households exposed to DR-TB. Our hope is to have teams who use the Guide come together soon to share experiences and to offer suggestions and corrections. In addition to an improved second edition, this shared learning will produce real-life examples of what resources are required to deliver an effective and efficient post-exposure management program.

You can help us with this goal by participating in these discussions and sharing your experience. Regardless of how you decide to incorporate these activities into your post-exposure program, please keep note of what tests, tools, algorithms, drugs, and other resources you found helpful, and what resources you would be eager to incorporate that were not included or available.

From those who use these materials, we welcome comments and suggestions to improve the next edition. Please send them to: sentinel_project@hms.harvard.edu.

How to Use This Guide

This Guide contains a detailed set of instructions on how to prepare for and carry out the **Triage Phase** and **Support Phase** activities that comprise the post-exposure framework (Figure 1). These instructions are marked as "Action Items" with this icon:

ACTION ITEM

Throughout this Guide you will find references to specific resources such as implementation tools and forms, tips for implementing, definitions, and existing evidence. These resources can be found at the end of the booklet under the title: "**Implementation Tools**." Items that can be found in the Implementation Tools will be marked with the following icon and labeled with the section it can be found in (either Forms, Resources, Tips, External Resources, or Evidence):

IMPLEMENTATION TOOL

A note about implementation tools: The forms included in this Guide are designed to be as comprehensive and adaptable as possible. We recognize that the collection of all of these data elements may not be practical or advisable to collect in your setting. The data elements that are bolded are those that we think should be the priority for clinical, programmatic, and research purposes. Before implementing your post-exposure program, you should adapt the forms according to your particular resource setting based upon what your team will realistically be able to record.

Preparation

Before you implement your post-exposure program, you will need to first assess your resources (human and financial), plan your approach, and train your team. Different settings have different resource capacities, and therefore require different approaches. It is important to determine the resources available to your program, human and otherwise. Next, you must decide how best to apply these resources by planning your approach to the Triage and Support Phases. Finally, you must provide training to all team members to build the knowledge and skills necessary to implement an effective program in collaboration with each other.

We suggest that you allow approximately one to two months' time for these preparations. Choose a start date to begin implementing post-exposure activities, and spend the preceding time planning your approach, gathering supplies and team members, and training your team. This section will walk you through these steps of assessment, planning, and training, outlined here:

Assess your capacity

1. Assess your resources
2. Assess your human resource capacity

Plan your approach

1. Choose your operational definition of Close Contact
2. Choose your approach to the Triage Phase
3. Choose your approach to the Support Phase

Train your team

1. General Overview
2. Specialized training

Assess Your Capacity

1. Assess your resources

Before you begin to plan your program, you must ensure you have the essential supplies you need. The supplies you have available may also affect your triage approach.

Different settings will inevitably have varying access to resources, including medical supplies and laboratory equipment. Use the **Resource Assessment Form** to assess the supplies available. Remember, the bolded supplies should be prioritized. Note that supplies will be needed throughout the duration of post exposure activities, so supplies should be renewable.

2. Assess your human resource capacity

Post-exposure interventions must be performed by a team of providers with varied skill sets. Different programs will have different numbers of staff or volunteers available to help implement the activities. Before you begin designing your approach, consider how many people you will have available to carry out activities.

Use the **Personnel Responsibilities Plan** to draft a strategy for your team. Assign persons to fill the suggested responsibilities to the extent that your human resources capacity allows. Your priority should be in covering the responsibilities marked in bold. Other responsibilities should be undertaken if there are sufficient human and financial resources available.

Form 1.1
Resource Assessment Form

Form 1.2
Personnel Responsibilities Plan

Plan Your Approach

1. Choose your operational definition of Close Contact

It is important to define who your program will target before you start. The scope of who your program will address will depend on your unique context. Programs with lower resource capacity may select a narrow approach that treats only household contacts. A standard definition of household includes all persons who share the living, eating and sleeping space (within the same building), though you may modify this definition based on your local context. On the other hand, programs with greater resource capacity may additionally incorporate close social contacts of index patients, such as persons they interact with daily at school or work.

A narrow definition of a Close Contact may ensure that the highest-risk individuals are identified, but may leave out other exposed persons who would benefit from preventive activities. On the other hand, a broad definition may make it difficult to decide which people are at the highest risk and will require more resources. Programs should choose a definition that works within their context and resources available, but also build in enough flexibility that unique situations can be incorporated into interventions as needed.

A **Close Contact Definition Form** is provided. Here you can mark the definition you decide to use and the date that you made this decision. You may decide to update or refine the definition after starting your program. If so, you should complete another form and date it, and keep the original. It will be useful to keep this documentation for your program files.

Form 1.3
Close Contact Definition Form

2. Choose your approach to the Triage Phase

All Close Contacts need to be assigned to a Triage Group. As noted earlier, there are three distinct Triage Groups. Triage Group 1 will be referred for DR-TB disease treatment; Triage Group 2 will receive DR-TB infection treatment, and Triage Group 3 will not receive any treatment, but will still follow a strict follow-up and support schedule.

You should first determine if your program is going to treat for DR-TB infection (Triage Group 2). If your program does not have the capacity to treat for DR-TB infection, all household members will be triaged into one of just two groups: Triage Group 1 or Triage Group 3.

If you have the capacity and plan to treat for DR-TB infection, then all Close Contacts will be assigned into one of the three triage groups. In this scenario, you must next define the criteria for who will be eligible to receive DR-TB infection treatment. Possible criteria to determine who will receive infection treatment include results of TST* or IGRA, age, or the presence of an immunocompromising condition, such as HIV or diabetes. Your program's approach to the criteria for treating contacts for DR-TB infection will depend on a number of factors, including your setting and resource capacity. When resources allow, it is preferable to provide DR-TB infection treatment to as many people as possible to reduce overall risk of developing DR-TB disease.

There are several approaches for determining which Close Contacts are eligible for DR-TB infection treatment. For example, some programs may:

1. Provide DR-TB infection treatment to all Close Contacts in whom DR-TB disease is ruled out.
    - Note: In this scenario, no Close Contacts will be triaged into Triage Group 3. This approach may be more practical in some settings, such as settings where tuberculin skin testing (TST) and/or Interferon Gamma Release Assay (IGRA) may not be available.

2. Use a targeted approach that gives priority for DR-TB infection treatment to the 'highest risk' individuals such as:
    (a) children younger than 5 years;
    (b) any Close Contact with an immunocompromising condition, such as HIV, diabetes, or malnutrition; or
    (c) those age 5 years and older with evidence of DR-TB infection (positive TST or IGRA).
    - Note: in this scenario, after DR-TB disease has been ruled out, Close Contacts who meet the criteria to receive DR-TB infection treatment will be triaged into Triage Group 2, and those who do not meet the criteria will be triaged into Triage Group 3.
    - If TST or IGRA is not available in your setting, you may treat only groups (a) and (b) for DR-TB infection.

3. Treat no household contacts for DR-TB infection.
    - Note: in this scenario, Close Contacts will be triaged into Triage Group 1 or Triage Group 3.

**A note on TST: In many low-TB burden, high-resource settings, a test of immunologic exposure to DR-TB is part of an assessment to determine if treatment of infection is needed. This is usually done via TST or IGRA. These tests have a role to play in the setting of a low-grade or questionable exposure to DR-TB, especially one that occurs outside of the household. For persons living within the household, however, such tests are not needed to determine if infection has occurred. Both tests have inadequate sensitivity or specificity to rule out or confirm infection, especially in young children and persons living with HIV—ironically, the persons most at risk for becoming sick with DR-TB after an exposure. For this reason, the WHO does not recommend these tests as necessary in the determination of persons in need of DS-TB infection treatment following a documented high-risk exposure. Such tests could be useful for assessing DR-TB infection when there has been a low-risk exposure, but as with DS-TB, they are not necessary to diagnose DR-TB infection or disease when a high-risk exposure, such as a household contact, has been documented.*

Table 2 describes three potential triage approaches to assigning Close Contacts to Triage Group 2 to receive DR-TB infection treatment.

Table 2. Triage approaches in post-exposure management: three examples

Approach	Contacts to receive DR-TB infection treatment (Triage Group 2)
A	All Close Contacts after DR-TB disease ruled out
B	All Close Contacts <5 years of age after DR-TB disease ruled out and All Close Contacts >5 years of age after DR-TB disease ruled out, who have HIV infection or other immunocompromising condition[¥] and All Close Contacts >5 years of age after DR-TB disease ruled out, who have a positive TST or IGRA
C	No Close Contacts treated for DR-TB infection

[¥] Includes individuals with a diagnosis of HIV infection, cancer, or diabetes, and those on medications that can suppress the immune system.

In addition, there are many medications and co-morbid conditions that can increase the risk of progression from DR-TB infection to disease. These factors may also be considered when choosing your triage approach. Some of these conditions include:

- malignancies
- parasitic infections,
- measles, and
- vitamin deficiencies.

Medications that increase the risk of DR-TB disease progression include:

- corticosteroids,
- cancer chemotherapeutic agents, and
- immunosuppressants.

Note that an inclusive triage approach, such as approach A or B, will provide the greatest protection against DR-TB for individuals and Close Contacts. However, an inclusive approach is very resource intensive. More conservative approaches are less resource intensive and aim to address the persons who would benefit from preventive activities. Programs should choose a triage approach that works within their context and resources available, but which treats DR-TB disease and infection and supports households to the maximum extent possible.

Complete the **Triage Approach Form** to document which approach you will use. You may decide to update or refine this approach after you have visited several households. If so, you would complete another form and date it, and keep the original. It will be useful to keep this documentation for your program files.

Form 1.4
Triage Approach Form

3. Choose your approach to the Support Phase

Support Phase activities include monitoring for adverse events and symptoms/signs of DR-TB disease, ensuring adherence to DR-TB disease treatment and DR-TB infection treatment, and providing comprehensive psychosocial support to patients, contacts, and their families.

Ideally, programs will implement all of the Support Phase activities for all Close Contacts, regardless of their Triage Group assignment. However, in the event of resource shortages, monitoring for symptoms of TB disease and adverse events, and ensuring adherence to DR-TB infection treatment should be prioritized.

Three decisions for the Support Phase need to be made; defining the duration of the support schedule, the frequency of monitoring, and what types of additional support will be incorporated, depending on your program's resource availability.

Duration:

The Support Phase should last a minimum of 12 months from the time the index patient begins treatment. Duration and frequency of the Support Phase will depend on your unique context and resource capacity.

Here are a few options for defining the duration of the support schedule for Close Contacts:

- Approach 1: All individuals are supported until the index patient completes treatment (minimum of 12 months).
- Approach 2: All individuals are supported until the last Close Contact completes their treatment (minimum of 12 months).
- Approach 3: All individuals are supported until 24 months from the date the index patient began treatment.

Frequency:

The more frequent the monitoring visits are, the more likely it is that infection and disease treatment will be completed successfully, that DR-TB disease will be caught early, and that side effects will be properly managed. This is particularly important for children under 18 years.

The frequency of monitoring may vary by Triage Group. Monitoring requires human resources, so the frequency of monitoring may depend on your program's human resource capacity.

Ideally, Triage Groups 1, 2, and 3 will be monitored monthly. However, the frequency can be decreased if resources are tight. If resources are scarce, you can reduce the frequency of monitoring Triage Group 3 individuals to every two months, every three months, or every six months. If resources are still scarce, you can reduce the frequency of monitoring Triage Group 1 and 2 individuals to every 6 weeks, every two months, every three months, or every six months if necessary.

Household Support:

Each household should be assessed for additional types of support that may benefit the Close Contacts. The types of support a program may be able to provide will vary depending on current systems in place and human and financial resources. Types of support that should be considered include:

- *Nutritional support:*

If resources allow, nutritional support should be provided for the patient or contact's entire family to reduce the risks of sickness and death for all. Interventions should offer all patients, contacts, and their household members balanced diets with locally available and appropriate protein and micronutrients for the full duration of the intervention. Working with other groups or NGOs that provide nutritional support can ease some of the financial and logistical burdens nutritional support may place on the TB Program. If nutritional support cannot be provided to the entire family due to resource constraints, a modified plan should be considered. However, programs should keep in mind that when nutritional support is given only to one member of the family, the food or supplements are often shared with other family members in the household.

- *Socioeconomic support:*

If resources allow, socioeconomic support should be provided to each patient, contact and their family to ensure there are no catastrophic costs to the household during the DR-TB episode. Specifically, families must not lose the ability to pay school fees to ensure children are returning to and remaining in school. Notably, in some locations patients may be entitled to grants, subsidies, or other resources from the government, but need help in applying for and accessing these resources. It may be possible to work with local groups or NGOs to support patients, exposed contacts and their families. If socioeconomic support cannot be provided to the entire family due to resource constraints, a modified plan should be considered.

- *Psychosocial support:*

If resources allow, psychosocial support should be provided to each patient, contact and their family, including support and counseling to deal with the grief, shame, anger, blame, and sadness that can occur in the household, and the discrimination that persons may face when DR-TB is diagnosed.

Complete the **Support Phase Approach Form** to document which approach you will use. You may decide to update or refine this approach after you have started the program. If so, you would complete another form and date it, and keep the original. It will be useful to keep this documentation for your program files.

Form 1.5
Support Phase Approach Form

Train Your Team

1. General Overview

This Guide provides an approach to DR-TB that involves many integrated steps. Therefore, it is important that all members of the team understand the overall approach and how their unique role fits in with the overall project. Training should begin with a general overview of the framework of these activities. This will usually take at least two days.

The goal of this training is to increase knowledge and understanding of the program among all team members to facilitate smooth implementation and integration.

The general overview training can be conducted in one comprehensive group or in small group settings. You may use the information in this toolkit as material for the training. The training can be broken up into several half hour or hour long training sessions. A two-day **Sample Training Itinerary** has been provided and can be used or adapted. Presentations to accompany the sample training itinerary will be provided.

Resource 1.1
Sample Training Itinerary

2. Specialized training

Subsequently, team members should undergo training specific to their role. Ideally, this should occur in small group settings to allow for questions and discussion to promote deep understanding.

Training duration and depth will vary depending on the position. Specialized training should be conducted by the program director or a designated individual who thoroughly understands the role they are teaching.

Specialized training should cover the following points:

- How does the specific role fit into the overall approach?
- What are the responsibilities of this role?
- How will these responsibilities be carried out?
- Provide necessary training on equipment, procedures, documentation, etc.
- What forms and paperwork are necessary? How to complete these forms and where to store them?
- Provide contact information for individuals or institutions with whom they will be coordinating with.
- Who to direct questions to and where to find resources

The goal of this training is to increase the knowledge and skills of each team member to implement an effective program.

Implement Triage Phase

During the Triage Phase, each Close Contact is identified, evaluated, and assigned to one of three treatment groups:

- Triage Group 1 has DR-TB disease and needs to be referred for DR-TB disease treatment
- Triage Group 2 does not have DR-TB disease and receives DR-TB infection treatment (some programs may choose to not treat DR-TB infection depending on available resources)
- Triage Group 3 does not have DR-TB disease and does not receive DR-TB infection treatment

This phase occurs in the following steps:

1. Identify all Close Contacts for evaluation
2. Apply tools to triage Close Contacts into one of three groups
3. Start DR-TB disease treatment for Triage Group 1
4. Start DR-TB infection treatment for Triage Group 2
5. Inform Triage Group 3 about support schedule

The Triage Phase is time sensitive and should be completed within a set time period. An acceptable initial goal is to complete all activities in this phase in all Close Contacts within four weeks. As you begin to optimize the Triage Phase, a rational next step is to shorten this time period to two weeks. Children under five, pregnant women, or people living with HIV should be prioritized to two weeks from the start, if possible.

1. Identify Close Contacts for Evaluation

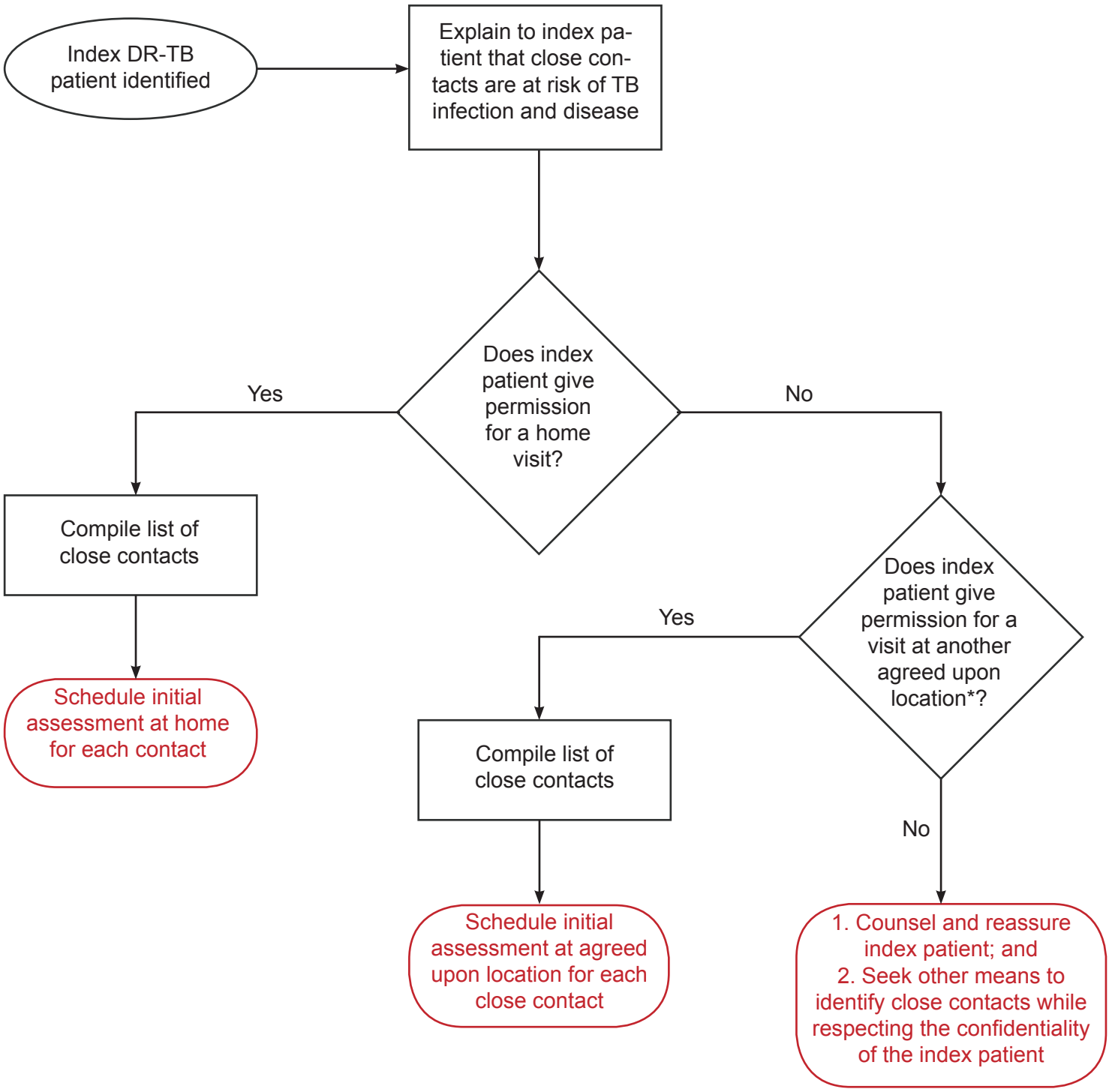
The first step is to interview the index DR-TB patient to compile a list of all Close Contacts and ask permission to evaluate them. The **Index Patient Interview Form** can be used. Be sure to adapt this form so that it reflects your definition of Close Contact. Additionally, the **Contact Registry** provides a place to record contact information for all Close Contacts and track whether the initial assessments for each Close Contact are scheduled and completed. For organization purposes, the index patient and each contact can be assigned a unique identification number.

Form 2.1
Index Patient Interview Form

Form 2.2
Contact Registry

Figure 2 depicts the complete flow for this action item.

Figure 2. Identify Close Contacts for evaluation



*Alternative locations might include a different private address, a public location, or a nearby clinic

2. Apply Tools to Triage Close Contacts into Three Treatment Groups

Every Close Contact must be screened for signs and symptoms of DR-TB disease regardless of their age or underlying risk factors. This will allow you to assign them to one of the three Triage Groups.

