

# Surveillance

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# Introduction

## Purpose

Use this section to

- Understand the importance of surveillance in tuberculosis (TB) control and prevention;
- Report suspected and confirmed TB cases;
- Ensure you are using the required data collection forms;
- Understand how the computerized TB registry works; and
- Understand how genotyping can assist TB control efforts.

Surveillance—the ongoing systematic collection, analysis, interpretation, and dissemination of data about a health-related event—is a critical component of successful TB control, providing essential information needed to

1. Determine TB patterns and trends of the disease;
2. Identify sentinel events, such as potential outbreaks, recent transmission, multidrug resistance, and deaths;
3. Identify high-risk populations and settings;
4. Establish priorities for control and prevention activities; and
5. Strategically plan use of limited resources.<sup>1</sup>

Surveillance data are also essential for quality-assurance purposes, program evaluation, and measurement of progress toward TB elimination.

State and local TB control programs should have the capability to monitor trends in TB disease and latent TB infection (LTBI) in populations at high risk in order to detect new patterns of disease and possible outbreaks. Populations at high risk should be identified and targeted for active surveillance and prevention, including targeted testing and treatment of LTBI. The following populations have been demonstrated to be at risk for TB exposure or progression from exposure to disease, or both: children, foreign-born persons, human immunodeficiency virus (HIV)-infected persons, homeless persons, and detainees and prisoners. Surveillance and surveys from throughout the U.S. indicate that certain epidemiologic patterns of TB are consistently observed among these populations, suggesting that the recommended control measures are generalizable. State and local surveillance data should be analyzed to determine additional high-risk population groups.

In addition to providing the epidemiologic profile of TB in a given jurisdiction, state and local surveillance are essential to national TB surveillance.<sup>2</sup> Data for the national TB

surveillance system is reported by state health departments in accordance with standard TB case definition and case-report formats. The Report of Verified Case of Tuberculosis (RVCT) forms are designed to collect information on cases of TB. The Centers for Disease Control and Prevention's (CDC's) national TB surveillance system publishes epidemiologic analyses of reported TB cases in the U.S.<sup>3</sup>

Reporting of new cases is essential for surveillance purposes.<sup>4</sup>

## Surveillance in TB Control Activities

**Case detection:** Case reporting to the jurisdictional public health agency is done for surveillance purposes and for facilitating a treatment plan and case management services.<sup>5</sup>



For more information on case reporting, see the “Reporting Tuberculosis” topic in this section.

**Outbreak detection:** Surveillance data should be routinely reviewed to determine if there is an increase in the expected number of TB cases, one of the criteria for determining if an outbreak is occurring. For an increase in the expected number of TB cases to be identified, the local epidemiology of TB should be understood. Detection of a TB outbreak in an area in which prevalence is low might depend on a combination of factors, including recognition of sentinel events, routine genotype cluster analysis of surveillance data, and analysis of *Mycobacterium tuberculosis* drug-resistance and genotyping patterns.<sup>6</sup> Genotyping data (see Specimen Collection and Laboratory Services chapter) should routinely be reviewed because genotype clusters also may indicate an outbreak. Prompt identification of potential outbreaks and rapid responses are necessary to limit further TB transmission. When an outbreak is identified, short-term investigation activities should follow the same principles as those for the epidemiologic part of the contact investigation (i.e., defining the infectious period, settings, risk groups, mode of transmission, contact identification, and follow-up). However, long-term activities require continued active surveillance.



For more information on outbreak investigations, see the “Outbreak Investigation” topic in the Contact Investigation section.

**Contact investigation:** Collecting, analyzing, interpreting, and disseminating data on contacts and contact investigations is necessary for prioritizing the highest-risk contacts, resulting in focused use of resources in accordance with national guidelines. Although surveillance of individual contacts to TB cases is not conducted in the U.S., the CDC collects aggregate data from state and local TB programs through the Aggregate Report for Program Evaluation (ARPE). Routine collection and review of this data can provide the basis for evaluation of contact investigations for TB control programs.<sup>7</sup>



For more information on surveillance in contact investigations, see the Contact Investigation section.

**Targeted testing:** Review and interpretation of surveillance data informs targeted testing policies and strategies. Targeted testing is intended to identify persons other than TB contacts who have an increased risk for acquiring TB and to offer such persons diagnostic testing for *M. tuberculosis* infection and treatment, if indicated, to prevent subsequent progression to TB disease. Targeted testing and treatment of LTBI is best accomplished through cost-effective programs aimed at patients and populations identified on the basis of local surveillance data as being at increased risk for TB.<sup>8</sup>



For more information on surveillance and targeted testing, see the Targeted Testing section.

