

2017

# >> Tuberculosis Surveillance Report

Oregon 2017



Oregon  
**Health**  
Authority  
PUBLIC HEALTH DIVISION

# Acknowledgments

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# Introduction

All Oregon physicians, other health care providers and laboratorians are required by law to report to the local public health authority confirmed or suspected cases of tuberculosis (TB) disease. Oregon uses the Report of Verified Case of Tuberculosis (RVCT), a nationally standardized data collection tool developed by the Centers for Disease Control and Prevention (CDC) Division of Tuberculosis Elimination (DTBE), to compile information on each confirmed case of TB. The RVCT collects data about each case such as demographic information, clinical and laboratory characteristics, treatment regimen, antibiotic susceptibility, treatment outcomes, and risk factors. This information is used to track the changing epidemiology of the disease within the state and to measure progress toward national TB program performance goals.

The Oregon Health Authority maintains the Oregon Public Health Epidemiologists' User System (Orpheus), an integrated electronic disease surveillance system intended for local and state public health epidemiologists and disease investigators to efficiently manage communicable disease reports. The Acute and Communicable Disease Prevention (ACDP) and the HIV, Sexually Transmitted Disease and Tuberculosis (HST) programs within the Oregon Public Health Division jointly sponsor and maintain Orpheus. TB case reporting through Orpheus is available to all local public health authorities and allows jurisdictions to submit TB case reports and access local data online and on demand.

This report covers calendar year 2017 and provides surveillance data on tuberculosis (TB) trends and outcomes. The data reflect the most complete information available as of Sept. 5, 2018. For additional details on definitions used in this report, please see "Technical notes" (page 20).

# Executive summary

In 2017, 69 confirmed cases of TB disease were reported from among Oregon's 36 local counties, continuing a 20-year decline in case numbers which seems to have reached a plateau since 2011. 2017 saw one fewer case of TB compared to the previous year, a decrease of approximately 1%. Oregon TB incidence remains at 1.7 cases per 100,000 persons. This rate has been lower than the U.S. incidence rate (currently 2.8 cases per 100,000) since at least 1985 (Figure 1).

Fourteen of Oregon's 36 counties reported at least one case of TB in 2017. Like previous years, the majority of cases were in Western Oregon counties (Figure 2), particularly in the Portland Metro areas of Multnomah and Washington counties.

Demographic characteristics of Oregon's TB cases were similar to those of the United States overall and have not changed significantly in recent years. The average case was 46 years old (Figure 3) and male (Figure 4). Unlike 2016, when five TB cases occurred among children under the age of 15, no cases of pediatric TB were reported in 2017 (Figure 3).

The greatest risk factor for developing TB disease is being foreign-born. In 2017, 51 of Oregon's 69 reported TB cases were foreign-born (Figures 5 and 6). Among foreign-born persons, more than half came from Asian nations, followed by Latin America, Africa and the Pacific Islands (Figure 7). The racial and ethnic distribution of TB disease does not mirror that of the state overall; 83% of Oregon's TB cases identify as a racial or ethnic minority (Figure 5), although racial and ethnic minorities make up only 24% of Oregon's population. Persons of Hispanic/Latino, Black and Native Hawaiian or Pacific Islander descent were overrepresented among TB cases compared to populations in the state overall.

Among new TB cases in 2017, the strongest reported modifiable risk factors for acquiring TB infection and/or developing active TB disease were smoking (17% of cases), excessive alcohol consumption (9% of cases), and recreational drug use (9% of cases) (Figure 8). Having a history of incarceration (Figure 8) was also notable risk factor. Compared to 2016, the risk associated with homelessness decreased somewhat (Figure 9).

Most new cases (67%) of TB reported in 2017 occurred in any combination of pulmonary, pleural or laryngeal respiratory sites (Figure 10). Drug susceptibility testing is recommended for all culture-positive TB cases in the United States. In 2017,

drug susceptibility testing was performed on cultured bacterial isolates from 48 cases. Resistance to isoniazid, an important first-line TB drug, was detected in nearly 15% of cases; this represents mild decrease over previous years (Figure 11). No cases of multi-drug-resistant (MDR) TB were reported in 2017.

HIV status was known for 100% of new cases of TB in 2017 (Figure 12). Five TB cases (7%) were HIV positive, which is an increase of nearly 5% over 2016 and is above the national rate of TB-HIV coinfection.

A typical person with TB disease can be on treatment for 6–9 months. Because of the length of treatment, treatment statistics for 2017 are not yet final. In 2016, however, 78% of eligible cases completed treatment within one year (Figure 13). Directly observed therapy (DOT), a treatment monitoring plan in which a health worker observes and records each dose of treatment, is the standard of care in Oregon. In 2016 the DOT rate was 87%.

