Understanding the **TB Cohort Review Process**

An Instruction Guide

2006

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TB Elimination

Understanding the TB Cohort Review Process:

Instruction Guide

2006

Department of Health and Human Services
Centers for Disease Control and Prevention
Division of Tuberculosis Elimination
Atlanta, Georgia

UNDERSTANDING THE TB COHORT REVIEW PROCESS: INSTRUCTION GUIDE

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Adopting Cohort Review: It Can Make a Difference

Letter from Director of CDC's Division of Tuberculosis Elimination

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service
Centers for Disease Control
and Prevention (CDC)
Atlanta, GA 30333

Dear Colleague:

The 2000 Institute of Medicine report *Ending Neglect: The Elimination of Tuberculosis in the United States* concluded that tuberculosis (TB) elimination is feasible, but will require "aggressive and decisive action beyond what is now in effect." The report recommended adopting an aggressive strategy in order to maintain control and ensure the most efficient application of resources. To this end, TB control programs must develop new standards by which to monitor and evaluate program performance.

One such evaluation method is cohort review, a systematic review of patients with TB disease and their contacts. This method, used in countries around the world and in several programs in the United States, examines a group or "cohort" of patients from a specific period of time in terms of individual patient outcomes and overall program performance.

The cohort review process has proven to be a very useful tool for ensuring accountability, educating staff about protocols and goals, and improving case management and prevention. Case managers and other staff know that their day-to-day efforts will be reflected in the cohort review several months later and that they are accountable for the services they provide. They are responsible for ensuring that patients who are started on treatment finish treatment. As a result, patients are less likely to "fall between the cracks" and receive inadequate care. Since 1993, when the cohort reviews began in New York City, the treatment completion rate there has increased from less than 50% to 93%.

You may already conduct administrative reviews of TB cases and contacts. The cohort review method builds upon many current practices, but adds a quantitative difference to program review and examination of treatment outcomes. It is a management process that will motivate staff, reveal program strengths and weaknesses, indicate staff training and professional education needs, increase staff accountability for completion of treatment for both TB disease and latent TB infection (LTBI), and improve TB case management and the identification of contacts.

Admittedly, adopting the cohort review methodology is a challenging undertaking. As with any change in management approach, there will be bumps in the road, and the positive results may not be immediately evident. Successful implementation requires an ongoing commitment to adopting this management approach, tailoring it to fit local needs, training and motivating staff, and following up on noted problems.

To assist you in learning and applying the cohort review method, a team from the Centers for Disease Control and Prevention and the Charles P. Felton National Tuberculosis Center at Harlem Hospital have developed the attached instruction guide. We believe it provides an excellent starting point for program areas in implementing the cohort review methodology.

I wish you success in adapting this methodology in your program area. Improved program evaluation data will allow you to efficiently apply your program resources and maintain TB control—the first steps toward eliminating tuberculosis.

Sincerely,

Kenneth G. Castro, M.D.
Assistant Surgeon General
Director
Division of Tuberculosis Elimination
National Center for HIV, STD, and TB Prevention

Acknowledgments

The Centers for Diseases Control and Prevention (CDC) and the Charles P. Felton National Tuberculosis Center at Harlem Hospital gratefully acknowledge the contributions of the staff of the New York City Department of Health and Mental Hygiene, Bureau of Tuberculosis Control (BTBC), for their expertise and ongoing guidance in the development of these materials. Their professionalism and dedication to the success of this project have made this instruction guide possible. We would also like to thank the Washington State Department of Health Tuberculosis Program for their contributions to and support of this project.

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About These Materials

This document will explain what the cohort review method is, how to use it to enhance your current TB control activities, and how to adapt it to your own program area. It is intended primarily for the management team—the program manager, medical reviewer, and epidemiologist or data analyst—or the staff person who performs these functions in your program area. It will also be a useful training resource and reference tool for case managers and their supervisors as they participate in reviewing the outcomes of treatment for TB disease and contact investigations.

The document can be used for self-study or for organizing training for groups of staff who will be involved in the cohort review. A 22-minute videotape, *Understanding the TB Cohort Review Process*, accompanies this guide. The videotape brings the cohort review process to life, illustrates the benefits of adopting cohort review, and highlights the roles of the cohort review team members. Quotes from TB cohort review experts appearing in the video are presented in this document to provide testimony about their experiences with implementing the cohort review process.

After you have read this guide and completed the exercises, you will be able to

- Define the cohort review approach
- Discuss the roles key TB control staff play in the cohort review process
- List the three essential elements of the cohort review process
- Plan how to adapt and implement the cohort review method in your program area

The document is organized into the following sections:

- **Definition** of the cohort review approach, its context, and its history
- **Roles** of key TB control staff in a cohort review
- **Timeline** for conducting cohort reviews
- **Three key elements** in the process
- **Guidance** on tailoring the cohort review to your program area
- **Glossary, Bibliography, and Resources**

Many of the tools and processes in this guide are modeled on the highly successful program at the New York City Department of Health and Mental Hygiene, Bureau of Tuberculosis Control (BTBC). It is recognized that each program area is different, in its TB epidemiology as well as in its TB control and prevention efforts. It is not true that one size fits all. However, in any setting the principles of systematic review and accountability that are fostered by the cohort review method can help improve overall program performance.

What Is the Cohort Review Method?

Cohort review has been an integral part of the TB control approach advocated by the International Union Against Tuberculosis and Lung Disease (IUATLD). Dr. Karel Styblo, who pioneered the approach in Tanzania, proposed the idea of a local management unit that would have the staff and resources necessary to diagnose disease, initiate treatment, monitor adherence, and report patient treatment progress. After Dr. Styblo visited and reviewed the New York City TB Program, the Medical Director of the program implemented a cohort review process in which the Medical Director himself personally reviewed every one of the thousands of cases for treatment details and completion. The implementation of cohort review in conjunction with other TB control measures resulted in a steep increase in completion rates and, beginning in 1993, a steep decline in the number of reported TB cases. More impressive was the even sharper decline in the number of reported cases of multidrug-resistant TB (MDR TB), from 441 cases in 1992 to just 38 cases in 1998.

The cohort review process can take many forms. In its most simplified form, TB control staff at the local level meet to review the treatment outcomes of every patient listed in a chronological patient register. Today, with computerized TB registries, multimedia projection, and cheaper long-distance communications, it can be adapted to a variety of settings.

> *"The fundamental concept of a cohort review is accountability. Staff are accountable to supervisors and to the program for how well they are caring for patients...and the program is accountable to patients and to the public for controlling tuberculosis."*
>
> Thomas Frieden, MD, MPH, New York City Commissioner of Health

Cohort review is a systematic review of the management of patients with TB disease and their contacts. A "cohort" is a group of TB cases counted over a specific period of time, usually 3 months. The cases are reviewed approximately 6–9 months after they are counted; therefore, many of the patients have completed treatment or are nearing the end of treatment. Details regarding the management and outcomes of TB cases are reviewed in a group setting with the following information presented on each case by the case manager:

- Patient's clinical status
- Patient's treatment outcome
- Adequacy of the medication regimen
- Treatment adherence or completion
- Results of contact investigation
- Percentage of patients who did, or are likely to, complete treatment.

All TB patients should be assigned a case manager, whether they receive TB care in one of the health department clinics or from a private provider. During the cohort review, case managers present the TB cases for which they are responsible, often assisted by staff involved in contact investigation, directly observed therapy, and initial patient evaluation. TB case managers know that their day-to-day case management efforts will be reflected in the cohort review several months later and that they are accountable for the services they provide. Information reported on each case at the cohort review session is found in Table 1.

Table 1: Case Information Reported in a Cohort Review

- Patient's initials and case number
- Age
- Sex
- Country of birth
- HIV status
- Smear and culture results
- Chest radiograph (CXR) results
- Drug susceptibility results
- Status of treatment (completed therapy, currently taking TB medications, lost, died, moved, or case reported at death)
- Directly observed therapy status
- Results of the source case investigation, if the patient is a child
- Number of contacts identified
- Number of contacts evaluated
- Number of contacts infected, but without disease
- Number of contacts infected and having disease
- Number of contacts started on treatment for latent TB infection (LTBI)
- Number of contacts completing treatment for LTBI

The presentation of cases allows staff to detect potential problems in the way the case is being managed, such as the use of an inappropriate regimen or an inadequate number of contacts tested. It also allows clinicians, managers, and public health advisors to consult on difficult cases, especially those in which the patient is nonadherent, has MDR TB, or has numerous contacts in a congregate setting. Finally, it allows senior staff and managers to recognize the intensive efforts of staff in managing TB cases and contacts.

Overall, the cohort review process can benefit the TB program by

- Increasing staff accountability for patient outcomes,
- Improving TB case management and the identification of contacts,
- Motivating staff,
- Revealing program strengths and weaknesses, and
- Indicating staff training and education needs.

1. Program Objectives

Increased accountability helps TB control programs meet their program objectives and national objectives. In order to assess progress in attaining objectives, TB control teams must clearly delineate the desired outcomes. Programs often have layers of objectives that they are striving to meet simultaneously. At the national level, the Centers for Disease Control and Prevention provides objectives for all programs they support. State or local TB control programs may also set objectives for program performance. The following are examples of layered program objectives that can be monitored with the use of cohort review.

Table 2: Examples of TB Program Objectives

Actual CDC National Objectives*	• At least 90% of confirmed TB cases will complete treatment within 365 days. • At least 90% of sputum AFB-smear positive TB cases will have contacts identified. • At least 95% of contacts to sputum AFB-smear positive TB cases will be evaluated. • At least 85% of infected contacts started on treatment for LTBI will complete treatment within 365 days.
Examples of State Objectives	• At least 80% of TB cases will be treated by DOT. • For close contacts placed on treatment for LTBI, at least 90% of those persons under 15 and 75% of persons 15 and older will complete a recommended course of LTBI treatment.
Examples of Local Objectives	• Health department staff will interview at least 90% of persons with TB disease within 3 business days of case notification. • At least 90% of contact investigations will be completed within 90 days.

* "Department of Health and Human Services, CDC, Tuberculosis Elimination and Laboratory Cooperative Agreements, Program Announcement Number 05003" (also referred to as the "FY 2005 TB Cooperative Agreement").

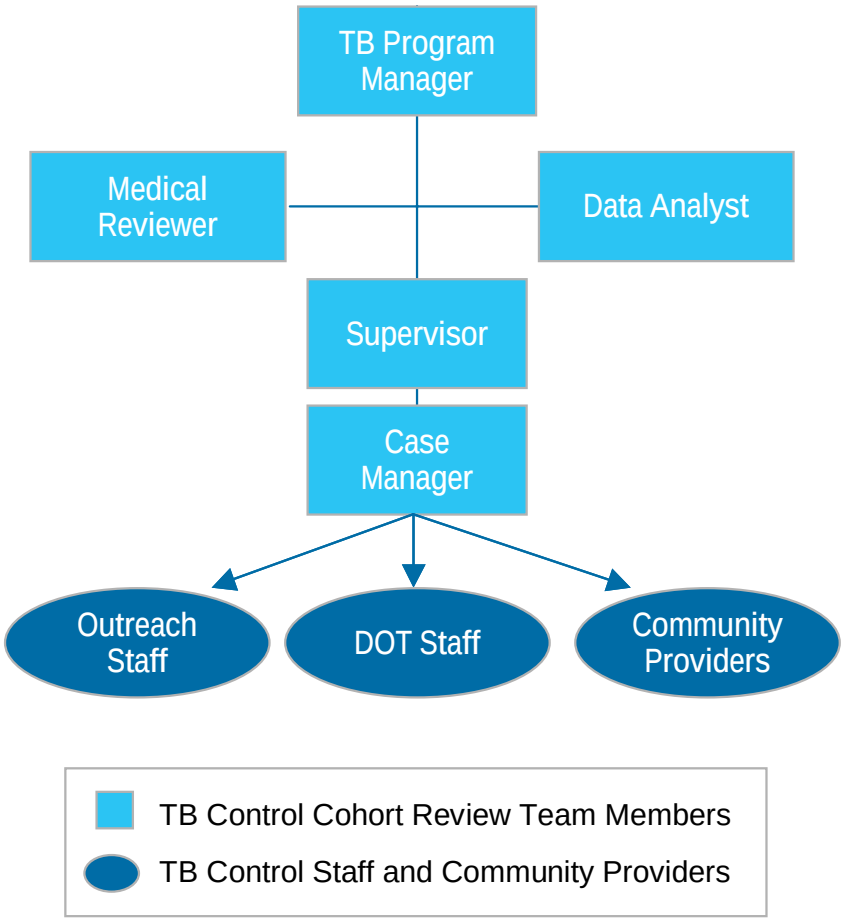
"The benefit of cohort review, in my experience, is that you really are changing the knowledge base of those who are practicing TB prevention and control…in just a year, we had improved timeliness of contact investigation and improved quality of our contact investigation."

Kim Field, RN, MSN, TB Program Manager, Washington State Department of Health TB Program

2. Roles of the TB Control Team

Tuberculosis control teams throughout the United States are composed of health professionals with many different job titles and roles. Urban, high-incidence areas may have a unit large enough to be divided into specific functional teams. In contrast, rural or low-incidence areas may have only a few staff who manage the entire TB program. For the purpose of outlining the cohort review approach, we will highlight five functional roles for TB control team members: TB program manager, medical reviewer, data analyst, supervisor, and case manager. It is important to note that although the roles have been given "position titles," these may be different in some settings. Depending on the size and make-up of the TB control team, members might also play multiple cohort review roles. In reading this section, one should focus on the functions for each of the team members rather than the specific position title.

The sample organizational chart below reflects the possible interrelationship of team members.



At first glance, a cohort review presentation may seem to be only a presentation of outcomes of TB case management activities. In reality, the cohort review presentation is the culmination of a long process that begins the day the case is reported, far in advance of the presentation day. The following tables highlight the specific roles of members of the TB control team in preparing for and conducting a cohort review. These roles will be explored in more detail as each element of the cohort review process is explained.

Table 3: Role of the TB Program Manager

TB Program Manager
Preparation for a cohort review • Demonstrate commitment to the cohort review process. • Ensure staff at all levels understand the reasons for undertaking cohort reviews. • Ensure staff at all levels have the knowledge and skills needed to perform the tasks required. **Cohort review presentation** • Listen to all case presentations. • Ask questions of clarification to ensure that all aspects of case management adhere to department of health policies and procedures. • Use teachable moments to illustrate important lessons in effective TB control. **Follow-up after cohort review** • Ensure that medical management and other issues are addressed. • Ensure that ongoing, follow-up staff education incorporates program strengths and weaknesses.