The following are the basic steps of assessing and triaging Close Contacts:

1. *Conduct an initial assessment for each Close Contact* using an **Initial Assessment Form**, which records medical history, signs and symptoms of DR-TB, basic physical exam findings, and other pertinent information. You should customize this form for your setting, based on which data elements will be realistic and useful to collect.

   Ideally, initial assessments will be performed at the contact's household or a convenient location. The **Equipment Checklist** may be useful in preparing for these visits.

   Symptom-based screening should focus on the common presenting signs and symptoms for TB disease. These include:

   - Cough for more than two weeks
   - Fever
   - Night sweats
   - Weight loss
   - Failure to gain weight or grow (for children)
   - Swollen lymph nodes
   - Lack of interest in normal activities, including play
   - Vomiting without any other symptoms

   However, it is important to remain aware that special populations such as young children and persons with HIV may present with atypical symptoms. Furthermore, cough due to respiratory infection is very common in infants and young children (often 4-6 episodes per year), making it difficult to diagnose TB disease. Figure 4 in **Tip 2.2** presents patterns of intensity and duration for three varieties of cough, which may help in differentiating a TB cough from cough caused by other diseases.

   For additional guidance in identifying signs and symptoms of DR-TB disease, refer to Tip 2.2 and the **External Resources** listed in the Implementation Tools.

Form 2.5
Initial Assessment Form

Form 2.3
Equipment Checklist

Tip 2.2
Conducting Initial Assessments

External Resources

2. *Conduct a chest radiograph** for each Close Contact to assess for the presence of DR-TB disease.

If a program clinician is to assess the chest radiograph, record the results of the radiograph on the **Chest Radiograph Form**. Again, this form can be customized for your program, based on which data elements will be realistic and useful to collect. If the chest radiograph will be performed at an external facility, a **Referral Card** is provided to help streamline the referral process. Include a copy of the patient's initial assessment form and other relevant information with the referral card.

Form 2.6
Chest Radiograph Form

Form 2.4
Referral Cards for Investigation of DR-TB Disease

3. *Determine which Close Contacts* likely do not have TB disease based on the initial assessment and/or chest radiograph. This may be indicated by a lack of signs and symptoms of DR-TB being present and a normal chest radiograph. If your program has decided not to provide DR-TB infection treatment to any Close Contacts (not using Triage Group 2), then these individuals are classified as Triage Group 3. If your program has decided to treat DR-TB infection, then assess these asymptomatic Close Contacts for eligibility (according to the criteria your program selected in the 'Plan Your Approach' section) to receive DR-TB infection treatment. If your eligibility criteria includes a TST or IGRA test, conduct TST or IGRA on contacts if the test is available.

a. If eligible, triage into Triage Group 2.
b. If not eligible, triage into Triage Group 3.

You may use the **Confirming Eligibility for Infection Treatment** form to document whether the individual meets the criteria to be assigned to Triage Group 2 to receive DR-TB infection treatment.

Form 2.8
Confirming Eligibility for Infection Treatment

4. *Conduct an Xpert test*¥ if a Close Contact exhibits signs or symptoms of TB during the initial assessment, and/or if abnormalities are present on the chest radiograph.

If Xpert testing must be performed at an external facility, a **Referral Card** is provided to help streamline the referral process. Include a copy of the patient's initial assessment form and other relevant information with the referral card.

Form 2.4
Referral Cards for Investigation of DR-TB Disease

If the Xpert test is positive, triage into Triage Group 1. If the Xpert test is negative, but initial assessment findings or chest radiograph are highly suggestive of TB disease, triage into Triage Group 1.

**Only perform a chest radiograph if it is available, affordable, of good quality, and someone competent is available to read the radiograph. If not available, proceed to the next step.*

¥If Xpert testing is not available, triage Close Contacts with initial assessment or chest radiograph results that are highly suggestive of TB disease into Triage Group 1 and continue to Step 5 to address other Close Contacts.

5. *Conduct a secondary assessment of Close Contacts* with a negative Xpert result or no Xpert result, but whose initial clinical assessment or chest radiograph results are abnormal but not obviously suggestive of DR-TB.

Prescribe a trial of antibiotics broad-spectrum penicillin or macrolide for 7-10 days (do not use a fluoroquinolone).*

Re-assess the Close Contact two weeks after the initial visit, after they have completed the course of antibiotics. Determine whether the Close Contact has responded to the antibiotics (decreased cough and sputum production, decreased fever, improved vital signs). Re-assess for signs and symptoms of DR-TB disease and conduct a second chest radiograph if possible.

Use the **Secondary Assessment Form** to record the trial of antibiotics prescribed, assessment results, and other pertinent information. If a program clinician is to assess the chest radiograph, they may use the **Chest Radiograph Form** for more thorough documentation of the assessment.

If abnormalities are present on the chest radiograph and/or if signs or symptoms suggestive of DR-TB are still present or have worsened, the Close Contact likely has DR-TB disease and should be categorized into Triage Group 1. If results of the secondary assessment and chest radiograph are not suggestive of DR-TB disease, assess the Close Contact for eligibility (as previously determined in the 'Plan Your Approach' section) to receive DR-TB infection treatment.

a. If eligible, triage into Triage Group 2.
b. If not eligible, triage into Triage Group 3.

You may use the **Confirming Eligibility for Infection Treatment** form to document whether the individual meets the criteria to be assigned to Triage Group 2 to receive DR-TB infection treatment.

If a clinician on your team is responsible for conducting assessments and diagnosing DR-TB disease, they may refer to the **External Resources** listed in the Implementation Tools for additional guidance.

After you complete a full assessment for each Close Contact, you will update the **Contact Action Plan** to reflect the DR-TB disease status, Triage Group, and action plan for each individual.

**If antibiotics are unavailable, repeat the patient assessment and conduct a second chest radiograph in two weeks to re-assess for signs and symptoms of DR-TB disease. Alternately, it may be possible to coordinate with a different local health provider to obtain access to antibiotics free of charge.*

Form 2.7
Secondary Assessment Form

Form 2.6
Chest Radiograph Form

Form 2.8
Confirming Eligibility for Infection Treatment

External Resources

Form 2.9
Contact Action Plan

When referred for treatment of DR-TB disease, all individuals in Triage Group 1 will likely undergo drug susceptibility testing. Record these drug susceptibility test results in the Contact Action Plan when available. The index patient's drug susceptibility test results should be recorded in the Contact Action Plan as well.

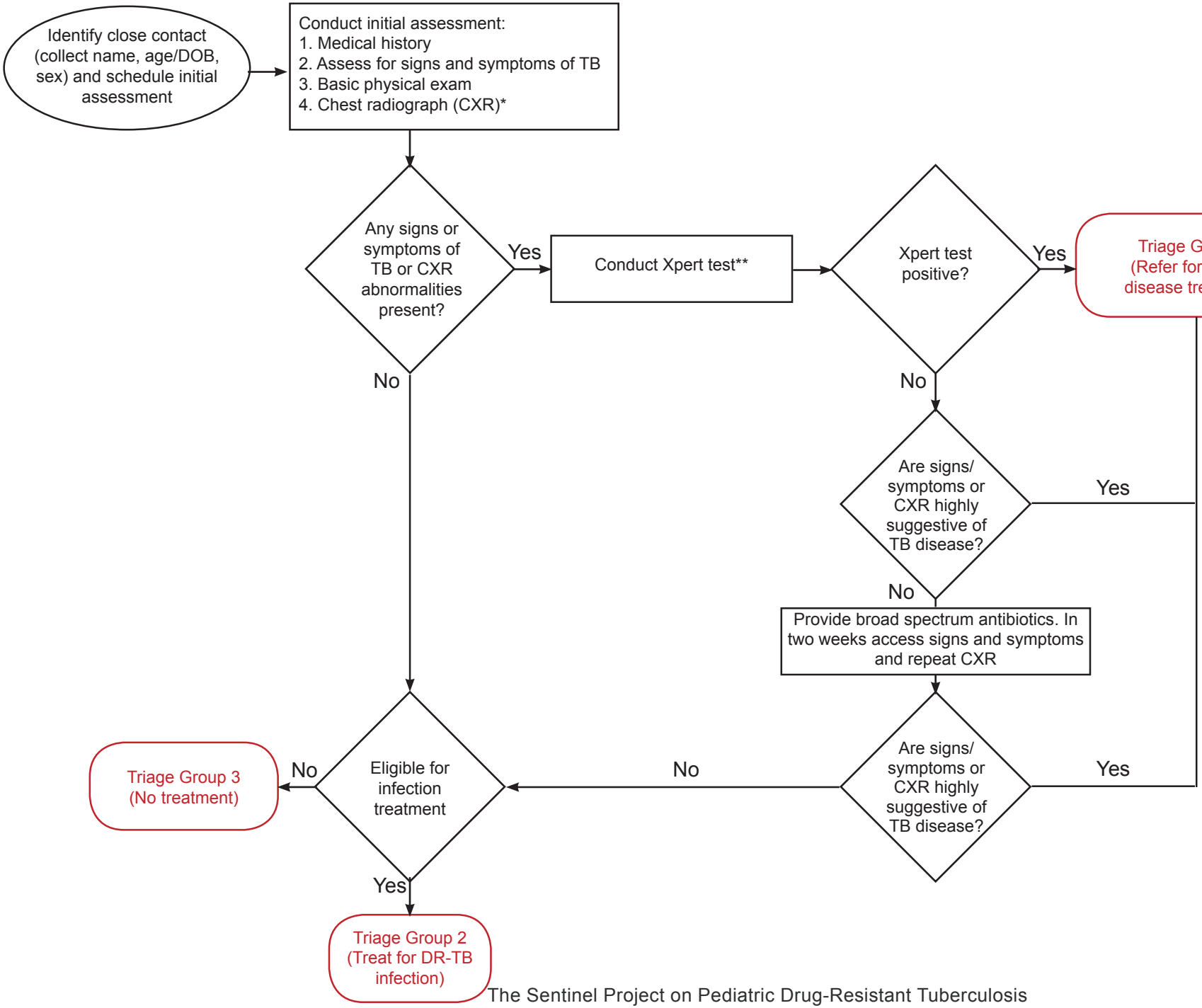
All families and contacts should be offered education about DR-TB and prevention of DR-TB in the household and community. Education should focus on basic information regarding DR-TB, risks for Close Contacts, signs and symptoms of DR-TB disease, and strategies to keep children and Close Contacts healthy and safe. For individuals on DR-TB infection or disease treatment, education should include possible side effects associated with medications as well. Education should be ongoing and provided in a culturally relevant fashion that is appropriate for the education level of the household. A **Patient Education Brochure** and a **Coloring Book** are provided to assist with these conversations.

At the end of this step, each Close Contact is classified to be in Triage Group 1, 2, or 3. Figure 3 depicts the complete flow of activities for this step.

Resource 2.1
Patient Education Brochure

External Resource
Coloring Book

Figure 3. Triage Phase Step 2: Evaluate Close Contacts and assign to one of three Triage Groups



*If chest radiography (CXR) is available, affordable, of good quality, and someone competent is available to read the CXR. If these are not the case, and the Close Contact is clinically well, then move to the evaluation for eligibility for infection treatment

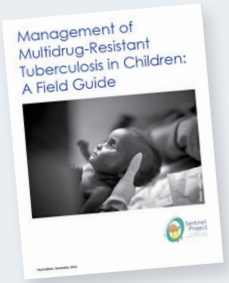
**If Xpert available. If not, follow the "No" path of "Xpert test positive?"

***If antibiotics are unavailable or unaffordable, wait two weeks and then re-assess signs and symptoms and repeat the CXR if it is available, affordable, of good quality, and someone competent is available to read the CXR. Proceed with the algorithm

3. Start DR-TB Disease Treatment for Triage Group 1

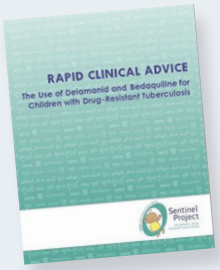
An individual with a diagnosis of DR-TB disease (Triage Group 1) should be initiated on treatment as soon as possible. In many cases, contacts with signs and symptoms of DR-TB disease will need to be referred to an external DR-TB provider for treatment. **Referral cards** for adults and children suspected of having DR-TB disease are provided to streamline the referral process. The patient's initial assessment and other applicable forms should be included with the referral card.

A **DR-TB Disease Treatment Initiation Form** should be completed for the patient noting the specific regimen prescribed. The **Dosing Chart for DR-TB Disease Treatment Regimens** may be a useful tool for the provider responsible for designing the DR-TB disease treatment regimen. The individual will likely be started on the same treatment regimen as the index patient until culture and drug susceptibility test results are available. Other clinical resources that may be useful follow:



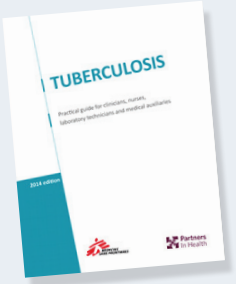
Management of Multidrug-Resistant Tuberculosis in Children: A Field Guide, 3rd Edition

- Sentinel Project



Rapid Clinical Advice: The Use of Delamanid and Bedaquiline for Children with Drug-Resistant Tuberculosis

- Sentinel Project



Tuberculosis: Practical Guide for Clinicians, Nurses, Laboratory Technicians and Medical Auxiliaries

- Médecins Sans Frontières and Partners In Health

Form 2.10
Referral Cards for Treatment of DR-TB Disease

Form 2.11
DR-TB Disease Treatment Initiation Form

Resource 2.3
Dosing Chart for DR-TB Disease Treatment Regimens

For full citations, see [External Resources]

In sum, **Triage Group 1** consists of all Close Contacts who should receive DR-TB disease treatment immediately, including the index patient.

4. Start DR-TB Infection Treatment for Triage Group 2

There is evidence from observational studies that treatment of DR-TB infection can prevent DR-TB disease and death. Thus, it is generally advantageous to provide DR-TB infection treatment over no treatment. Again, deciding which Close Contacts receive DR-TB infection treatment will depend on which Triage Approach you selected. If your program decides not to treat for DR-TB infection due to limited resources (no Triage Group 2), this section will not apply.

Choosing a regimen to treat DR-TB infection

Due to the limited amount of published evidence on treatment of DR-TB infection, there are still challenges in deciding the optimal treatment regimen, including which drugs to give and the duration of therapy.

Expert consensus is that a fluoroquinolone (moxifloxacin or levofloxacin) alone or together with one other agent (but not pyrazinamide) to which the strain from the index case is susceptible, daily for six months, is generally an appropriate regimen.

The drug regimen used should be selected based on local epidemiology, availability of drugs, drug-resistance pattern(s) of the index patient, and the adverse event profiles of the medications in the regimen. Please refer to the **Flowchart to Assign DR-TB Infection Treatment Regimen** for guidance.

The **Dosing Chart for DR-TB Infection Treatment Regimens** provides recommended weight-based dosages of each drug.

Once the regimen is determined, a **DR-TB Infection Treatment Initiation Form** should be completed for each patient, detailing the specific regimen being used.

Evidence 2.1
Reports of the Treatment of Presumed DR-TB Infection

Resource 2.2
Flowchart to Assign DR-TB Infection Treatment Regimen

Resource 2.4
Dosing Chart for DR-TB Infection Treatment Regimens

Form 2.12
DR-TB Infection Treatment Initiation Form

5. Inform Triage Group 3 About Support Schedule

Although Close Contacts placed in Triage Group 3 will not receive any form of drug treatment, it is important to tell each of these individuals (or their caregivers) that they will benefit from a comprehensive follow-up schedule. They should be informed that they will be monitored closely by a health worker for a pre-determined duration to see if they develop signs or symptoms of DR-TB disease. If they are found to have DR-TB disease, then they will be referred promptly to start life-saving treatment.

Triage Group 3 Close Contacts will also be counseled on signs and symptoms of DR-TB that should prompt immediate evaluation, regardless of the planned follow-up schedule. They should be advised to take certain action steps should such symptoms occur, including calling the clinical team, their case manager, and/or presenting to the nearest health center. They should be told that if they seek care, then they should always tell the person evaluating them that they have been exposed to DR-TB.

Triage Phase Tips

Tip 2.1 Planning for a Successful Household Visit

Tip 2.2 Conducting Initial Assessments

Tip 2.3 How to Perform Assessment Procedures

Tip 2.4 Referrals

Tip 2.5 Reverse Contact Tracing (or Source Case Investigation)

Tip 2.6 Interventions Outside the Household

Implement Support Phase

The goal of the Support Phase is to provide assistance to the patients, contacts, and families affected by DR-TB. Implementing a support schedule for each close contact has several benefits:

- Increases likelihood of all individuals completing assigned treatment
- Reduces likelihood of anyone else in a patient or contact's household becoming sick with TB disease
- Increases likelihood for prompt detection and management of adverse events of TB treatment
- Increases likelihood that any breakthrough TB disease is detected promptly for optimal management
- Increases likelihood that co-morbidities will be detected promptly for optimal management

The Support Phase consists of the following activities:

1. Prepare a post-exposure monitoring booklet for the household
2. Support treatment adherence
3. Provide clinical monitoring to identify both adverse events and the development of DR-TB disease
4. Address household needs
5. Minimize risk to Close Contacts
6. Record progress

Ideally, programs will implement all activities outlined here. In the case of resource shortages, steps 1-3 and 6 should be prioritized. Your program should outline which activities you plan to include in your Support Phase in the **Support Phase Approach Form.**

See **Treatment Timelines** for a basic outline of events from initial evaluation to treatment to support phase for Triage Groups 1, 2, and 3. Note that these were created to model the ideal scenario; your program may modify the duration and frequency of the Support Phase based on the availability of resources.

You may consider assigning each household to one health care worker as the 'case manager'. The case manager would complete all follow-up visits and monitor the household's progress, including the progress of the index case being treated for DR-TB disease. This will ensure continuity throughout the support phase, help Close Contacts develop a trusting relationship with their case manager, and allow the case manager to become more attuned to and able to meet each specific household's needs.

Form 1.5
Support Phase Approach Form

Resource 3.1
Treatment Timelines

1. Prepare a Post-Exposure Monitoring Booklet for the Household

It may be beneficial for all information for Close Contacts to be kept in a single Post-Exposure Monitoring Booklet. This booklet would be kept in the household and brought to or filled out at each household or health clinic visit. This would allow for longitudinal tracking of variables such as height and weight, and would also allow providers at any center to quickly become familiar with the interventions delivered to each contact. If Close Contacts are outside the household this strategy can be adapted so that they have a monitoring booklet in their own home.

A suggested **Post-Exposure Monitoring Booklet: Table of Contents** is included in the Implementation Tools. The booklet should include forms relevant to the entire household, such as the contact registry, contact action plan, and household needs assessment forms. The booklet should also include forms for each patient in the household, including the initial assessment form, the treatment initiation form, and adherence forms. Forms should be organized by patient.

Form 3.1
Post-Exposure Monitoring Booklet: Table of Contents

2. Support Treatment Adherence

An **Adherence Card** should be completed for each Close Contact in Triage Groups 1 and 2 during each home visit or other point of contact. Some possible mechanisms to support adherence include:

- Home visits from trained community health workers on a weekly/regular basis;
- Monthly refresher training and support for family members to self-administer therapy;
- Text reminders and other social media support; and
- Directly observed therapy may be needed for some periods of time; if this is the case, it should be provided at a location most convenient and comfortable for the contacts.

Form 3.2
Adherence Card for Treatment Regimens

3. Provide Clinical Monitoring to Identify Adverse Events and DR-TB Disease

All Close Contacts should be monitored according to the support phase schedule you have chosen (see the decision made on Form 1.5: Support Phase Approach Form). The **Follow-up Evaluation Form** can be used or adapted for use at each follow-up visit. If Close Contacts in Triage Groups 2 or 3 exhibit signs or symptoms of DR-TB disease, they should be immediately referred for further evaluation to assess for DR-TB disease.

Adverse events may occur in those receiving DR-TB infection or disease treatment. Proper management of adverse events will help improve adherence to treatment of DR-TB infection and disease. In the event that an adverse event occurs, an **Adverse Event Form** should be completed and the Close Contacts should be immediately referred to a clinician for further evaluation and to determine the most appropriate course of action.