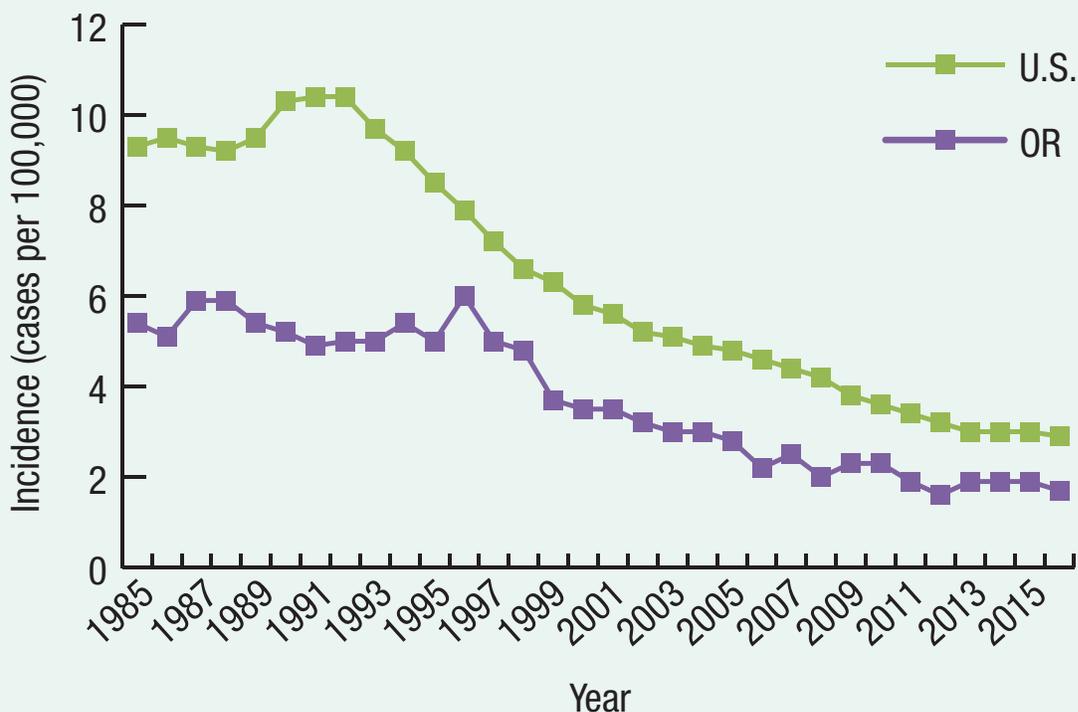
# Tuberculosis incidence

Rates of tuberculosis (TB) disease have been dropping in Oregon and the United States since the mid-1990s but seem to have reached a plateau in 2011. While case rates continue to decline, the decline in recent years is more modest than in previous decades.

Oregon's rate of TB disease is lower than the U.S. rate. National rates dropped slightly to a new low of 2.8 cases per 100,000 persons in 2017. Oregon's 2017 TB disease rate was 1.7 cases per 100,000 and was unchanged from 2016.

Sixty-nine TB disease cases were reported in Oregon in 2017, compared to 70 cases in 2016 and 76 cases in 2015. The lowest count to date was in 2012, when 61 cases were reported. Incidence has decreased more than threefold since the recent peak in 1996.

Figure 1. TB incidence in the United States and Oregon, 1985–2017

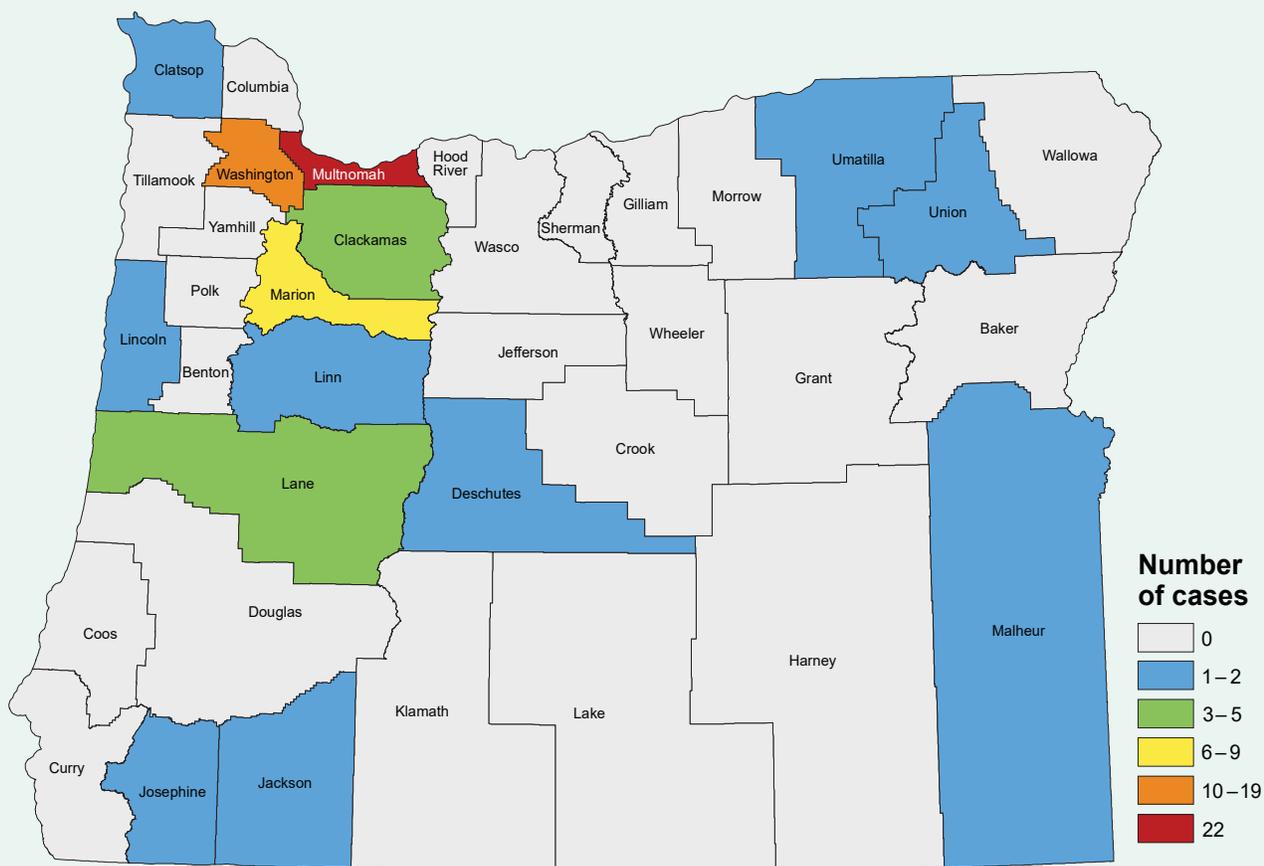


# Tuberculosis cases by county

In 2017, Oregon counties reported 69 cases of TB disease. The three counties with the most cases were Multnomah (n=22), Washington (n=19) and Marion (n=8). Fourteen counties reported at least one case. Most cases were found in the population centers in the western portion of the state.