Table 4: Role of the Medical Reviewer

Medical Reviewer
Preparation for a cohort review • Demonstrate commitment to the cohort review process. • Ensure staff at all levels understand the reasons for undertaking cohort reviews. **Cohort review presentation** • Listen carefully to all case presentations and review available support documents (e.g., printouts from TB registry, charts, and medical records). • Ensure that all aspects of case management adhere to department of health policies and procedures. This includes ensuring that – Activities are completed in a timely manner – Data are complete (e.g., date of birth, entry to US, HIV status) – Drug regimen is appropriate (e.g., probe for explanations for nonstandard regimens) – Susceptibility results are obtained, drug regimen adjusted if necessary – Sputum conversion and completion of treatment are documented – Contact investigation activities and outcomes are assessed • Ask questions of clarification to make sure policies and procedures were followed and the outcome is satisfactory. • Use teachable moments to illustrate important lessons in effective TB control. **Follow-up after cohort review** • Ensure that medical management issues are addressed. • Ensure that ongoing, follow-up staff education incorporates program strengths and weaknesses.

Table 5: Role of the Data Analyst

Data Analyst
Preparation for a cohort review • Prepare lists of cases to be reviewed ahead of time: preliminary cohort list 5 months before cohort review, final cohort list 2 months before cohort review. • Distribute the lists to case managers and supervisors so they can be prepared to present these cases. • Enter relevant information on each case and contact on the cohort summary sheet. • Prepare a summary of the current cohort to present at the review session. • Calculate the outcomes of previous cohort patients who were likely to complete and contacts who were still on treatment for LTBI. **Cohort review presentation** • Present summary of the current cohort of cases. • Record data on treatment outcomes and other missing information, while the case managers present each case. Note any issues for clarification. • Tabulate or calculate the treatment outcomes for cases and contacts; present this at the end of the cohort review session. **Follow-up after cohort review** • Write a report of the cohort review outcomes and distribute it to everyone who has a need to know.

Table 6: Role of the Case Manager

Case Manager
Preparation for a cohort review • Follow all protocols for case management to ensure that patients adhere to treatment, comply with medical visits, and complete treatment. • Follow all protocols for contact investigation to ensure that contacts are identified and evaluated, and that they complete treatment for LTBI, if appropriate. • Communicate periodically with clinic and outreach workers to ensure everything is proceeding without problems; troubleshoot problems. • Participate in case review meetings with your supervisor and case conference meetings with your TB control team as these are scheduled. • Ensure a complete job had been done (e.g., all loose ends are tied up, all details are considered, and you have information to answer any questions). • Prepare a concise presentation of the case according to a standard format. • Participate in a mock cohort review session to practice your presentation and become accustomed to handling questions that might arise (optional). **Cohort review presentation** • When the TB program manager calls one of your cases, speak loudly and clearly as you deliver your concise presentation. • Answer questions from the TB program manager, medical reviewer, data analyst, or other TB team members. • Ask any questions you may have about patient care issues. • Ask your fellow caseworkers and supervisor to provide any information relevant to your case presentation if necessary. **Follow-up after cohort review** • Follow up to obtain any missing information or clarify details that were noted during the cohort review. • Update TB registry information as needed. • Meet with your supervisor to discuss what went well and what could be improved for the next cohort review in 3 months. • Continue case management if patient has not completed treatment; continue contact investigation activities until contacts who should start or complete LTBI treatment have done so.

Table 7: Role of the Supervisor

Supervisor
Preparation for a cohort review • Supervise and assist your case management and contact investigation staff in following protocols. • Hold one-on-one case review meetings with each staff member. • Hold periodic case conference meetings with your entire team. • Troubleshoot problems with staff. • Make sure staff prepare a concise presentation of the case according to a standard format. • Hold a mock cohort review session for staff to practice presentation skills. Ask them the kinds of questions that might arise in a real cohort review. **Cohort review presentation** • Let staff members speak for themselves. • Only add something if more detail or confirmation of the approach or activities is required. **Follow-up after cohort review** • Follow up to ensure staff obtain missing information, clarify details, and update TB registry information, as noted during the cohort review. • Meet with staff as soon as possible to discuss what went well and what could be improved for the next cohort review in 3 months.

3. Timeline for Activities in the Cohort Review Process

A "cohort" is a group of TB patients who are being managed over a specific period of time, usually 3 months. In order to evaluate treatment and contact investigation outcomes, the patients'cases are reviewed approximately 6–9 months after initial case reporting. This is after most patients with TB disease have had time to complete treatment and after most contacts have been identified, evaluated, and started on treatment for latent TB infection (LTBI), if indicated. A review at 6–9 months allows the TB control team to evaluate the adequacy of treatment and correct any problem areas while there is still time for the patient to complete treatment within 365 days. Most contacts infected with LTBI will not have completed therapy because of the time gap between patient reporting, testing of contacts, and the 9-month duration of standard isoniazid (INH) treatment. Contacts on treatment for LTBI should be tracked through to completion by the case manager. The data analyst reports treatment completion rate for contacts at the next review session.

The following timeline illustrates the cohort review process:

Table 8: Cohort Review Timeline

1ST Quarter Months 1–3	2ND Quarter Months 4–6	3RD Quarter Months 7–9	4TH Quarter Months 10–12	Next Year 1ST Quarter Months 1–3
• TB cases counted • Treatment started • Contact investigation initiated	• Ongoing treatment of patients with TB disease • Contacts evaluated and started on treatment, as necessary	• Ongoing treatment of patients with TB disease • Contacts evaluated and started on treatment, as necessary	• TB disease treatment completed • Infected contacts continue on treatment for LTBI	• Contacts identified in previous year's 1st quarter complete treatment
• Cohort review process begins, ongoing case management, case review meetings, cohort review practice session			Cohort Review Session • Begin to follow up on suggestions from cohort review	• Treatment completion rate presented for contacts of cases from previous 1st quarter • Continue to follow up on suggestions made during cohort review session

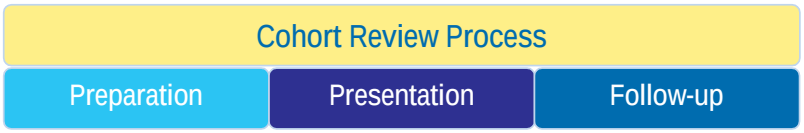
This cycle is repeated throughout the year. Cohort review sessions take place each quarter so that every TB case and contact investigation receives a thorough review. An example of a cohort review schedule is presented below.

Table 9: Example of a Cohort Review Schedule

Quarter Case Reported	Quarter Case Reviewed
1st (Jan-Mar 05)	4th (Oct-Dec 05)
2nd (Apr-Jun 05)	1st (Jan-Mar 06)
3rd (Jul-Sep 05)	2nd (Apr-Jun 06)
4th (Oct-Dec 05)	3rd (Jul-Sep 06)

4. Essential Elements of the Cohort Review Process

TB programs across the country have adopted a variety of approaches to conducting cohort reviews. All of the approaches incorporate the same key elements of preparation, presentation, and follow-up.



Preparation encompasses developing program objectives, ensuring that sound case management protocols are in place, using a reliable TB registry, and carefully preparing the case.

The element of presentation includes using a standardized format for cohort reviews, providing TB case and contact information to the TB control team, and presenting immediate feedback on goal accomplishment.

Follow-up involves acting on the recommendations of the TB control team from the cohort review session, ensuring that those patients and contacts started on treatment complete treatment, and following up on programmatic issues (e.g., training) that were noted at the cohort review session. Using this process allows TB programs to improve outcomes through a continual cycle of learning.

> *"I see the cohort review as an educational experience. I learn what it is that staff are doing, it tells me what are the issues that are there for every patient, what are the barriers that staff face, and all of the things that they accomplish…"*
>
> Sonal Munsiff, MD, Director, Bureau of TB Control,
> New York City Department of Health and Mental Hygiene

The following table lists the elements associated with the preparation, conduct, and follow-up in a cohort review process. It is designed so that your TB program may conduct an at-a-glance assessment of its readiness to conduct cohort reviews, and it provides an overview of what may need to be enhanced in order for you to implement the cohort review approach.

Exercise 1: TB Program Self Assessment

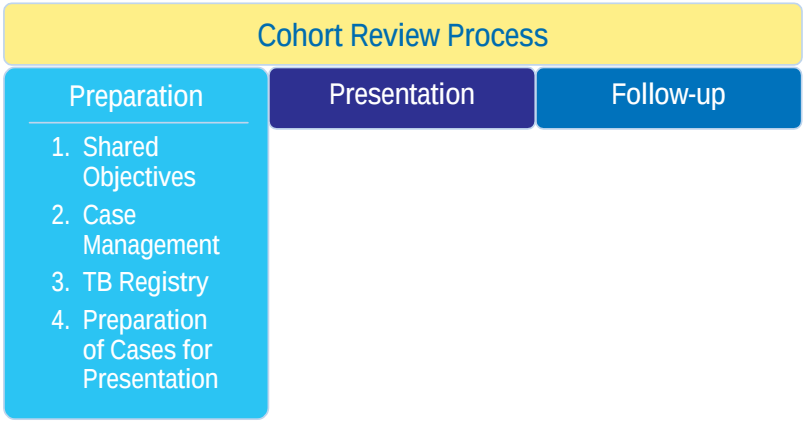
Essential Elements of the Cohort Review Process			
What are you already doing?	**YES**	**NO**	**What may need to be enhanced in order for you to conduct a cohort review:**
1. Preparation			
• Ensuring that TB program staff know TB program objectives			• Delineate national, state, and local objectives for your program • Communicate these objectives to all TB program staff
• Using a comprehensive case management system			• Ensure that case management protocols are clearly written, comprehensive, and practical for staff to implement
• Using a reliable TB registry			• Specify data elements that need to be collected to evaluate program objectives • Ensure that staff update registry information regularly • Use the registry to generate cohort lists for TB control team members
• Carefully preparing cases for presentation			• Use periodic case reviews to ensure that case and contact information needed for the cohort review is collected • Consider adding practice sessions to hone case presentation skills • Implement a standard form and presentation format to ensure consistent, concise, and complete presentations
2. Presentation			
• Presenting each case in detail to the TB control team			• Allow team members sufficient time to analyze and evaluate TB cases and contact investigations
• Providing on-the-spot feedback to staff, troubleshooting, and aggregate reporting			• Allow time for troubleshooting of case management issues • Develop a standard format for aggregate reporting of data
3. Follow-up			
• Following up on noted problems			• Team members use information gathered at cohort review to follow up on cases and contact investigations, address staff training issues, and solve programmatic problems

These elements of cohort review will be detailed in the next chapters.

Notes

Essential Element 1: Preparation for a Cohort Review

This chapter provides information for preparing for a cohort review session. Each of the four areas of cohort review preparation is explained in detail, and the necessary tools are provided. For some areas, case studies or exercises are suggested to help individual readers or groups learn necessary skills.



1. Shared TB Program Objectives

In order for cohort reviews to be successful, all staff should know the objectives of the TB program. Staff who have shared in the development or articulation of these objectives may be more vested in their accomplishment. Working toward the same goals instills accountability within each TB team member for TB cases, contact investigations, and program outcomes.

To guide TB control efforts, several levels of objectives have already been set by other agencies such as CDC, or state and local health departments. Examples of these objectives were presented in "Table 2: Examples of TB Program Objectives" on page 3. It is essential that staff members understand how their efforts aid the TB control program in meeting these objectives.

The following exercise assists TB control teams with understanding the importance of developing shared objectives.

Exercise 2: Developing TB Program Objectives

1. Read the CDC National TB Program Objectives below.
2. How do the outcomes in your program area compare to the CDC National Objectives?
3. Write any specific state-level TB control objectives in the second box. How do the outcomes in your program area compare with the objectives listed?
4. Write any specific local-level TB control objectives in the third box. How do the outcomes in your program area compare with the objectives listed?

Read CDC National TB Program Objectives	• At least 90% of confirmed TB patients will complete treatment within 365 days. • At least 90% of TB patients with positive AFB sputum-smear results will have contacts identified. • At least 95% of contacts to TB patients with positive AFB sputum-smear results will be evaluated. • At least 85% of infected contacts who are started on treatment for LTBI will complete treatment within 365 days.
Insert state-level objectives for TB control	• • •
Insert local-level objectives for TB control	• • •

5. Are there any new objectives your program area would like to set? If so, what are they?

For a cohort review, the objectives become the standards to which the outcomes of case management and contact investigation efforts are compared. The objectives also dictate which data elements need to be collected in the TB registry and presented at the cohort review session. For example, in order to determine what percentage of contacts of smear-positive patients were evaluated, data must be collected on smear results, number of contacts identified, and number of contacts evaluated.

After the cohort review, if some new aspect of the program needs to be strengthened, objectives can be revised or new objectives can be added for the next cohort review. For example, one TB program believed that the timeliness of conducting the first interview with a newly diagnosed TB patient was an area that needed improvement. Therefore they set an objective that was SMART, an objective that is specific, measurable, attainable, realistic, and time-framed. The objective was that "At least 90% of persons identified with TB disease will be interviewed by health department staff within 3 business days of case notification." Starting at the next cohort review, the date the case was reported and the date of the initial interview were part of the standard case presentation format. By adding these data elements, the program was able to track this timeliness variable and measure improvement over time.

2. Comprehensive Case Management

Comprehensive case management is essential in TB control and elimination efforts. Cohort review brings together data from many of the components of case management and provides a qualitative assessment of the effectiveness of case management activities.

Case management is a system in which a specific health department employee, typically a case manager, is assigned primary responsibility for managing the patient's case. Systematic, regular review of patient progress is conducted, and plans are made to address any barriers to adherence. All reported cases should be assigned to a case manager, whether they are seen at a health department clinic or in the private sector. The case manager is responsible for ensuring that patients adhere to treatment, comply with medical visits, and complete treatment. In addition, case managers are also responsible for making sure that contacts are identified and evaluated, and that they complete treatment for LTBI, if appropriate.

In general, case managers are expected to

- Follow all policies and protocols for **case management** to ensure that patients adhere to treatment, comply with medical visits, and complete treatment.
- Follow all policies and protocols for **contact investigation** to ensure that contacts are identified and evaluated, and that they complete treatment for LTBI if appropriate.
- Communicate periodically with clinic and outreach workers to ensure all aspects of patient care are being addressed and troubleshoot any problems that arise.
- Participate in case review meetings with their supervisor and the TB control team.
- Prepare information on each case, present the information at the cohort review session, and follow up on suggestions made at the cohort review session.

Exercise 3: Reviewing Case Management Protocols

Discuss the following questions with your TB control team.

1. What case management policies and protocols does your program area have?

2. How are existing case management policies and protocols leading to successful outcomes compared to your objectives?

3. How are contact investigations included in the policies and protocols?

4. What modifications of the policies and protocols would be useful to help staff do a better job?

For more information on case management protocols and training, see the Resources section at the end of this document.

3. Reliable TB Registry

A reliable TB registry is an essential tool of the cohort review process. Typically, programs use a registry database to collect TB patient and contact investigation information. A locally developed database provides the universe of patients from which the cohort is drawn. The date on which the case is counted determines the cohort in which the case will be reviewed.