Form 3.3
Follow-up Evaluation Form

Form 3.4
Adverse Event Form

4. Address Household Needs

Households affected by DR-TB are vulnerable and require support beyond the treatment of DR-TB infection and disease. Numerous psychosocial stressors, including unstable housing, food insecurity, and substance abuse, are likely putting their health at risk and need to be addressed. Integrated approaches to DR-TB prevention and care, which address these stressors, have been shown to be most successful in combating and preventing DR-TB.

First, basic household needs must be assessed. This can be facilitated using the **Food Security Assessment** and the **Psychosocial Assessment of Households**. One of these forms should be completed for every household; this includes the household of the index patient, as well as the household of each contact addressed in the Post-exposure Management Program. The **Initial Assessment Form** (used during the Triage phase) also queries whether each contact being assessed has any nutritional, economic, transportation or educational problems. These assessments should be reviewed by a trained counselor to determine what forms of social support may be necessary or may benefit the household. If surveys of food security or other psychosocial assessments that are validated to your setting are available, these should be utilized instead.

Form 3.5
Food Security Assessment

Form 3.6
Psychosocial Assessment of Household

Form 2.5
Initial Assessment Form

The following are common types of support provided to DR-TB-affected households:

- *Nutritional support* for the entire family to reduce the risks of sickness and death in all members of the household;
- *Psychosocial support*, including support and counseling to deal with the grief, shame, anger, blame and sadness that can occur in the household and the discrimination that the household may face when DR-TB is diagnosed; and
- *Socioeconomic support* to ensure there are no catastrophic costs to the household during the DR-TB episode and that families do not lose the ability to pay school fees to ensure children are returning to and remaining in school. Assisting families to claim any money for which they are eligible can be of great benefit.

Coordination and collaboration with other social support agencies will be vital. This includes faith-based groups, non-governmental organizations, and other significant groups working locally. Working in coordination with these groups will maximize the impact and minimize the duplication of efforts.

If Close Contacts are from outside the household of the index case, these tools can be adapted so that these evaluations are undertaken in their respective homes.

5. Minimize Risk to Close Contacts

Most exposure to DR-TB occurs prior to the diagnosis and treatment of DR-TB disease in the index patient. Therefore, the most important infection control measure is to ensure the index patient adheres to his or her therapy and has a successful treatment outcome. However, other interventions should still be considered to reduce the risk of transmitting DR-TB.

The **Infection Control Assessment** form provided can be used to assess the risk of patients with DR-TB disease in spreading infection to others. Compassionate infection control measures that should be implemented when a DR-TB patient has been identified include:

- Wearing of a surgical mask (not an N-95 respirator) by the DR-TB index patient during the first few days or weeks after effective therapy has been started or during situations with high transmission potential (i.e. breast feeding of infants);
- Opening of windows and curtains to allow for natural ventilation and sunlight in the home;

Form 3.7
Infection Control Assessment

- Avoiding that the index patient shares a bed or even bedroom/sleeping space with others if possible during the first few weeks after effective therapy has been started; and
- Spending time with visitors outside or in other well-ventilated areas of the home during the first few weeks of treatment.

All patients, contacts, and their families should be offered education about DR-TB and prevention of DR-TB in the household. Education should focus on basic DR-TB, risks for Close Contacts, signs and symptoms that are concerning for DR-TB disease, and strategies to keep children healthy and safe. For individuals on DR-TB infection treatment, education should include possible symptoms of adverse events associated with medications as well. Education should be ongoing and provided in a culturally relevant fashion that is appropriate for the audience. Care should be taken to explain the infection control practices in a manner that is not blaming and minimizes the risk of discrimination. A **Patient Education Brochure** and a **Coloring Book** are provided.

6. Record Progress

Visits to Close Contacts should be documented throughout the support phase to track progress and ensure proper follow-up. The **Support Phase Record Form** provides a place to record dates of support phase visits, what occurred during these visits, and a space for comments. The **Contact Follow-up Form** provides a place to track treatment completion dates and outcomes, support phase completion dates, and disease status for all contacts.

External Resource
Patient Education Brochure

External Resource
Coloring Book

Form 3.8
Support Phase Record Form

Form 3.9
Contact Follow-up Form

Support Phase Tips

Tip 3.1 Potential Adverse Events of DR-TB Medications

Tip 3.2 Infection Control

Conclusion: What did we do?

Exposure to a deadly infectious disease like DR-TB requires immediate action to protect the health of those who have been exposed. That is the purpose of this Guide: to provide guidance on how to prevent DR-TB disease and death in those who have been exposed to DR-TB.

You should prepare an in-house evaluation of your pilot experiences. Completing the **Quarterly Report Form** every three months will allow you to keep track of how many cases and contacts your program is caring for. This will help you to assess whether you are appropriately reaching your target population and allow you to reassess your human, physical, and financial resources on a quarterly basis.

A tool that you may want to use and adapt is a proposed **Program Evaluation** which includes a basic framework of process indicators, a calculation worksheet, and an interpretation guide to assess how your program is performing. These results will help you improve your program and allow you to share your experiences widely, which will benefit your colleagues caring for DR-TB-exposed contacts around the world.

We hope you will let us know about your experience with this Guide. Our hope is for front-line providers to use this Guide to implement comprehensive post-exposure management programs tailored to their unique setting. We also strive to open a discussion to optimize effectiveness and develop best practices in post-exposure care.

Form 3.10
Quarterly Report Form

Resource 4.0
Program Evaluation

IMPLEMENTATION TOOLS

Implementation Tools

FORMS

These are forms that may be useful in implementing your program. Forms may be copied directly from this handbook for immediate use, or used as a template that may be adapted for your program's specific needs.

Forms are organized into three groups, based on the stages laid out in the Guide:

1. Preparation Forms
2. Triage Phase Forms
3. Support Phase Forms

PREPARATION FORMS

Form 1.1 Resource Assessment Form

The supplies you have available may affect your triage approach, such as chest radiography and TST. Assess your resource capacity here. Please note that many supplies are disposable and are needed throughout the duration of the Guide, so you should prepare to renew your stores regularly. **Bolded** supplies should be prioritized.

☐ **N95 respirators**	☐ Latex gloves
☐ **Tools to assess height and weight**	☐ Stethoscope
☐ **Watch to assess vital signs**	☐ Blood pressure cuff
☐ **Thermometer**	☐ Alcohol swabs
☐ **Alcohol-based hand sanitizer**	☐ Cotton swabs
☐ **Biohazard waste bag**	☐ Sharps disposal box
☐ **Pens**	☐ Supplies for TST test
☐ **Paper**	☐ Supplies for IGRA test
☐ **Access to laboratory for Microbiology and Drug Susceptibility Testing**	☐ Cooler
☐ **Cell phone for emergencies**	☐ HIV testing supplies or referral forms
	☐ Histopathology
	☐ Access to laboratory for blood tests
	☐ Access to chest radiography
	☐ Drugs
	☐ Broad spectrum antibiotics

Form 1.2 Personnel Responsibilities Plan

Responsibilities		Training requirements	Persons assigned
Patient assessment and care	• **Perform initial and follow up visits** • **Take exposure and medical history** • **Check vital signs** • **Weigh and measure children** • Obtain necessary samples for diagnosis	• Nurse or nurse-level training preferred ○ Could be done by a high-level lay health provider depending on the situation and resources • Clinical training in DR-TB	
	• **Assess all close contacts with signs or symptoms of TB disease** • **Coordinate referrals for DR-TB treatment** • Assess chest radiography • Initiate treatment of DR-TB infection for Close Contacts assigned to Triage Group 2	• Medical degree or equivalent • Clinical DR-TB training	
Coordination and support	• **Program management** • **Coordinate activities of team members** • **Procure necessary supplies** • Generate weekly list of households that need visits, including newly identified households	• Managerial Skills • Basic DR-TB training	

Psychosocial support	• Patient education activities • Identify and help address any barriers households may have in adhering to recommendations • Reassess and address household's needs throughout the program • Provide HIV counseling and testing • Coordinate transportation needs of the family • Liaise between households and nutritional, economic, and psychosocial support specialists	• Lay health worker with mental health training • Basic DR-TB training	
External support	• Work with donors and complete new funding applications	• Basic communication skills	
Research activities	• Oversee data collection • Collect all data and forms from assessment team • Enter data into electronic database • Complete reports on safety, efficacy, program completion rates, etc.	• Basic computer skills • Basic DR-TB training	

Your priority should be in covering the responsibilities marked in **bold**. Other responsibilities should be undertaken if there are sufficient human and financial resources available.

Form 1.3 Close Contact Definition Form

Choose the definition of who comprises an index patient's "close contact" to be addressed by your program. These are examples and you can document here which definition you will use for your program.

Definition A	Household contacts: all persons who share the living, eating and sleeping space (within the same building) with the index patient.	☐
Definition B	Household contacts and close social contacts, to include all persons who have been in close proximity with the index patient for at least 8 consecutive hours on a single day, or for a total of at least 15 hours per week for multiple weeks (could be outside the household, such as work, school, etc.).	☐
Definition C	Household contacts, as locally defined group according to customs and practices (describe):	☐
Definition D	Other (describe):	☐

Date definition was chosen (dd/mm/yyyy):_____ Initials: _____

Form 1.4 Triage Approach Form

Below are multiple approaches to triage that you may use to determine who is eligible to receive infection treatment. Use this form to document which approach your program will use.

Approach	**Contacts to receive DR-TB infection treatment**	
Triage Approach A	• All Close Contacts after DR-TB disease ruled out	☐
Triage Approach B	• All Close Contacts <5 years of age after DR-TB disease ruled out *and* • All Close Contacts ≥5 years of age after DR-TB disease ruled out, who have HIV infection or other immunocompromising condition ¥ *and* • All Close Contacts ≥5 years of age after DR-TB disease ruled out, who have a positive TST or IGRA	☐
Triage Approach C	• No Close Contacts treated for DR-TB infection	☐
Triage Approach D	Other (describe):	☐

Note: these approaches are listed in descending order of coverage of infection treatment. Approaches that treat the greatest number of contacts (Approaches A and B) are preferred over more selective approaches.

¥ Includes individuals with a diagnosis of HIV infection, cancer, or diabetes, and those on medications that can suppress the immune system.

Date definition was chosen (dd/mm/yyyy):_____ Initials: _____

Form 1.5 Support Phase Approach Form

Use this form to record important information regarding your support phase approach.

Duration of support phase?		
☐ All patients are supported until the index patient completes treatment (**minimum 12 months**)		
☐ All individuals are supported until the last Close Contact completes treatment (**minimum 12 months**)		
☐ Other (describe):		
	How frequently are contacts monitored?	What types of support activities will be performed? This may include nutritional, psychosocial, and socioeconomic support. Describe duration and activities to be carried out.
Triage Group 1	During treatment: ☐ **Monthly** ☐ Every 2 months ☐ Other (describe):	
	Post-treatment: ☐ **Every 2 months** ☐ Other (describe):	
Triage Group 2	During treatment: ☐ **Monthly** ☐ Every 2 months ☐ Other (describe):	
	Post-treatment: ☐ **Every 2 months** ☐ Other (describe):	
Triage Group 3	☐ **Every 2 months** ☐ Every 6 months ☐ Other (describe):	

Date definition was chosen (dd/mm/yyyy):_____ Initials: _____

Index Patient #:	Date (dd/mm/yyyy):

TRIAGE PHASE FORMS

Form 2.1 Index Patient Interview Form

PERSONAL INFORMATION	
Name of index patient:	
Number assigned to index patient:	
Address:	
Phone:	
Directions to home:	
QUESTIONAIRE	
1. May we make a visit to your home and speak with your family?	☐ Yes ☐ No
If no, why not?	
If visit to home declined, list other potential meeting sites:	
2. How many people currently share your living, eating, and sleeping space (within the same building)?	_____
List names and ages:	
3. Are there any people with whom you have been in close proximity with for at least 8 consecutive hours on a single day, or for a total of at least 15 hours per week over multiple weeks, who are not mentioned above?	☐ Yes ☐ No ☐ Does not know
If yes, list names, ages, and contact information:	

*Note: this form is based on Close Contact definition B. You should adapt this form based on your chosen definition of close contact (Form 1.3).

Index Patient #:	Date (dd/mm/yyyy):

Form 2.2 Contact Registry

Assigned #	Name	Age	Permission to contact?	Address/ Best means to reach contact	Approximate contact with Index Patient	Initial Assess-ment planned?	Initial Assess-ment completed?
			☐ Yes ☐ No	☐ Same as index ☐ Other, specify:	___ hours/day ___ hours/week	☐ Yes Date: ☐ No If no, why:	☐ Yes Date: ☐ No, If no, why:
			☐ Yes ☐ No	☐ Same as index ☐ Other, specify:	___ hours/day ___ hours/week	☐ Yes Date: ☐ No If no, why:	☐ Yes Date: ☐ No, If no, why:
			☐ Yes ☐ No	☐ Same as index ☐ Other, specify:	___ hours/day ___ hours/week	☐ Yes Date: ☐ No If no, why:	☐ Yes Date: ☐ No, If no, why:
			☐ Yes ☐ No	☐ Same as index ☐ Other, specify:	___ hours/day ___ hours/week	☐ Yes Date: ☐ No If no, why:	☐ Yes Date: ☐ No, If no, why:
			☐ Yes ☐ No	☐ Same as index ☐ Other, specify:	___ hours/day ___ hours/week	☐ Yes Date: ☐ No If no, why:	☐ Yes Date: ☐ No, If no, why:

Form 2.3 Equipment Checklist

Supplies to bring to household and close contact visits:

Medical Supplies
☐ **N95 respirators**
☐ **Tools to assess height and weight**
☐ **Watch to assess vital signs**
☐ **Thermometer**
☐ **Alcohol-based hand sanitizer**
☐ **Biohazard waste bag**
☐ Latex gloves
☐ Alcohol swabs
☐ Cotton swabs
☐ Stethoscope
☐ Blood pressure cuff
☐ Supplies for TST test
☐ Supplies for IGRA test
☐ HIV Testing supplies or referral forms
☐ Sharps disposal box
☐ Cooler
☐ Drugs
☐ Broad spectrum antibiotics

Forms
☐ **List of close contacts to be assessed**
☐ **Address and directions of close contacts**
☐ Household contact intervention booklets
☐ Education and counseling tools (TB, DR-TB, HIV)
☐ Psychosocial assessment forms

Miscellaneous
☐ **Cell phone for emergencies**
☐ **Pens**
☐ **Paper**
☐ Calendars/ planners to leave with family with appointment dates and reminder

Bolded supplies should be prioritized.

Form 2.4 Referral Cards for Investigation of DR-TB Disease

FAST TRACK EVALUATION NEEDED	
Name of Individual:	Date of Birth (dd/mm/yyyy):
Address:	
I am coming to the clinic today for evaluation because someone who I have been in close contact with was diagnosed with drug-resistant TB. I was advised to come to the clinic to be assessed.	
Name of Provider:	
Provider Contact Information:	
Comments:	

OR

FAST TRACK EVALUATION NEEDED	
Name of Child:	Date of Birth (dd/mm/yyyy):
Address:	
I am bringing my child to the clinic today for evaluation because someone someone who my child has been in close contact with was diagnosed with drug-resistant TB. I was advised to come to the clinic to have my child assessed.	
Name of Provider:	
Provider Contact Information:	
Comments:	

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Form 2.5 Initial Assessment Form

INDIVIDUAL ASSESSMENT*		
Name of individual assessed:	**Date of birth** (dd/mm/yyyy):	
Sex: ☐ M ☐ F	Age:	
TB EXPOSURE ASSESSMENT		
Relationship to index patient:		
Over the past two weeks, has the contact:		
Slept in the same room as the index patient	☐ Yes ☐ No ☐ Does not know	
Spent a total of 15 hours per week with the index patient	☐ Yes ☐ No ☐ Does not know	
Spent at least 8 consecutive hours with the index patient on a single day	☐ Yes ☐ No ☐ Does not know	
Other close contact?	☐ Yes ☐ No ☐ Does not know	
Please describe nature and duration of exposure:		
MEDICAL HISTORY		
Has contact ever been diagnosed with TB?	☐ Yes ☐ No ☐ Does not know	
Has contact previously received treatment for TB infection?	☐ Yes ☐ No ☐ Does not know	
If yes, date of previous TB treatment initiation:		
Health facility where received previous TB treatment:		
Result of treatment:		
Has contact ever been diagnosed with diabetes?	☐ Yes ☐ No ☐ Does not know	
Does contact have HIV infection?	☐ Yes ☐ No ☐ Does not know	
If yes, is the contact on ARVs?	☐ Yes ☐ No ☐ Does not know	
If yes, list the last CD4 count (and CD4% if a child <5 years):		
Is the contact taking any medications on a regular basis?	☐ Yes ☐ No ☐ Does not know	
If yes, list medications:		
Is the contact currently pregnant?	☐ Yes ☐ No ☐ Does not know	
List pregnancy history:		
Any other immunocompromising condition:	☐ Yes ☐ No ☐ Does not know	
List:		
If yes to any, contact faces higher risk of developing DR-TB disease. Consider evaluation for DR-TB disease		
Additional pertinent medical history:		

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

SIGNS AND SYMPTOMS*	
Ask contact if they have experienced the following signs or symptoms in the past two weeks:	
	Tick if present
Cough	☐
Cough with phlegm	☐
Coughing up blood	☐
Fever	☐
Night sweats	☐
Loss of appetite	☐
Weight loss	☐
Lethargy	☐
Headache	☐
Lumps in neck, armpit, or groin	☐
Swollen joints	☐
Back pain	☐
Unable to awake*	☐
Vomiting without other gastrointestinal symptoms*	☐
Other (describe):	☐
Only for children <12 years	
Not gaining weight as expected	☐
Reduced playfulness	☐
Frequent crying	☐
If yes to any of these, evaluate for DR-TB disease. *If yes to these, needs urgent evaluation.	

Temp:	**Weight:**	**Height (length if under 2 years):**
Plot weight and height on growth chart; compare to weight from previous visit.		
If the lungs are examined with a stethoscope, do the lungs sound abnormal?		☐ Yes ☐ No ☐ Unknown
Physical Exam Findings:		

IMPORTANT QUESTIONS TO BE ADDRESSED	
Does this person have any nutritional issues that need to be addressed?	☐ Yes ☐ No
Does this person have any economic issues that need to be addressed?	☐ Yes ☐ No
Does this person have any transportation issues that need to be addressed?	☐ Yes ☐ No
Does this person have any health education/promotion gaps that need to be addressed?	☐ Yes ☐ No
Other issues or concerns:	
If yes to any of these, consider providing support to address concerns.	

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

CHEST RADIOGRAPHY		
CXR available, affordable, of good quality?		☐ Yes ☐ No
Is someone available to read the radiograph?		☐ Yes ☐ No
If yes, conduct a chest radiograph to assess for DR-TB disease. If no, skip to next section.		
Scheduled date of CXR:		
OVERALL ASSESSMENT*		
Outcome:	☐ Possible TB disease: requires additional evaluation for TB disease ☐ No TB disease: assess eligibility for infection treatment	
Action Steps *(check at least one):*		
☐ Further evaluation for TB disease (state below)	☐ Provide psychosocial support	
☐ Assess eligibility for infection treatment	☐ Provide nutritional support	
☐ Completion of current treatment (state below)	☐ Provide economic support	
Notes:		
Date of next follow up visit (dd/mm/yyyy):		
Name of Assessment Provider:		
Signature of Assessment Provider:		

Note: this form should not take more than a couple of minutes to complete. However, it is appreciated that forms can be time-consuming. If it is not possible to complete the whole form, make sure that the sections marked with an asterisk (*) are completed: INDIVIDUAL ASSESSMENT, SIGNS AND SYMPTOMS and OVERALL ASSESSMENT.