**Figure 2. TB cases by county, Oregon, 2017**

Most 2017 cases of TB disease were in Multnomah, Washington and Marion counties.

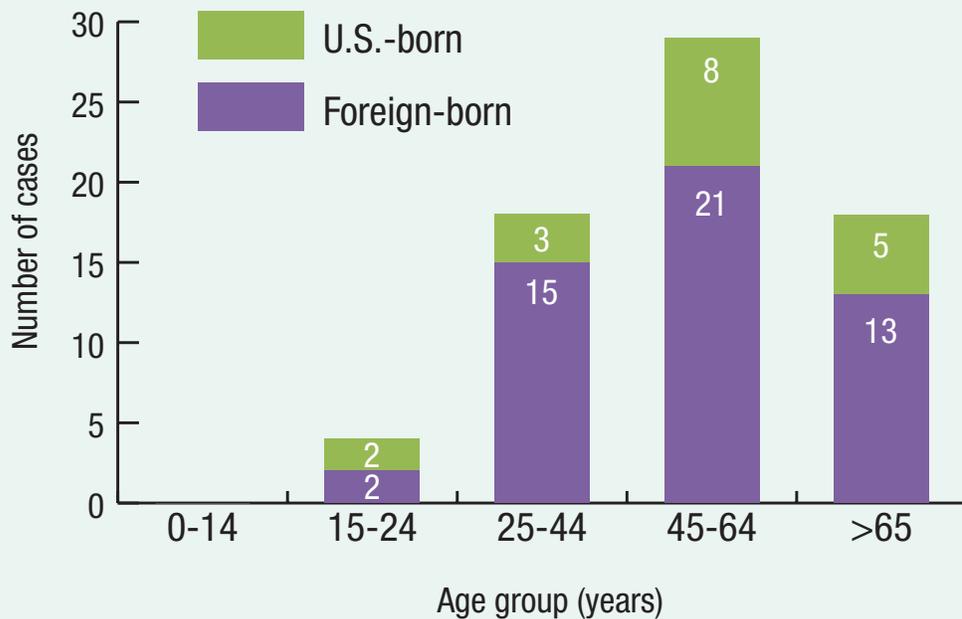


# Tuberculosis by age group

In 2017, most TB disease cases were in adults age 25 or older. The largest number of cases was seen in 45-64-year-olds (n=29). The highest percentage of U.S.-born cases occurred in both the 45–64-year-old age group (U.S.-born, 38%) and the over-64-year-old age group (U.S.-born, 38%).

The mean case age was 52 years and the median case age was 55 (range 15 to 84). Both the mean and median age rose over 2016, when both the mean and median case age was 46 years. This is likely due to the fact that no pediatric cases were reported in 2017.

**Figure 3. Number of TB cases by age group and foreign-born status, Oregon, 2017**

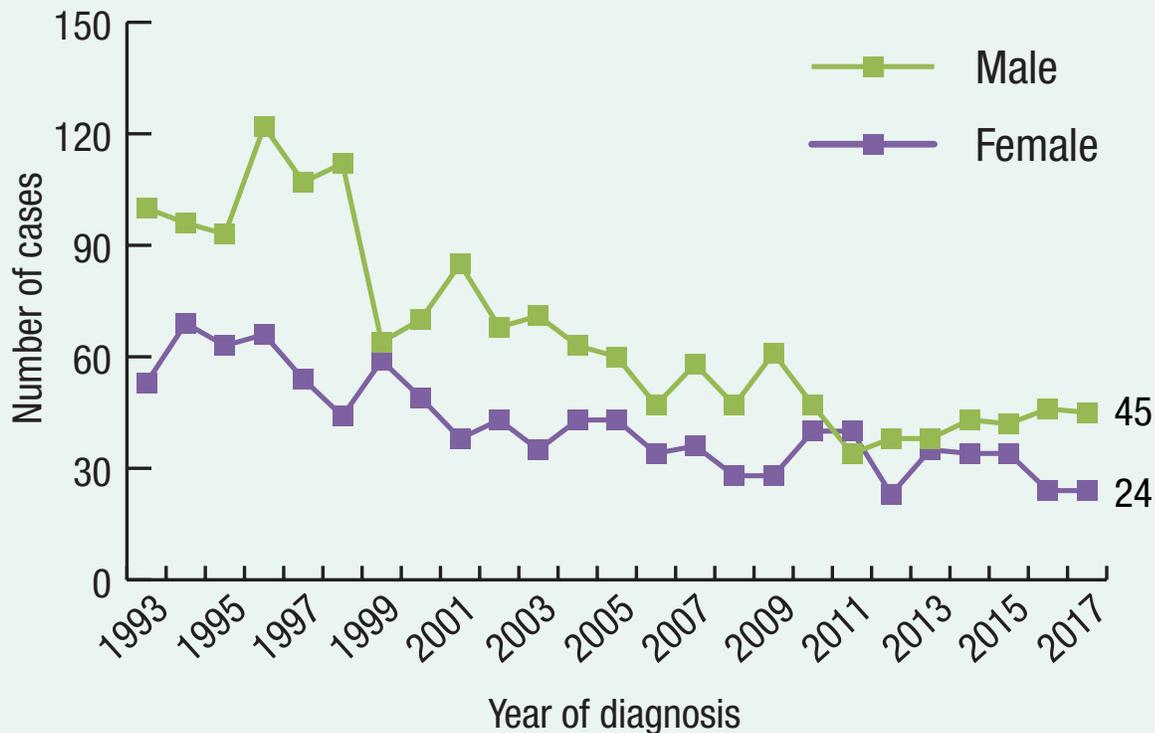


# Tuberculosis by sex

Historically, TB disease rates are higher among men than women. Reasons for this may include differences in access to care, underlying susceptibility to TB or distribution of TB risk factors like homelessness and substance abuse.