**Treatment of LTBI:** Surveillance of persons with LTBI does not routinely occur in the U.S. However, the CDC is developing a national surveillance system to record adverse events leading to the hospitalization or death of a person under treatment for LTBI. Healthcare providers are encouraged to report such events to the CDC's Division of Tuberculosis Elimination by calling 1-404-639-8401. Surveillance of these events will provide data to evaluate the safety of treatment regimens recommended in current guidelines.<sup>9</sup>



For more information on surveillance and targeted testing, see the Targeted Testing section. For more information on updated LTBI treatment recommendations, see the CDC's "Update: Adverse Event Data and Revised American Thoracic Society/CDC Recommendations Against the Use of Rifampin and Pyrazinamide for Treatment of Latent Tuberculosis Infection---United States, 2003" (MMWR 2003;52[31];735–739) at this hyperlink:  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5231a4.htm>.

## Guidance

Data collection and reporting on TB should be done in accordance with Idaho laws and regulations. Reporting and recordkeeping requirements are covered in this section.



For roles and responsibilities, refer to the “Roles, Responsibilities, and Contact Information” topic in the Introduction.



For more information on confidentiality and the Health Insurance Portability and Accountability Act (HIPAA), see the Confidentiality section.

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# Reporting Tuberculosis

Detecting and reporting suspected cases of tuberculosis (TB) is the key step in stopping transmission of *Mycobacterium tuberculosis* because it leads to prompt initiation of effective multiple-drug treatment, which rapidly reduces infectiousness. The Centers for Disease Control and Prevention (CDC) reports that delays in reporting cases of pulmonary TB are one of the major challenges to successful control of TB.<sup>10</sup> As one of the strategies to achieve the goal of reduction of TB morbidity and mortality, the CDC recommends immediate reporting of a suspected or confirmed case of TB to the jurisdictional health agency.<sup>11</sup> Also, by Idaho law and regulation, a case of TB disease in the state must be reported to the local public health district or the state's Office of Epidemiology and Food Protection.

When reporting TB, keep the following definitions in mind:

- **Case:** An episode of TB disease in a person meeting the laboratory or clinical criteria for TB, as defined in the document "Case Definitions for Infectious Conditions Under Public Health Surveillance."<sup>12</sup> These criteria are listed below in Table 1.<sup>13</sup>
- **Suspect:** A person for whom there is a high index of suspicion for active TB (e.g., a known contact to an active TB case or a person with signs or symptoms consistent with TB) who is currently under evaluation for TB disease.<sup>14</sup>
- **Confirmed:** A case that meets the clinical case definition or is laboratory confirmed, as described below in Table 1.<sup>15</sup>

TABLE 1: CASE DEFINITIONS<sup>16</sup>

Clinical Case Definition	Laboratory Criteria for Diagnosis
<p>A case that meets all of the following criteria:</p> <ul style="list-style-type: none"> <li>▪ A positive tuberculin skin test<sup>^</sup></li> <li>▪ Other signs and symptoms compatible with tuberculosis (e.g., an abnormal, unstable [i.e., worsening or improving] chest radiograph, or clinical evidence of current disease)</li> <li>▪ Treatment with 2 or more antituberculosis medications</li> <li>▪ Completed diagnostic evaluation</li> </ul>	<p>A case is laboratory confirmed when it meets one of the following criteria:</p> <ul style="list-style-type: none"> <li>▪ Isolation of <i>Mycobacterium tuberculosis</i> from a clinical specimen<sup>*</sup></li> <li>▪ Demonstration of <i>M. tuberculosis</i> from a clinical specimen by nucleic acid amplification test (NAAT)<sup>†</sup></li> <li>▪ Demonstration of acid-fast bacilli (AFB) in a clinical specimen when a culture has not been or cannot be obtained</li> </ul>
<p><sup>^</sup> In practice, this is not always the case. A person can have active disease and not have a positive skin test.</p> <p><sup>*</sup> Use of rapid identification techniques for <i>M. tuberculosis</i> (e.g., deoxyribonucleic acid [DNA] probes and mycolic acids high-pressure liquid chromatography performed on a culture from a clinical specimen) is acceptable under this criterion.</p> <p><sup>†</sup> NAATs must be accompanied by culture for mycobacteria species. However, for surveillance purposes, the CDC will accept results obtained from NAA tests approved by the Food and Drug Administration and used according to the approved product labeling on the package insert.</p>	

Source: Adapted from: CDC. Case definitions for infectious conditions under public health surveillance. MMWR 1997;46(No.RR-10):40–41.