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Form 2.6 Chest Radiograph Form

Patient name:			Date of birth (dd/mm/yyyy):			
CXR code:			**CXR date (dd/mm/yyyy):**			
Reader code:			**Date read (dd/mm/yyyy):**			
Quality	AP/PA			Lateral		
Adequate for assessment?	☐ Yes ☐ No			☐ Yes ☐ No		
Parenchymal	*Present?*	*RUZ*	*RMZ*	*RLZ*	*LUZ*	*LLZ*
Airspace consolidation	☐ Yes					
Interstitial linear	☐ Yes					
Interstitial nodular	☐ Yes					
Cavity	☐ Yes					
Calcification	☐ Yes					
Extra-parenchymal	*Present?*	*Right*			*Left*	
Central soft tissue mass	☐ Yes					
Soft tissue calcification	☐ Yes					
Large airway compression	☐ Yes					
Pleural fluid	☐ Yes					
Pneumothorax	☐ Yes					
Raised hemi-diaphragm	☐ Yes					
Enlarged cardiac shadow	☐ Yes					
Vertebral collapse (gibbus)	☐ Yes					
Other relevant abnormalities or comments	☐ Yes	Specify:				
Conclusion:	☐ **Normal**	☐ **Abnormal** ☐ Equivocal ☐ Likely TB (specify):				
Name of provider assessing radiograph:						
Signature of provider assessing radiograph:						

Note: this form should not take more than a minute to complete. However, it is appreciated that forms can be time-consuming. If it is not possible to complete the whole form, make sure that the patient name is completed, the date that the CXR was carried out, the date it was read, and the conclusion.

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Form 2.7 Secondary Assessment Form

ANTIBIOTICS		
Antibiotics prescribed? ☐ Yes ☐ No		If yes, fill out rest of section. If no, skip to next section.
Date of prescription (dd/mm/yyyy):		
Name of antibiotics prescribed:		
Dose:	Frequency (OD, BD, TDS):	Duration in days:
Date of evaluation of response to antibiotics (dd/mm/yyyy):		
Response to antibiotics:		

TWO WEEK REASSESSMENT	
Start date of wait period:	
Date of reassessment (dd/mm/yyyy):	
SIGNS AND SYMPTOMS*	
Ask contact if they have experienced the following signs or symptoms in the past two weeks:	
	Tick if present
Cough	☐
Cough with phlegm	☐
Coughing up blood	☐
Fever	☐
Night sweats	☐
Loss of appetite	☐
Weight loss	☐
Lethargy	☐
Headache	☐
Lumps in neck, armpit, or groin	☐
Swollen joints	☐
Back pain	☐
Unable to awake*	☐
Vomiting without other gastrointestinal symptoms*	☐
Other (describe):	☐
Only for children <12 years	
Not gaining weight as expected	☐
Reduced playfulness	☐
Frequent crying	☐
If yes to any of these, evaluate for DR-TB disease. *If yes to these, needs urgent evaluation.	

Temp:	**Weight:**	**Height (length if under 2 years):**
Plot weight and height on growth chart; compare to weight from previous visit.		
If the lungs are examined with a stethoscope, do the lungs sound abnormal? ☐ Yes ☐ No ☐ Unknown		
Physical Exam Findings:		

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

CHEST RADIOGRAPHY		
CXR done?		☐ Yes ☐ No
If yes, fill out rest of section and complete Form 2.6. If no, skip to next section.		
Date of CXR (dd/mm/yyyy):		
Radiographic findings:	☐ Normal in both lungs ☐ Abnormal, possibly TB ☐ Abnormal, but not consistent with TB	
OVERALL ASSESSMENT*		
Outcome:	☐ Possible TB disease: requires additional evaluation for TB disease ☐ No TB disease: assess eligibility for infection treatment	
Action Steps *(check at least one):*		
☐ Further evaluation for TB disease (state below)		☐ Provide psychosocial support
☐ Assess eligibility for infection treatment		☐ Provide nutritional support
☐ Completion of current treatment (state below)		☐ Provide economic support
Notes:		
Date of next follow up visit (dd/mm/yyyy):		
Name of Assessment Provider:		
Signature of Assessment Provider:		

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Form 2.8 Confirming Eligibility for Infection Treatment

Eligibility for DR-TB Infection Treatment (Triage Approach A)		
Patient name:	**Date of birth (dd/mm/yyyy):**	
Ask the following questions:		
1) Has TB disease been ruled out?	☐ Yes *Mark question 2 "yes".*	☐ No *If no, refer for clinical assessment to rule out TB disease [end form here].*
How was TB disease ruled out? (Check all that apply) ☐ Clinical diagnosis ☐ CXR ☐ Course of antibiotics ☐ Other: _____		
2) Is the patient eligible for infection treatment?	☐ Yes	☐ No
*If "yes" to question 2, use an **Infection Treatment Start Form**. Assign patient to Triage Group 2. *If "no" to question 2, do not begin infection treatment. Assign patient to Triage Group 3 to receive clinical monitoring and follow-up.		
Name of assessment provider:		

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Eligibility for DR-TB Infection Treatment (Triage Approach B)		
Patient name:	**Date of birth (dd/mm/yyyy):**	
Ask the following questions:		
1) Has TB disease been ruled out? How was TB disease ruled out? (Check all that apply) ☐ Clinical diagnosis ☐ CXR ☐ Course of antibiotics ☐ Other: _____	☐ Yes *Continue to question 2.*	☐ No *If no, refer for clinical assessment to rule out TB disease [end form here]*
2) Is this individual under 5 years of age?	☐ Yes *Mark question 5 "yes" [end form here].*	☐ No *Continue to question 3.*
3) Does this individual meet any of the following criteria? (Check all that apply) ☐ Diabetes Mellitus ☐ Malnutrition ☐ HIV Infection ☐ Other immuno-compromising condition:_____	☐ Yes *Mark question 5 "yes" [end form here].*	☐ No *Continue to question 4.*
4) Does this individual have a positive TST or IGRA result?	☐ Yes *Mark question 5 "yes".*	☐ No *Mark question 5 "no".*
5) Is the patient eligible for infection treatment?	☐ Yes	☐ No
*If "yes" to question 5, use an **Infection Treatment Start Form**. Assign patient to Triage Group 2. *If "no" to question 5, do not begin infection treatment. Assign patient to Triage Group 3 to receive clinical monitoring and follow-up.		
Name of assessment provider:		

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Eligibility for DR-TB Infection Treatment (Triage Approach D)		
If you have chosen to customize a triage approach (triage approach D), please edit this form to reflect your eligibility criteria for infection treatment.		
Patient name:	**Date of birth (dd/mm/yyyy):**	
Ask the following questions:		
1) Has TB disease been ruled out? How was TB disease ruled out? (Check all that apply) ☐ Clinical diagnosis ☐ CXR ☐ Course of antibiotics ☐ Other: _____	☐ Yes *Continue to question 2.*	☐ No *If no, refer for clinical assessment to rule out TB disease [end form here]*
2) Criteria 1:	☐ Yes *Meets criteria for infection treatment. Mark question 5 "yes" [end form here].*	☐ No *Continue to question 3.*
3) Criteria 2:	☐ Yes *Meets criteria for infection treatment. Mark question 5 "yes" [end form here].*	☐ No *Continue to question 4.*
4) Criteria 3:	☐ Yes *Meets criteria for infection treatment. Mark question 5 "yes".*	☐ No *Mark question 5 "no".*
5) Is the patient eligible for infection treatment?	☐ Yes	☐ No
*If "yes" to question 5, use an **Infection Treatment Start Form**. Assign patient to Triage Group 2. *If "no" to question 5, do not begin infection treatment. Assign patient to Triage Group 3 to receive clinical monitoring and follow-up.		
Name of assessment provider:		

Index Patient #:	Date (dd/mm/yyyy):

Form 2.9 Contact Action Plan

Index patient information				
Index patient's DST results:	Xpert - Xpert +	Resistant to:	☐ Isoniazid (H) ☐ Rifampin (R)	☐ Fluoroquinolones (FQ) ☐ Injectables (I)
How long was the index patient infectious [approximate time in weeks elapsed since index patient started coughing]?				
Infectiousness of index patient:	Xpert - Xpert +	Culture - Culture +	Smear - Smear +	Smear ++ Smear +++

Close Contact			Screening results and TB disease evaluation									Action Plan	
#	**Name**	**Age**	**Initial Assessment completed?**	**If yes, date (dd/mm/yyyy):**	**If no, why?**	**TB disease symptoms present?***	CXR Result Abnormal? [if unavailable, leave blank]	TST Result (mm) [if unavailable, leave blank]	**Diagnosed with TB disease?**	Microbiologically confirmed TB disease?**	Drug susceptibility results – check all drugs to which resistant	**G1= Triage Group 1 G2= Triage Group 2 G3= Triage Group 3 L= lost to follow up**	**Intervention (treatment/ follow-up) start date**
			☐ Yes ☐ No			☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	☐ H ☐ R ☐ FQ ☐ I		
			☐ Yes ☐ No			☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	☐ H ☐ R ☐ FQ ☐ I		
			☐ Yes ☐ No			☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	☐ H ☐ R ☐ FQ ☐ I		

*Cough, chest pain, difficulty breathing, fatigue, fever, loss of appetite, weight loss

**Microbiologically confirmed disease: indicated by positive Xpert, smear, or culture result

Index Patient #:	Date (dd/mm/yyyy):

Close Contact			Screening results and TB disease evaluation									Action Plan	
#	Name	Age	**Initial Assessment completed?**	**If yes, date (dd/mm/yyyy):**	**If no, why?**	**TB disease symptoms present?***	CXR Result Abnormal? [if unavailable, leave blank]	TST Result (mm) [if unavailable, leave blank]	**Diagnosed with TB disease?**	Microbiologically confirmed TB disease?**	Drug susceptibility results – check all drugs to which resistant	**G1= Triage Group 1 G2= Triage Group 2 G3= Triage Group 3 L= lost to follow up**	**Intervention (treatment/ follow-up) start date**
			☐ Yes ☐ No			☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	☐ H ☐ R ☐ FQ ☐ I		
			☐ Yes ☐ No			☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	☐ H ☐ R ☐ FQ ☐ I		
			☐ Yes ☐ No			☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	☐ H ☐ R ☐ FQ ☐ I		
			☐ Yes ☐ No			☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	☐ H ☐ R ☐ FQ ☐ I		
			☐ Yes ☐ No			☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk		☐ Yes ☐ No ☐ Unk	☐ Yes ☐ No ☐ Unk	☐ H ☐ R ☐ FQ ☐ I		

*Cough, chest pain, difficulty breathing, fatigue, fever, loss of appetite, weight loss

**Microbiologically confirmed disease: indicated by positive Xpert, smear, or culture result

Form 2.10 Referral Cards for Treatment of DR-TB Disease

TB DISEASE TREATMENT NEEDED	
Name of Individual:	Date of Birth (dd/mm/yyyy):
Address:	
I am coming to the clinic today because I have been in contact with someone with drug-resistant TB and I have been diagnosed with TB disease. I was advised to come to the clinic for further evaluation and treatment.	
Name of Provider:	
Provider Contact Information:	
Comments:	

OR

TB DISEASE TREATMENT NEEDED	
Name of Child:	Date of Birth (dd/mm/yyyy):
Address:	
I am bringing my child to the clinic today because my child has been in contact with someone with drug-resistant TB and has been diagnosed with TB disease. I was advised to bring my child to the clinic for further evaluation and treatment.	
Name of Provider:	
Provider Contact Information:	
Comments:	

NOTE: Referring provider should include with the referral card a copy of the initial assessment and other applicable forms or information.

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Form 2.11 DR-TB Disease Treatment Initiation Form

Name of patient:					
Treatment Start Details					
DR-TB disease treatment initiation date (dd/mm/yyyy):					**Patient weight (kg):**
Please list all drugs used in the patient's treatment course. If a drug is discontinued or added, or if the dosing is changed, record it here.					
Drug Name/ Formulation	Dose (units)	Frequency	Start Date (dd/mm/yyyy)	End Date (dd/mm/yyyy)	Notes
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
Name of treatment supporter:					
Treatment supporter phone number:					
Relationship of treatment supporter to the patient:					
Name of prescribing physician:					

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Form 2.12 DR-TB Infection Treatment Initiation Form

Name of patient:					
Treatment Start Details					
DR-TB infection treatment initiation date (dd/mm/yyyy):					**Patient weight (kg):**
Please list all drugs used in the patient's treatment course. If a drug is discontinued or added, or if the dosing is changed, record it here.					
Drug Name/ Formulation	**Dose (units)**	**Frequency**	**Start Date**	**End Date**	**Notes**
1.					
2.					
3.					
4.					
5.					
Name of treatment supporter:					
Treatment supporter phone number:					
Relationship of treatment supporter to the patient:					
Name of prescribing physician:					

SUPPORT PHASE FORMS

Form 3.1 Post-Exposure Monitoring Booklet: Table of Contents

Index patient name:	Household Address:		
Index patient number:			
Phone number:			
		Pages	X if not needed
General Forms			
Form 2.1	Index Patient Interview Form		
Form 2.2	Contact Registry		
Form 2.9	Contact Action Plan		
Form 3.5	Food Security Assessment		
Form 3.6	Psychosocial Assessment of Household		
Form 3.7	Infection Control Assessment		
Form 3.8	Support Phase Record Form		
Form 3.9	Contact Follow-up Form		
Patient Forms			
Contact #:	Name:		
Form 2.5	Initial Assessment Form		
Form 2.6	Chest Radiograph Form		
Form 2.8	Confirming Eligibility for DR-TB Infection Treatment		
Form 2.11	TB Disease Treatment Initiation Form		
Form 2.12	DR-TB Infection Treatment Initiation Form		
Form 3.2	Adherence Card for Treatment Regimens		
Form 3.3	Follow-up Evaluation Form		
Form 3.4	Adverse Event Form		
Contact #:	Name:		
Form 2.5	Initial Assessment Form		
Form 2.6	Chest Radiograph Form		
Form 2.8	Confirming Eligibility for Infection Treatment		
Form 2.11	TB Disease Treatment Initiation Form		
Form 2.12	DR-TB Infection Treatment Initiation Form		
Form 3.2	Adherence Card for Treatment Regimens		
Form 3.3	Follow-up Evaluation Form		
Form 3.4	Adverse Event Form		

Contact #:	Name:		
Form 2.5	Initial Assessment Form		
Form 2.6	Chest Radiograph Form		
Form 2.8	Confirming Eligibility for Infection Treatment		
Form 2.11	TB Disease Treatment Initiation Form		
Form 2.12	DR-TB Infection Treatment Initiation Form		
Form 3.2	Adherence Card for Treatment Regimens		
Form 3.3	Follow-up Evaluation Form		
Form 3.4	Adverse Event Form		
Contact #:	Name:		
Form 2.5	Initial Assessment Form		
Form 2.6	Chest Radiograph Form		
Form 2.8	Confirming Eligibility for Infection Treatment		
Form 2.11	TB Disease Treatment Initiation Form		
Form 2.12	DR-TB Infection Treatment Initiation Form		
Form 3.2	Adherence Card for Treatment Regimens		
Form 3.3	Follow-up Evaluation Form		
Form 3.4	Adverse Event Form		
Contact #:	Name:		
Form 2.5	Initial Assessment Form		
Form 2.6	Chest Radiograph Form		
Form 2.8	Confirming Eligibility for Infection Treatment		
Form 2.11	TB Disease Treatment Initiation Form		
Form 2.12	DR-TB Infection Treatment Initiation Form		
Form 3.2	Adherence Card for Treatment Regimens		
Form 3.3	Follow-up Evaluation Form		
Form 3.4	Adverse Event Form		
Contact #:	Name:		
Form 2.5	Initial Assessment Form		
Form 2.6	Chest Radiograph Form		
Form 2.8	Confirming Eligibility for Infection Treatment		
Form 2.11	TB Disease Treatment Initiation Form		
Form 2.12	DR-TB Infection Treatment Initiation Form		
Form 3.2	Adherence Card for Treatment Regimens		
Form 3.3	Follow-up Evaluation Form		
Form 3.4	Adverse Event Form		

*Repeat individual contact patient form section for as many Close Contacts have been identified. Note that not all forms may be used for each individual contact; ex.: Close Contacts assigned to Triage Group 1 will require Form 2.11, while Close Contacts assigned to Triage Group 2 will require Form 2.12.

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Form 3.2 Adherence Card for Treatment Regimens

Name of Patient:										
Month/Year:										
Day	Drug Name									
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
Tick above in each box when dose taken. Record adherence for each drug below for the current month using the following coding scheme: 0 = No doses missed; 1 = 1-3 doses missed; 2 = >3 doses missed; 3 = Pt. stopped medication										
Adherence:										
Plan for addressing poor adherence?										
Were any adverse events reported by the patient during this period? ☐ Yes ☐ No If yes, complete Form 3.4 Adverse Event Form										

*Note: This form is to track adherence of each medication dose, for each day in a month for a patient. Use additional copies of this form as needed to record adherence for all drugs for the entire duration of treatment.

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Form 3.3 Follow-up Evaluation Form

Name of individual assessed:	**Date of birth** (dd/mm/yyyy):
Sex: ☐ M ☐ F	Age:
Have any new individuals entered the household since the last assessment? ☐ Yes ☐ No If yes, fill out initial assessment form for all new members.	
SIGNS AND SYMPTOMS*	
Ask contact if they have experienced the following signs or symptoms in the past two weeks:	
	Tick if present
Cough	☐
Cough with phlegm	☐
Coughing up blood	☐
Difficulty breathing	☐
Fever	☐
Night sweats	☐
Loss of appetite	☐
Weight loss	☐
Lethargy	☐
Headache	☐
Lumps in neck, armpit, or groin	☐
Swollen joints	☐
Back pain	☐
Unable to awake*	☐
Vomiting without other gastrointestinal symptoms*	☐
Other (describe):	☐
Only for children <12 years	
Not gaining weight as expected	☐
Reduced playfulness	☐
Frequent crying	☐
If yes to any of these, evaluate for DR-TB disease. ***If yes to these, needs urgent evaluation.** **¥If yes to these, complete an Adverse Event Form.**	
Since the time of the last assessment, has this patient had any other health problems?	☐ Yes ☐ No If Yes, list:
Since the time of the last assessment, has this patient been started on any new medications?	☐ Yes ☐ No If Yes, list:
Since the time of the last assessment, has this patient become pregnant?	☐ Yes ☐ No If Yes, list:
TREATMENT OF INFECTION	
Is the contact on treatment for DR-TB infection?	☐ Yes ☐ No If Yes, list:
Is the contact having any problems with the medication?	☐ Yes ☐ No If Yes, list:

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

PHYSICAL EXAMINATION		
Temperature:	**Weight:**	**Height (length if under 2):**
Plot weight and height on growth chart; compare to weight from previous visit.		
If evaluated with a stethoscope, do the lungs sound abnormal? ☐ Yes ☐ No ☐ Not done		
Overall appearance:		
If any abnormal findings, patient requires further evaluation.		
IMPORTANT QUESTIONS TO BE ADDRESSED		
Does this person have any nutritional issues that need to be addressed?		☐ Yes ☐ No
Does this person have any economic issues that need to be addressed?		☐ Yes ☐ No
Does this person have any transportation issues that need to be addressed?		☐ Yes ☐ No
Does this person have any health education/promotion gaps that need to be addressed?		☐ Yes ☐ No
Other issues or concerns:		
If yes to any of these, consider providing household support to address concerns.		
OVERALL ASSESSMENT		
Outcome:	☐ Findings are concerning: requires additional evaluation for TB disease and/or adverse events ☐ Findings are not concerning: continue treatment and monitoring	
Action Steps *(check at least one):*		
☐ Continue current management		☐ Provide psychosocial support
☐ Refer for further evaluation for TB disease (state below)		☐ Provide nutritional support
☐ Refer for further evaluation for TB disease (state below)		☐ Provide nutritional support
☐ Modify regimen (describe below; complete new Form 2.11 or 2.12)		☐ Provide economic support
☐ Refer for evaluation and management of AE		
Notes:		
Date of next follow up visit (dd/mm/yyyy):		
Name of Assessment Provider:		
Signature of Assessment Provider:		

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Form 3.4 Adverse Event Form

Adverse Event Follow-up											
Name of patient:						Date of birth:					
Name of assessment provider:											
Adverse event details											
Type of Event	None	Grade 1 Mild		Grade 2 Moderate		Grade 3 Severe		Grade 4 Potentially life-threatening		Unknown	
Joint, muscle, or bone pain	☐	Pain but no interference with function or movement	☐	Moderate pain, affecting function but able to carry out normal activities	☐	Severe pain limiting activities	☐	Disabling pain -- unable to carry out activities	☐	☐	
Skin rashes	☐	Small areas of redness /rash	☐	Dry peeling or widespread rash	☐	Wet peeling, ulcers or uticaria	☐	Severe, widespread rash, necrosis needing hospitalization	☐	☐	
Itchy skin	☐	Slight itching in localized areas	☐	Severe itching in localized areas	☐	Widespread itching over entire body	☐	Uncontrollable scratching needing hospitalization	☐	☐	
Headache	☐	Mild – does not need treatment	☐	Transient/moderate – needs non-narcotic treatment	☐	Severe –responds to narcotics	☐	Intractable pain	☐	☐	
Changes in sleeping/ mood	☐	Mild anxiety	☐	Moderate anxiety or problems getting to sleep	☐	Severe anxiety, problems getting to sleep or repeated waking	☐	Psychosis, unable to sleep for more than an hour	☐	☐	
Lethargy	☐	Activity Reduced but for <48 hours	☐	Slightly irritable or slightly subdued	☐	Very irritable or lethargic	☐	Inconsolable or obtunded	☐	☐	

Patient #:	Index Patient #:	Date (dd/mm/yyyy):

Visual problems	☐	None	☐	Blurred vision or minor visual disturbance lasting less than 1 hour	☐	Repeated episodes of blurring or visual disturbances which resolve	☐	Permanent decrease in visual acuity or field defect	☐	☐
Vomiting	☐	1 episode in 24 hours	☐	2-3 episodes in 24 hours	☐	4-6 episodes in 24 hours	☐	>6 episodes in 24 hours or needing hospitalization	☐	☐
Diarrhea	☐	Slight change in consistency or frequency of stool	☐	Liquid stool	☐	Liquid stool >4x normal frequency for child	☐	Liquid stool >8x normal frequency for child	☐	☐
Jaundice	☐	Jaundice just detectable clinically – bilirubin 1.1 - 1.5 x ULN	☐	Obvious clinical jaundice – bilirubin 1.6 – 2.5 x ULN	☐	Severe jaundice – bilirubin 2.6 – 5 x ULN	☐	Hospitalization – bilirubin >5x ULN	☐	☐
Appetite/nausea	☐	Mild – still eating/ drinking well	☐	Moderate - decreased appetite	☐	Severe – little food taken	☐	No solid or liquid food taken	☐	☐
	☐	*If any, consult clinician regarding AE management.		*If any, consult clinician regarding AE management.		*If any, refer to clinician for evaluation and management.		*If any, refer to clinician and seek immediate medical attention		

Description of event:

Plan of Action:

Index Patient #:	Date (dd/mm/yyyy):

Form 3.5 Food Security Assessment

These next questions are about the food consumed and the affordability of food in the household in the last 12 months, since (current month) of last year. Select the appropriate response from provided choices.