In 2017, like 2016, two-thirds of TB cases in Oregon occurred in men (65%, n=45, 2.3 cases per 100,000 men). Women made up 35% of cases (n=24, 1.2 cases per 100,000 women). Based on 2017 population numbers, and like previous years, the incidence of TB in men was nearly double the rate in women.

Figure 4. Number of TB cases by sex, Oregon, 1993–2017



# Tuberculosis by race/ethnicity

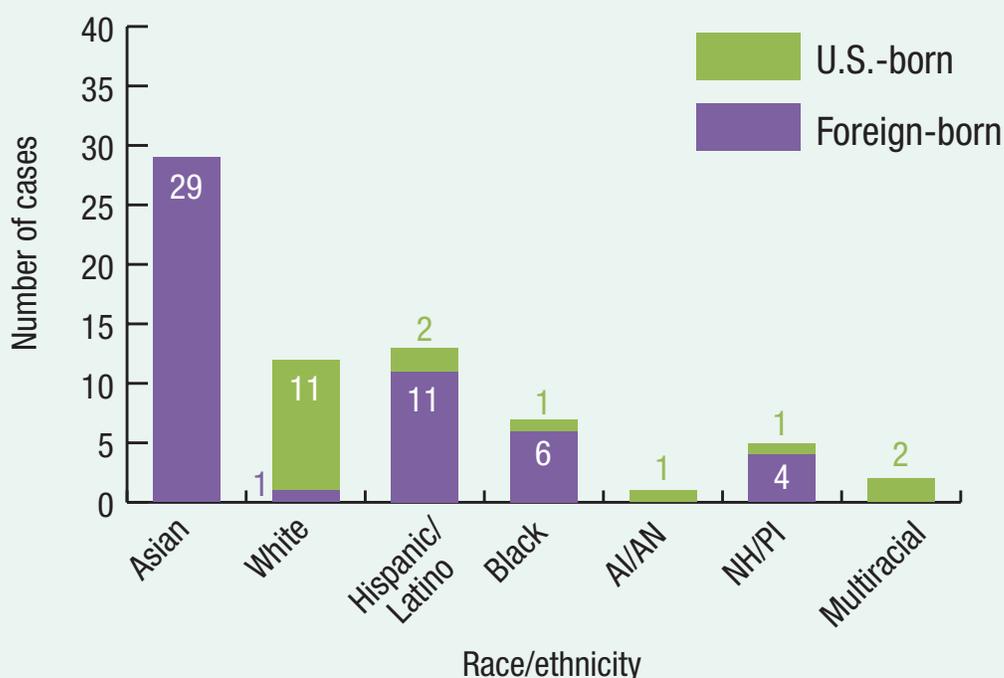
During 2017, 29 cases (42%) of TB disease occurred among people identifying as Asian. Twelve cases were reported among non-Hispanic whites (17%), and 7 cases identified as non-Hispanic black (10%). The case counts rose in Asians and dropped in non-Hispanic whites compared to 2016, when rates were 34% and 30%, respectively. Overall, 83% of Oregon's TB cases identify as a racial or ethnic minority, although racial and ethnic minorities make up only 24% of Oregon's population. This rate is unchanged compared to 2016.<sup>1</sup>

One case identified as American Indian/Alaska Native (AI/AN). Five cases identified as Pacific Islander (NH/PI=Native Hawaiian/Pacific Islander). Two cases identified as multiracial.

Hispanic or Latino ethnicity was reported for 13 cases (19%), regardless of race.

The percentage of foreign-born cases varied by race/ethnicity. Most non-Hispanic white as well as all AI/AN and all multi-racial cases were born in the United States. All Asian cases and most of the remaining cases in other race/ethnicity groups were born outside of the United States.

Figure 5. Number of TB cases by race/ethnicity, Oregon, 2017



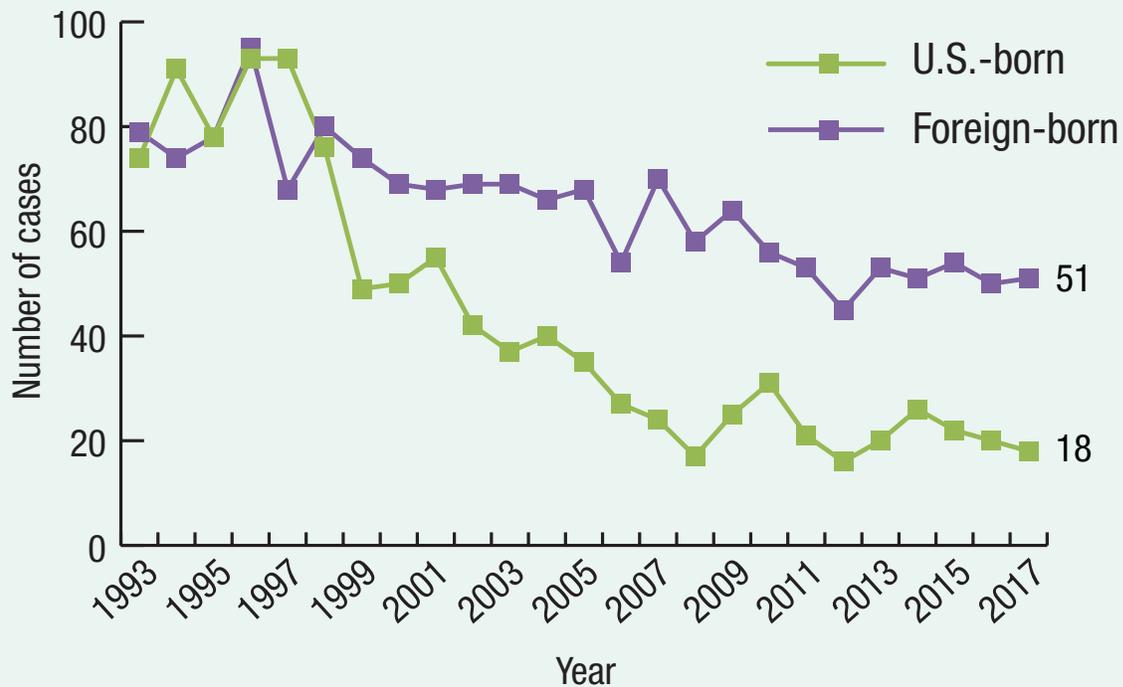
# Tuberculosis cases by place of origin

In Oregon, the number of US-born cases generally has dropped over time.