A reliable TB registry will include

1. General patient information: name, address, telephone number, date of birth, sex, race, ethnic origin, date of entry into the United States (if foreign born), and country of origin.
2. Medical history: disease site, laboratory results (smear, culture, susceptibility, conversion), radiology, drug regimen, adherence, if on DOT, evaluation dates, completion of treatment or other disposition, provider name or code, etc.
3. Contacts: name, address, telephone number, sex, date of birth, relationship to patient, TST status, medical evaluation, and information about LTBI treatment (started treatment, regimen, disposition).

The data analyst will use the registry to generate the list of TB cases to be reviewed in a given cohort, being certain to include the data elements needed to evaluate program objectives. He or she will distribute the lists to case managers and supervisors so they can be prepared to present these cases.

The following lists are prepared and distributed ahead of time:

- **Preliminary cohort list.** Distributed 5–6 months before a cohort review. This list provides diagnostic and preliminary treatment and contact information. The supervisor and case manager use this list to track the cohort of patients from a quarter and to begin preparation of case presentations for a cohort review.
- **Final cohort list.** Distributed 1–2 months before a cohort review. This list provides updated treatment information from the registry and the results of the contact investigation. The supervisor and case managers use this list to hold practice review sessions and complete final preparation of the case presentations.

Typically, a "line listing" is all that is needed—one line for each case. The information may be more complete for the final cohort list because more time has elapsed. See "Table 10: Sample of Preliminary Cohort List" and Table 11: Sample Final Cohort List: on the following two pages.

Table 10: Sample Preliminary Cohort List

(An actual cohort list would include all patients reported over a 3-month period.)

Preliminary Cohort List
(5 months prior to cohort review)

Quarter:_____

Last Name	Registry Number	Case ID Date	Last Visit	Site – Diagnosis	Cavitary CXR	Smear Positive	Culture Positive	INH Resistant	RIF Resistant	On DOT	Treatment Status	Contacts Identified	Contacts Evaluated	Contacts Infected	Started on Treatment for LTBI
Parks	10123	1/25	7/26	Pulmonary	N	Y	Y	N	N	Y	Complete	12	5	2	2
Morales	10119	1/20	8/25	Pulmonary	Y	Y	Y	N	N	Y	Current	13	9	3	3
Nguyen	10216	1/28	7/31	Pulmonary	N	N	Y	N	N	Y	Complete	1	1	0	0

Table 11: Sample Final Cohort List

(An actual cohort list would include all patients reported over a 3-month period.)

Final Cohort List
(2 months prior to cohort review)

Quarter:_____

Last Name	Registry Number	Case ID Date	Last Visit	Site – Diagnosis	Cavitary CXR	Smear Positive	Culture Positive	INH Resistant	RIF Resistant	On DOT	Treatment Status	Contacts Identified	Contacts Evaluated	Contacts Infected	Started on Treatment for LTBI
Parks	10123	1/25	7/26	Pulmonary	N	Y	Y	N	N	Y	Complete	15	7	2	2
Morales	10119	1/20	8/25	Pulmonary	Y	Y	Y	N	N	Y	Current	16	12	4	4
Nguyen	10216	1/28	7/31	Pulmonary	N	N	Y	N	N	Y	Complete	5	2	0	0

The data analyst will also use information from the TB registry to prepare a summary of the current cohort to present at the beginning of the cohort review session. The data analyst can choose the format (e.g., projected slides, flip chart, verbal summary) for the presentation that is most appropriate to the setting. He or she can also choose the type of information to summarize for the group. The overview might include

- Age
- Year of entry if foreign-born
- Culture conversion
- Medical evaluation
- Sex
- Country of origin
- Radiology results
- Race/ethnicity
- HIV status
- DOT status
- Number of contacts

There are no set rules on what types of data are presented to summarize the cohort. It is up to each program area or TB control team to decide what information will be most useful and informative for their program.

4. Preparation of Cases for Presentation

Careful preparation for a cohort review begins the day a TB case is reported. Cohort review facilitates quality assessment of case management activities, which may motivate staff to be accountable for every aspect of every TB case and subsequent contact investigation. The case manager is ultimately responsible for presenting the treatment and contact investigation outcomes for each case to the TB control team.

In preparing cases for presentation, using a standardized form is an effective way to ensure that consistent information is presented on each case. The detailed information on the form provides the necessary clinical data that allow the data analyst to compile the overall statistics. It also provides a guide for case presentation so that essential information is covered in a concise and consistent manner. In general, each presentation should include

- Demographic information
- Site of disease, bacteriology, radiology
- Treatment regimen, adherence, DOT
- Unusual events in monitoring treatment (if any)
- Status of treatment completion
- Contact investigation results

Sample forms for reporting both pulmonary and extrapulmonary cases appear on the following pages. Some TB programs may find it useful to use different forms for pulmonary and extrapulmonary cases, since the latter typically do not require a contact investigation.

The sample forms are very basic forms that collect and report information required for monitoring compliance with the CDC national objectives. As your program becomes accustomed to conducting cohort reviews, you can insert additional data elements that will allow you to evaluate other objectives. Appendix B contains sample forms from the New York City Department of Health and Mental Hygiene, Bureau of Tuberculosis Control (BTBC). Appendix C contains forms used by the Washington State Department of Health Tuberculosis Program. Both sets of forms are used to collect information that allows the programs to monitor other indicators, such as timeliness of initial interview and DOT status.

Sample Cohort Review Presentation Form I
Pulmonary or Laryngeal TB

1. Patient Information:

- Registry number _____
- Date case reported _____
- _____ year-old _____ (male/female) born in _____ (country)
- HIV status (+ / - / refused / unknown) Protease inhibitor or NNRTI (name)[1]: _____

2. TB Information:

- TST ___ mm, read on _____ (date)
- Sputum smear results: (+ / –) if + _____plus[2]
- Culture _____ (+, -, or not done)
- Pansusceptible, or MDR or rifampin-resistant or other resistance (_____)
- Cavitary, or abnormal (noncavitary), or normal CXR[3]
- Culture conversion? Y/N Date: _____

3. Treatment Information:

- Completed therapy _____
- Taking TB medications_____ Has completed _____ months of treatment
  Likely to complete by _____ (date) Drug regimen _____
- Check other disposition below:
  ___Refused ____Lost ____Died ____Moved[4] ____Reported at death
- On DOT? ___Yes ___No If no, why not? _____
- On DOT _____ months of which _____ months were > 80% adherent
- If patient is a child 18 years old or younger: Source identified? Y/N Name/Registry number _____[5]

4. Contacts

#		#	
	Identified		Started treatment for LTBI[8]
	Appropriate for evaluation[6]		Completed treatment for LTBI
	Evaluated[7]		Current to care[9]
	Infected (TST+) without disease (confirmed by CXR)		Discontinued treatment for LTBI (adverse reaction/ died/ moved/ refused/ lost to follow-up)
	Infected, with disease		

Reverse Side of Sample Cohort Review Presentation Form

Notes, Definitions, and Special Cases

1. If patient is taking a protease inhibitor or nonnucleoside reverse transcriptase inhibitors (NNRTIs), specify the name of the medication.
2. Highest grade of smear, if known.
3. CXRs are reported as cavitary, noncavitary, or normal. Do not report CXR dates or the results of follow-up CXRs.
4. A patient can only be classified as "moved" if a new address is documented and a transfer form has been completed.
5. Be prepared to present the source case and associated contact investigation, including whether this child was listed as a contact in the contact investigation for the source case.
6. Contacts appropriate for evaluation include all contacts identified who were not counted as "died prior to testing."
7. Evaluation of TB contacts should be done in an orderly manner, starting with the highest-priority group of contacts. Contacts should be evaluated for LTBI and TB disease. This evaluation includes at least
   - A medical history and
   - A Mantoux tuberculin skin test (unless there is a previous documented positive reaction)

   For immunosuppressed contacts or contacts who are under 4 years of age, the evaluation should also include a CXR, regardless of skin test result, because of the possibility of a false-negative reaction to the tuberculin skin test and risk of early progression to TB disease if infected.

   In addition, any contact who has TB symptoms should be given both a CXR and a sputum examination.
8. Report the number of people who started treatment for LTBI. Do not report the number of people who did ***not*** start treatment for LTBI; however, be prepared to explain. Do not report people who received window-period prophylactic treatment and were found not to have had latent TB infection. Provide updated information on those contacts who started treatment for LTBI.
9. Report the number of people who remain on treatment and are currently up-to-date with their follow-up appointments. People who are delinquent with their follow-up appointments are not counted.

Sample Cohort Review Presentation Form II
Clinically Confirmed or Extrapulmonary TB

1. Patient Information:

- Registry number _____
- Date case identified _____
- _____ year-old _____ (male/female) born in _____ (country)
- HIV status (+ / -/ refused / unknown)

2. TB Information:

- Clinically confirmed _____
- Extrapulmonary _____ Site of disease _____
- Pansusceptible, or MDR or rifampin-resistant or other resistance (_____)

2. Treatment Information:

- Completed therapy _____
- Taking TB medications _____ Has completed _____ months of treatment
  Likely to complete by _____ (date) Drug regimen _____
- Check other disposition below:
  ____Refused ____Lost ___Died ____Moved ___Reported at death
- On DOT? ____Yes ___No If no, why not? _____
- On DOT _____ months of which _____ months were >80% adherent

4. Skip Contacts: *If patient is a child 18 years old or under, the Cohort Presentation Form I is to be used.*

5. Discussion

These forms outline the essential TB case and contact investigation data that need to be presented to the TB control team at the cohort review session. It is important that case managers begin completing cohort review presentation forms from the day a case is reported.

Periodic reviews offer a spot-check system before TB cases and contact investigations are presented at the cohort review session. These reviews can take various forms:

- Ongoing case management meetings with the supervisor and other case managers to review case details and detect and resolve any difficult case management issues. This is the time to make sure no details are omitted, all follow-up actions are taken, and all case information is accurate and complete.
- Case reviews or consultations with an experienced TB physician to get feedback on the adequacy of treatment regimens for TB patients and contacts on treatment for LTBI.

In addition to these ongoing reviews, a practice cohort review meeting or "mock" cohort review can serve as a dress rehearsal for the final session. The practice presentation is more informal than the actual cohort review. If your area chooses to conduct practice presentations, they should be conducted approximately 2 months before the real cohort review session so that any missing information or needed follow-up can be addressed before the final cohort review. During a practice cohort review presentation, each element of case management is reviewed, with special attention paid to case details, including patient information, TB information, treatment regimen, DOT adherence, and contact investigation.

Practice sessions often point out weak areas in the patient's case management that need to be strengthened prior to the final cohort review. TB team members can help to brainstorm ideas and develop suggestions for solving difficult case management situations. In addition to the main goal of making sure problems are addressed in the patient's care and follow-up, an additional goal of the practice cohort review presentation is to help the case presenters be well prepared for the actual cohort review session.

Exercise 4: Completing Forms for Cohort Review

Step One: Description of Exercise

Complete a blank presentation form, using all the information provided for each of the following sample cases. Keep in mind that the information provided on these cases may not be comprehensive. Each case will have flaws that should be picked up by the reviewer(s) in "Exercise 5: Practice Presentation and Review of Cases."

Glossary of Abbreviations

CXR:	chest radiograph	**IRZE:**	isoniazid, rifampin, pyrazinamide, ethambutol
DOT:	directly observed therapy	**M.tb:**	*Mycobacterium tuberculosis*
HIV:	human immunodeficiency virus	**RIF:**	rifampin
INH:	isoniazid	**TST:**	tuberculin skin test

Case # 1

Mr. Parks

49-year-old homeless male born in the United States

1/20	TST + (9mm); sputum smear 4+; culture M.tb, pansusceptible; CXR abnormal, noncavitary; HIV infected
1/21	Started on rifabutin, IZE; DOT started while in hospital
2/28	Continues on DOT at homeless shelter after discharge from the hospital
5/2	Continues on DOT at homeless shelter
7/2	Due to complete treatment at the end of this month
Contacts	15 contacts identified, 7 evaluated, 2 TST positive (7 mm, 12 mm), 2 started on treatment for LTBI but one is lost to follow-up

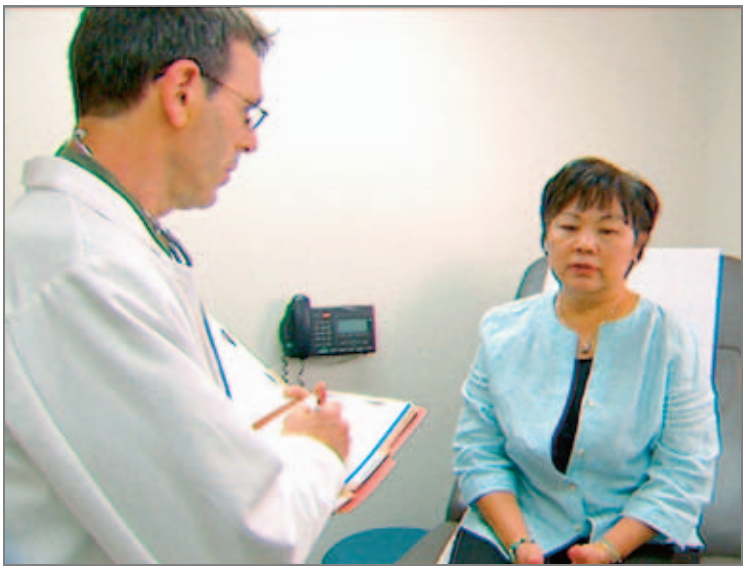
Case # 2

Mr. Morales

32-year-old male born in Mexico, in United States for 2 years

1/20	TST + (11 mm); HIV negative; sputum smear 4+; culture M.tb, pansusceptible; CXR abnormal, cavitary; IRZE started; refused DOT because of irregular work schedule as construction day laborer
2/25	Missed clinic appointment
2/26	Home visit; family had moved; no forwarding address with post office
3/10	Admitted to hospital with cough, fever, night sweats; smear positive/ culture positive, still pansusceptible; patient admitted to stopping medications; started on DOT while in the hospital
4/28	Culture conversion
5/18	Compliant with worksite DOT
8/25	Continues on DOT
9/30	Continues on DOT
Contacts	16 contacts identified, 4 refused evaluation, 12 evaluated, 8 TST negative, 4 TST positive, 2 of the positives are his wife and brother; both on treatment for LTBI; 2 other positives are his children ages 5 and 7; they had negative CXR and are on treatment for LTBI

Case # 3



Mrs. Nguyen

43-year-old Vietnamese female in the United States for 3 years

1/28	Went to private provider with complaints of nonproductive cough, fever, chills, night sweats x 1 month; TST + (12mm); sputum smear negative; culture M.tb, pansusceptible; CXR abnormal, noncavitary
1/31	Telephone call to private provider to obtain medication regimen; clinical diagnosis of TB; patient on INH/RIF (inappropriate treatment)
2/1	Had conference call with TB physician and private provider regarding inappropriate regimen; treatment regimen changed to IRZE
2/2	Telephone interview with patient; contacts identified; patient reports taking prescribed medications
2/3	Follow-up telephone call to private physician; permission given to health department to continue follow-up treatment and care, including DOT
2/4	Patient started on DOT
4/01	Continues on DOT
6/15	Continues on DOT
8/15	Completed treatment; sputum smear negative / culture negative
Contacts	3 contacts identified; 3 evaluated; all TST negative

Step Two: Analysis of Forms

Have a supervisor or coworker review the forms that you have prepared for the sample cases. Ensure that all of the information provided is included on the forms. Together, review the forms for incomplete/missing information that was not provided in the case study. Try to determine what additional information a reviewer might expect to be presented and what aspects of the case management might have been handled differently. You will be able to compare your analysis with that of the reviewer later in the document.