Say to the person answering for the household, "I'm going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for (you/your household) in the last 12 months—that is, since last (name of current month)."

1. "The food that (I/we) bought just didn't last, and (I/we) didn't have money to get more."
   Was that often, sometimes, or never true for (you/your household) in the last 12 months?

   ☐ Often true (1)
   ☐ Sometimes true (1)
   ☐ Never true (0)
   ☐ Don't know or refused (0)

2. "(I/we) couldn't afford to eat balanced meals."
   Was that often, sometimes, or never true for (you/your household) in the last 12 months?

   ☐ Often true (1)
   ☐ Sometimes true (1)
   ☐ Never true (0)
   ☐ Don't know or refused (0)

3. In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

   ☐ Yes (1) [Proceed to Question 3a]
   ☐ No (0) [Skip Question 3a]
   ☐ Don't know (0) [Skip Question 3a]

   3a. How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

   ☐ Almost every month (1)
   ☐ Some months but not every month (1)
   ☐ Only 1 or 2 months (0)
   ☐ Don't know (0)

Index Patient #:	Date (dd/mm/yyyy):

4. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?
   - ☐ Yes (1)
   - ☐ No (0)
   - ☐ Don't know (0)

5. In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?
   - ☐ Yes (1)
   - ☐ No (0)
   - ☐ Don't know (0)

Food Security Assessment Score:
Comments:
Name of assessment provider:

User Notes for Food Security Assessment:

(1) Assessing Households' Food Security Status:

Sum up the values next to the patient's responses. This provides the raw score for the affirmative responses to the six questions.

Food security status is assigned as follows:

- Raw score 0-1—High or marginal food security (raw score 1 may be considered marginal food security, but a large proportion of households that would be measured as having marginal food security using the household or adult scale will have raw score zero on the six-item scale)
- Raw score 2-4—Low food security
- Raw score 5-6—Very low food security

For some reporting purposes, the food security status of households with raw score 0-1 is described as food secure and the two categories "low food security" and "very low food security" in combination are referred to as food insecure.

(2) 30-Day Reference Period: The questionnaire items may be modified to a 30-day reference period by changing the "last 12-month" references to "last 30 days." In this case, item 3a must be changed to read as follows:

3a. [IF YES ABOVE, ASK] In the last 30 days, how many days did this happen?
_____ days or ☐ Don't know

Responses of 3 days or more are coded as "affirmative" responses and contribute 1 point.

(Adapted from U.S. Household Food Security Survey Module: Six-Item Short Form, Economic Research Service, USDA, September 2012)

Index Patient #:	Date (dd/mm/yyyy):

Form 3.6 Psychosocial Assessment of Household

Psychosocial Assessment of Household
1) Housing
What is the primary material of which the house is made?
Does the house have a permanent roof?
How many rooms are in the house?
How many windows are in the house?
Do the windows open?
Does the house have running water?
Does the house have electricity
How many people eat meals in the house?
How many people sleep in the house?
How many beds are there?
How many people sleep in each bed?
Does the house have a yard or outdoor sitting area?
Does the house have a fan?
What kind of cooking fuel is used in the household?
Other comments:
2) Income
What is the primary source of income for the household?
Who earns the primary income for the household?
Are there other income sources for the household? If yes, please list them.
Is this income adequate to meet household needs? Why or why not?
Other comments:
3) Education
How many school-aged children are in the household?
Of these, how many are attending school?
Of those not attending school, why not?
Of those attending school, what barriers do they face to staying in school?
Other comments:
4) Mental health
Are people in the household happy or sad?
Does anyone in the household seem depressed (i.e. crying, lack of interest in activities, etc)?

Index Patient #:	Date (dd/mm/yyyy):

Does anyone in the household drink alcohol? If so, how often?
Does anyone in the household use drugs? If so, how often?
Does anyone in the household seem angry?
Other comments:
5) Social support
Who helps the family when they need something?
Does the household have any religious beliefs or belong to a religious community?
Are there members of extended family who might be able to help if needed?
Other comments:
6) Transportation
What is the primary mode of transport for the household?
What are alternative methods of transport available to the household?
How far away is the nearest health center?
Other comments:
7) Legal issues
Has anyone in the household ever been in prison? If so, describe:
Is there anyone in the household currently in prison? If so, please describe:
Are there other legal issues facing the household? If so, please describe:
Other comments:
8) Other issues
Is anyone in the household drinking alcohol in a way that is problematic for the family (i.e. uses money/resources, inebriation,etc.)?
Is anyone in the household using drugs in a way that is problematic for the family (i.e. uses money/resources, inebriation,etc.)?
Is anyone in the household experiencing violence (i.e. hitting, kicking, slapping, punching, pushing) either from another Close Contact or from someone outside of the household?
How secure is the household in terms of safety?
How stable is the household in terms of permanent or temporary residency?
Are there any other stressors for this household not covered in the previous questions? If yes, please describe.

Index Patient #:	Date (dd/mm/yyyy):

Form 3.7 Infection Control Assessment

ADMINISTRATIVE REQUIREMENTS	
Does the patient understand how TB is transmitted?	☐ Yes ☐ Vaguely ☐ No
Has the patient disclosed his/her TB status to their family?	☐ Yes ☐ Vaguely ☐ No
Does the patient work outside the home?	☐ Yes ☐ Vaguely ☐ No
Does the patient travel outside the home apart from visits to the clinic?	☐ Yes ☐ Vaguely ☐ No
Education offered about DR-TB and prevention of DR-TB?	☐ Yes ☐ Vaguely ☐ No

ENVIRONMENTAL SITUATION		
Structure		
Nature of accommodation: ☐ Slum ☐ Multi-story ☐ Rural		
Number of rooms:		
Number and dimensions of doors:		
Number and dimensions of windows:		
Number and dimensions of fans:		
Facilities in the home		
Running water: ☐ Available ☐ Not available	Electricity: ☐ Available ☐ Not available	Bathrooms: ☐ Available ☐ Not available
Hygiene		
Sanitation and hygiene level: ☐ Poor ☐ Average ☐ Good	Water drainage: ☐ Clean ☐ Dirty ☐ Obstructed	
Awareness of hygiene behavior: ☐ Poor ☐ Average ☐ Good	Waste management: ☐ Clean ☐ Dirty ☐ Obstructed	

Index Patient #:	Date (dd/mm/yyyy):

Form 3.8 Support Phase Record Form

	Date	Contacts assessed (list #s)	Activities	Comments
Visit 1				
Visit 2				
Visit 3				
Visit 4				
Visit 5				
Visit 6				
Visit 7				
Visit 8				
Visit 9				
Visit 10				
Visit 11				
Visit 12				
Visit 13				
Visit 14				
Visit 15				
Visit 16				
Visit 17				
Visit 18				
Visit 19				
Visit 20				
Visit 21				
Visit 22				

*Note: Use additional copies of this form as needed to record all support phase visits

Index Patient #:	Date (dd/mm/yyyy):

Form 3.9 Contact Follow-up Form

#	Contact Name	Age	Contact Action Plan (from Form 2.9)	Treatment completed? (Groups 1 and 2)	Support schedule completed? (All groups)	Disease free at completion of support schedule?	Disease free at 1 year post index patient treatment initiation?
				☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:
				☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:
				☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:
				☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:
				☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:
				☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:
				☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:	☐ Yes. Date: ☐ No. Explain:

Form 3.10 Quarterly Report Form

Quarter:	*Year:*	
Variable	*Value*	*Comment*
Number of index patients identified		
Number of contacts enumerated		
Male		
Female		
Number of contacts assessed in each of the following age groups:		
<1 years		
1 to <5 years		
5 to <10 years		
10 to <15 years		
15 to <20 years		
≥20 years		
Number of contacts referred for secondary assessment		
<20 years		
≥20 years		
Number of contacts with secondary assessment completed internally		
<20 years		
≥20 years		
Number of contacts with chest radiographs completed		
<20 years		
≥20 years		
Number of contacts diagnosed with DR-TB disease		
<20 years		
≥20 years		
Number of contacts started on treatment for DR-TB disease		
<20 years		
≥20 years		
Number of contacts started on treatment for DR-TB infection		
<20 years		
≥20 years		
Number of contacts who experienced an adverse event		
<20 years		
≥20 years		
Number of contacts who completed follow-up and remain symptom-free		
<20 years		
≥20 years		
Number of contacts who developed DR-TB disease		
<20 years		
≥20 years		
Number of households given nutritional support		
Number of households given economic support		

Bolded data points should be prioritized.

RESOURCES

These are algorithms, dosing charts, treatment timelines, and more which may be useful in designing and implementing your program.

TRIAGE PHASE RESOURCES

Resource 1.1 Sample Training Itinerary

Day 1		
Time	**Session Title**	**Topics**
9:00–9:45 am	Introduction	• Presenter introduction • What is TB? • Global and local burden • Difference between TB infection and TB disease • Useful terminology and definitions

9:45–10:30 am	Overview of the Guide	• Introduction to post-exposure care
		  ○ Who, what, when, where, why?
		  ○ Importance of treating TB infection
		• Framework for action

10:30-10:45 am	**BREAK**	

10:45-12:00 pm	Getting Started	• Assessing your capacity
		  ○ Physical, financial, and human resources
		• Planning your approach
		  ○ Defining Close Contacts
		  ○ Choose Triage Phase approach
		  ▪ Criteria for infection treatment
		  ○ Choose Support Phase approach
		• Training your team

12:00-12:30 pm	Getting Started Resources	• Available resources, flow sheets, algorithms, and forms
12:30-1:30 pm	**LUNCH**	

1:30-2:30 pm	Triage Phase	• Index case definition
		• Classification of contacts into three groups:
		  ○ Triage Group 1: TB disease treatment
		  ○ Triage Group 2: TB infection treatment
		  ○ Triage Group 3: Support schedule
		• Triage Phase steps:
		  ○ Identification of Close Contacts
		  ○ Assess contacts for TB disease and triage to three groups
		  ○ Start treatment (Triage Groups 1 and 2) and inform groups about support schedule

2:30-3:00 pm	Triage Resources	• Available resources, flow sheets, algorithms, and forms
3:00-3:30 pm	Triage Barriers	• Potential implementation / logistics barriers
3:30-3:45 pm	**BREAK**	
3:45-4:45 pm	Triage Examples	• Case examples
4:45-5:00 pm	**SESSION WRAP UP**	

Day 2		
Time	**Session Title**	**Topics**

9:00–11:00 am	Support Phase	• Support Phase approach
		  ○ Length of support phase
		  ○ Frequency of monitoring
		• Components of the Support Phase
		  ○ Post-exposure monitoring booklet
		  ○ Support treatment adherence
		  ○ Provide clinical monitoring to identify TB disease and adverse events
		  ○ Address household needs
		  ○ Minimize risk to Close Contacts
		  ○ Record progress

11:00-11:15 am	**BREAK**	
11:15-11:45 pm	Support Resources	• Available resources, flow sheets, timelines, and forms
11:45-12:15 pm	Support Barriers	• Potential implementation / logistics barriers
12:15-1:00 pm	Support Examples	• Case examples
1:00-2:00 pm	**LUNCH**	

2:00-3:00 pm	Program Evaluation	• Collecting baseline data
		• Process indicators
		  ○ Definitions
		  ○ Calculating
		• Interpretation

3:00-3:45 pm	Advocacy	• Convincing policymakers • Bringing stakeholders on board
3:45-4:00 pm	**BREAK**	
4:00-5:00 pm	Questions and Feedback	

SUPPORT PHASE RESOURCES

Resource 2.1 Patient Education Brochure

WHAT IS DR-TB?

TB is a disease caused by germs that mainly causes problems in the lungs and can be dangerous if not treated. DR-TB is a sickness that is caused by the same germ, but the germ is stronger and cannot be treated with the normal medications used for TB. The disease can be cured, but requires more medications given for a longer period of time.

HOW IS DR-TB SPREAD?

DR-TB is spread through the air, after a sick person coughs the germs and other people breathe them in. When a person coughs DR-TB germs into the air, they remain there for a long time, unless they are blown away by a breeze or killed by the light of the sun. Another person breathing this air can become infected with DR-TB.The disease spreads better in people who spend a lot of time indoors together, such as those who sleep in the same room, live in the same house, or share meals together on a regular basis.

This resource is designed to help families understand drug-resistant TB disease and infection.

ZERO child deaths from DR-TB

Sentinel Project on pediatric drug-resistant tuberculosis

This pamphlet was developed by the Sentinel Project on Pediatric Drug Resistant Tuberculosis http://www.sentinelproject.org/

GET THE FACTS ABOUT DRUG-RESISTANT TUBERCULOSIS

A RESOURCE FOR FAMILIES

WHAT IS DR-TB INFECTION?

When a person breathes in the DR-TB germs, sometimes a small number of them invade the lungs and stay there. The person may be fine and have no signs or symptoms at all. This is called DR-TB "infection." In many cases, this DR-TB will stay controlled by the body and not cause any problems. However, in some people, these germs can multiply in number and cause problems in the body.

WHAT IS DR-TB DISEASE?

When the DR-TB germs have multiplied, they cause DR-TB disease. People with DR-TB disease usually have problems with their bodies and they feel sick. Some of these problems may include weight loss or failure to gain weight, tiredness, cough, fever, sweats, headache and lumps in the neck, armpits or groin. Someone with DR-TB disease needs treatment quickly to make them healthy again and to stop them from spreading the disease to others.

HOW IS DR-TB DISEASE DIAGNOSED?

A person who has health problems like the ones described above should be evaluated by a health provider. This provider will examine that person looking for signs of disease, take an Xray of the chest or other parts of the body to look for TB, and get a sample of sputum or other fluids to look for the TB germ. Based on the results of all these tests, a health care provider will decide if a person has DR-TB disease or if there is another reason for the sickness the person is feeling.

HOW IS DR-TB DISEASE TREATED?

DR-TB is a powerful disease and in order to make it go away, persons with the disease will take a number of medications (usually 4 or 5) for a period of 2 years. This can be difficult, but taking the medications every day is the only way to make sure that health returns.

HOW AND WHY IS DR-TB INFECTION TREATED?

People who have been infected by DR-TB but who are not sick have a high risk of becoming sick if nothing is done to stop the disease from getting stronger in the body. One way to stop the disease is to give some medication to the person who has been infected. The number of medications given is less and the period of time they are given for is shorter than for people with DR-TB disease. Healthy foods can also help prevent DR-TB infection from turning into disease.

WHAT CAN BE DONE TO PREVENT DR-TB IN MY HOUSEHOLD?

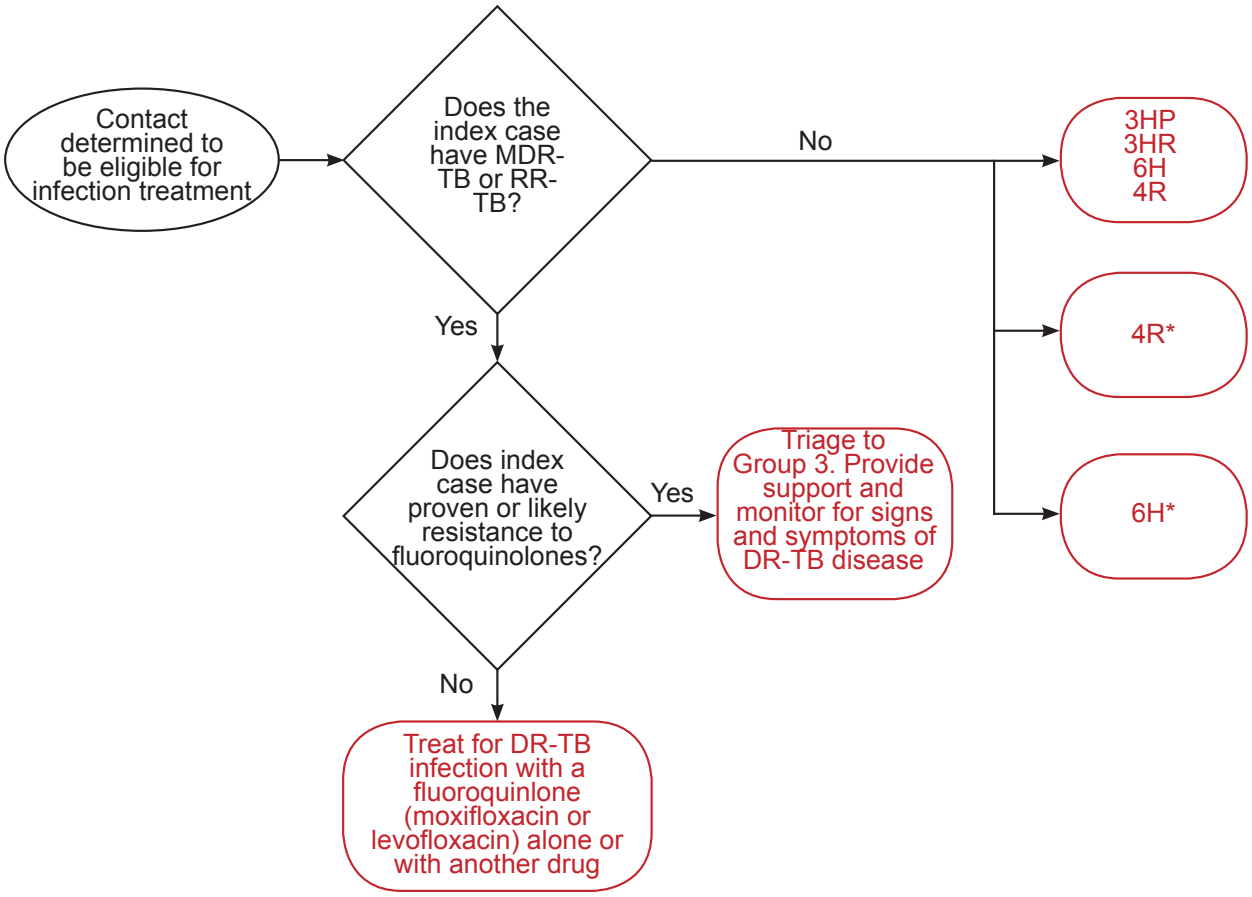
There are many ways to prevent DR-TB. The most important is to recognize the signs and symptoms of DR-TB and immediately take the person with these problems to the health center so they can be started on treatment. Other ways to prevent DR-TB are to keep the windows open and make sure there is good flow of air in the house. Another way is to have fans in the house that can move air around, and to make sure there is sunlight in the house and that persons with DR-TB spend as much time as possible outside. If possible, persons with DR-TB should not share beds with others in the family. Furthermore, family members should give as much encouragement as possible to persons with DR-TB disease or infection receiving medications so they can finish treatment and stay healthy.