Since 2009, the percentage of TB cases among foreign-born persons has ranged from 64% to the current high of 74%. In 2017, 51 cases were among foreign-born persons.

**Figure 6. Number of TB cases in foreign-born and US-born residents, Oregon, 1993–2017**

In 2017, 74% of Oregon's TB cases occurred among among foreign-born persons.



# Tuberculosis by region of birth

In 2017, 74% of Oregon's TB disease cases were reported as foreign-born (n=51).

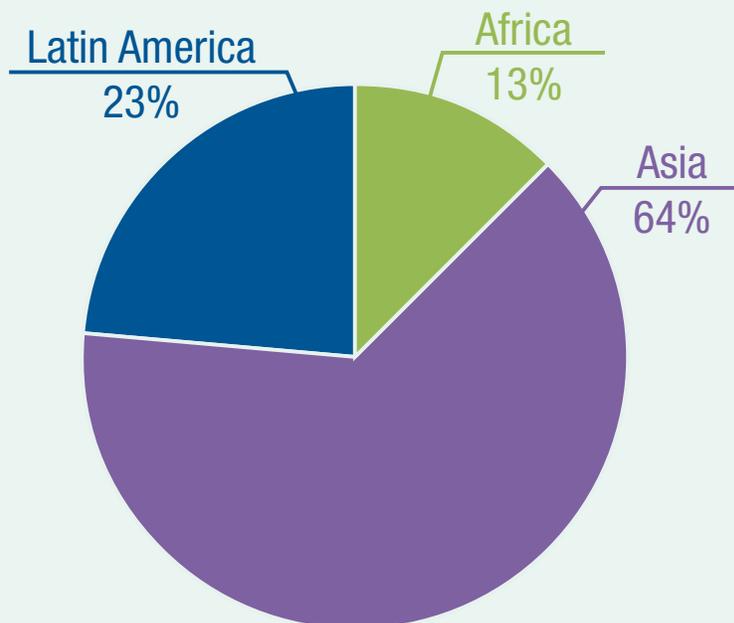
The majority of foreign-born 2017 cases were from Asia (59%, n=30). Cases born in Asia included 11 from Vietnam, five from India, six from the Philippines, and four from China. The remaining Asian cases were from Thailand, South Korea, and Myanmar (Burma).

Six cases in 2017 were from Africa (12%); three were from Ethiopia, one from the Republic of Congo, one from Kenya, and one from Somalia.

Eleven cases came from Latin America (21%). Seven were from Mexico, two were from Guatemala, one was from El Salvador, and one was from Peru. This year's data continue the trend of a declining proportion of cases from Latin America.

Four cases (8%) were from the Pacific Island nations; two cases were from Micronesia, and one case was from each the Marshall Islands and Guam.

Figure 7. Percentage of foreign-born cases by region of birth, Oregon, 2017



# Risk factors and tuberculosis disease

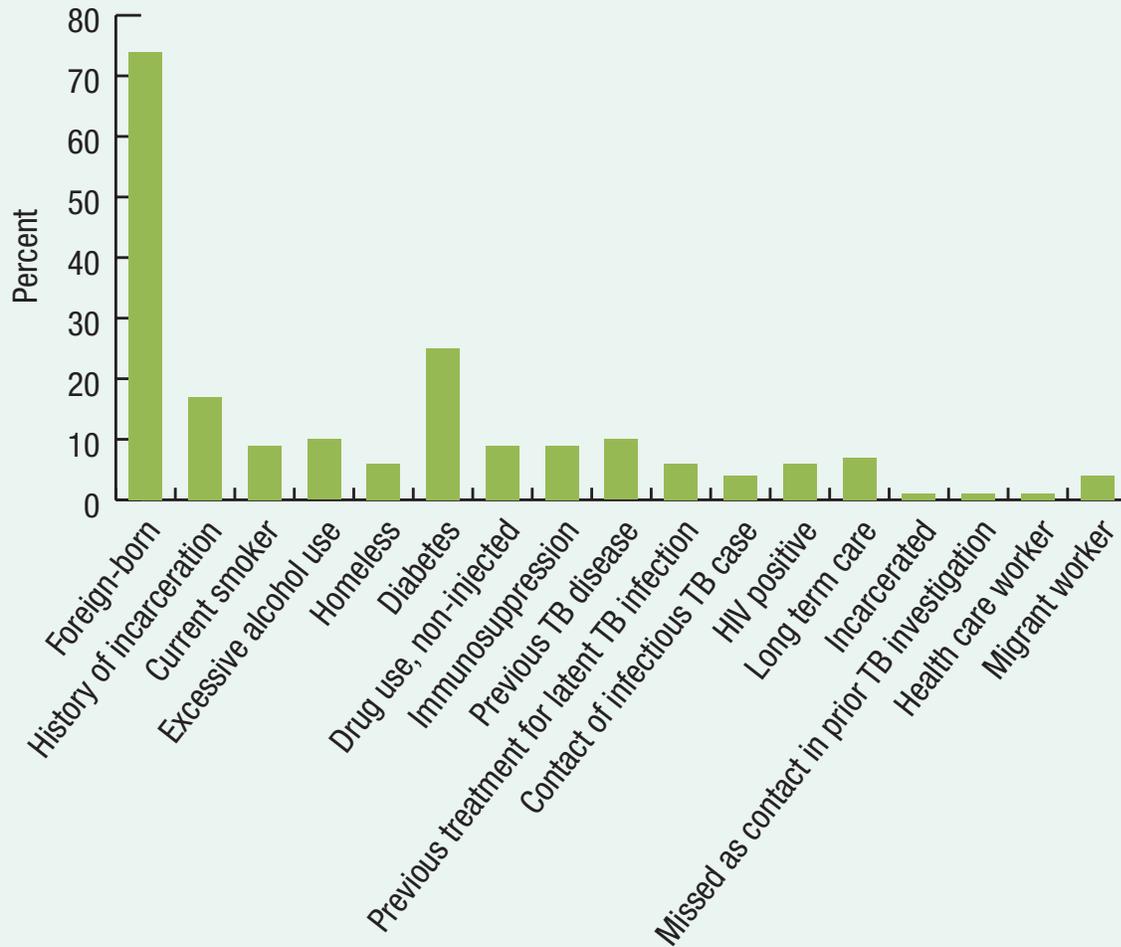
Some population groups are at increased risk for TB. These include foreign-born persons who come from countries with a high burden of TB. As in previous years, in 2017 the most common risk factor among Oregon's TB disease cases was foreign-born status, found in 74% of all cases (n=51) and a slight increase over 2016. Persons who are incarcerated or who have experienced homelessness also have higher rates of TB. Homelessness factored in 4 cases (6%) and incarceration, previous or current, together factored in to 10 (14%) of cases.