"I believe that in our practice today, to have the time commitment of having direct care staff sitting with the medical staff – which we don't do in our hurried and busy lives – that is where real learning and education and a real team bonding occurs. And it wouldn't occur in any other way if we didn't stop and do this cohort process…"

Kim Field, RN, MSN, TB Program Manager, Washington State Department of Health TB Program

Sample Cohort Presentation Form I
Pulmonary or Laryngeal TB

1. Patient Information:

- Registry number _____
- Date case reported _____
- _____ year-old _____ (male/female) born in _____ (country)
- HIV status (+ / – / refused / unknown) Protease inhibitor or NNRTI (name)[1]: _____

2. TB Information:

- TST ___ mm, read on _____ (date)
- Sputum smear results: (+ / –) if + _____plus[2]
- Culture _____ (+, -, or not done)
- Pansusceptible, or MDR or rifampin-resistant or other resistance (_____)
- Cavitary, or abnormal (noncavitary), or normal CXR[3]
- Culture conversion? Y/N Date: _____

3. Treatment Information:

- Completed therapy _____
- Taking TB medications_____ Has completed _____ months of treatment
  Likely to complete by _____ (date) Drug regimen _____
- Check other disposition below:
  ___Refused ____Lost ____Died ____Moved[4] ____Reported at death
- On DOT? ___ Yes __ No If no, why not? _____
- On DOT _____ months of which _____ months were > 80% adherent
- If patient is a child 18 years old or younger: Source identified? Y/N Name/Registry number _____[5]

4. Contacts

#		#	
	Identified		Started treatment for LTBI[8]
	Appropriate for evaluation[6]		Completed treatment for LTBI
	Evaluated[7]		Current to care[9]
	Infected (TST+) without disease (confirmed by CXR)		Discontinued treatment for LTBI (adverse reaction/ died/ moved/ refused/ lost to follow-up)
	Infected, with disease		

Sample Cohort Presentation Form I
Pulmonary or Laryngeal TB

1. Patient Information:

- Registry number _____
- Date case reported _____
- _____ year-old _____ (male/female) born in _____ (country)
- HIV status (+ / – / refused / unknown) Protease inhibitor or NNRTI (name)[1]: _____

2. TB Information:

- TST ___ mm, read on _____ (date)
- Sputum smear results: (+ / –) if + _____plus[2]
- Culture _____ (+, -, or not done)
- Pansusceptible, or MDR or rifampin-resistant or other resistance (_____)
- Cavitary, or abnormal (noncavitary), or normal CXR[3]
- Culture conversion? Y/N Date: _____

3. Treatment Information:

- Completed therapy _____
- Taking TB medications_____ Has completed _____ months of treatment
  Likely to complete by _____ (date) Drug regimen _____
- Check other disposition below:
  ___Refused ____Lost ____Died ____Moved[4] ____Reported at death
- On DOT? ___Yes ___No If no, why not? _____
- On DOT _____ months of which _____ months were > 80% adherent
- If patient is a child 18 years old or younger: Source identified? Y/N Name/Registry number _____[5]

4. Contacts

#		#	
	Identified		Started treatment for LTBI[8]
	Appropriate for evaluation[6]		Completed treatment for LTBI
	Evaluated[7]		Current to care[9]
	Infected (TST+) without disease (confirmed by CXR)		Discontinued treatment for LTBI (adverse reaction/ died/ moved/ refused/ lost to follow-up)
	Infected, with disease		

Sample Cohort Presentation Form I
Pulmonary or Laryngeal TB

1. Patient Information:

- Registry number _____
- Date case reported _____
- _____ year-old _____ (male/female) born in _____ (country)
- HIV status (+ / – / refused / unknown) Protease inhibitor or NNRTI (name)[1]: _____

2. TB Information:

- TST ___ mm, read on _____ (date)
- Sputum smear results: (+ / –) if + _____plus[2]
- Culture _____ (+, – , or not done)
- Pansusceptible, or MDR or rifampin-resistant or other resistance (_____)
- Cavitary, or abnormal (noncavitary), or normal CXR[3]
- Culture conversion? Y/N Date: _____

3. Treatment Information:

- Completed therapy _____
- Taking TB medications_____ Has completed _____ months of treatment
  Likely to complete by _____ (date) Drug regimen _____
- Check other disposition below:
  ___Refused ____Lost ____Died ____Moved[4] ____Reported at death
- On DOT? ___Yes ___No If no, why not? _____
- On DOT _____ months of which _____ months were > 80% adherent
- If patient is a child 18 years old or younger: Source identified? Y/N Name/Registry number _____[5]

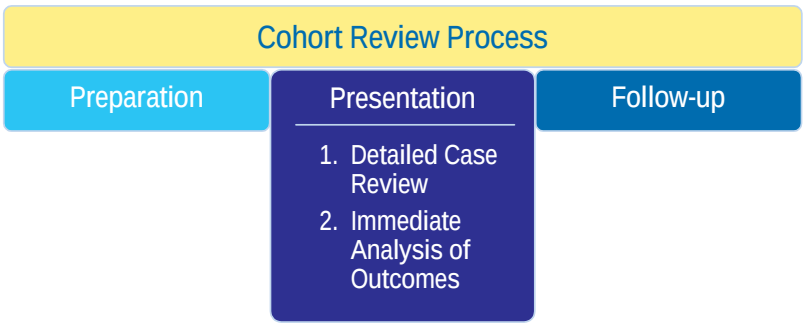
4. Contacts

#		#	
	Identified		Started treatment for LTBI[8]
	Appropriate for evaluation[6]		Completed treatment for LTBI
	Evaluated[7]		Current to care[9]
	Infected (TST+) without disease (confirmed by CXR)		Discontinued treatment for LTBI (adverse reaction/ died/ moved/ refused/ lost to follow-up)
	Infected, with disease		

Notes

Essential Element 2: Cohort Review Presentation

This chapter will focus on the presentation of cases and analysis of aggregate data at the cohort review session. Section one, Detailed Review of Each Case, explains how the final cohort review process works and highlights how the TB control team examines the case details. Section two describes the on-the-spot feedback to staff, aggregate reporting, and troubleshooting of the cohort cases. Details on preparing the analysis of data on the treatment and contact investigation outcomes for the cohort are provided.



1. Detailed Review of Each Case

Cohort review sessions are adaptable to any setting. They consist of a team reviewing a listing of the TB cases in the cohort. The team consists of the case managers and others with knowledge of the cases, senior staff (usually a medical reviewer and TB program manager) to evaluate the adequacy of treatment and the thoroughness of the contact investigation, and a data analyst to compile data from the session and provide immediate feedback to the group.

> *"Cohort reviews aren't fancy. They are not expensive. In fact, at heart, they are incredibly simple…You've got a list of patients, you've got the people with first-hand knowledge of each patient, and you've got someone supervising and reviewing their work. That is what cohort review is… it doesn't take a lot of money, doesn't take high tech; just takes knowledge of the patients and systematic tracking of how each one is doing…"*
>
> Thomas Frieden, MD, MPH, New York City Commissioner of Health

The TB program manager typically chairs the cohort review meeting. The manager has the list of TB cases and calls them to be reviewed. Because a cohort session can be rather lengthy and clinical staff may have other commitments for patient care, the program manager may group the cases to allow some essential staff to leave before the end of the session.

The following is a sample agenda for a cohort review presentation.

Table 12: Sample Cohort Agenda

Cohort Review Session Agenda 1st Quarter Cases		
9:00	Summary of current cohort	Data Analyst
9:15	Case by case review of patient outcomes • 10 presentations by South Street clinic case managers • 32 presentations by other case managers • Questions from the Medical Director about diagnosis, bacteriology, radiology, treatment regimens, adherence, and contact investigation, as needed • Decisions about disposition of each case	TB Program Manager Medical Reviewer Case Managers
11:30	Calculation and presentation of outcomes for this cohort	Data Analyst
11:40	Summary of treatment outcomes for patients who were "likely to complete" from previous cohort review	Data Analyst
11:50	Summary of treatment outcomes for contacts of patients treated from previous cohort review	Data Analyst
12:00	Summary of issues noted, suggestions for follow-up	Medical Reviewer
Reminder: Next cohort review session scheduled for February 15th		

As the cases are called, the staff member responsible for managing each TB case presents patient case data to the rest of the TB program staff. The presenter clearly and concisely presents information on his or her cases and responds to questions from the program manager and other staff.

The TB program manager and the medical reviewer listen to the case presentations, ask questions for clarification about each case, prompt for details of staff efforts to solve problems (e.g., trace patients who are lost), and provide feedback and suggestions on how to follow up on the patients and their contacts. It can be expected that more time will be spent on difficult cases, especially those in which the patient is nonadherent, has MDR TB, or has numerous contacts in a congregate setting.

The people involved in the cases, such as outreach staff, laboratory staff, clinic staff, and supervisors, are there to provide additional information as needed. As each case manager describes the details of the cases, the data analyst updates the registry information. At the end of the cohort review, the data analyst tallies the data elements needed to evaluate the objectives, and prepares a summary in aggregate form to present to the meeting participants.

While a primary function of the cohort review is to provide medical oversight of cases and examine outcomes, another very important function is the addressing of programmatic issues. The medical reviewer or TB program manager can use "teachable moments" to give feedback to staff and update them on policies, protocols, and scientific changes. Lapses in following protocols, missing information, or incorrect information can be pointed out and actions taken to prevent their occurrence in future reviews. The medical reviewer may use specific cases as examples of how certain problems should be handled. Finally, staff training and professional education needs may be identified.

Exercise 5: Practice Presentation and Review of Cases

This exercise requires at least two people: a **presenter** and a **reviewer**.

1. The **presenter** will make a brief case presentation to the reviewer, using one of the forms prepared from the case studies in Exercise 4 on page 28.
2. The **reviewer** will ask questions to ensure that all aspects of case management adhere to department of health policies and procedures. Questions should address the consistency of details presented, treatment completion (or if no completion why not), and thoroughness of the contact investigation. Ask all of the questions that you think a reviewer would ask in a real cohort review.

Switch roles in order to experience both perspectives. Thinking like the reviewer may help you develop better case presentations.

For the case studies presented in Exercise 4, the reviewer will likely have the following questions or comments:

Case # 1 – Mr. Parks

- Why was there no mention of culture conversion?
- Why were fewer than 50% of contacts evaluated?
- Need to coordinate TB and HIV care and treatments
- Need to explain how the one contact started on treatment for LTBI was lost and what efforts have been made to return the individual to treatment

Case # 2 – Mr. Morales

- Because his 4 household contacts were TST positive, need to test the 4 who initially refused testing
- Patient needed to be on DOT from the start of treatment; failure to do so caused his treatment to be extended

Case # 3 – Mrs. Nguyen

- Why was HIV status not reported?
- Home visit rather than telephone interview would have been more appropriate to find additional household contacts
- Need to reach out to private providers with TB education and encourage interaction with health department staff
- Who were the three TST-negative contacts? Were they members of the household?

2. Immediate Analysis of Outcomes

The data analyst or epidemiologist is responsible for providing an analysis of cohort review outcomes, preferably by the end of the cohort review session. Immediate feedback lets the team know how they are doing in relation to program objectives and allows for discussion of case management or programmatic improvements that might enhance treatment and contact investigation outcomes. In order to accomplish this, the data analyst should update information in the registry on treatment outcomes, contact investigations, programmatic indicators, and other information obtained during the case presentations. This recording and analysis may be accomplished using a manual tally sheet or a computerized spreadsheet or database.

At the end of the session, the data analyst

- Tallies the totals of each category of information.
- Calculates the indices and rates.
- Presents these to the group as a "report card" on the group's progress toward meeting TB program objectives.

On the following page is a sample tally sheet that can be used manually for a small cohort of cases. It may be used to create a spreadsheet that will do the calculations automatically. The sample tally sheet is based upon the cohort presentation forms provided earlier.

The "TB Information" section of the tally sheet pertains to the diagnostic information about the case (site, smear/culture results, sensitivity, CXR results).

The "DOT" section of the tally sheet provides information on the number of months the patient has been on DOT.

The "Disposition" section documents the disposition of the TB case: is treatment completed and, if not, why not.

The "Contacts" section documents information on the contact investigation—how many were identified; how many were evaluated; how many were infected; do any have disease; how many started on treatment for LTBI. A legend to the tally sheet follows.

The information collected on the tally sheet can be modified to fit specific program needs and data reporting requirements.

Table 13: Sample Tally Sheet

(See Table 14: Sample Legend for Tally Sheet on next page)

Tally Sheet

Date:_____ Quarter:_____ Cases Counted: __ January 1 – March 31

	TB Information					DOT	Disposition											Contacts						
Name	Registry #	A-D	Sm+	Cult+	Cav CXR	Mos. DOT	a	b	c	d	e	f	g	h	i	j	k	# ID	App test	# Eval	# Inf	# Trt LTBI	# Comp	# Curr
Parks	10123	A	Y	Y	N	6	Y											15	7	7	2	2		1
Morales	10119	A	Y	Y	Y	5.5		Y										16	16	12	4	4		4
Nguyen	10216	B	N	Y	N	6	Y											3	3	3	0	0		

Table 14: Sample Legend for Tally Sheet

TB Information	
A-D	A = positive sputum smear result B = negative sputum smear result, positive sputum culture results C = negative sputum smear result, negative sputum culture results, but has other clinical characteristics relevant to contact investigation such as cavitary CXR, positive respiratory culture, or is a pediatric case. D = extrapulmonary or clinically confirmed case
SM+	Smear positive
Cult+	Culture positive
Cav CXR	Cavitary CXR
DOT	
Mos. DOT	Months on directly observed therapy
Disposition	
a	Completed treatment
b	Likely to complete treatment within 365 days
c	Noncount—not a true case of TB
d	Reported at death—case was reported after the patient's death
e	Counted by other—another program is counting this case
f	MDR—patient organism is resistant to at least isoniazid and rifampin
g	RIF resistant—patient organism is resistant to rifampin
h	Died during treatment
i	Moved—moved to another program area and records were transferred
j	Cohort failure—patients unable to complete within 365 days regardless of reason
k	Lost—lost to follow-up
Contacts	
# ID	Number of contacts identified
App test	Number of contacts appropriate for testing
# Eval	Number of contacts evaluated
# Inf	Number of contacts infected
# trt LTBI	Number of contacts started on treatment for latent TB infection (LTBI)
# Comp	Number of contacts who completed treatment for LTBI
# Curr	Number of contacts who are still on treatment for LTBI

The data analyst uses the information from the tally sheet to calculate certain indices, rates, and indicators. These data are presented to the group as a summary or "report card" for that quarter's TB control efforts. For the purposes of learning the basics of cohort review, we will only examine a few basic indicators, particularly focusing on those that evaluate progress toward meeting the national TB objectives. For further details, Appendix B contains more complex calculation forms from programs already conducting cohort reviews.