COMMON SIGNS AND SYMPTOMS OF DR-TB IN CHILDREN

1. Tiredness
2. Failure to gain weight
3. Weight loss
4. Cough for more than 2 weeks
5. Fever for more than 2 weeks
6. Nightsweats
7. Joint swelling
8. Lumps in the neck, armpit or groin
9. Back pain or swelling
10. Headache
11. Loss of interest in playing
12. Sleepiness without being able to wake*
13. Vomiting without diarrhea*

** These are danger signs and should prompt emergency referral to a health provider*

Resource 2.2 Flowchart to assign DR-TB Infection Treatment Regimen



*If 4R is unavailable, 4HR (child-friendly, fixed dose combination, dispersible) may be substituted. If 6H is unavailable, 6HR (child-friendly, fixed dose combination, dispersible) may be substituted.

Note the following abbreviations used in the above flowchart: 3HP – Isoniazid and rifapentine once a week for 3 months, 3HR – Isoniazid and rifampicin daily for 3 months, 4R – Rifampin daily for 4 months, 4HR – Isoniazid and rifampicin daily for 4 months, 6H – Isoniazid daily for 6 months, 6HR – Isoniazid and rifampicin daily for 6 months.

Due to the limited amount of published evidence on treatment of DR-TB infection, there are challenges in deciding the optimal treatment regimen, including which drugs and the duration of therapy. The drug regimen used should be selected based on local epidemiology, the drug-resistance pattern of the index case, and the adverse event profiles of the medications in the regimen.

The following are samples of regimens given for 6-12 months that have shown significant benefit in observational cohorts in a variety of settings:

1. Ofloxacin, ethambutol, and high-dose isoniazid
2. Moxifloxacin and ethambutol
3. Levofloxacin and ethambutol
4. Levofloxacin and ethionamide
5. Moxifloxacin alone

Expert consensus is that a fluoroquinolone alone or together with one other agent (but not pyrazinamide) to which the strain from the index case is susceptible daily for six months is generally an appropriate regimen.

There may also be a role for delamanid in the prevention of DR-TB in high risk adults, adolescents, children and young children who have been exposed to the DR-TB. The drug is being evaluated in large DR-TB prevention trials and a pediatric formulation of the drug will soon be available, as it is undergoing both long-term safety studies and studies to guide optimal dosages in young children at the time of this writing.

Resource 2.3 Dosing Chart for Disease Treatment Regimens

Target Dose	Group 1: Oral first-line anti-TB drugs				Group 2:	Group 3: Fluoroquinolones					Group 4: Oral bacteriostatis agents					Group 5:		Target Dose
	Ethambutol (15-25 mg/kg)		Pyrazinamide (30-40 mg/kg)		Injectable anti-TB drugs (injectable agents or parenteral agents)	Levofloxacin (15-20 mg/kg)		Moxifloxacin (7.5-10 mg/kg)		Ofloxacin (15-20 mg/kg)	Cycloserine/ Terizidone (15-20 mg/kg)		PAS (150-200 mg/kg)		Protionamide/ Ethionamide (15-20 mg/kg)	Anti-TB drugs with unclear efficacy or unclear role in MDR-TB treatment	Isoniazid High Dose (15-20 mg/kg)	
Available Formulations	100 mg tablet	Suspend 400mg tab in 8 mL of water for a 50 mg/mL suspension	400 mg tablet	500 mg tablet		250 mg tablet	25 mg/mL suspension	400 mg tablet	20 mg/mL suspension	200 mg tablet	250 mg capsule	1 capsule in 10 mL water	Daily	Twice Daily	250 mg tablet		100 mg tablet	Available Formulations
Wt (kg)	Consult with a clinician experienced in pediatric MDR-TB prescribing for neonates (<28 days of age) and infants weighing <3 kg																	Wt (kg)
<3																		<3
3-3.9	1 tab	2 mL	.25 tab	.25 tab	To illustrate dose calculation, take the example of a child that weighs 6.9 kg. Both the low and high doses for the child's weight are calculated. For kanamycin: Low dose: 15 mg/kg x 6.9 kg = 103 mg High dose: 20 mg/kg x 6.9 kg = 138 mg A convenient dosing is then chosen between the two numbers. Select a dose between the two numbers and towards the higher number. In this case, choose: 125 mg per day, single dose. Calculate the number of mL to draw up in the syringe based on the mg/mL concentration of the preparation.	.25 tab	2.5 mL	not recommended	1.5 mL	.5 tab	.25 cap	2.5 mL	500 mg	250 mg	.25 tab	Group 5 drugs are not recommended by the WHO for routine use in MDR-TB treatment because their contribution to the efficacy of MDR regimens is unclear. Their role in pediatric MDR-TB treatment is even less clear. Most of these drugs are expensive, and some require intravenous administration, and/or have severe side effects. However, they can be used in cases where adequate regimens are impossible to design with the medications from Groups 1-4. They should be used in consultation with an expert in the treatment of DR-TB.	.5 tab	3-3.9
4-4.9													1000 mg	500 mg				4-4.9
5-5.9			.5 tab			.5 tab	5.0 mL		2 mL		.5 cap	5 mL			.5 tab		1 tab	5-5.9
6-6.9		4 mL		.5 tab					2.5 mL				1500 mg	750 mg				6-6.9
7-7.9																		7-7.9
8-8.9	2 tabs																	8-8.9
9-9.9						.75 tab	7.5 mL		5 mL		.75 cap	7.5 mL	2000 mg	1000 mg	.75 tab		2 tabs	9-9.9
10-10.9			1 tab							1 tab								10-10.9
11-11.9																		11-11.9
12-12.9				1 tab														12-12.9
13-13.9	3 tabs	6 mL				1 tab	10 mL				1 cap	10 mL	2500 mg	1250 mg	1 tab		3 tabs	13-13.9
14-14.9																		14-14.9
15-15.9			1.5 tabs						7.5 mL	1.5 tabs								15-15.9
16-16.9	4 tabs	8 mL						.5 tab					3000 mg	1500 mg				16-16.9
17-17.9						1.5 tabs	15 mL				1.5 caps	15 mL			1.5 tabs			17-17.9
18-18.9				1.5 tabs					10 mL	2 tabs								18-18.9
19-19.9			2 tabs										4000 mg	2000 mg			4 tabs	19-19.9
20-20.9																		20-20.9
21-21.9																		21-21.9
22-22.9																		22-22.9
23-23.9																		23-23.9
24-24.9																		24-24.9
25-25.9																		25-25.9
26-26.9				2 tabs														26-26.9
27-27.9	5 tabs	10 mL	2.5 tabs			2 tabs	20 mL		12.5 mL	2.5 tabs	2 caps	20 mL	5000 mg	2500 mg	2 tabs		5 tabs	27-27.9
28-28.9																		28-28.9
29-29.9													6000 mg	3000 mg				29-29.9

For preventive regimens, consult with experts regarding optimal regimen construction.
The doses of isoniazid, ethambutol, and fluoroquinolones for preventive regimens are the same as in this dosing chart.

Sentinel Project on pediatric drug-resistant tuberculosis
http://sentinel-project.org

Group 2	Steptomycin	Amikacin	Kanamycin	Capreomycin
Daily Dose	20-40 mg/kg once daily	15-20 mg/kg once daily	15-20 mg/kg once daily	15-20 mg/kg once daily
Maximum Daily Dose	1000 mg	1000 mg	1000 mg	1000 mg

Group 5	Clofazimine (CFZ)	Amoxicillin-clavulanate (AMX-CLV)	Meropenem (MPN)	Linezolid (LZD)	Clarithromycin (CLR)
Daily Dose	2-3 mg/kg once daily; if the child is <25kg give 100mg every second day	80 mg/kg in two divided doses based on the amoxicillin component	20-40 mg/kg IV every 8 hours	10 mg/kg dose twice daily for children <10 years of age 300 mg daily for children >10 years of age (also give vitamin B6)	7.5 mg/kg twice daily
Maximum Daily Dose	200 mg	4000 mg amoxicillin and 500 mg clavulanate	6000 mg	600 mg	1000 mg

Resource 2.4 Dosing Chart for Infection Treatment Regimens

Group A: Fluoroquinolones		
Levofloxacin (Lfx) (15-20 mg/kg/day)		
kg	**250 mg tablet**	**25 mg/mL suspension**
1.0–2.9	Expert consultation	
3.0–4.9	0.25 tab	2.5 mL
5.0–8.9	0.5 tab	5 mL
9.0–11.9	0.75 tab	7.5 mL
12.0–16.9	1 tab	10 mL
17.0–24.9	1.5 tabs	15 mL
25.0–29.9	2 tabs	20 mL
Moxifloxacin (Mfx) (7.5-10 mg/kg)		
kg	**400 mg tablet**	**20 mg/mL Suspension***
1.0–2.9	Expert consultation	
3.0–3.9	not recommended	1.5 mL
4.0–4.9	not recommended	2 mL
5.0–7.9	not recommended	2.5 mL
8.0–13.9	not recommended	5 mL
14.0–14.9	0.5 tab	5 mL
15.0–19.9	0.5 tab	7.5 mL
20.0–26.9	0.5 tab	10 mL
27.0–29.9	0.5 tab	12.5 mL
*Note: the Mfx suspension is not available commercially and must be prepared.		

Group C: Other core second-line agents	
Ethionamide (Eto) (15-20 mg/kg)	
kg	**250 mg tablet 25 mg/mL suspension**
1.0–2.9	Expert consultation
3.0–4.9	0.25 tab
5.0–8.9	0.5 tab
9.0–11.9	0.75 tab
12.0–16.9	1 tab
17.0–24.9	1.5 tabs
25.0-29.9	2 tabs
High Dose Isoniazid (H^h) (15-20 mg/kg)	
kg	**100 mg tablet 25 mg/mL suspension**
1.0–2.9	Expert consultation
3.0–4.9	0.5 tab
5.0–8.9	1 tab
9.0–12.9	2 tabs
13.0–20.9	3 tabs*
21.0–26.9	4 tabs*
27.0–29.9	5 tabs*
Standard Dose Isoniazid (H) (10-15 mg/kg)	
kg	**100 mg tablet 25 mg/mL suspension**
1.0–1.9	Expert Consultation
2.0–3.4	0.25 tab
3.5–4.9	0.5 tab
5.0–7.4	0.75 tab
7.5–9.9	1 tabs
10.0–14.9	1.5 tab
15.0–19.9	2 tabs
20.0–29.9	3 tabs
30.0-40.0	4 tabs

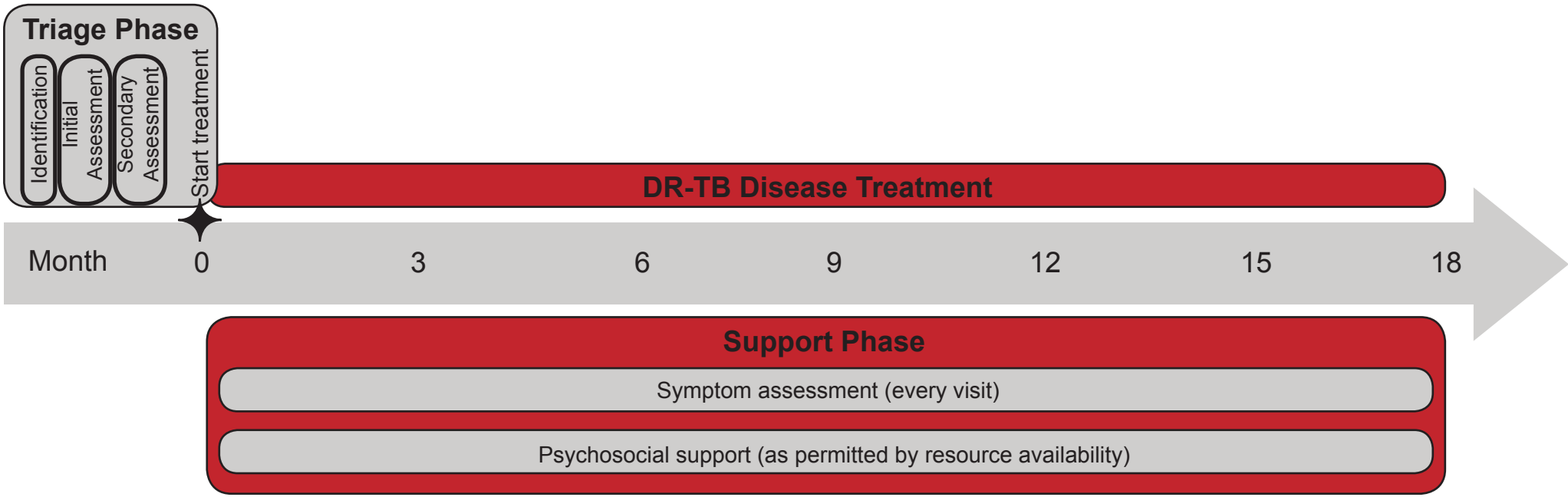
*Note: children over 14 kg can use the adult 300 mg tablet in combination with the 100 mg tablet to reduce the pill count.

Group D: Add-on agents (not part of the core MDR-TB regimen)		
Ethambutol (E) (15-25 mg/kg)		
kg	**100 mg tablet** **25 mg/mL suspension**	
1.0–2.9	Expert consultation	
3.0–7.9	1 tab	
8.0–12.9	2 tabs	
13.0–15.9	3 tabs	
16.0–26.9	4 tabs	
27.0–29.9	5 tabs	
*Note: Older children over 16 kg can use the adult 400 mg tablet in combination with the 100 mg tablet to reduce the pill count.		
Rifampicin (R) (10-20 mg/kg)		
kg	**150 mg tablet**	**300 mg tablet**
1.0–2.9	Expert consultation	
3.0–3.9	0.5 tab	-
4.0–4.9	0.5 tab	-
5.0–7.9	1 tab	-
8.0–12.9	1.5 tabs	-
13.0–17.9	2 tabs	1 tab
18.0–25.9	3 tabs	1.5 tabs
26.0–29.9	4 tabs	2 tabs

Other drugs	
Fixed-Dose Combination: RH 75/50 Rifampicin (75 mg) + Isoniazid (50 mg)	
kg	
1.0–3.9	0.5 tab
4.0–7.9	1 tab
8.0–11.9	2 tabs
12.0–15.9	3 tabs
16.0–24.9	4 tabs
Rifapentine (20-30 mg/kg)	
kg	**150 mg tablet**
1.0–10.0	Expert consultation
10.0–13.9	2 tabs
14.0–24.9	3 tabs
25.0–31.9	4 tabs
32.0–49.9	5 tabs
50.0+	6 tabs (maximum)

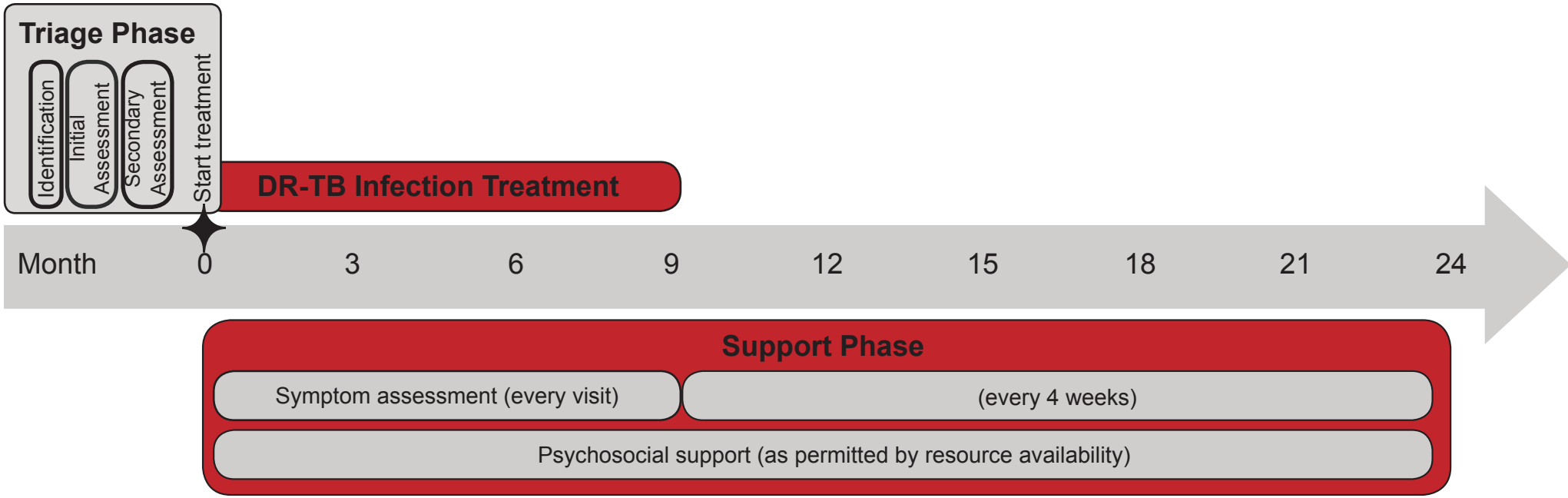
Resource 3.1 Treatment Timelines

Triage Group 1 TB Disease Treatment Timeline



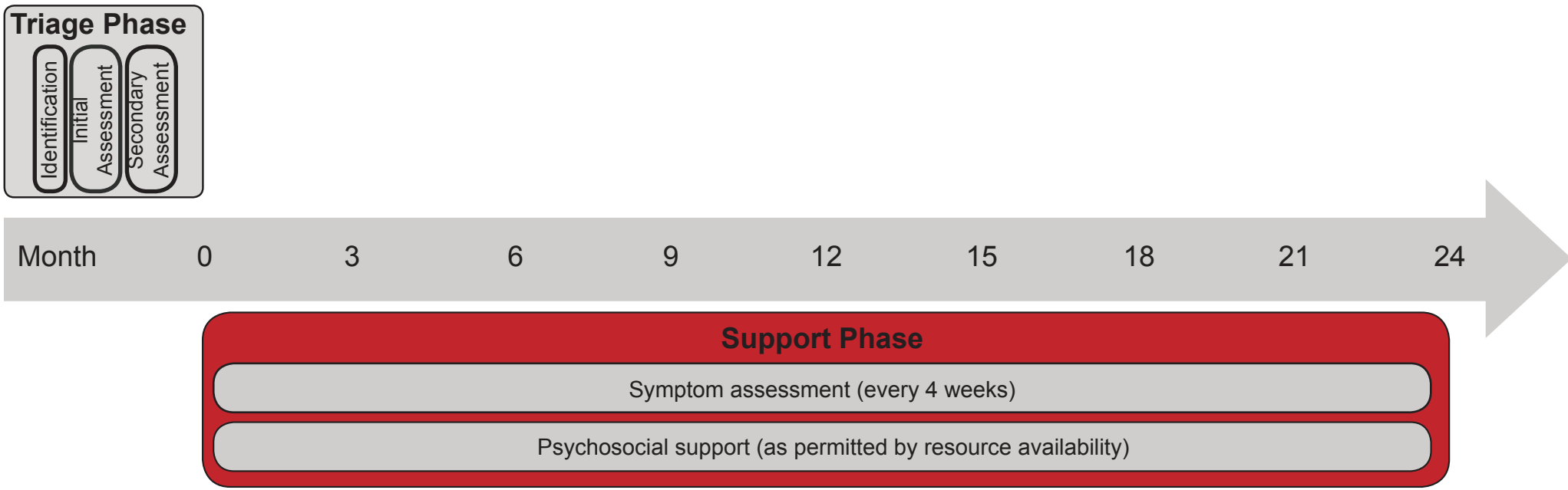
*Note: the duration and monitoring frequency of the Support Phase for Group 1 individuals in your program may differ from this example based on the support phase approach you choose.

Triage Group 2 TB Infection Treatment Timeline



*Note: the duration and monitoring frequency of the Support Phase for Group 2 individuals in your program may differ from this example based on the support phase approach you choose.