Certain individual behaviors can increase the risk of developing TB disease in persons who are infected. Smoking, excessive alcohol use, and recreational drug use are modifiable behaviors that increase TB risk. In 2017, smoking was a risk factor in 17% (n=12) of cases. Excessive alcohol use factored in 9% (n=6) of cases, a decrease from 2016 of more than 50%.

Health-related factors can also increase risk for acquiring TB infection or developing TB disease. Medical risk factors included diabetes (17 cases, an increase of seven cases over 2016), and immunosuppression (six cases). HIV co-infection rose sharply in 2016, with five cases (7%) compared to only two cases (3%) in 2016. See other risk factors in Figure 8. Risks are not mutually exclusive; cases can have simultaneous multiple risks factors.

**Figure 8. Risk factors for TB disease, Oregon, 2017**

The most prevalent risk factor among Oregon's TB disease cases is foreign birth.



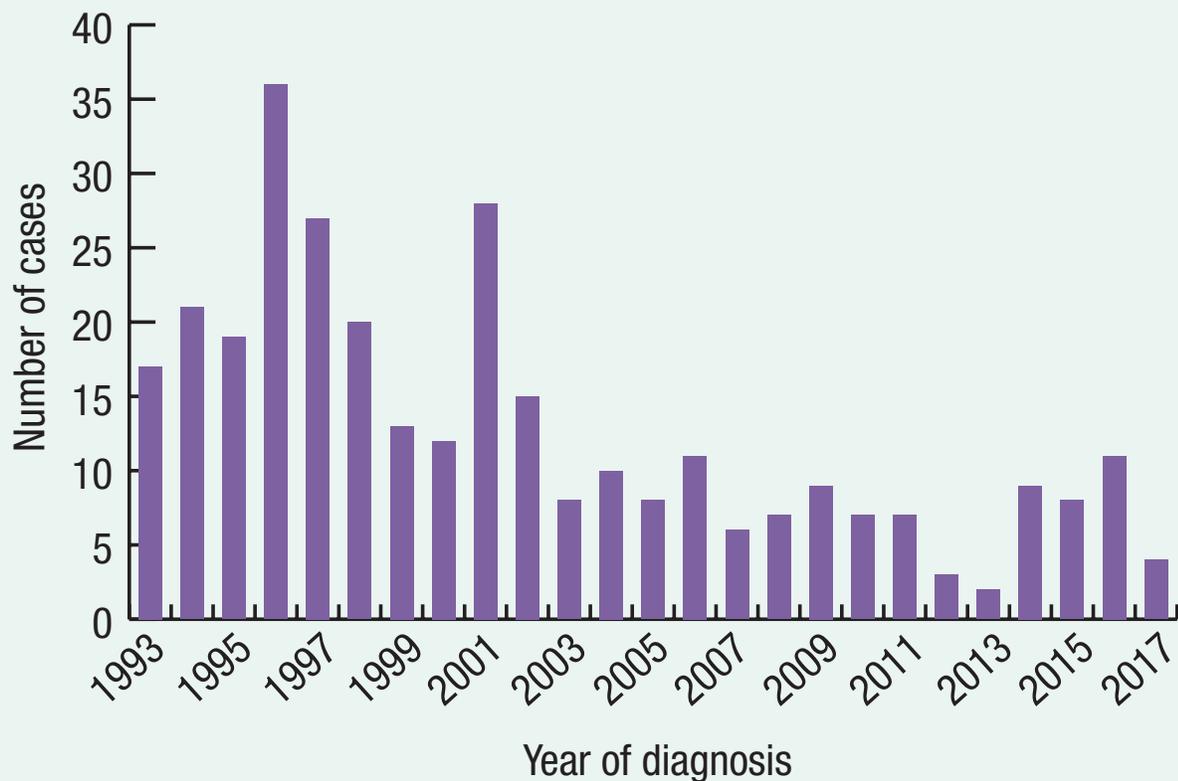
# Tuberculosis in the homeless

The number of Oregon TB disease cases among the homeless has declined over time. In 2017 only 4 cases (6%) were homeless in the year prior to or at the time of diagnosis, compared to 11 (16%) in 2016.

A spike in the number of homeless cases occurred in 2001 due to a homeless shelter outbreak in Lane County; 18 of the 28 homeless cases that year were from Lane County.

Cases with the 2001 Lane County outbreak strain continue to arise sporadically, but no cases with a matching genotype have been reported since 2012.