THE INDICES AND RATES INCLUDE

- Index of treatment completion at time of cohort review—reflects percentage of patients who have completed treatment at the time of review, excluding those not appropriate for treatment (noncount, reported at death, and counted by another program)
- Index of possible treatment completion at time of cohort review—reflects percentage of patients who have completed treatment at the time of review, excluding those not appropriate for treatment AND excluding those who could not possibly complete (died during treatment, multidrug resistant, and RIF resistant)
- Index of completion—including those likely to complete by the end of the cohort year; reflects percentage of patients who have completed treatment or are likely to complete within 365 days
- Death rate
- Default rate
- Total cohort failure rate

Variables collected in order to calculate the rates and indices appear in Table 15.

Table 15: Cohort Review Variables

Sample Variables Form

Date:_____ _____Quarter of _____

Instructions: Insert the numbers within each category from your tally sheet (or generate it automatically if you are using an electronic spreadsheet).

a	Patients completing recommended therapy	
b	Likely to complete treatment within 365 days	
c	Noncount	
d	Reported at death	
e	Counted by "other"	
f	MDR and still on treatment	
g	RIF resistant/intolerant and still on treatment	
h	Died during treatment	
i	Moved	
j	Cohort failure	
k	Lost	

Use the formulas below to calculate the indices and rates.

Table 16: Indices/Rates for Treatment of TB Disease

Index Calculations for Treatment of TB Disease	
Name of Index	**Formula**
Index of treatment completion at time of cohort review, *excludes cases reported at death, counted by another program, or not a true case of TB*	$\frac{a}{\text{Total cases} - (c + d + e)} \times 100$
Index of possible treatment completion at time of cohort review, *excludes patients who cannot complete by the time of the review (multidrug or RIF resistant) or died during treatment*	$\frac{a}{\text{Total cases} - (c + d + e + f + g + h)} \times 100$
Index of likely to complete treatment, *including those likely to complete within 365 days; same exclusions as above*	$\frac{a + b}{\text{Total cases} - (c + d + e + f + g + h)} \times 100$
Death rate	$\frac{d + h}{\text{Total cases} - (c + e)} \times 100$
Default rate	$\frac{k}{\text{Total cases} - (c + e)} \times 100$
Total cohort failure rate	$\frac{j + k}{\text{Total cases} - (c + e)} \times 100$

The data analyst also calculates another set of indices and indicators for the outcomes of contact investigations, including

- Contact index (number of contacts identified per pulmonary case)
- Percent of smear-positive patients with contacts identified
- Percent of contacts of smear-positive patients evaluated
- Percent of contacts of smear-positive patients started on treatment for LTBI
- Percent of contacts of smear-positive patients completing treatment for LTBI

The data analyst uses the totals from the tally sheet to calculate the indices and indicators according to the formulas below (or generates the data automatically in an electronic spreadsheet).

Table 17: Contact Investigation Indices

Index Calculations for Contact Investigations	
Overall contact index	$\frac{\text{\# of contacts identified}}{\text{\# of cases appropriate for contact investigation}}$
Percent of smear positive cases with contacts identified	$\frac{\text{\# smear positive cases with \# identified >0}}{\text{\# smear positive cases}} \times 100$
Percent of contacts of smear positive cases evaluated	$\frac{\text{\# contacts of smear positive cases evaluated}}{\text{\# contacts of smear positive cases}} \times 100$
Percent of contacts of smear positive cases started on treatment for LTBI	$\frac{\text{\# contacts of smear positive cases started trtmt for LTBI}}{\text{\# contacts of smear positive cases}} \times 100$
Percent of contacts of smear positive cases completing treatment for LTBI	$\frac{\text{\# contacts of smear positive cases comp. trtmt for LTBI}}{\text{\# contacts of smear positive cases started trtmt for LTBI}} \times 100$

Exercise 6: Calculation of Indices/Rates for Treatment of TB Disease

Given the information below, calculate the indices and rates for outcomes of treatment of TB disease. Show your work by putting the actual numbers into the formulas (answer sheet is located in Appendix A).

Sample TB Disease Treatment Outcome Data from Cohort Review

43	Cases of TB disease
26	Completed treatment
8	Likely to complete treatment in < 365 days
1	Noncount
2	Reported at death
1	Cases of MDR TB and still on treatment
2	Died
0	Moved
1	Cohort failure
1	Lost to follow-up
0	RIF resistant and still on treatment

1. Index of treatment completion

   Answer: _____

2. Index of possible treatment completion

   Answer: _____

3. Percent of cases who are likely to complete treatment within 365 days

   Answer: _____

4. Death rate

   Answer: _____

5. Default rate

   Answer: _____

6. Cohort failure rate

   Answer: _____

Index of treatment completion	$\frac{a}{\text{Total cases} - (c + d + e)} \times 100$
Index of possible treatment completion	$\frac{a}{\text{Total cases} - (c + d + e + f + g + h)} \times 100$
Index of likely to complete treatment	$\frac{a + b}{\text{Total cases} - (c + d + e + f + g + h)} \times 100$
Death rate	$\frac{d + h}{\text{Total cases} - (c + e)} \times 100$
Default rate	$\frac{k}{\text{Total cases} - (c + e)} \times 100$
Total cohort failure rate	$\frac{j + k}{\text{Total cases} - (c + e)} \times 100$

Exercise 7: Calculation of Indices for Contact Investigation

Given the following information, calculate the indices and indicators for outcomes of contact investigations. Show your work by putting the actual numbers into the formulas (answer sheet is located in Appendix A).

Sample Contact Investigation Data from Cohort Review

294	Contacts of cases of pulmonary TB identified
42	Pulmonary TB cases
20	Smear positive cases
202	Contacts of smear positive cases identified
19	Smear positive cases with >0 contacts identified
182	Contacts of smear positive cases evaluated
46	Contacts of smear positive cases started on treatment for LTBI
10	Contacts of smear positive cases completed treatment for LTBI
26	Contacts of smear positive cases still taking meds for LTBI
6	Moved
2	Died
10	Lost to follow up

1	Contact index:	$\frac{\text{\# of contacts identified}}{\text{\# of pulmonary cases}}$	= ____

2	Percent smear positive cases with >0 contacts identified:	$\frac{\text{\# smear positive cases with \# identified >0} \times 100}{\text{\# smear positive cases}}$	= ____

3	Percent contacts of smear positive cases evaluated:	$\frac{\text{\# contacts of smear positive cases evaluated} \times 100}{\text{\# contacts of smear positive cases}}$	= ____

4	Percent contacts of smear positive cases completing treatment for LTBI:	$\frac{\text{\# contacts of smear positive cases comp. trtmt for LTBI} \times 100}{\text{\# contacts of smear positive cases started trtmt for LTBI}}$	= ____

The following is a sample "Group Report Card" that could be presented at the end of the cohort review session.

This information can be presented in a slide presentation, on a flipchart, or by verbal summary.

Table 18: Sample Report Card—Summary of Variables

First Quarter Cohort Review
Summary of Variables

TB Cases Counted 1/1 – 3/31	
Total cases counted	42
Completed treatment	26
Likely to complete treatment	8
Noncount	1
Reported at death	2
MDR TB	1
Died	2
Moved	0
Cohort failure	1
Lost	1

Table 19: Sample Report Card—Indices/Rates for TB Cases

First Quarter Cohort Review
Indices/Rates for TB Cases

TB Cases Counted 1/1 – 3/31	
Index of completion	65%
Index of possible completion	70.3%
Index of likely to complete treatment	91.9%
Death rate	9.5%
Default rate	2.4%
Cohort failure rate	4.8%

Table 20: Sample Report Card—Indices for Contact Investigation

First Quarter Cohort Review
Indices for Contact Investigation

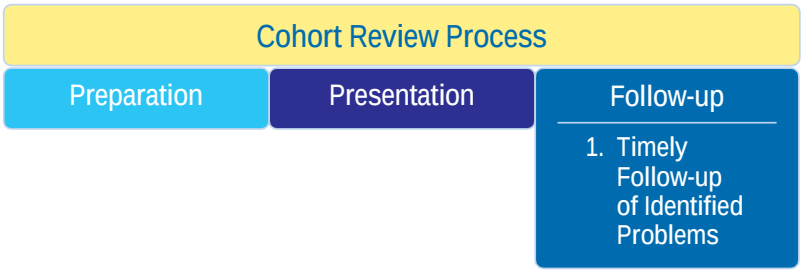
TB Cases Counted 1/1 – 3/31		
		National Objective
Pulmonary cases	42	
Contacts identified	294	
Smear positive cases	20	
Contacts of smear positive cases identified	202	
Smear positive cases with >0 contacts identified	19 (95%)	90%
Contacts of smear positive cases evaluated	182 (90.1%)	95%
Contacts of smear positive cases started LTBI treatment	46	
Contacts of smear positive cases completed LTBI treatment	10 (21.7%)	85%
Contacts of smear positive cases still taking meds for LTBI	26	

"The fundamental question is 'What percentage of patients do you cure?' and too many programs can't answer that question. The cohort review not only allows you to answer, but to improve your answer to get an accurate, higher number…"

Thomas Frieden, MD, MPH, New York City Commissioner of Health

Essential Element 3: Follow-up from a Cohort Review

The cohort review process does not end with case presentations and a summary of outcomes. Each of the major participants must bring the process full circle by applying information gained it to improve treatment and contact investigation outcomes.



1. Timely Follow-Up of Identified Problems

Performing follow-up is an essential piece in the cohort review process. Each participant has follow-up tasks to perform.

- **Supervisors, nurses, and case managers** will follow up on case management suggestions made during the cohort review and ensure that patients and contacts still on treatment finish treatment. Because cohort reviews are held several months before the end of the treatment year (from the time a case is reported to 365 days later), suggestions provided at a cohort review can allow case managers to improve completion rates.
- The **TB program manager** will address programmatic concerns and consider modifying staff training to address staff learning needs.
- The **data analyst or epidemiologist** will update the registry and prepare a summary report.
- The **medical reviewer** will address clinical and programmatic problems that were noted and provide medical consultation.

Over time, the TB control program improves its outcomes through a continual cycle of implementing, evaluating, and refining procedures and processes.

The following page shows a sample Cohort Review Summary Report from the data analyst to the members of the TB control team.

Sample Cohort Report Letter

City/State Department of Health
Tuberculosis Control Program
100 Main Street
Any City, Any State, USA

Dear TB Control Team Members,

Thank you for your participation in the first-quarter cohort review session held October 15, 200_. The following tables summarize the results:

Indices/Rates for TB Cases Counted 1/1 – 3/31

Index/Rate	Quarter 1 Result	Objective
Index of completion at time of cohort review	65%	60%
Index of possible completion at time of cohort review	70.3%	90%
Index of likely to complete	91.9%	90%
Death rate	9.5%	
Default rate	2.4%	<2%
Cohort failure rate	4.8%	<2%

Indices for Contact Investigation—Counted 1/1 – 3/31

Index	Quarter 1 Result	Objective
Contact index	7	7
Smear-positive cases with >0 contacts identified	95%	90%
Contacts of smear-positive cases evaluated	90.1%	95%
Contacts of smear-positive cases completed treatment	21.7%	85%

The "Index of possible completion at time of cohort review" fell short of our objectives; however, when those likely to complete are added, we meet our objective. We have a number of patients who have not yet completed treatment. These patients need to be followed closely to ensure that they complete within 365 days. We did not meet our objectives for two of the indices for smear-positive patients. In order to improve the percentage of contacts of smear-positive patients who have completed treatment, we need to encourage them to stay on treatment. I will report the final percentage for contacts at the next cohort review after all the final data on treatment completion are reported.

Our medical reviewer, Dr. Taylor, provided the following suggestions to increase the completion rates:

- Pursue every option for DOT with the patient. Get ideas from your team on how to keep your patients adherent and on DOT.
- Always get cultures monthly until conversion at 2 months and at completion of treatment to document conversion and successful treatment.
- Keep tracking contacts, and make sure that those infected are evaluated and those on treatment finish treatment.
- When working with private providers, be especially careful to get the names of contacts, obtain smear and culture results, and ensure medication regimens and dosages are correct.

Thank you for your continued hard work and dedication. See you next quarter.

Sincerely,

Data Analyst

How to Tailor Cohort Review to Local Program Areas

The purpose of this section is to provide practical guidance on implementing the cohort review method in local program areas. As stated previously, many of the forms and processes highlighted in this document reflect the New York City Department of Health and Mental Hygiene cohort review methodology. Because the New York City program has a high case volume in a small, highly concentrated geographic area, the program has developed methods that work well in that setting. Your program profile may be very different. The keys to successful implementation in your program area include two steps:

- Establish political and managerial commitment
- Modify the elements of cohort review to fit your program area's needs

1. Establishing Political and Management Commitment

Staff are often reluctant to accept change, such as a new policy or procedure. Change may make them feel uncomfortable. This may be especially true if they perceive that the new policy or procedure means extra work or scrutiny for them. People have to believe something is important to them before they will accept change. Therefore, management staff in the health department must communicate to staff at all levels that they themselves, the management team, believe in the cohort review method. There is no substitute for leading by example. If it is not important to TB program leadership, why will staff want to do it?

In communicating with staff, think of all the people who will need to know about cohort review, what each person's role is, and what new tasks they will have to do. Staff may be more likely to accept the implementation of the cohort review process if management staff emphasize how the process builds on what they are already doing well. In addition, staff may be more invested and motivated in the process if they are directly involved in tailoring the review process to the particular strengths and needs of the program area. Staff need to hear why it is important and how assistance will be provided to make sure everyone has the knowledge and skills to do the new tasks.

A sample letter follows, showing what the director of TB control may want to communicate to staff when initiating cohort reviews.

Sample Letter from Director of Local Health Department

Dear Colleagues:

Our TB control program has been successful in reducing rates dramatically since the peak of reported cases in the early 1990s; however, the rate of decline has slowed. We have already implemented effective case management and DOT practices, and have improved our contact investigation procedures. You are all to be congratulated on your efforts, which have led us to the point where we are today—at the lowest number of cases since reporting began.

