

# 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, 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 United States 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 are 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 United States.<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 Section of Epidemiology 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. **2.8**



For a list of reportable diseases, including tuberculosis and instructions on how to report in Alaska, see *Conditions Reportable to Public Health* at <http://dhss.alaska.gov/dph/Epi/Pages/pubs/conditions/default.aspx> .

**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>5</sup> Genotyping data 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. **11.42**

**Contact investigation:** Collecting, analyzing, interpreting, and disseminating data on contacts and contact investigations are 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 United States, 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>6</sup>



For more information on surveillance in contact investigations, see the Contact Investigation section. **11.1**

**Targeted testing:** Review and interpretation of surveillance data inform 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. **3.1**

**Treatment of LTBI:** Surveillance of persons with LTBI does not routinely occur in the United States. 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 *Latent Tuberculosis Infection: A Guide for Primary Health Care Providers* available at:

<https://www.cdc.gov/tb/publications/ltbi/pdf/LTBIbooklet508.pdf>

## Policy

Data collection and reporting on TB should be done in accordance with Alaska statutes 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. **1.11**



For more information on confidentiality and the Health Insurance Portability and Accountability Act (HIPAA), see the Confidentiality section. **14.3**

## State Statutes and Regulations

Several Alaska statutes and regulations govern infectious diseases, including tuberculosis, reporting and control. Suspected or confirmed cases of tuberculosis are reportable by law within five (5) working days.



See the Statutes and Regulations section of this manual **19.1** or *Conditions Reportable to Public Health, pages 5-46*, <http://dhss.alaska.gov/dph/Epi/Documents/pubs/conditions/ConditionsReportable.pdf> .



Contact the Alaska TB Program at 907-269-8000 for assistance with interpreting state laws and regulations regarding TB control.

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## Reporting Tuberculosis

Detecting and reporting suspected cases of tuberculosis (TB) are key steps 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>6</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>7</sup> By Alaska statute and regulation, a suspected or confirmed case of TB disease in Alaska must be reported to the Section of Epidemiology (907-269-8000) within five working days; however reports should be made as soon as possible.

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>8</sup> These criteria are listed below in Table 1.<sup>9</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>10</sup>

**Confirmed:** A case that meets the clinical case definition or is laboratory confirmed, as described below in Table 1.<sup>11</sup>

Table 1: **CASE DEFINITIONS**<sup>12</sup>

Clinical Case Definition	Laboratory Criteria for Diagnosis
<p>A case that meets of the following criteria:</p> <ul style="list-style-type: none"> <li>▪ A positive tuberculin skin test or interferon gamma release assay (IGRA)</li> <li>▪ Other signs and symptoms compatible with tuberculosis (e.g., an abnormal, unstable [i.e., worsening or improving] chest radiographs, or clinical evidence of current disease)</li> <li>▪ Treatment with two 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*</li> <li>▪ Demonstration of <i>M. tuberculosis</i> from a clinical specimen by nucleic acid amplification (NAA) test†</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>* 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>† NAA tests 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. NAA is not available in Alaska.</p>	

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

Suspect pulmonary TB and initiate a diagnostic investigation when the medical history, signs, symptoms, and radiographic findings of TB are evident among adults or children. TB should be suspected in any patient who has a persistent cough for over two to three weeks, or other indicative signs and symptoms.<sup>13</sup>



For more information on suspected pulmonary TB, see the Diagnosis of Tuberculosis Disease section. **5.11**

Mandatory and timely case reporting from community sources (e.g., providers, and laboratories) should be enforced and evaluated regularly. 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>14</sup>

Prompt reporting (prior to culture confirmation) allows the Alaska TB Program to do the following quickly:

- Verify the diagnosis
- Assign a public health nurse (PHN) case manager and coordinate treatment
- Determine if an outbreak is occurring
- Control the spread of TB<sup>15</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>16</sup>

Reporting gives physicians access to resources provided by the local public health agency. Private physicians are encouraged to work collaboratively with their local public health agency in the management of their TB cases and contacts. All providers who undertake evaluation and treatment of patients with TB must recognize that, not only are they delivering care to an individual, they are assuming an important public health function that entails a high level of responsibility to the community, as well as to the individual patient.