**Figure 9. Number of homeless cases, Oregon, 1993–2017**

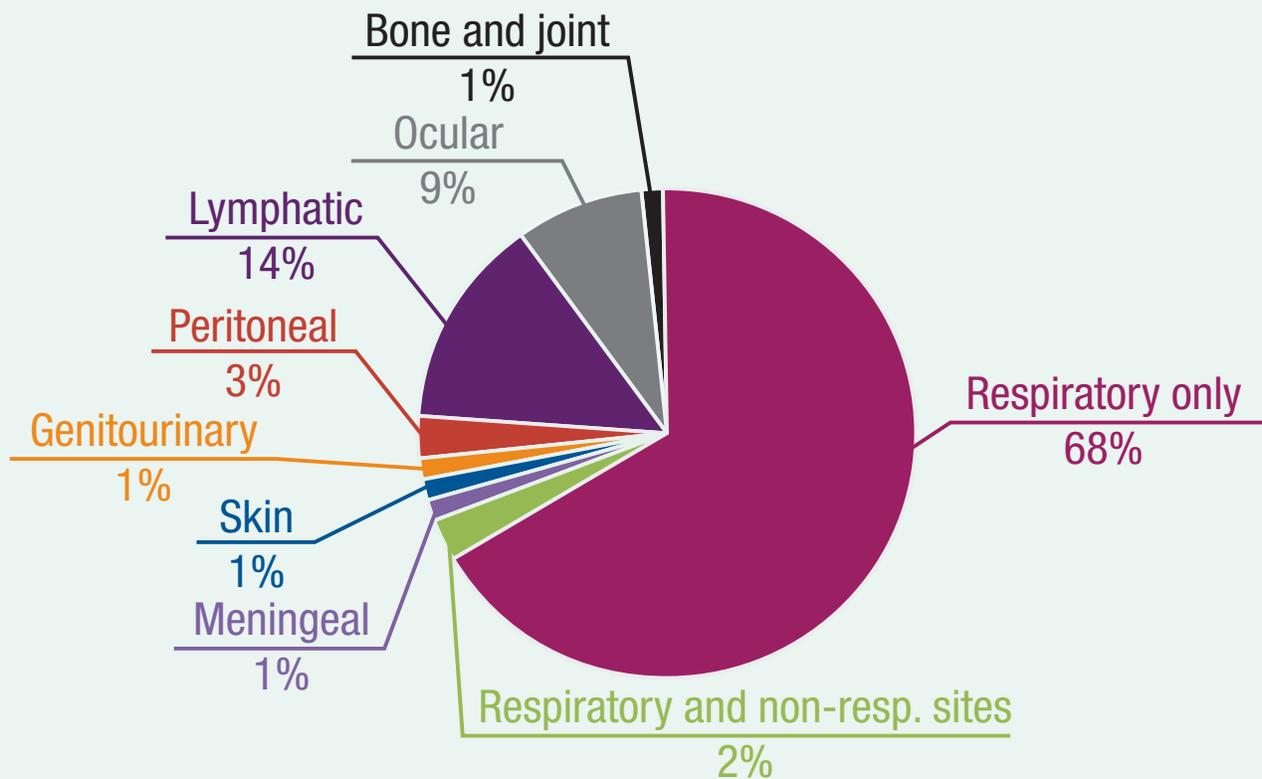


# Tuberculosis cases by major site of disease

In 2017, 48 (68%) of Oregon's 69 TB disease cases had TB in a respiratory site only (any combination of pulmonary, pleural or laryngeal disease), a slight increase over 2016. Only one additional case had both respiratory and non-respiratory sites of disease. There were 10 lymphatic cases (14%), and thirteen cases with TB in other sites.

Among the 48 cases with any type of respiratory involvement, 27 (56%) were sputum-smear positive, meaning that bacteria were visible in the sputum when examined microscopically. Sixteen cases (33%) had abnormal chest x-rays with evidence of pulmonary cavities. Sputum-smear positivity and cavitary chest x-rays are each strong indicators of infectiousness.