What is the next step? Starting cohort reviews—a system of quality assurance and accountability that can help us improve outcomes using the resources we have available. The cohort review process is used in countries all over the world to help ensure improved case management, greater staff accountability, educational support that meets staff and program needs, and achievement of objectives for treatment completion and contact investigation.

The cohort review process builds upon our current practices, like the monthly case review meetings. However, it adds a quantitative difference to program review and examination of treatment outcomes. This new management approach is challenging. It will require commitment and hard work. But it will guide us in correcting problems we find, and ultimately, improve the services our patients and contacts receive.

The following is a proposed schedule:

Cases counted from:	**will be reviewed on:**
January 1 – March 31	October 15
April 1 – June 30	January 15
July 1 – September 30	April 15
October 1 – December 31	July 15

Case managers and supervisors will continue to manage cases and contact investigations following our protocols. Case review meetings will continue as usual, but will include preparation of a simple case format for presentation in a cohort review meeting.

Dr. _____ will provide clinical oversight before cases are presented.

_____ (data analyst) will generate a list of the cases and contacts and will assist in gathering and analyzing data at the cohort review meeting.

Successful implementation will require time, patience, and understanding—the positive results you expect may not be evident immediately. However, experience shows that programs that regularly conduct cohort reviews continue to improve.

Sincerely,

Director of TB Control

2. Modifying the Elements of the Cohort Review Process

Adapting the cohort review method to fit the program area is also essential. At first, it is better to start small and allow staff to become accustomed to the process. For each element, be sure that the plan is consistent with the local situation.

Preparation

Shared TB program objectives: Consider using only the most basic objectives at first. Select objectives that are familiar to staff. Ensure staff understand the time frame for defining the cohort and conducting the review. Let them know that program management is committed to conducting periodic cohort reviews and that you understand it may take time to improve outcomes.

Comprehensive case management: This may be an area that needs little change in order for your group to conduct a cohort review. Case managers can proceed with their routine activities of ensuring that a) patients with TB disease adhere to treatment, comply with medical visits, and complete treatment; and that b) contacts are identified, evaluated, and complete treatment for latent TB infection (LTBI), if appropriate.

Reliable TB registry: This also may need little change. Continue using a locally developed database to provide the "universe" or cohort of patients to be reviewed. Make sure the data analyst generates the preliminary and final lists of cases, so staff know what presentations to prepare.

Preparation of cases for presentation: Program areas may already conduct periodic case review meetings. Supervisors and case managers should continue their preparations to make sure all the case details are in place, from the initial interview to compliance with and completion of treatment, to the contact investigation. New cohort review forms may be added to guide case presentation. Consider organizing mock cohort review sessions to ensure staff develop their confidence and presentation skills.

Presentation

Detailed review of each case: This is an element that needs to be specifically tailored to each local situation. There are several approaches to consider for the cohort review session:

- A city or county health department may prefer a face-to-face meeting in one large room. Case managers, contact investigators, public health nurses, data analysts, supervisors, and clinicians can be called to a mandatory meeting. Travel within the city, county, or region is a normal part of the job.
- In large geographic areas where travel may be a challenge for face-to-face meetings, video and teleconference technology should be considered to facilitate the cohort review session.

The case manager or the presenter should be well prepared to present the details of the cases that he/she is responsible for. The case manager should prepare information on each case, present the information at the cohort review session, and be prepared to follow up on suggestions made by reviewers at the cohort review session.

The reviewer will need practice in learning how to manage time and go over all of the most important points raised in regards to each case. In general, routine cases need less time and attention. It is important to spend more time on the difficult cases, especially those in which the patient is nonadherent, has multidrug-resistant TB, or has numerous contacts in a congregate setting. The reviewer should remember to use "teachable moments" to give feedback to staff and update them on policies, protocols, and guideline revisions.

During the presentation and review of each case, the data analyst must quickly and accurately tally results, update information, and note issues that require follow-up. This can be very exacting work in a fast-paced cohort review session, and it takes some time to get accustomed to the process and how and where to enter results.

Immediate analysis of outcomes: This is the role of the data analyst. If possible, the data analyst should immediately provide a report card of the status of the cohort. The status of patient and contact investigation outcomes should lead to a discussion of programmatic issues, as well as yield direction for follow-up to in order to achieve program objectives.

Follow-up

Timely follow-up of noted problems: No management process is complete until information collected is used to guide improvement. Usually it is the job of the data analyst to compile a summary report of the cohort review outcomes, as well as a list of issues that require follow-up actions. These actions, however, may need follow-up by several different people: program director, medical director, public health nurse, case manager, supervisor, outreach worker—thus, a separate list for each person may be useful.

Also, remember that the outcomes of persons with TB disease who were "likely to complete" treatment and the contacts who are still on treatment for LTBI will be reported and reviewed in 6 months, as part of a future cohort review. Case managers and their supervisors have to keep managing these cases and contact investigations until they are "closed."

Be patient. With time and practice, the skills of the case managers, reviewers, and data analysts will improve.

"For any program that is considering implementing cohort review, there are four main points you have to keep in mind: first you have to have the commitment of your staff to move towards this process; second, recognize that there is a time factor; third, be flexible and look at the models from New York City but adapt them to your regional area; and fourth, you are going to need buy-in from your higher management or others in your state who are providing the direct care…"

Kim Field, RN, MSN, TB Program Manager, Washington State Department of Health TB Program

Case Study: Washington State Department of Health Cohort Review Process

Process in Washington State

In 2003, the Washington (WA) State Department of Health (DOH) TB Program adapted the New York City cohort review model and implemented this process. Reasons for implementing the cohort review process in WA State included the desire to: 1) increase accountability for patient outcomes, 2) ensuree completion of therapy for TB patients and contacts, 3) evaluate achievement of program objectives, and 4) provide opportunities for staff education.

The ***cohort*** includes all patients whose cases were counted by the WA State TB Program during a particular quarter of the year. Quarterly cohort review sessions are scheduled approximately 7–9 months after cases are counted (Table 21).

Table 21: Washington Cohort Review Timeline for 2005

January 2005	April 2005	July 2005	October 2005
Review cases counted April–June 2004 and their contacts	Review cases counted July–Sept 2004 and their contacts	Review cases counted Oct–Dec 2004 and their contacts	Review cases counted Jan–March 2005 and their contacts

The quarterly cohort review session is conducted with the DOH TB Program Coordinator, DOH Nursing Consultants, DOH medical consultant, DOH epidemiologist, and local health jurisdiction (LHJ) staff. Telephone conference calls are used to conduct these sessions. Nursing Consultants work with LHJ staff to prepare for cohort review presentations using a cohort review form (Appendix C).

Data Analyses

1. Case reports are sent from LHJs to the WA State Department of Health TB Program and entered into the Tuberculosis Information Management System and DOH Contacts Database.
2. The DOH TB Program epidemiologist analyzes the DOH databases and certain information from the cohort review forms prior to the cohort review session.
3. At the beginning of the cohort review session, the epidemiologist presents final case and contact data summaries for the previous cohort and preliminary summaries for the cohort being reviewed during the session (Table 22: “WA Cohort Review Data Analyses” on the following page).
4. Case and contact summaries include outcome measures and timeliness measures developed specifically for WA State. Timeliness measures include lab sputum collection, start of medication, reporting from LHJ to the DOH, reporting from health care provider to LHJ, reporting from lab to LHJ, reporting from lab to LHJ of susceptibility results, and identification of contacts.

Table 22: Washington Cohort Review Data Analyses

January 2005	April 2005	July 2005	October 2005
Final analyses of Jan–March 2004 cases and contacts	Final analyses of April–June 2004 cases and contacts	Final analyses of July–Sept 2004 cases and contacts	Final analyses of Oct–Dec 2004 cases and contacts
Preliminary analyses of April–June 2004 cases and contacts	Preliminary analyses of July–Sept 2004 cases and contacts	Preliminary analyses of Oct–Dec 2004 cases and contacts	Preliminary analyses of Jan–March 2005 cases and contacts

Impact of Cohort Review

In 2004, the DOH TB Program conducted an assessment of the impact of implementing cohort review in Washington State. A comparison of the outcome and timeliness measures were analyzed for January–March 2001 patients and their contacts (prior to the introduction of cohort review) and January–March 2003 patients and their contacts (post 1 year of implementing cohort review). The results of the comparison demonstrated that cohort review made a substantial impact on the management of TB cases in Washington State.

Table 23: Outcome measures on TB cases by year, Washington, 2001 and 2003.

	Jan–March 2001 (n=37 cases)	Jan–March 2003 (n=54 cases)
Completion of therapy	91%	93%
DOT usage	71%	73%
Died during therapy + reported at death	8%	0
Lost to follow-up	6%	0
Treatment not completed within 12 months	15%	8%
HIV test not offered at time of screening	27%	15%

Table 24: Timeliness of reporting measures on TB cases by year, Washington, 2001 and 2003

	Jan–March 2001 (n=37 cases)		Jan–March 2003 (n=54 cases)	
	Mean Days	Range (max-min)	Mean Days	Range (max-min)
Timeliness of lab sputum collection	5.5	44–0	0.8	4–0
Timelines of reporting from local health to state health department	15.5	45–1	6.3	31–0
Timeliness of reporting from the lab to local health department	7.0	31–0	2.6	18–0
Timeliness of susceptibility reporting	71.6	313–2	21.2	90–4

No patients died during treatment or were reported at death among the 2003 cohort as compared to 2001 (0 in 2003 vs. 8% in 2001) (Table 23).

- No patients were lost during treatment among the 2003 cohort as compared to 2001 (0 in 2003 vs. 6% in 2001), despite being a larger cohort of cases to manage in 2003 (Table 23).
- A smaller proportion of patients did not complete treatment within 12 months among the 2003 cohort as compared to 2001 (8% in 2003 vs. 15% in 2001) (Table 23).
- A smaller proportion of patients among the 2003 cohort were not offered HIV tests at the time of their screening as compared to 2001 (15% in 2003 vs. 27% in 2001) (Table 23).
- It took an average of 0.79 days to collect sputum and have it received at the lab in 2003 vs. 5.49 average days among the 2001 cohort (Table 24).
- Local health jurisdictions improved their timeliness of reporting TB cases to the state health department in 2003 as compared with 2001 (an average of 6.30 days in 2003 vs. 15.50 days in 2001) (Table 24).
- Labs improved the reporting of positive sputum-smear results to local health in 2003 as compared to 2001 (an average of 2.60 days in 2003 vs. 7.00 average days in 2001) (Table 24).
- Labs also improved the reporting of culture + MTB susceptibility results to local health in 2003 as compared to 2001 (an average of 21.23 days in 2003 vs. 71.58 in 2001) (Table 24).

Table 25. Outcome measures on TB contacts by year, Washington, 2001 and 2003

	Jan–March 2001 (n=84 Contacts)	Jan–March 2003 (n=504 Contacts)*
Refused to continue therapy	33%	6%
Treatment not completed within 12 months	13%	0
Timeliness of identifying contacts to smear-positive cases (mean days)	4.3	2.7
*Note: The large number of contacts (504) was a result of an incarcerated patient.		

- A smaller proportion of contacts refused to continue treatment in 2003 as compared to 2001 (6% vs. 33%, respectively) (Table 25).
- A smaller proportion of contacts were lost to follow-up in 2003 as compared to 2001 (1% vs. 7%, respectively) (Table 25).
- All contacts in 2003 completed treatment within 12 months as compared to 2001 (0 vs. 13%, respectively) (Table 25).
- In 2003, contacts of infectious (smear-positive) patients were identified in a shorter period of time as compared to 2001 (an average of 2.66 days in 2003 vs. an average of 4.33 days in 2001) (Table 25).

Since implementation in WA State, cohort review has increased knowledge of TB among staff and has increased staff accountability for the management of their cases. Benefits closer scrutiny of patients and contacts, and an increased understanding of TB morbidity due to the cohort review sessions, have improved patient outcomes and the treatment of patients and contacts in Washington State.

Summary

The purpose of this document is to describe the cohort review process. The cohort review process has proven to be a very useful tool for ensuring accountability, educating staff about protocols and objectives, and improving case management and prevention. It is a management process that will motivate staff, reveal programs' strengths and weaknesses, indicate staff training and professional education needs, increase staff accountability for completion of treatment for both TB disease and latent TB infection (LTBI), and improve TB case management and the identification of contacts.

Cohort review is a systematic review of the management of patients with TB disease and their contacts. A "cohort" is a group of TB cases counted over a specific period of time, usually 3 months. The cases are reviewed approximately 6–9 months after they are counted; therefore, many of the patients have completed treatment or are nearing the end of treatment. Details regarding the management and outcomes of TB cases are reviewed in a group setting. Case managers and other staff know that their day-to-day efforts will be reflected in the cohort review several months later and that they are accountable for the services they provide.

TB programs across the country have adopted a variety of approaches to conducting cohort reviews. All of the approaches incorporate the same key elements of preparation, presentation, and follow-up.

Preparation encompasses developing program objectives, ensuring that sound case management protocols are in place, using a reliable TB registry, and carefully preparing the case. The element of presentation includes using a standardized format for cohort reviews, providing TB case and contact information to the TB control team, and presenting immediate feedback on goal accomplishment. Follow-up involves acting on the recommendations made by the TB control team during the cohort review session, ensuring that those patients and contacts started on treatment complete treatment, and following up on programmatic issues (e.g., training) that were noted at the cohort review session. Using this process allows TB programs to improve outcomes through a continual cycle of learning.

Adopting the cohort review methodology is a challenging undertaking. As with any change in management approach, there will be bumps in the road, and the positive results may not be immediately evident. Successful implementation requires an ongoing commitment to adopting this management approach, tailoring it to fit local needs, training and motivating staff, and following up on noted problems.