The Alaska TB Control Program provides the following public health services to assist physicians and other health care providers with managing their TB cases:

- Epidemiologic investigation, including identification and examination of contacts
- Chest radiographic services
- Antituberculosis medications
- Case management by a PHN
- Public health laboratory services and consultation: All *M.tuberculosis* isolates should be sent to the Alaska State Public Health Laboratory (ASPHL) so that genotyping can be performed.<sup>17</sup>



For more information on confidentiality and the Health Insurance Portability and Accountability Act (HIPAA), see the Confidentiality section **14.3**

## **Reporting Suspected or Confirmed Cases of Tuberculosis to the Section of Epidemiology**

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



Table 2: **WHEN TO REPORT TUBERCULOSIS**

What Condition/ Test Result	Who Reports	When to Report	How to Report
<p><b>Suspected or confirmed cases of tuberculosis (TB) disease</b> Confirmation by laboratory tests is not required. This includes pulmonary and extrapulmonary cases.</p>	<p><b>Health care providers</b>  <b>Note:</b> The attending physician or other healthcare provider must report even if the laboratory is also reporting the test results.</p>	<p>Reports should be made as soon as possible and must be made within two (2) working days</p>	<p>Alaska TB Program Staff 1-907-269-8000 during work hours 1-800-478-0084 after hours  Fax 1-907-561-4239</p>
<p><b>Sputum smears positive for acid-fast bacilli (AFB)</b>  <b>Nucleic Amplification (NAA) tests; polymerase chain reaction (PCR) or GeneXpert positive for <i>M. tuberculosis</i> complex</b>  <b>Cultures that are positive for <i>Mycobacterium tuberculosis</i> complex*</b>  <b>DNA probes positive for <i>M. tuberculosis</i> complex</b></p>	<p>All laboratories that perform TB testing In-state laboratories that send specimens for out-of-state testing  <b>Note:</b> The laboratory must report even if the attending physician or other healthcare provider is also reporting.</p>	<p>Reports should be made as soon as possible and must be made within two (2) working days</p>	<p>Alaska TB Program Staff 1-907-269-8000 during work hours 1-800-478-0084 after hours  Fax 1-907-561-4239</p>
<p>* Note: Preliminary report of cultures growing AFB without confirmation of <i>M. tuberculosis</i> complex; final report of cultures that are demonstrated to be positive for <i>M. tuberculosis</i> complex.</p>			



Use the *Infectious Disease Report Form* to report suspected and confirmed cases of TB. It is available at:

<http://dhss.alaska.gov/dph/Epi/Documents/pubs/conditions/frmlnfect.pdf>

# Tuberculosis Case Information to Report to the Alaska TB Program

## Healthcare Providers

Healthcare providers attending patients with confirmed or suspected TB should provide the following information to the Alaska TB Program, if available.

### Patient Information

- Name
- Address
- Phone numbers
- Marital status
- Occupation
- Hospital admission information (name, admission date, etc.)
- Type of isolation arrangements (if applicable, home, hospital, other)
- Date of anticipated discharge and tentative discharge plan

### Demographic and Social Information

- Date of birth
- Sex
- Race/ethnic origin
- Country of birth/date of U.S. arrival
- Drug and alcohol use
- Homeless within past year?
- Diagnosed in a correctional facility or long-term care facility?

### Medical Information

- Reason for test
- Symptoms/onset
- Disease site
- Co-morbid health conditions
- Human immunodeficiency virus (HIV) testing information
- Results of QuantiFERON®-TB Gold (QFT-G) or tuberculin skin test (TST) (TST in mm) and date of test
- Chest radiograph results and dates (if applicable)
- Bacteriology results, date(s), and name of laboratory performing test(s)
- Drug therapy (medications used, dosages, start dates and dates given, mode of treatment)

### Provider Information

- Names of primary and other physicians, discharge planners, case managers, social workers, etc.
- Phone numbers

## Laboratories

Laboratories should report the following information on test results.

### Reporting Laboratory

- Name
- Address
- Phone number
- Date of report

**Sputum Smears Positive for Acid-Fast Bacilli (AFB)**

- Collection date
- Specimen source
- Result

**Cultures Growing AFB or Cultures Positive for *Mycobacterium tuberculosis***

- Collection date
- Specimen source
- Result

**Nucleic acid amplification tests/DNA probes positive for *M. tuberculosis* complex**

- Collection date
- Specimen source
- Result

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# Data Collection

## Forms

The following standardized forms may be useful to document reporting activities and then placed in the patient's chart (Table 3). Additional forms pertaining to TB diagnosis, treatment and case management will be discussed in those sections.