If pulmonary TB is suspected, initiate a diagnostic investigation when the historic features, signs, symptoms, and radiographic findings of TB are evident among adults. TB should be suspected in any patient who has a persistent cough for two to three weeks or more that may be accompanied by fever, sweating at night, weight loss, or other indicative signs and symptoms.<sup>17</sup>



For more information on suspected pulmonary TB, see the Diagnosis of Tuberculosis Disease section.

Mandatory and timely case reporting from community sources (e.g. providers, laboratories, hospitals, and pharmacies) is required. Reporting enables the TB control program to take action at local, state, and national levels and to understand the magnitude and distribution of the TB problem.<sup>18</sup>



For more information on case reporting as it appears in Idaho Rules and Regulations, see: <http://adm.idaho.gov/adminrules/rules/idapa16/0210.pdf>.

Prompt reporting (prior to culture confirmation) allows the state and local public health agency to do the following quickly:

- Verify diagnosis
- Assign a case manager and coordinate treatment
- Determine if an outbreak is occurring
- Control the spread of TB<sup>19</sup>

Failure to report cases threatens public health because it may result in the adverse outcome of a patient's treatment or delayed contact investigation of an infectious case.<sup>20</sup>

The following public health services are available to assist physicians with managing their TB cases:

- Epidemiologic investigation, including identification and examination of contacts
- Chest radiographic services (limited basis; requires state approval)
- Anti-tuberculosis medications
- State public health laboratory services. The actual *M. tuberculosis* isolate should be sent to the state laboratory so that genotyping can be performed.<sup>21</sup>

## Reporting Suspected or Confirmed Cases of Tuberculosis to the Local Public Health Agency

Healthcare providers and laboratories should report suspected or confirmed cases of TB using the information on Table 2.

TABLE 2: WHEN TO REPORT TUBERCULOSIS

What Condition/ Test Result	Who Reports	When to Report	How to Report
<p><b>Confirmed or suspected cases of tuberculosis (TB) disease</b></p> <p>Confirmation by laboratory tests is not required.</p> <p>This includes pulmonary and extrapulmonary cases.</p>	<p>Anyone who knows or suspects that a case or suspected case of TB exists, including but not limited to physician, dentist, nurse, medical examiner, other health care practitioner, administrator of health care facility, public or private school administrator, city health officer, or laboratorian</p>	<p>Within 3 working days</p>	<p>Call the local public health agency or call the Office of Epidemiology and Food Protection's WATTS line at 800-632-5927.</p> <p>For a list of local public health districts in Idaho and their contact information go to:</p> <p><a href="http://healthandwelfare.idaho.gov/Health/HealthDistricts/tabid/97/Default.aspx">http://healthandwelfare.idaho.gov/Health/HealthDistricts/tabid/97/Default.aspx</a></p>

### Healthcare Providers

Healthcare providers should report the following information on suspect or confirmed cases of TB and any other information related to case management requested by the local public health district and/or the Idaho TB Program.

1. Name, age and sex of the case
2. Phone number and address
3. Name and phone number of the treating physician, other health care provider, of the reporter or other person the department can contact for pertinent information about the case

### Laboratories

Laboratories should report the same information as healthcare providers.

## Required Reports from Local Public Health Agencies to the Idaho Tuberculosis Program

Local public health districts are required to complete and submit the reports listed in Table 3 to the Idaho TB Program Manager at the Idaho Division of Health TB Program.

Transmit these reports by fax to the attention of the Idaho TB Program Manager at (208) 332-7307 or mail to the Office of Epidemiology and Food Protection.

TABLE 3: REQUIRED REPORTS

Report Title	When Due
RVCT form	When information is available
RVCT follow-up 1 form	When sensitivities are available, or, if culture negative, once the laboratory declares the specimens to be culture negative.
RVCT follow-up 2 form	At the end of regimen
Directly Observed Therapy Record	At the end of regimen
Contact Tracing Form	Return with RVCT Follow-up 2 form or when contacts complete evaluation or treatment
TB Control Activities Quarterly Report	Quarterly



If RVCT report forms or a copy the Quarterly report form are needed contact the Idaho TB program. The DOT Record and Contact Tracing Forms can be found either in chapter 17 “Forms”, on the TB Forms website (<http://healthandwelfare.idaho.gov/Health/DiseasesConditions/Tuberculosis/TuberculosisForms/tabid/854/Default.aspx>), or on the Idaho Learning Management System.

# Data Collection and Management

## Forms

The following types of forms (or similar forms developed by the district) are examples and not required (except as noted in Table 3: Required Reports) but may be completed and placed with the patient's records. For more examples of forms see chapter 17 "Forms".