> *"Cohort review can be an important means of increasing your completion rate, of tracking your contact index, of seeing how well you are doing with contact elicitation and starting contacts on treatment; so every aspect of a TB program can be tracked through this. Basically it is a management tool. It is a management tool that says we care about every single patient…"*
>
> Thomas Frieden, MD, MPH, New York City Commissioner of Health

Glossary

Adherence to treatment	Following the recommended course of treatment by taking all the prescribed medications for the entire length of time necessary.
Case management	A system in which a specific health department employee is assigned primary responsibility for managing the patient's case, systematic regular review of patient progress is conducted, and plans are made to address any barriers to adherence.
Cohort review	A systematic review of the management of patients with TB disease and their contacts. A "cohort" is a group of TB cases counted over a specific period of time, usually 3 months. TB cases are reviewed for the patient's clinical status, the adequacy of the medication regimen, treatment adherence or completion, and the results of contact investigation.
Contact investigation	A procedure for interviewing a person who has TB disease to determine who may have been exposed to TB. People who have been exposed to TB are screened for TB infection and disease.
Culture	Organisms grown on media (substances containing nutrients) so that they can be identified; a positive culture for *M. tuberculosis* contains tubercle bacilli, whereas a negative culture contains no detectable tubercle bacilli.
Directly observed therapy (DOT)	A strategy devised to help patients adhere to treatment; means that a health care worker or another designated person watches the TB patient swallow each dose of the prescribed drugs.
Extrapulmonary TB	TB disease that occurs in places other than the lungs, such as the lymph nodes, the pleura, the brain, the kidneys, or the bones; most types of extrapulmonary TB are not infectious.
Multidrug-resistant TB (MDR TB)	TB that is resistant to at least isoniazid and rifampin; more difficult to treat than drug-susceptible TB.
Pulmonary TB	TB disease that occurs in the lungs (about 85% of all U.S. cases), typically causing a cough and resulting in an abnormal CXR; pulmonary TB is usually infectious until adequately treated.
Reported at death	A person with TB disease who was not diagnosed until time of death.
Tuberculin skin test (TST)	A test used to detect TB infection. Done by using a needle and syringe to inject 0.1 ml of 5 tuberculin units of liquid tuberculin between the layers of the skin (intradermally), usually on the forearm; the reaction to this test, usually a small swollen area (induration), is measured 48–72 hrs after the injection and is classified as positive or negative depending on the size of the reaction and the patient's risk factors for TB.

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Resource List

Case Management

Tuberculosis Case Management for Nurses: Self-Study Modules
This book is separated into four study modules covering public health and public nursing issues, the fundamentals of TB case management, leadership skills of the nurse case manager, and case management of pediatric patients with TB (New Jersey Medical School, National Tuberculosis Center, 2001).

Available from University of Medicine and Dentistry of New Jersey, New Jersey Medical School National Tuberculosis Center, 225 Warren St, First Fl, West Wing, PO Box 1709, Newark, NJ 07103-1709; tel. no. 973-972 -0979; website www.umdnj.edu/ntbcweb.

Facilitating TB Outreach: Community Workers and Hard-to-Reach TB Populations
This videotape uses realistic scenarios and patient encounters to introduce concepts for improving patient care outcomes. It addresses building rapport with patients, locating patients who have discontinued treatment, conflict resolution, and outreach safety (Francis J. Curry National Tuberculosis Center, 2003).

Available from Francis J. Curry National Tuberculosis Center, 3180 18th St, Ste 101, San Francisco, CA 94110-2028; tel. no. 415-502-4600; website www.nationaltbcenter.edu.

Nursing Care Management for Tuberculosis
This fact sheet provides information about the role of nurses in case management of persons with TB. It explains case management, when it begins, and what activities it entails (Massachusetts Department of Public Health, 1999).

Available from Massachusetts Department of Public Health, Division of Tuberculosis Control, 305 South St, Jamaica Plain, MA 02130; tel. no. 617-983-6970; website www.state.ma.us/dph/dphhome.htm.

Quality Improvement for TB Case Management: An Online Course
This interactive online course provides TB control program managers and staff with information for developing a systematic quality improvement program for TB case management (Francis J. Curry National Tuberculosis Center, 2002).

Available at www.nationaltbcenter.edu/pmi/working1.

Tuberculosis Case Management
This CD-ROM provides comprehensive information on the diagnosis and treatment of TB as well as case management in an international setting. It also discusses the tuberculin skin test, other diagnostic tests, and directly observed therapy short-course (DOTS) (Center for Human Services, 2000).

Available from Quality Assurance Project, 7200 Wisconsin Ave, Ste 600, Bethesda, MD 20814; tel. no. 301-654-8338; website www.qaproject.org.

TB Case Management CD-ROM Developed in Spanish for Bolivia by Cynthia F. Young, GMT; website www.qaproject.org/archivespantbcd.htm.

Social Support for Tuberculosis Clients
This pamphlet was developed to help providers establish and enhance social support services in a TB clinic (Charles P. Felton National Tuberculosis Center, 1999).

Available from Charles P. Felton National Tuberculosis Center at Harlem Hospital, 2238 Fifth Ave, First Fl, New York, NY 10037; tel. no. 212-939-8254; website www.harlemtbcenter.org.

Contact Investigation

Contact Investigation in a Worksite Toolbox
This toolbox compiles instruments and resources for use when a contact investigation extends into a worksite. Using these materials, TB control staff will be able to follow step-by-step instructions for contact, implementation, and follow-up; develop protocols for inclusion of a worksite in an investigation; and adapt standard templates for local use. The toolbox provides letters, forms, policies, and referenced materials (Francis J. Curry National Tuberculosis Center, 2003).

Available from Francis J. Curry National Tuberculosis Center, 3180 18th St, Ste 101, San Francisco, CA 94110-2028; tel. no. 415-502-4600; website www.nationaltbcenter.edu.

Effective TB Interviewing for Contact Investigations
This 67-minute videotape demonstrates successful interviewing strategies with TB patients and is designed to enhance the knowledge and skills of health care workers who are responsible for conducting TB interviews with patients as part of contact investigations.

Available from CDC National Center for HIV, STD, and TB Prevention (NCHSTP). Materials can be ordered by accessing the online order form by selecting "Order Publications" at www.cdc.gov/nchstp/tb or by mailing a request to the CDC NCHSTP Office of Communications at 1600 Clifton Rd, NE, MS E-07, Atlanta, GA 30333.

Ins and Outs of Contact Investigation
This videotape for health professionals working in correctional facilities discusses conducting a contact investigation for incarcerated persons with TB (Texas Department of Health, 1999).

Available from Texas Department of Health, Tuberculosis Elimination Division, 1100 W 49th Street, Austin, TX 78756-3199; tel. no. 512-458-7447; website www.tdh.state.tx.us/tb/default.htm.

Prevention: Evaluation and Follow-up of Contacts of Persons with TB
This fact sheet discusses the diagnosis of persons who have been in close contact with persons who have TB. It stresses the need to evaluate contacts for latent TB infection and active TB disease by symptom, and the need for follow-up diagnosis of contact persons (New York City Department of Health and Mental Hygiene, 2001).

Available from New York City Department of Health and Mental Hygiene, Tuberculosis Control Program, Education and Training Unit, 253 Broadway, Rm. 602, #CN72, New York, NY 10007; tel. no. 212-442-9968; website www.nyc.gov/html/doh/html/tb/tb.html.

TB Contact Investigation: Fact Sheet
This fact sheet provides guidelines for conducting a TB contact investigation. It explains in what situations the contact investigation should be used and who should conduct it (Massachusetts Department of Public Health, 2000).

Available from Massachusetts Department of Public Health, Division of Tuberculosis Control, 305 South St, Jamaica Plain, MA 02130; tel. no. 617-983-6970; website www.state.ma.us/dph/dphhome.htm.

TB Simulated Patients: A Training and Resource Guide for Contact Investigation
This manual presents a role-play–based curriculum on how to conduct a contact investigation for persons with TB. It provides scripts and evaluation forms for each role-play session (New Jersey Medical School, National Tuberculosis Center, 2001).

Available from University of Medicine and Dentistry of New Jersey, New Jersey Medical School, National Tuberculosis Center, 225 Warren St, First Fl, West Wing, PO Box 1709, Newark, NJ 07103-1709; tel. no. 973-972-0979; website www.umdnj.edu/ntbcweb.

Self-Study Modules on Tuberculosis 6-9
A continuation of the Self-Study Modules on TB series, these four new modules cover contact investigations, confidentiality, TB surveillance and case management in hospitals and institutions, and patient adherence.

Available from CDC National Center for HIV, STD, and TB Prevention (NCHSTP). Materials can be ordered by accessing the online order form by selecting "Order Publications" at www.cdc.gov/nchstp/tb or by mailing a request to the CDC NCHSTP Office of Communications at 1600 Clifton Rd, NE, MS E-07, Atlanta, GA 30333.

Tuberculosis Education and Training Resources Website
Use this site to search for TB education and training materials, submit TB materials for inclusion in the database, find out how to order TB materials, locate funding opportunities, get information about TB organizations, find out about upcoming events, sign up for TB-related listservs and digests, and locate TB-related Web links.

Available at www.findtbresources.org.

Appendix A

Answers to Exercises

Answers to Exercise 6
Calculation of Indices/Rates for Treatment of TB Disease

1	Index of treatment completion:	$\frac{a}{\text{Total cases} - (c + d + e)} \times 100$	$= \frac{26}{43 - (1+2+0)} = \frac{26}{40}$	= **.65 × 100 = 65%**
2	Index of possible treatment completion:	$\frac{a}{\text{Total cases} - (c + d + e + f + g + h)} \times 100$	$= \frac{26}{43 - (1+2+0+1+0+2)} = \frac{26}{37}$	= **.703 × 100 = 70.3%**
3	Index of likely to complete treatment:	$\frac{a + b}{\text{Total cases} - (c + d + e + f + g + h)} \times 100$	$= \frac{26 + 8}{43 - (1+2+0+1+0+2)} = \frac{34}{37}$	= **.919 × 100 = 91.9%**
4	Death rate:	$\frac{d + h}{\text{Total cases} - (c + e)} \times 100$	$= \frac{2 + 2}{43 - (1+0)} = \frac{4}{42}$	= **.095 × 100 = 9.5%**
5	Default rate:	$\frac{k}{\text{Total cases} - (c + e)} \times 100$	$= \frac{1}{43 - (1+0)} = \frac{1}{42}$	= **.024 × 100 = 2.4%**
6	Cohort failure rate:	$\frac{j + k}{\text{Total cases} - (c + e)} \times 100$	$= \frac{1 + 1}{43 - (1+0)} = \frac{2}{42}$	= **.048 × 100 = 4.8%**

Answers to Exercise 7
Calculation of Indices for Contact Investigation

1	Contact Index:	$\frac{\text{\# of contacts identified}}{\text{\# of pulmonary cases}}$	$= \frac{294}{42}$	= **7**
2	Percent smear positive cases with >0 contacts identified:	$\frac{\text{\# smear positive cases with \# identified >0}}{\text{\# smear positive cases}}$	$= \frac{19}{20}$	**= .95 x 100 = 95%**
3	Percent contacts of smear positive cases evaluated:	$\frac{\text{\# contacts of smear positive cases evaluated}}{\text{\# contacts of smear positive cases}}$	$= \frac{182}{202}$	**= .90 x 100 = 90.1%**
4	Percent contacts of smear positive cases completing treatment for LTBI:	$\frac{\text{\# contacts of smear positive cases comp. trtmt for LTBI}}{\text{\# contacts of smear positive cases started trtmt for LTBI}}$	$= \frac{10}{46}$	**= .217 X 100 = 21.7%**

Appendix B: Sample Cohort Review Forms

New York City Department of Health and Mental Hygiene, Bureau of Tuberculosis Control (BTBC)

NEW YORK CITY DEPARTMENT OF HEALTH and MENTAL HYGIENE
Cohort Presentation I: Pulmonary or Laryngeal TB Case

1. Name: _____ CRS # _____
   Noncount [No further report necessary]
   _____ year-old _____ {male/female}, born in _____ {country}.
   Special therapy _____ {+ or – /refused/unknown} ❒ Protease inhibitor or NNRTI (name)[1]: _____

2a. Sputum Smear Positive,[2] Pulmonary,[3]	**2b. Sputum Smear Negative, Sputum Culture Positive**	**2c.Other: (Pediatric; other respiratory culture positive; cavitary, culture negative)[4]**
a) ❒ Pulmonary[3] TB ❒ (Both) Pulmonary & Extrapulmonary {site}. b) Sputum smear positive: _____ plus[5] c) Culture _____ [+, –, or not done] d) If culture positive, Source: _____ e) Date assigned: _____ f) Date interviewed: _____ If >3 days for interview – state reason[6]:	a) ❒ Pulmonary[3] TB ❒ (Both) Pulmonary & Extrapulmonary {site}. b) Sputum smear negative c) Sputum culture positive d) Date assigned: _____ e) Date interviewed: _____ If >5 days for interview – state reason[6]:	a) ❒ Pulmonary[3] TB ❒ (Both) Pulmonary & Extrapulmonary {site}. b) Smear status: _____ [–, or not done] c) Culture _____ [+ or –] if +, source of + culture: _____ d) Date assigned: _____ e) Date interviewed: _____ If >5 days for interview – state reason[6]:
Drug Susceptibility Results: ❒ Pansensitive ❒ ***MDR*** ❒ ***Rifampin resistant*** ❒ Other resistance _____ Chest Radiograph Results: ❒ Cavitary[7] ❒ (Abnormal) ❒ Non-Cavitary ❒ Normal CXR		

3a. Treatment outcome at time of cohort

❒ Completed therapy	❒ Taking TB medications[8] If yes, has completed _____ months of tx.[9]
❒ Likely to complete therapy by (date) _____	
❒ Did not complete treatment and no longer in care (reason): ❒ Refused ❒ Lost ❒ Died ❒ Reported at death ❒ Moved[10] Where_____ Date of Interstate referral: _____	

3b. ❒ On DOT: _____ total number of months on DOT; _____ months on DOT with ≥ 80% compliance
If NO DOT, why not: _____ ❒ Pharmacy checks[11] done

4. *If case is a child 18 years old or under:* Source identified?[12] Name: _____ CRS#: _____

5a. ❒ Employed Type of Work _____
❒ ECI associated with this case ECI site and results: _____

NEW YORK CITY DEPARTMENT OF HEALTH and MENTAL HYGIENE
Cohort Presentation I: Pulmonary or Laryngeal TB Case (cont.)

5b. Contacts

_____ Identified[13]
- _____ Inappropriate for TST (Died prior to end of window period)[14]
- _____ Appropriate for TST[15]

_____ Evaluated[16]
- _____ Prior cases (adequately treated)
- _____ Prior positive
- _____ Infected with disease: Name: _____ CRS#: _____
- _____ Infected with suspected disease[17]: Name: _____ CRS#: _____
- _____ Infected (New TST+), no disease [confirmed by CXR]
  - _____ Appropriate for treatment of latent TB infection (LTBI)[18]
    - _____ Started treatment for LTBI[19]
      - _____ Completed treatment for LTBI
      - _____ Current to care
      - _____ Discontinued treatment for LTBI due to:
        - _____ Adverse reactions to medications
        - _____ Died
        - _____ Moved[10]
        - _____ Refused to continue treatment for LTBI
        - _____ Lost to follow-up

6. Discussion[20]

TB 307 (Rev. 11/04)

NEW YORK CITY DEPARTMENT OF HEALTH and MENTAL HYGIENE
Cohort Presentation I: Pulmonary or Laryngeal TB Case (cont.)

Notes, Definitions and Special Cases

1 If patient is taking a protease inhibitor or non-nucleoside reverse transcriptase inhibitors (NNRTIs), specify the name of the medication.

2 Report positive sputum smears regardless of the culture's result. Suspicious smears are considered to be positive.

3 A disease site in the respiratory system including the airways (sputum and specimens from tissue codes: 18-25, 27 & 28).