Table 3: **RECOMMENDED FORMS FOR A TUBERCULOSIS PATIENT'S CHART**

Chart of a Patient on Treatment for Tuberculosis Disease	
<b>Tuberculosis (TB) Disease Treatment/Case Management</b> <ul style="list-style-type: none"><li>▪ Infectious Disease Report Form</li><li>▪ TB Case Management Form</li><li>▪ Tuberculosis Treatment Contract</li></ul> <b>Contact Investigation</b> <ul style="list-style-type: none"><li>▪ Contact Investigation Form</li></ul>	<b>Transfer Notifications</b> <ul style="list-style-type: none"><li>▪ Interjurisdictional TB Notification</li><li>▪ Interjurisdictional TB Notification Follow-Up</li></ul>



To download the recommended forms go to the Forms section of the manual. **18.1**

## Computerized Tuberculosis Registry

To carry out mandatory community public health responsibilities, the Alaska TB Program maintains a computerized record system (case registry) with information on all current clinically active and suspected TB cases.<sup>18</sup> Critical medical information is gathered on cases so that each case is optimally managed during their TB treatment.

The following information is maintained on each patient:<sup>19</sup>

- Acid-fast bacilli smear results
- Culture results
- NAA test results
- Drug susceptibility results

- Clinical status
- Chest radiograph results
- Drug regimen information
- Doses of medications being administered

## **Document Retention**

The Alaska TB Program maintains all state TB public health records according to the Alaska Records Retention schedule.

Active TB case records are retained at the Alaska TB Program offices for at least seven years beyond completion of case follow-up; electronic case information is kept indefinitely. Paper records on individuals who were suspected to have tuberculosis are kept on-site for seven years after completion of follow-up. Electronic records on persons treated for latent tuberculosis infection or with suspected tuberculosis are available from 2000 forward are kept indefinitely.

Radiographs/ digital films are not stored by the state. Case management health information and other TB records should be maintained at the local public health agency according to current applicable record retention rules and regulations.

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# Genotyping

Genotyping is a useful tool for studying the pathogenesis, epidemiology, and transmission of *Mycobacterium tuberculosis*. *M. tuberculosis* genotyping refers to laboratory procedures developed to identify *M. tuberculosis* isolates that are identical in specific parts of the genome (of similar strain types).

The addition of genotype information to the pool of information generated by surveillance data and data collected through epidemiologic investigation allow confirmation of suspected transmission. A potential outbreak should be suspected whenever there is more than one case of TB whose isolate has the same genotype (genotype cluster). Further investigation that includes review of surveillance data, chart review, and reinterview of TB cases may refute or confirm the epidemiologic connection between more than one TB case. In some instances, a genotype cluster reflects a false-positive culture that may be a result of laboratory cross-contamination. Routine review of genotyping data, along with epidemiologic, clinical, and laboratory data, may identify patients who are wrongly classified as TB patients and should be further investigated.

All *Mycobacterium tuberculosis* isolates in Alaska are submitted for genotyping. Suspected clusters are investigated to determine whether an outbreak has occurred.



For more information on genotyping, see the National Tuberculosis Controllers Association/Centers for Disease Control and Prevention Advisory Group on Tuberculosis Genotyping's *Guide to the Application of Genotyping to Tuberculosis Prevention and Control* (2004) at <http://www.cdc.gov/tb/programs/genotyping/manual.htm>



All positive *M. tuberculosis* cultures should be sent to the Alaska Public Health Laboratory in Anchorage for submission to the appropriate national genotyping laboratory.

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# Dissemination and Evaluation

## Dissemination

Tuberculosis (TB) surveillance data are disseminated periodically to healthcare providers, health agencies, and the public through multiple channels including the Epidemiology Bulletin and annual report which can be found on the Alaska TB Program website. <http://epibulletins.dhss.alaska.gov/Bulletin/DisplayClassificationBulletins/39>

## Evaluation

Alaska TB surveillance data are routinely evaluated to determine the status of TB in Alaska. The Alaska TB Program uses this information to develop public health actions that will help reduce the burden of TB in Alaska. In addition the surveillance system is evaluated periodically to ensure that it 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 <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5013a1.htm>

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