TABLE 4: EXAMPLES OF FORMS WHICH CAN BE USED TO COMPLETE A TUBERCULOSIS (TB) PATIENT'S RECORDS

For a Patient on Treatment for Tuberculosis Disease	
<b>Tuberculosis (TB) Disease Treatment/Case Management</b> <ul style="list-style-type: none"> <li>▪ "Confirmed/Suspected Report of Tuberculosis Disease"</li> <li>▪ "Tuberculosis Case Update Monthly Report"</li> <li>▪ "Treatment Plan"</li> <li>▪ "Directly Observed Therapy Agreement"</li> <li>▪ "Home Isolation Agreement"</li> <li>▪ "TB Home Evaluation"</li> <li>▪ "Bacteriology Data Sheet"</li> <li>▪ "Biochemistry Data Sheet"</li> </ul>	<ul style="list-style-type: none"> <li>▪ "Treatment of Active TB Education Form"</li> <li>▪ "Monthly TB Patient Assessment"</li> <li>▪ "Directly Observed Therapy Form 1: Treatment Record"</li> <li>▪ "Directly Observed Therapy Form 2: Side Effects and Adverse Reactions"</li> </ul> <b>Transfer Notifications</b> <ul style="list-style-type: none"> <li>▪ "Interjurisdictional Tuberculosis Notification Form" (NTCA)</li> <li>▪ "Interjurisdictional Follow-Up Form" (NTCA)</li> </ul>
For a Patient on Treatment for Latent Tuberculosis Infection	
<b>Latent Tuberculosis Infection (LTBI) Treatment</b> <ul style="list-style-type: none"> <li>▪ "Treatment of LTBI Education Form"</li> </ul> <b>If on Directly Observed Therapy</b> <ul style="list-style-type: none"> <li>▪ "Directly Observed Therapy Agreement"</li> <li>▪ "Directly Observed Therapy Form 1: Treatment Record"</li> <li>▪ "Directly Observed Therapy Form 2: Side Effects and Adverse Reactions"</li> </ul>	<b>Transfer Notifications</b> <ul style="list-style-type: none"> <li>▪ "Interjurisdictional Tuberculosis Notification Form" (NTCA)</li> <li>▪ "Interjurisdictional Follow-Up Form" (NTCA)</li> </ul>
Contact Investigation	
<ul style="list-style-type: none"> <li>▪ "TB Contact Investigation Report" (with instructions)</li> </ul>	



The forms listed in Table 4 can be found either in chapter 17 “Forms”, on the Idaho LMS, or online at <http://healthandwelfare.idaho.gov/Health/DiseasesConditions/Tuberculosis/TuberculosisForms/tabid/854/Default.aspx>. Additional examples of these types of forms can also be found in both chapter 17 and the LMS.

Records on TB patients prior to 1995 are kept by the state in hard copy; please inquire with the state TB program to access these records if needed.

## Tuberculosis Data and Registry

To carry out mandatory community public health responsibilities, the state TB control program maintains a computerized record system (case registry) with up-to-date information on all current clinically active and suspected TB cases in the community.<sup>22</sup> The TB case registry ensures that laboratory data, including all initial diagnostic tests, are promptly reported, if applicable, to the healthcare provider and local and state TB control programs. Follow-up tests, including data on sputum culture conversion and drug susceptibility testing of clinical isolates, should also be promptly reported so any needed modifications in management can be made. Aggregate program data is analyzed, interpreted, and made available to the healthcare community and to community groups and organizations with specific interests in public health. Providing this information supports education and advocacy and facilitates their collaboration in the planning process.

To ensure appropriate follow-up of all TB patients and persons suspected of having TB, the following information is updated by the state TB program on a continuing basis:<sup>23</sup>

- Acid-fast bacilli smear results
- Culture results
- Drug susceptibility results
- Chest radiograph results
- Treatment information

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# Dissemination and Evaluation

## Dissemination

Tuberculosis (TB) surveillance data will be disseminated periodically to healthcare providers, health agencies, and the public through multiple channels including health alerts, reports, summaries, and presentations.

## Evaluation

The purpose of evaluating public health surveillance systems is to ensure that problems of public health importance are being monitored efficiently and effectively. TB surveillance systems should be evaluated periodically, and the evaluation should include recommendations for improving quality, efficiency, and usefulness. Evaluation of a public health surveillance system focuses on how well the system operates to meet its purpose and objectives.



For more information see the CDC's "Updated Guidelines for Evaluating Public Health Surveillance Systems" (MMWR 2001;50[No RR-13]) at this hyperlink: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5013a1.htm> .

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