4 Use this section to present the following cases that do not meet the 2A or 2B criteria: culture negative, cavitary, respiratory culture positive, no sputum smear done; and pediatric cases (cases under 18 years old at TB diagnosis). For culture negative cases without a positive sputum smear or cavitary CXR, use Cohort Presentation II: Clinically Confirmed or Extrapulmonary.

5 Highest grade of smear, if known.

6 Use this space to document reasons for delayed interview, for example, a change in patient's priority level.

7 CXRs are reported as cavitary, non-cavitary, or normal. Do not report CXR dates or the results of follow-up CXRs.

8 Do not list medications. The Director has the printout of drug regimens. However, be prepared to discuss if case is MDR, rifampin resistant, taking a protease inhibitor/NNRTI, or if regimen is unusual.

9 If adherence for any period has been below 80%, state so and be prepared to explain.

10 A case can only be closed as moved if an interstate had been done.

11 For patients on self-administered treatment, present a review of pharmacy records to assess treatment adherence.

12 Be prepared to present the source case and associated contact investigation, including whether this child was listed as a contact in the contact investigation for the source case.

13 "Contacts identified" include all true contacts with legitimate names and addresses.

14 Contacts "inappropriate for evaluation" will be subtracted from the contacts identified to determine the number appropriate for evaluation.

15 Contacts "appropriate for evaluation" include all legitimate contacts identified who were not counted as "died prior to testing." "Evaluation" consists of tuberculin skin testing and chest radiograph unless there is a documented prior positive TST. A contact is given one or two TSTs (Post–window period testing is only required for contacts who initially test TST-negative).

16 Report only the number evaluated. Do not report the number of contacts who were UTL, who moved more than 60 days after being identified and were not evaluated, or who refused. These explanations may come up in discussion, but are not part of the standard format.

17 All suspects must be reclassified to either "infected with disease" or "infected without disease" within four months of the initiation of treatment.

18 Contacts "appropriate for treatment of latent TB infection" include all TST+ contacts recommended for medical follow-up for whom treatment is medically indicated. Persons identified during a contact investigation who need treatment, but were TST negative or prior TST positive, will be excluded from this number. Be prepared to explain.

19 Report the number who started treatment for LTBI. Do not report the number of people who did not start treatment for LTBI; however, be prepared to explain. Do not report people who received window prophylactic treatment and were found not to have had latent TB infection. Provide updated information on those contacts who started treatment for LTBI.

20 It is important to be familiar with

- Patient's adherence history, latest DOT status, dates of regulatory requests/outcomes, and current regulatory status;
- Patient's occupation and residence settings, particularly if patient is homeless;
- Where contact with others occurred and how often;
- When contacts were evaluated in relation to patient's last positive smear;
- If source case investigation was conducted and results, including relationship of this to any other known cases;
- Evaluations of sex/needle-sharing partners of HIV-infected patients; also, are there any HIV-positive contacts;
- Status of treatment for LTBI when appropriate, including window prophylaxis;
- If and when expanded contact testing occurred and results of investigation.

TB 307 (Rev. 11/04)

NEW YORK CITY DEPARTMENT OF HEALTH and MENTAL HYGIENE
Cohort Presentation II: Clinically Confirmed or Extrapulmonary TB Case

1. Name: _____ CRS # _____

Noncount [No further report necessary]

_____ year-old _____ {male/female}, born in _____{country}.

Special therapy _____ {+ or – /refused/unknown} ❒ Protease inhibitor or NNRTI (name)[1]: ____

Date Assigned: _____

Date Interviewed: _____ If > 5 days for interview – state reason: _____

❒ Clinically confirmed, pulmonary, smear negative, culture negative, non-cavitary.[2]

❒ Extrapulmonary only. [Site of disease: _____]

❒ Pansensitive ❒ MDR ❒ Rifampin resistant ❒ Other resistance _____

❒ Completed therapy

❒ Currently taking TB medications.[3]

Has completed _____ months of treatment

❒ Likely to complete therapy by (date) _____

❒ Did not complete therapy and no longer in care

Reason patient did not complete: ❒ Refused ❒ Lost ❒ Died ❒ Moved[4] ❒ Reported at death

ON DOT: YES *or* NO (circle):

If YES: _____ total number of months on DOT; _____ months on DOT with ≥ 80% compliance

If NO DOT, why not: _____

❒ Pharmacy checks[5] done

Skip contacts.

If case is under 18 years old then use COHORT PRESENTATION FORM I.

2. Discussion[6]

Notes:

If patient is taking a protease inhibitor or non-nucleoside reverse transcriptase inhibitors (NNRTIs), specify the name of the medication.

If the patient has pulmonary disease and has either a positive sputum AFB smear or a cavitary CXR then use Cohort Presentation Form I: Pulmonary or Laryngeal TB.

Do not list medications. The Director has the printout of drug regimens. However, be prepared to discuss if case is MDR or regimen is unusual.

A case can only be closed as moved if an interstate has been done.

For patients on self-administered treatment, present a review of pharmacy records to assess treatment adherence.

It is important to be familiar with:

- Adherence history;
- Patient's occupation and residence settings, particularly if patient is homeless;
- Results from any contact investigation that may have been conducted before culture results were available, particularly if any HIV positive contacts were identified.

TB 306 (Rev. 11/04)

NEW YORK CITY DEPARTMENT OF HEALTH and MENTAL HYGIENE
Patient Review Calculation Form

Network: _____ ___ Quarter of _____ Date: _____

CASES:

A. Total counted cases
B. Cases started on drugs
C. Cases completing recommended therapy
D. Cohort failures
E. Likely to complete
F. MDR
G. Lost
H. Died
I. Moved
J. Cases reported at death
K. Cases counted by other
L. Noncount

Index of completion at the time of the patient review:

$$\textbf{Index} = \frac{C}{B - (H+K+L)} \times 100$$

Index of completion at the time of the patient review, excluding those who could not complete by the time of the review (MDRs):

$$\textbf{Index} = \frac{C}{B - (H+F+K+L)} \times 100$$

Index of completion including those likely to complete by the end of the cohort year (<365 days):

$$\textbf{Index} = \frac{C + E}{B - (H+K+L)} \times 100$$

Index of completion including those likely to complete by the end of the cohort year, excluding those could not complete treatment within one year (MDRs):

$$\textbf{Index} = \frac{C + E}{B - (H+F+K+L)} \times 100$$

Death rate:

$$\textbf{Index} = \frac{H + J}{A - (K+L)} \times 100$$

NEW YORK CITY DEPARTMENT OF HEALTH and MENTAL HYGIENE
Patient Review Calculation Form (cont.)

Default rate:

Index = $\frac{G}{A-(K+L)}$ X 100

Total cohort failure rate:

Index = $\frac{D+G}{A-(K+L)}$ X 100

CONTACTS:

Contact Index: $\frac{\text{all contacts identified}}{\text{total cases appropriate for contact investigation}}$

$\frac{\text{Contacts inappropriate for evaluation}}{\text{All contacts identified}}$ X 100

$\frac{\text{Contacts appropriate for evaluation}}{\text{All contacts identified}}$ X 100

$\frac{\text{Contacts evaluated}}{\text{Contacts appropriate for evaluation}}$ X 100

$\frac{\text{Contacts infected w/o disease}}{\text{Contacts evaluated}}$ X 100

$\frac{\text{Contacts suspected}}{\text{Contacts evaluated}}$ X 100

$\frac{\text{Contacts infected with disease}}{\text{Contacts evaluated}}$ X 100

$\frac{\text{Contacts appropriate for treatment of LTBI}}{\text{Contacts infected w/o disease}}$ X 100

NEW YORK CITY DEPARTMENT OF HEALTH and MENTAL HYGIENE
Patient Review Calculation Form (cont.)

$$\frac{\text{Contacts that started LTBI}}{\text{Contacts appropriate for treatment of LTBI}} \times 100$$

$$\frac{\text{Contacts that did not start LTBI}}{\text{Contacts appropriate for treatment of LTBI}} \times 100$$

$$\frac{\text{Contacts completed LTBI}}{\text{Contacts started LTBI}} \times 100$$

$$\frac{\text{Contacts still on LTBI}}{\text{Contacts started LTBI}} \times 100$$

Categories of contacts that discontinued treatment of LTBI:

$$\frac{\text{Contacts with adverse reaction}}{\text{Contacts started LTBI}} \times 100$$

$$\frac{\text{Contacts died}}{\text{Contacts started LTBI}} \times 100$$

$$\frac{\text{Contacts moved}}{\text{Contacts started LTBI}} \times 100$$

$$\frac{\text{Contacts refused}}{\text{Contacts started LTBI}} \times 100$$

$$\frac{\text{Contacts lost}}{\text{Contacts started LTBI}} \times 100$$

Appendix C: Sample Cohort Review Forms

Washington State Department of Health Tuberculosis Program

WASHINGTON STATE DEPARTMENT OF HEALTH TUBERCULOSIS PROGRAM
Cohort Presentation Form: Pulmonary and Extrapulmonary TB

Initials_____ County_____ TIMS Case #_____

A) If the case is a child less than 5 years of age
□ Yes, source identified[1]

B) If the case is HIV+
□ Yes, source identified

1a. _____year-old [male / female] born in _____ (Country). Arrived in the US _____(year). Class A, B1, B2 _____[yes, no].

b. Risk/social factors [medical conditions, substance abuse, homeless, employment, other _____]

c. _____ (date) patient presented with symptoms of [cough, hemoptysis, night sweats, fever, weight loss, chest pain, enlarged lymph node, other _____]
for _____ (days, weeks or months).

d. PPD ____mm read on _____ (date).

e. CXR shows [cavitary / abnormal non-cavitary / normal] taken on _____ (date).

2.a. This is a case of pulmonary[2] TB and/or extrapulmonary TB_____(site)
□ culture confirmed □ clinically confirmed □ provider diagnosed

b. **Sputum**[3] was collected on _____ (date) and received at lab on _____ (date).

c. MTD negative/positive on _____ (date). □ not done

d. **Sputum**[4] smear [_____ plus positive / negative] on _____ (date). LHJ first notified_____ (date) by lab of sputum smear positive result.

e. **Sputum** culture [+ / – / not done] and reported on _____ (date). Sputum culture conversion [occurred / did not occur / not obtained] within 2 months of treatment.

f. **Other specimens**: source_____ collected on _____ (date).
Smear [_____ plus positive / negative] on _____ (date).
Culture results [+, – , not done] and reported on _____ (date).

g. Sensitivity testing [pansensitive, MDR, resistant to_____]. LHJ first notified_____ (date) by lab of susceptibility results.

h. HIV[5] [positive / negative / refused / not offered] on _____(date).

3. TB treatment

a. Four-drug regimen or other regimen _____started on _____ (date).

b. Treatment plan of _____ (months).

c. On DOT? [yes / no] for a total of: □ 26 wks □ 9 mos □ 18 mos □ other_____

d. If no DOT, reason: □ lack of resources □ patient refused □ provider refused □ other_____

e. Pharmacy checks done[6]? [yes, no].

f. Completed _____ weeks of TB treatment on _____(date) **OR** still on therapy and is due to complete _____ (date).

g. Did not complete therapy because:
□ refused treatment
□ lost
□ died □TB related □non-TB related
□ moved Date of interjurisdictional referral:_____
□ reported at death

WASHINGTON STATE DEPARTMENT OF HEALTH TUBERCULOSIS PROGRAM
Cohort Presentation Form: Pulmonary and Extrapulmonary TB (cont.)

h. Treatment interruptions[7] ☐ yes ☐ no

Medical/adverse reactions	☐ yes	☐ no
Patient nonadherence	☐ yes	☐ no
Provider reasons	☐ yes	☐ no

4. Follow-up of the case

a. Completion of therapy CXR on _____ (date) showed [improved / worsened / no change / not done]

b. If treatment still ongoing, follow-up CXR on _____ (date) showed [improved / worsened / no change / not done]

5. Contacts (*indicate number in each box*)

	Identified[8]		Started treatment for LTBI[14]
	Date contacts identified[9]_____		Completed treatment for LTBI
	Date contacts interviewed[10]_____		Currently on treatment
	Evaluated[11] [Include those with initial and F/U PPD; CXR if PPD positive]		Discontinued treatment for LTBI due to:
	Date of evaluation[12] _____		Adverse reactions to medications
	Prior positive PPD		Died
	Infected (TST+) without disease [confirmed by CXR]		Moved[15]
	Diagnosed with TB disease		Refused to continue treatment
	Eligible for treatment of latent TB infection[13]		Lost to follow-up
	Started window prophylaxis (i.e., for those < 5 yrs of age, immunocompromised)		Provider decision (e.g. unable to monitor pt care)

6. Items needing follow-up:_____

_____

_____

Please fill out but do not present this information during cohort review

1. LHJ first notified_____ (date) by [health care provider, other_____]
2. DOH first notified by LHJ_____ (date) [includes DOH calling LHJ and start of report]

WASHINGTON STATE DEPARTMENT OF HEALTH TUBERCULOSIS PROGRAM
Cohort Presentation Form: Pulmonary and Extrapulmonary TB (cont.)

1. Be prepared to present the source case and associated contact investigation, including whether this child or HIV-infected person was listed as a contact in the contact investigation for the source case.
2. A disease site in the respiratory system including the airways (e.g., endobronchial, laryngeal).
3. Report the first sputum collected. All lab questions refer to local labs **or** state public health lab.
4. Report initial sputum unless initial is smear negative. Then report first sputum that is smear positive.
5. HIV testing should be current and done within 6 months of diagnosis.
6. A review of pharmacy records to determine whether a patient filled their anti-tuberculosis medications.
7. Report >2 weeks interruption during initial phase or >20% during the continuation phase.
8. Contacts identified include all true contacts with legitimate names, addresses, and DOB.
9. Report date when the first contact was identified (usually when case was interviewed).
10. Report date when the first contact was interviewed.
11. Evaluation is defined as 1) TST positive, CXR completed, and sputum collected if indicated; 2) TST placed and read after the end of the window period; or 3) contacts with documentation of previous diagnosed disease or LTBI—even if no further tests and exams are done. If started on treatment for LTBI, do not include these contacts in the number of "eligible for treatment."
12. Report date when the first contact was evaluated with an initial PPD.
13. Contacts "eligible for treatment of latent TB infection" include: i) all TST+ contacts recommended for medical follow-up for whom treatment is medically indicated; and ii) persons identified during a contact investigation who need treatment, *whether or not they were TST tested* (e.g., HIV).
14. Report the number who started treatment for LTBI. Do not report the number of people who did ***not*** start treatment for LTBI; however, be prepared to explain. Do not report people who received window prophylactic treatment and were found not to have had latent TB infection. Provide updated information on those contacts who started treatment for LTBI.
15. Complete an interjurisdictional referral form. Send the form to the county where contact is transferring and send copy to DOH TB Program.