Triage Group 3 Follow-up Timeline



*Note: the duration and monitoring frequency of the Support Phase for Group 3 individuals in your program may differ from this example based on the support phase approach you choose.

Resource 4.0 Program Evaluation

PROGRAM EVALUATION

To assess how your program is working, it is recommended that some basic baseline measures be recorded from the year prior to the program being implemented. Collecting baseline measures of TB disease, TB infection, and treatment initiation rates will allow for a comparison to be made to rates after the implementation of your program. This comparison will provide an indication about how your program is performing and what pieces may need to be improved upon.

Baseline data that would be helpful to collect include, but are not limited to the following:

- Number of patients diagnosed with DR-TB disease in the last year;
- Number of patients diagnosed with DR-TB disease through contact investigations in the last year;
- Number of patients with DR-TB disease who initiated TB disease treatment in the last year; and
- Number of Close Contacts of patients with DR-TB disease who initiated DR-TB infection treatment in the last year.

We have proposed a basic framework of 10 process indicators that will allow you to evaluate your program's performance. These process indicators will provide important information about areas in which the program is successful and areas in which the program can be improved upon. Identifying areas for improvement may trigger some corrective action measures to be taken, such as reallocating resources where necessary, changing approaches to the triage or support phases, providing further training to your team members, or adapting forms and/or processes to better reflect the workflow of your program.

We suggest that you assess the process indicators at 3, 6, and 12 months. Below are details about how to assess the process indicators, including:

1. *Defining 10 process indicators that we suggest collecting data on, at a minimum, to evaluate how your program is working;*
2. *Assessing process indicators with collected data;*
3. *Calculation worksheet; and*
4. *Indicator interpretation.*

1. Defining 10 process indicators

10 process indicators are defined below in Table 4.1.

Table 4.1 Process Indicator Definitions

Process Indicator	Definition
P1	The ratio of enumerated contacts to DR-TB disease patients.
P2	The proportion of DR-TB disease patients with zero close contacts identified.
P3	The proportion of DR-TB disease patients for whom a contact investigation is attempted.
P4	The proportion of enumerated contacts who are evaluated.
P5	Contact evaluation outcomes:
P5a	The proportion of contacts diagnosed with TB disease and referred for TB disease treatment.
P5b	The proportion of contacts eligible for TB infection treatment and referred for TB infection treatment.
P5c	The proportion of contacts referred for clinical monitoring (no TB disease and not eligible for TB infection treatment).
P6	The proportion of contacts with TB disease who initiate treatment.
P7	The proportion of those eligible for DR-TB infection treatment who initiate DR-TB infection treatment.
P8	The proportion of those who initiate DR-TB infection treatment who complete the regimen.
P9	The proportion of evaluated contacts who remain TB disease-free after 1 year.
P10	Time to complete the Triage Phase (time from identifying Close Contacts to when the last Close Contact's TB treatment, TB infection treatment, or support schedule begins).

2. Assessing process indicators

Below is a breakdown of how to assess each process indicator, including the data elements that belong in the numerators and denominators for all calculations of proportions and dates for time measurements.

$$\text{Process Indicator} = \frac{\text{(Numerator (N))}}{\text{(Denominator (D))}}$$

Data sources to collect each required data point are listed, including specific form names from the Implementation Tools Annex. Actual calculations can be filled out in **Section 3. Calculation Worksheet**.

Table 4.2 Process Indicator Data Elements and Sources

Process indicator	Data element (all stratified by adults/ children)		Data source
P1	N	Total number of contacts enumerated	Total the number of contacts from all *Contact Registry forms* (Form 2.2)
	D	Number of patients started on DR-TB disease treatment	Count number of *Index Patient Interview Forms* (Form 2.1)
P2	N	Number of patients with zero close contacts identified	Count the number of *Index Patient Interview forms* (Form 2.1) with zero people identified in questions 2-5
	D	Number of patients started on DR-TB disease treatment	Count number of *Index Patient Interview Forms* (Form 2.1)
P3	N	Number with contact investigation attempted	Count the number of *Contact Registry forms* (Form 2.2) with at least one contact marked “yes” on the question: “Initial assessment planned?”
	D	Number of patients started on DR-TB disease treatment	Count number of *Index Patient Interview Forms* (Form 2.1)
P4	N	Total number of contacts evaluated	Total the number of contacts from all *Contact Registry forms (*Form 2.2) with the “Initial Assessment completed” question marked “yes”
	D	Total number of contacts enumerated	Total the number of contacts from all *Contact Registry forms* (Form 2.2)
P5a	N	Contact evaluation outcomes: Number of contacts diagnosed with TB disease and referred for TB disease treatment	Total the number of contacts marked G1 (Triage Group 1: refer for disease treatment) on all *Contact Action Plans* (Form 2.9)
	D	Total number of contacts evaluated	Total the number of contacts from all *Contact Registry forms (*Form 2.2) with the “Initial Assessment completed” question marked “yes”

P5b	N	Contact evaluation outcomes: Number of contacts eligible and referred for DR-TB infection treatment	Total the number of contacts marked G2 (Triage Group 2: refer for infection treatment) on all *Contact Action Plans* (Form 2.9)
	D	Total number of contacts evaluated	Total the number of contacts from all *Contact Registry forms (*Form 2.2) with the "Initial Assessment completed" question marked "yes"
P5c	N	Contact evaluation outcomes: Number of contacts referred for clinical monitoring (no TB disease and not eligible for DR-TB infection treatment)	Total the number of contacts marked G3 (Triage Group 3: refer for clinical monitoring) on all *Contact Action Plans* (Form 2.9)
	D	Total number of contacts evaluated	Total the number of contacts from all *Contact Registry forms (*Form 2.2) with the "Initial Assessment completed" question marked "yes"
P6	N	Number of contacts who initiated TB disease treatment	Count the number of *Disease Treatment Initiation Forms (*Form 2.11)
	D	Contact evaluation outcomes: Number of contacts diagnosed with TB disease and referred for TB disease treatment	Total the number of contacts marked G1 (Triage Group 1: refer for disease treatment) on all *Contact Action Plans* (Form 2.9)
P7	N	Number of contacts who initiated DR-TB infection treatment	Count the number of *Infection Treatment Initiation Forms (*Form 2.12)
	D	Contact evaluation outcomes: Number of contacts eligible and referred for DR-TB infection treatment	Total the number of contacts marked G2 (Triage Group 2: refer for infection treatment) on all *Contact Action Plans* (Form 2.9)
P8	N	Number of contacts who successfully completed DR-TB infection treatment	Total the number of patients with initial action plan listed as Triage Group 2 (G2) and the "Treatment completed?" question marked "yes" on all *Close Contact Follow-up forms (*Form 3.9)
	D	Number of contacts who initiated DR-TB infection treatment	Count the number of *Infection Treatment Initiation Forms (*Form 2.12)
P9	N	Number of contacts who were alive and TB disease-free 1 year after index patient treatment initiation	Total the number of patients with the "disease free at 1 year post index patient treatment initiation?" question marked "yes" on all *Close Contact Follow-up forms (*Form 3.9)
	D	Total number of contacts evaluated	Total the number of contacts from all *Contact Registry forms (*Form 2.2) with the "Initial Assessment completed" question marked "yes"
P10	Time difference between the Triage phase start date and the Triage Phase end date (Triage Phase end date – Triage Phase start date)		Triage phase start date: the date marked at the top of the *Index Patient Interview Form* (Form 2.1) Triage phase end date: the most recent date listed under "intervention (treatment/follow-up) start date" on the *Contact Action Plan*s (Form 2.9)

3. Calculation Worksheet

P1 = $\frac{\text{P1N}}{\text{P1D}}$ = _____ =

P2 = $\frac{\text{P2N}}{\text{P2D}}$ = _____ =

P3 = $\frac{\text{P3N}}{\text{P3D}}$ = _____ =

P4 = $\frac{\text{P4N}}{\text{P4D}}$ = _____ =

P5 = $\frac{\text{P5N}}{\text{P5D}}$ = _____ =

P6 = $\frac{\text{P6N}}{\text{P6D}}$ = _____ =

P7 = $\frac{\text{P7N}}{\text{P7D}}$ = _____ =

P8 = $\frac{\text{P8N}}{\text{P8D}}$ = _____ =

P9 = $\frac{\text{P9N}}{\text{P9D}}$ = _____ =

P10 = Triage Phase start date - Triage Phase end date = _____ - _____ =

4. Indicator interpretation

These indicators are meant to provide valuable information regarding the performance of your post-exposure program. Table 4.3 below provides guidance to assist with the interpretation each process indicator.

Table 4.3 Process Indicator Interpretation Guidance

Process Indicator	Interpretation
P1	The ratio observed should be consistent with household sizes. If the ratio is much lower than the household sizes, then the quality of contact investigations may be low and should be addressed.
P2	The proportion should not be too high as some people do, in fact, live alone. However, a large proportion of patients without contacts may suggest incomplete contact investigations and should be explored further.
P3	The proportion should be as close to 1 as possible. A low proportion should initiate further exploration into available resources and personnel.
P4	The proportion should be as close to 1 as possible. A low proportion should initiate further exploration into available resources and personnel.
P5a	A diagnosis rate of 5-10% is expected based on the literature. A much higher rate suggests delayed diagnoses of index patients. A rate <1% could suggest poor quality evaluations, particularly in young children.
P5b	This will depend on which strategy your program chooses to determine eligibility criteria for DR-TB infection treatment. If treating for DR-TB infection, then this proportion should be as close to 1 as possible.
P5c	This will depend on which strategy your program chooses to determine eligibility criteria for DR-TB infection treatment. If not treating for DR-TB infection, then this proportion should be as close to 1 as possible.
P6	The proportion should be as close to 1 as possible. If less than 1, immediate action should be taken to ensure all persons eligible for TB disease treatment are initiated on TB disease treatment. Barriers to starting TB disease treatment should be noted and addressed.
P7	The proportion should be as close to 1 as possible. If less than 1, immediate action should be taken to ensure all persons eligible for DR-TB infection treatment are initiated on DR-TB infection treatment. Barriers to starting DR-TB infection treatment should be noted and addressed.
P8	The proportion should be as close to 1 as possible. A low proportion should initiate further exploration into barriers preventing persons from completing their DR-TB infection treatment.
P9	This should increase as DR-TB infection treatment use expands and improves.
P10	The time of the Triage Phase should be no longer than 4 weeks. 2 weeks should be the goal.

TIPS

TRIAGE PHASE TIPS

Tip 2.1 Plan for a Successful Household Visit

Home visits can be an important part of the post-exposure activities for families and households in which a patient has been diagnosed with DR-TB. In fact, providing services at the household level will likely increase the yield of all the interventions described in the Guide. Furthermore, a visit to the home can help health care workers assess the living conditions, improve infection control, and understand the needs families may have during this time of health crisis. Most importantly, contacts are frequently identified during a home visit that were not identified during the index patient interview.

There are many practical aspects of home visits that are important to take into consideration:

1. Plan a time for the visit when most household members will be present. This may require evening or weekend visits if children and adolescents are in school and adults are working, or multiple visits.

2. Locating the home: formal addresses may not be available in many communities, and relying on them could be frustrating for providers and families alike. If a formal address is lacking, then the health care workers should get as detailed a set of directions as possible, including important landmarks, and contact phone number(s) (if available). If the family gives permission, a community health worker or nurse could meet the clinic team and provide directions to the home.

3. Privacy and confidentiality must be protected at all times to protect patients and prevent stigma and harassment. When possible, travel in unmarked vehicles wearing plain clothes, with all tools and masks kept in an opaque bag. Respirators should not be worn outside the home. If neighbors should ask about the purpose of the visit, have a neutral answer prepared, such as “I was hoping to have a chance to speak with the family living here” or other culturally appropriate responses.

4. Only visit the household once permission has been given by the index patient. If the family does not want a visit to their household, invite them to suggest other locations that might be more comfortable or convenient for them, such as a nearby health clinic.

5. To protect health care worker’s safety, all personnel involved in household contact interventions should be trained in universal precautions and offered the use of personal protective equipment (i.e. N95 respirators, see Photo 1). All workers involved in the care of DR-TB patients and exposed individuals should undergo yearly health evaluations by a clinical provider as part of the employment package, as they are in a high-risk situation. This includes all personnel who interact with DR-TB patients, including drivers and administrators.

Photo 1. N95 Respirator

Tip 2.2 Conducting Initial Assessments

We describe relevant information to assist with conducting initial assessments for index cases and Close Contacts. The following are suggested to be recorded: medical history assessment, signs and symptoms of TB disease, physical exam findings, results of diagnostic testing (microbiology, drug susceptibility testing (DST) results, chest x-ray, and more), and other pertinent information.

Who should perform the assessments?

Initial assessments can be performed by trained health care workers. If a patient requires a secondary assessment, they will likely be referred to an external facility. If not, further evaluation may be performed by a trained health care worker as well. See Triage Phase Step 2 for more details on how to determine if an individual has DR-TB disease through a secondary assessment.

If there is no provider available who is comfortable assessing special populations, such as young children, international support can be provided by contacting one of the specialists who contributed to this toolkit (sentinel_project@hms.harvard.edu).

Where should initial assessments be performed?

Assessments should be done at a time and place that is convenient for the Close Contacts and their carers. The majority of interventions and assessments can be done in the home, including baseline physical assessments, obtaining sputum and blood samples, and performing HIV counseling and testing, as well as ongoing monitoring and support of other post-exposure interventions. However, some assessments will require visiting a health facility.

A simple note or **referral card** stating that the person has been exposed to DR-TB and needs assessment as well as a description of any symptoms he or she may be having can help streamline the referral process. Examples are provided.

What should the basic physical exam include?

A basic examination should consist of: measurement of temperature, heart rate, and respiratory rate; general physical appearance and mental status; examination and palpation of the neck, axillae, and groin for lymphadenopathy; examination and palpation of the spine for tenderness or deformities; auscultation of the chest for any wheezing, crackles, or other abnormalities. The abdomen should be examined for abdominal distension, tenderness and masses. Results of the physical exam should be documented on the **Initial Assessment Form** (Form 2.5).

All children should be weighed; this should be recorded in the child's Road to Health (or equivalent) card and compared to previous weights.

Form 2.4
Referral Cards for Investigation of DR-TB Disease

Form 2.5
Initial Assessment Form

What are the symptoms of TB disease?

Following is a list of some common symptoms of TB disease in adults and children that should be assessed at each visit:

- Cough for more than two weeks
- Fever
- Night sweats
- Weight loss
- Failure to gain weight or grow
- Swollen lymph nodes
- Lack of interest in normal activities, including play
- Vomiting without any other symptoms

Symptom-based screening should focus on the common presenting symptoms for TB disease, in particular the presence of persistent cough, fever, and failure to thrive or weight loss. However, it is important to remain aware that special populations such as young children and persons with HIV may present with atypical symptoms. Such symptoms include unexplained lethargy, difficulty in breathing without cough and abnormal mental status. Children with pulmonary TB may have significant clinical (and radiological) abnormalities on examination even when there is no clinical evidence of respiratory distress. It is imperative to ask about these, especially in children.

The majority of persons with TB disease identified by contact screening will not be sick enough to require hospitalization even when they have some symptoms. On the other hand, high risk populations, such as children with TB disease or adults with severe TB disease, advanced age, or co-morbidities, can present with clinical illness that requires hospitalization, as well as prompt investigation and management, even when the cause of the illness is still uncertain; this may be the case with illnesses such as meningitis, severe pneumonia or severe malnutrition. Therefore, if there is diagnostic uncertainty, it might be most appropriate to follow-up and re-assess within the next 1 to 2 weeks, in some instances following a course of oral antibiotics.

Chest Radiography

If a contact's initial assessment prompts further assessment for DR-TB disease, one option to help determine if an individual has DR-TB disease is to perform a chest radiograph. If a chest X-ray is done, these films should be read by someone experienced in reading chest x-rays, especially given that abnormalities may be difficult to interpret in children and in people living with HIV. Radiographs should be reviewed for the presence or absence of bony abnormalities, effusions, lymphadenopathy, large airway compression, infiltrates, miliary patterns, cavities or other signs of TB disease. These findings should be documented in the **Secondary Assessment Form** (Form 2.7). The **Chest Radiograph Form** (Form 2.6) may be used to document greater detail. Pathologic lymphadenopathy can be difficult to assess in some settings and may require interpretation by more than one practitioner. In settings where practitioners experienced in reading chest radiographs are scarce or when a second opinion is desired, radiographs may be evaluated by another practitioner remotely via telemedicine. Radiographic findings should always be correlated with clinical signs and symptoms.

Form 2.7
Secondary Assessment Form

Form 2.6
Chest Radiograph Form

Cough

Cough due to respiratory infection is very common in infants and young children (often 4-6 episodes per year). This can make it difficult to diagnose TB disease. Most cases of cough will be due to a viral illness that is self-limiting and will improve after 1 week. Therefore, if the cough has lasted for less than 2 weeks and there is no sign of pneumonia (i.e. no fast breathing or chest indrawing), arrange for follow-up in 1-2 weeks; if at that point the cough is persistent and not improving, evaluate for TB disease. If pneumonia is suspected, treat the child with antibiotics according to local program guidelines and monitor the child's response. Again, consider TB disease if symptoms persist. Figure 4 shows a number of different types of cough. Cough associated with TB disease usually gets progressively worse over time as shown by the solid line.

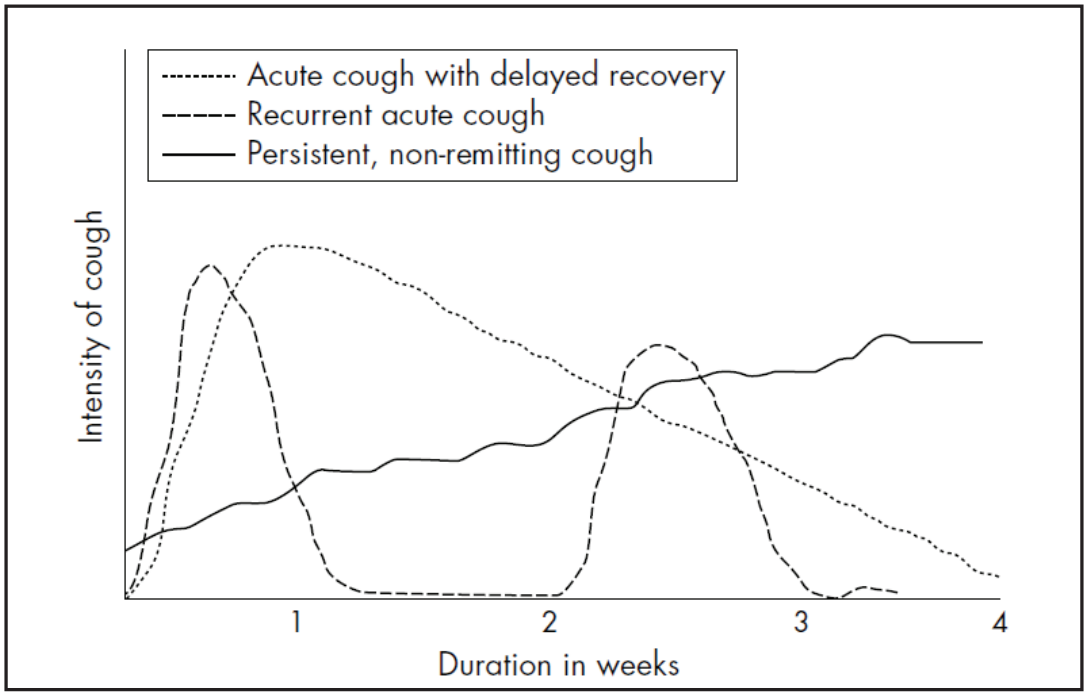


Figure 4. Patterns of intensity and duration for three varieties of cough: the solid black line is characteristic for TB disease[1]

Weight

Weight loss or failure to gain weight can be the first sign of TB disease in a child, signaling the need for further investigation, even in the absence of other symptoms. It is essential that all children be weighed and that their growth curve is assessed at each interaction. Guidelines for the management of a sick child (e.g. External Resource: **Integrated Management of Childhood Illness Pocketbook**) should always be followed. When in doubt, referring a child for further evaluation is a reasonable choice of action.

External Resource
Integrated Management of Childhood Illness Pocketbook

HIV Testing and Treatment

Many persons exposed at home to DR-TB are known to be HIV infected and may already be on antiretroviral therapy. In such instances, DR-TB screening, treatment of infection, and/or treatment of disease should be coordinated with HIV care.

[1]Figure from: Marais BJ, Gie RP, Obihara CC, Hesseling AC, Schaaf HS, Beyers N. Well defined symptoms are of value in the diagnosis of childhood pulmonary tuberculosis. Arch Dis Child. 2005;90(11):1162-5.

Those who do not know their HIV status or who have previously tested HIV negative should be offered HIV counseling and testing. These should be offered at a time and location that is convenient and confidential.

Tuberculin skin test (TST) and Interferon Gamma-Releasing Assay (IGRA)

In many low-TB burden, high-resource settings, a test of immunologic exposure to TB is part of an assessment to determine if treatment of infection is needed. This is usually done via a TST or an IGRA. These tests have a role to play in the setting of a low-grade or questionable exposure to DR-TB, especially one that occurs outside of the household. For persons living within the household, however, such tests are not needed to determine if infection has occurred. Both tests have inadequate sensitivity or specificity to rule out or confirm infection, especially in young children and persons living with HIV—ironically the persons most at risk for becoming sick with DR-TB after an exposure. For this reason, the WHO does not recommend these tests as necessary in the determination of persons in need of treatment DS-TB infection following a documented high-risk exposure. Such tests could be useful for assessing DR-TB infection when there has been a low-risk exposure, but as with DS-TB, they are not necessary to diagnose DR-TB infection or disease when a high-risk exposure has been documented.

Tip 2.3 How to Perform Assessment Procedures

Many programs will already have standard techniques for performing the following procedures and activities. If your program does not have standard procedures in place, the following general tips can be incorporated.

Height

Height should be recorded, if possible, especially for children so a growth curve can be followed. A portable measurer would be ideal. The person being measured should be instructed to remove their shoes and any items on their head (caps, hair clips, etc.), as culturally appropriate. They should place their back against a wall, ensuring that their position is as straight as possible, verifying that the heels, buttocks, upper back, and back of the head are in contact with the wall. Arms should be held straight down, next to the body, and legs should be together and straightened with heels together and toes separated, forming a 45° angle, and ensuring the patient is not on their tiptoes. The patient's head should be upright and facing forward. If the patient's neck needs to be stretched, place both hands on the lower edge of the lower jaw and gently pull upwards until the neck is fully stretched and straight. The measuring device (stick or tape, or other) should measure from the floor to the top-most part of the patient's head (gently compressing the hair down if necessary). Height should be recorded in centimeters and with one decimal; e.g. 162.5 cm.

Length

For children under 2 years of age, length should be recorded when possible. The simplest way to do this is to use a simple tape measure, or whatever other measuring tool is available. The baby should be positioned on his/her back with his/her head against a wall or another flat surface. The baby's knees should then be held together and gently pressed down until they straighten. Length should be recorded in centimeters and with one decimal; e.g. 25.5 cm.

Weight

A scale should be placed in a suitable location on a flat level and firm floor. Scales should be calibrated (at least) annually to ensure accuracy of measurements. Before each use, the scale should be checked to make sure it is balanced at zero prior to any weight being added. The person being measured should be instructed to remove their shoes and any items in their pockets such as keys, coins, etc. that might alter weight, as culturally appropriate. The patient will then step on the scale, standing on the center of the platform of the balance with arms extended along the body and head facing forward. The patient should be in-

structed to avoid moving if possible to avoid oscillations in readings of the weight. Weight should be recorded in kilograms and with one decimal; e.g. 42.5 kg.

To weight a baby, a basket can be used. The baby can be placed in a basket, which will then be placed on the center of the scale platform. Record this weight (W1). Next, the baby can be removed from the basket, and the basket weighed on its own. Record this weight (W2). The baby's weight can be calculated as W1 – W2. Weight should be recorded in kilograms and with one decimal; e.g. 12.1 kg.

Temperature

Prior to vital signs (including temperature and blood pressure) being taken, the patient will be asked to sit or stand still for at least 15 minutes.

Guidance for using a thermometer in an axillary position (under the armpit) follows. This is written assuming a mercury thermometer is being used. First, the thermometer should be cleaned with a cotton swab moistened with alcohol and then allowed to dry. Verify that the mercury column of the thermometer reads less than 35°C. Ask the patient to separate their arm from their chest. If the armpit is damp, first clean with a wet cloth. Once the patient's arm is raised, place the bulb of the thermometer in the armpit. Remove after three to five minutes. Observe the degree of mercury in the mercury column. Record the temperature in degrees centigrade (°C).

Guidance for using an oral thermometer follows. Use a digital thermometer, when possible. Take the thermometer out of its holder, put the tip into a new throw-away plastic cover, if available. If a cover is not available, clean the thermometer with alcohol and then rinse with cool water. If using an oral glass thermometer, turn the thermometer in your hand until you see the red, blue, or silver line. The line should read less than 35° C. If the line reads more than 35° C, firmly shake the thermometer downward several times. Next, with mouth open, put the covered tip if digital and covers available, or end with red, blue, or silver tip if oral glass thermometer, under the tongue, gently closing lips around the thermometer. If digital, the thermometer will beep when ready and the temperature can be read from the thermometer's digital window. If oral glass thermometer, keep under tongue for 3 minutes and then remove without touching the tip. Gently wipe with a tissue, hold at eye level, and read the red, blue, or silver-colored line. Record the temperature in degrees centigrade (°C).

Tip 2.4 Referrals

Places and types of referrals:

- Health centers: young children, persons with HIV, and persons with symptoms of TB may be referred to a health center to have a physical examination performed. Other activities that could be done at the health center include chest x-rays, obtaining sputum or gastric samples for TB testing, HIV counseling and testing, and more.

- District Hospitals: If x-rays are not available at the health center, patients must be referred to a district hospital. Other complicated procedures, such as extraction of samples from the lymph nodes or abdominal fluid, biopsy, lumbar puncture, and bronchoscopy may require referral to the district hospital as well. Very sick patients may require admission to the hospital for further assessment and monitoring.

- Specialist Referral Centers: In some situations, there may be need for assessments to be done at a specialized hospital with expertise in the diagnosis and management of DR-TB in special populations.

Whenever possible, assessments should be done close to home and be convenient for the family. All assessments needed at a health center or other specialized centers should be coordinated. If a referral center is far away or difficult to access, transportation support should be provided for the family to ensure they are able to attend their appointments. Adding additional incentives for attending appointments could be considered. If hospitalization is required, the family should be supported so that there is minimum disruption to the family.

Continuation of care

To ensure that individuals receive the services they need in a timely fashion, the reason for the referral must be clearly communicated from the referring to the receiving providers. A simple note or **referral card** stating that the person has been exposed to DR-TB and needs assessment as well as a description of any symptoms he or she may be having can also help streamline the referral process. Finally, the results and findings of the referral must clearly communicated to the family and the team doing the post-exposure assessment to ensure proper continuation of care.

Ensure completion of the referral

It is important to note that if steps are not taken to ensure the successful completion of this evaluation, the effectiveness of this Guide is decreased. It is often found that contacts who are referred do not attend their follow-up visit for numerous reasons, including lack of transportation, long wait times at the referral clinic, referral and diagnostic fees, poor communication between the referring and receiving clinicians, fear of attending a hospital or TB clinic, and lack of quality services at the referral site. Each of these factors must be addressed for the intervention to be a success.

It is recommended that these sick patients follow up with the team to which the patient has been referred within one to two weeks. The referring team should follow up with the patient in two weeks; if the patient has not completed the referral, the referring team must work with the patient to address barriers to care. Front-line providers or health care workers may even consider accompanying the Close Contacts when they go for referrals to ensure the necessary evaluations are completed and results are well communicated.

Form 2.4
Referral Cards for Investigation of DR-TB Disease

Tip 2.5 Reverse Contact Tracing (or Source Case Investigation)

If a child with microbiologically-confirmed DR-TB disease does not have an identified Close Contacts with DR-TB disease and has been in at least one of the settings mentioned in **Tip 2.6**, reverse contact tracing or source case investigation should be considered. The objective of this activity is to find and treat the source case that infected the child the DR-TB. This Guide can be applied in such scenarios, with the sick child defined as the "index" patient.

Countries will need to decide when and how to carry out these interventions, as they may be expensive and relatively low yield. Decisions could be made on a case-by-case basis, depending on the details of the exposure. Take the example of a 3 year-old child who is diagnosed with DR-TB disease, has no household contacts can be identified, and spends 8 hours a day in a pre-school care center with 10 other young children. In this case, an expanded contact tracing would be prudent, given the large amount of time the child spends at the care center and the fact that other children may be at risk. On the other hand, if an 11 year-old is diagnosed with DR-TB and no contacts are found at home, investigating the football club where he spends 2 hours a week playing outside would likely return a low yield.

Tip 2.6

Tip 2.6 Post-exposure Activities Outside the Household

There may be other settings where individuals—especially children—are at high risk of being exposed to DR-TB. These may be difficult to define and act upon from a public health point of view, but they should be considered for expanded post-exposure interventions, especially when an infectious adult is identified within the setting.

These include:

1. Crèche /day care centers;
2. School;
3. Sports and social clubs;
4. Orphanages;
5. Malnutrition and diarrheal disease wards;
6. Religious gatherings; and
7. Detention centers.

While it may be important to carry out post-exposure activities outside of the household or close social setting, doing so increases the risk for loss of privacy, discrimination, and severe psychosocial consequences for the sick child. In spite of efforts to protect privacy, it can often be easy to identify who the sick child is because he or she may be absent from school or crèche. Other parents in the setting may panic upon hearing that there has been a potential DR-TB exposure. For these reasons, staff should approach contact tracing in settings outside of the household/close social network in a delicate manner with a clear plan to act in a calm and reasonable manner that can be picked up by parents and other families in the setting.

Coordination with other health initiatives

There are multiple ongoing and successful public health interventions deployed for children on a large scale basis that focus on preventing disease (i.e. vaccination campaigns) and identifying at-risk children (i.e. nutritional screening). While keeping these interventions focused is important, they present an ideal setting for other simple children's health interventions.

TB is usually not included in these interventions, often because of the misconception that initial screening of children for TB is too complicated. While a full assessment of a child for TB risk is clearly outside of what can be paired with a targeted health intervention, such as a vaccination campaign or community de-worming, asking a simple question of all families presenting for such interventions could identify children who have been exposed to both TB and DR-TB and allow for a specialized team to deploy a full post-exposure intervention. While there are many examples of questions that could be asked of parents or caregivers, some simple examples are "has anyone in your household been diagnosed with TB in the last year?" or "has anyone in your household died in the past year?" Although these questions will not capture every at-risk child and adolescent, they are good screenings question that could readily be added to other child health interventions. Referral cards such as the **"Referral Cards for Investigation of DR-TB Disease"** implementation tool may be helpful for the referring clinician or health worker to provide in order to inform the receiving clinic of the patient's TB exposure and improve the coordination of care.

Form 2.4
Referral Cards for Investigation of DR-TB Disease

SUPPORT PHASE TIPS

Tip 3.1 Potential Adverse Events of DR-TB Medications when treating for DR-TB infection

Adverse event	Management strategy	Comment
Nausea/vomiting	• If hepatitis suspected, stop all drugs and refer for urgent assessment. • Give medications with food, or space the doses throughout the day • Usually diminishes over time	• Can be caused by multiple medications (isoniazid, levofloxacin) • If persistent or accompanied by jaundice or abdominal pain, may be a sign of liver toxicity. Persistent vomiting could be a sign of increased intracranial pressure. • Important to consider TB meningitis as a cause of vomiting
Headache	• Make sure the patient is drinking lots of fluids • Symptomatic management with anti-inflammatories	• Can be caused by multiple medications (isoniazid, levofloxacin) • If severe and associated with vomiting, may be a sign of TB meningitis
Joint pain	• Symptomatic management with anti-inflammatories • Check correct dosage being given • Topical treatment • Exercise	• Often caused by fluoroquinolones • Usually transient
Rash	• If severe or widespread, consult a clinician as may need to stop medications • Topical creams • Antihistamine	• Could be caused by multiple medications

Tip 3.2 Infection Control

The **Infection Control Assessment** form provided can be used. Compassionate infection control measures that should be implemented in the household when a DR-TB patient has been identified include:

- Wearing of a surgical mask by the DR-TB index patient during the first few days or weeks after effective therapy has been started or during situations with high transmission potential (i.e. breast feeding of infants);
- Opening of windows and curtains to allow for natural ventilation and sunlight in the home;
- Avoiding the index patient sharing beds or even bedrooms/sleeping spaces with other Close Contacts if possible during the first few weeks after effective therapy has been started; and
- Spending time with visitors outside or in other well-ventilated areas of the home during treatment.

Patients diagnosed with DR-TB disease are often instructed to wear surgical masks to decrease the likelihood of transmission. While this may be reasonable during the first few weeks they are started on therapy, when inside and in close proximity to others, being asked to wear a mask can be isolating and stigmatizing for patients. Once a person has been started on effective therapy—even for just several days—there is good evidence to show their likelihood of transmitting TB reduces dramatically. Breastfeeding mothers may want to wear surgical masks during feeding sessions for the first couple of weeks of DR-TB disease treatment and care should be taken to avoid co-sleeping, but there is little need for a DR-TB patient to wear a mask at home or in the community as long as they remain on appropriate therapy.

Form 3.7
Infection Control Assessment

EXTERNAL RESOURCES

EXTERNAL RESOURCES

Resource	Author	Full Citation
Coloring Book: *We can defeat TB! A book of stories and activities to learn about tuberculosis.*	The Sentinel Project on Pediatric Drug-Resistant Tuberculosis	The Sentinel Project on Pediatric Drug-Resistant Tuberculosis (2016). We can defeat TB! A book of stories and activities to learn about tuberculosis. Boston, USA: The Sentinel Project on Pediatric Drug-Resistant Tuberculosis.
Integrated Management of Childhood Illness Pocketbook	World Health Organization	World Health Organization (2005). Model IMCI Handbook: Integrated Management of Childhood Illness (WHO/FCH/CAH/00.12). Geneva: World Health Organization. ISBN: 9241546441
Management of Multidrug-Resistant Tuberculosis in Children: A Field Guide, 3rd Edition	The Sentinel Project on Pediatric Drug-Resistant Tuberculosis	The Sentinel Project on Pediatric Drug-Resistant Tuberculosis (2016). Management of Drug-Resistant Tuberculosis in Children: A Field Guide. Third edition. Boston, USA: The Sentinel Project on Pediatric Drug-Resistant Tuberculosis.
Rapid Clinical Advice: The Use of Delamanid and Bedaquiline for Children with Drug-Resistant Tuberculosis	The Sentinel Project on Pediatric Drug-Resistant Tuberculosis	The Sentinel Project on Pediatric Drug-Resistant Tuberculosis (2016). Rapid Clinical Advice: The use of Delamanid and Bedaquiline for Children with Drug-Resistant Tuberculosis. Boston, USA: The Sentinel Project on Pediatric Drug-Resistant Tuberculosis.
Tuberculosis: Practical guide for clinicians, nurses, laboratory technicians and medical auxiliaries	Médecins Sans Frontières and Partners In Health	Médecins Sans Frontières & Partners In Health (2014). Tuberculosis: Practical guide for clinicians, nurses, laboratory technicians and medical auxiliaries. ISBN: 2-906498-96-3
Systematic Review, Meta-analysis, and Cost-effectiveness of Treatment of Latent Tuberculosis to Reduce Progression to Multidrug-Resistant Tuberculosis	Suzanne Marks, Sundari Mase, and Sapna Bamrah Morris	Marks SM, Mase SR, Morris SB. Systematic Review, Meta-analysis, and Cost-effectiveness of Treatment of Latent Tuberculosis to Reduce Progression to Multidrug-Resistant Tuberculosis. Clin Infect Dis. 2017;64(12):1670-7.

EVIDENCE

For your reference, this section provides evidence to support the Guide, including the treatment of TB infection, rationale for the support phase, and so on.

EVIDENCE: Reports on the Treatment of Presumed Multidrug-Resistant Tuberculosis Infection

Because there is limited published evidence on treatment of DR-TB infection, there are still challenges deciding on the optimal treatment regimen, including the drugs to give, the length of therapy, and what the risk-benefit ratio of such treatment is in a relatively healthy population of individuals. The drug regimen used should be selected based on local epidemiology, the drug-resistance pattern(s) of the index patient(s), and the adverse event profiles of the medications in the regimen.

First Author	Year	Location	Regimen	Efficacy	Safety
Adler-Shohet[1]	2014	California, USA	Lfx and PZA given under DOT, aiming for 9 months	26 children treated for TB infection. None developed TB disease.	Only 8 completed therapy with Lfx and PZA due to adverse events. 6 changed to Lfx monotherapy.
Attamna[2]	1998-2006	Israel	Tailored treatment mainly Cfx and PZA	12 contacts treated for TB infection with tailored regimen: 71 given H, 6 other treatments and 387 given nothing. None developed TB disease.	Not stated.
Bamrah[3]	2009-2012	Chuuk, Federated States of Micronesia	Mfx or Lfx alone, or Mfx or Lfx combined with E, or Lfx combined with Eto.	Of 104 treated for TB infection, none developed TB disease. Of 15 not treated for TB infection, 3 developed TB disease.	56 of 104 (53%) experienced adverse events. 4 patients stopped treatment early due to adverse events.
Denholm[4]	1995-2010	Victoria, Australia	A variety of regimens including first-line drugs and fluoroquinolones	Of 49 eligible contacts, 11 treated for TB infection. None developed TB disease.	4 of 11 had adverse events. 2 patients stopped treatment early.
Feja[5]	1995-2003	New York, USA	Regimen tailored to the DST of the index case Mean duration: 9.1 months	51 children treated for TB infection. None developed TBw disease.	8 out of 22 with charts available for evaluation experienced adverse events. 2 required cessation of treatment.
Garcia-Prats[6]	2013	Cape Town, South Africa	Ofx, E and high-dose H Duration: 6 months	24 children treated for TB infection. None developed TB disease.	2 children developed adverse events; 1 child stopped treatment early.
Lou[7]	1999	Pittsburgh, USA	Lfx and PZA Duration: 12 months	57 solid organ transplant patients treated for MDR-TB infection. None developed TB disease.	32 stopped treatment early due to adverse events.

Papastavros[8]	2000	Hamilton, Canada	Lfx and PZA	17 contacts treated for TB infection. None developed TB disease.	Adverse events seen in 14 patients. Treatment stopped in all.
Ridzon[9]	1997	California, USA	Ofx and PZA Duration: 12 months	22 contacts treated for TB infection. None developed TB disease.	Medications stopped in 13 contacts due to adverse events, serious adverse events in 3.
Sasaki[10]	1998-2002	Japan	Varied combinations of first- and second-line drugs	41 contacts treated for TB infection. 13 developed TB disease.	Not stated.
Schaaf[11]	1994-2000	Cape Town, South Africa	Regimen tailored to DST of index case Duration: 6 months	2 (5%) of 41 children given 6 months of treatment for TB infection developed TB; 13 (20%) of 64 children not given treatment progressed to disease	Some gastrointestinal adverse events due to ethionamide.
Seddon[12]	2010-2012	Cape Town, South Africa	Ofx, E and high-dose H Duration: 6 months	186 children treated for TB infection. Of those with good adherence to treatment, 2 developed TB disease.	7 (3.7%) children developed grade 3 adverse events. No children required cessation of treatment.
Trieu[13]	2005	New York, USA	Mfx and PZA	50, mainly HIV-positive, adult contacts treated for TB infection. 30 (60%) completed treatment. None developed TB disease of the same strain as the index case.	3 discontinued due to adverse events.
Williams[14]	2006-2010	United Kingdom	A variety of 2-drug regimens including first-line and second-line drugs Duration: 6-12 months	8 children treated for TB infection. None developed TB disease.	Not stated.

Lfx: levofloxacin; PZA: pyrazinamide; Cfx: ciprofloxacin; H; isoniazid; Mfx: moxifloxacin; Eto: ethionamide; E: ethambutol; DST: drug susceptibility test; Ofx: ofloxacin; TB: tuberculosis; MDR: multidrug-resistant; HIV: human immunodeficiency virus

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ZERO child deaths from DR-TB

Sentinel Project
on pediatric drug-resistant tuberculosis