Figure 10. Reported major site of disease, Oregon 2017

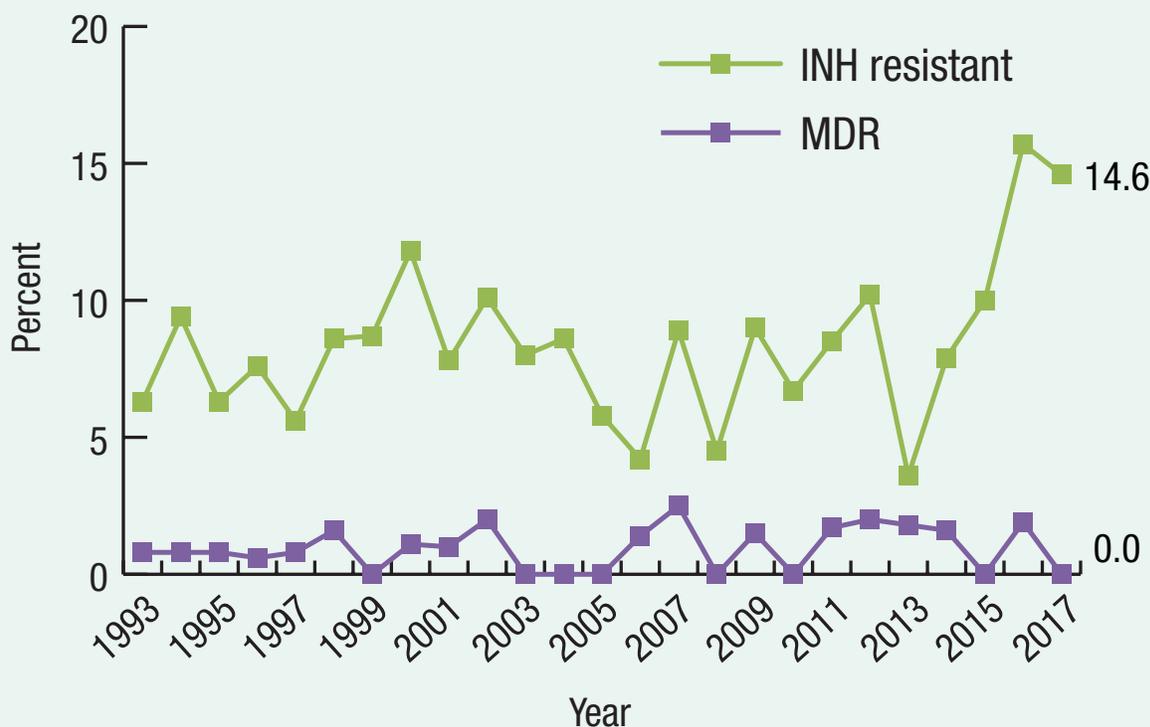


# Drug resistance and tuberculosis

Isoniazid (INH) drug resistance levels in Oregon TB disease cases have ranged over time from a low of 4% to a high of 15.6% in 2016, when 8 out of 51 cases with drug susceptibility results\* were resistant to INH. The US average in 2016 was 8.7%.<sup>2</sup> In 2017, INH resistance levels remained above the national average but dropped slightly compared to 2016. In 2017, seven cases (14.5%) of cases were INH-resistant

Since 1993, only 20 cases of multi-drug-resistant TB disease (MDR-TB or TB that is resistant to at least both INH and rifampin) have been reported in Oregon. Eighteen (90%) of the MDR cases were among foreign-born persons. The MDR-TB rate in the United States was 1.1% in 2015<sup>3</sup>, somewhat lower than Oregon's rate. No cases of MDR-TB were reported in Oregon in 2017.

Figure 11. INH drug resistance and MDR rate, Oregon, 1993–2017

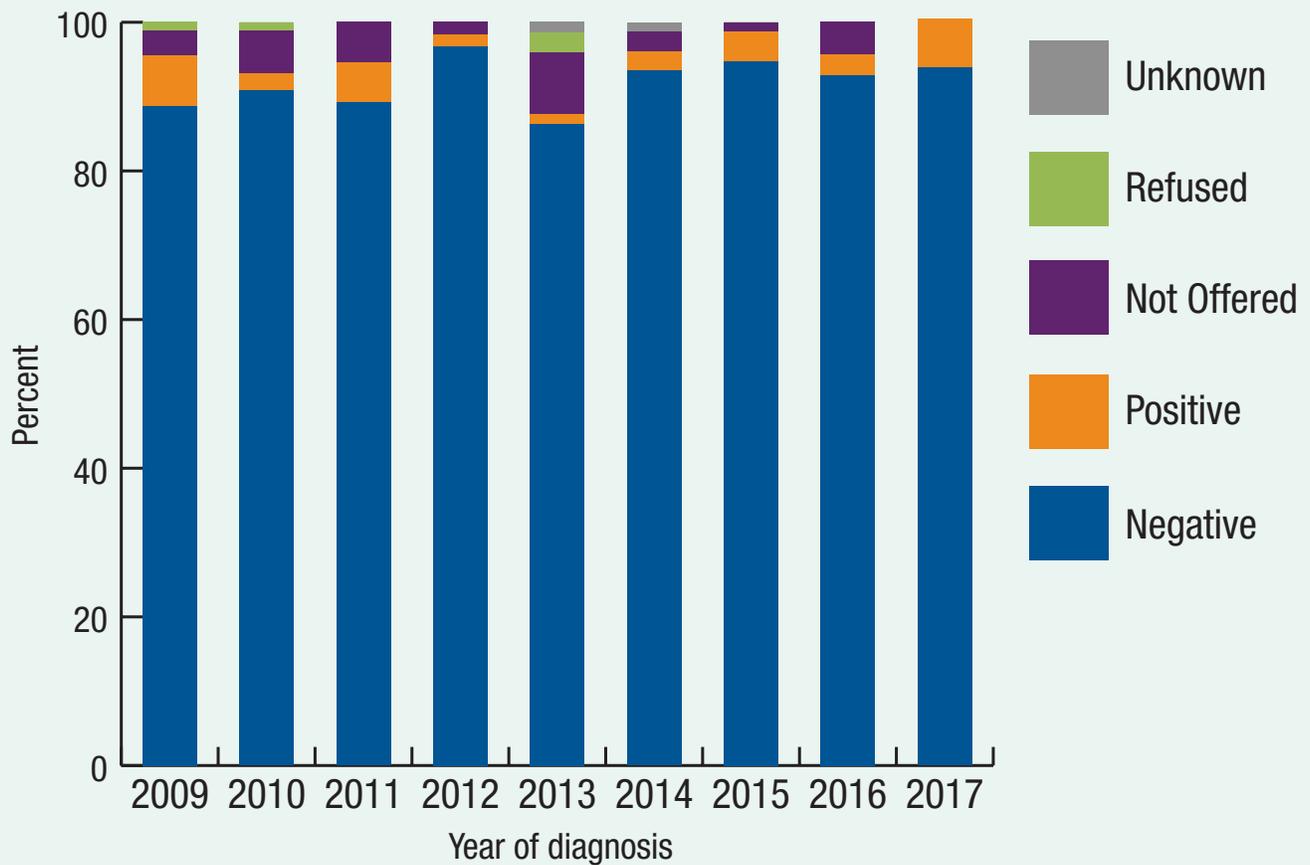


\* INH and MDR resistance numbers are not mutually exclusive.

# HIV and tuberculosis

HIV status was known for 100% of the TB disease cases reported in Oregon in 2017. Five cases (7.2%) were HIV positive, an increase of more than two-fold over 2016. The 2017 TB-HIV co-infection rate is above the national rate for TB/HIV coinfection (5.6% in 2017).<sup>4</sup>

Figure 12. TB cases by HIV status, Oregon, 2009–2017



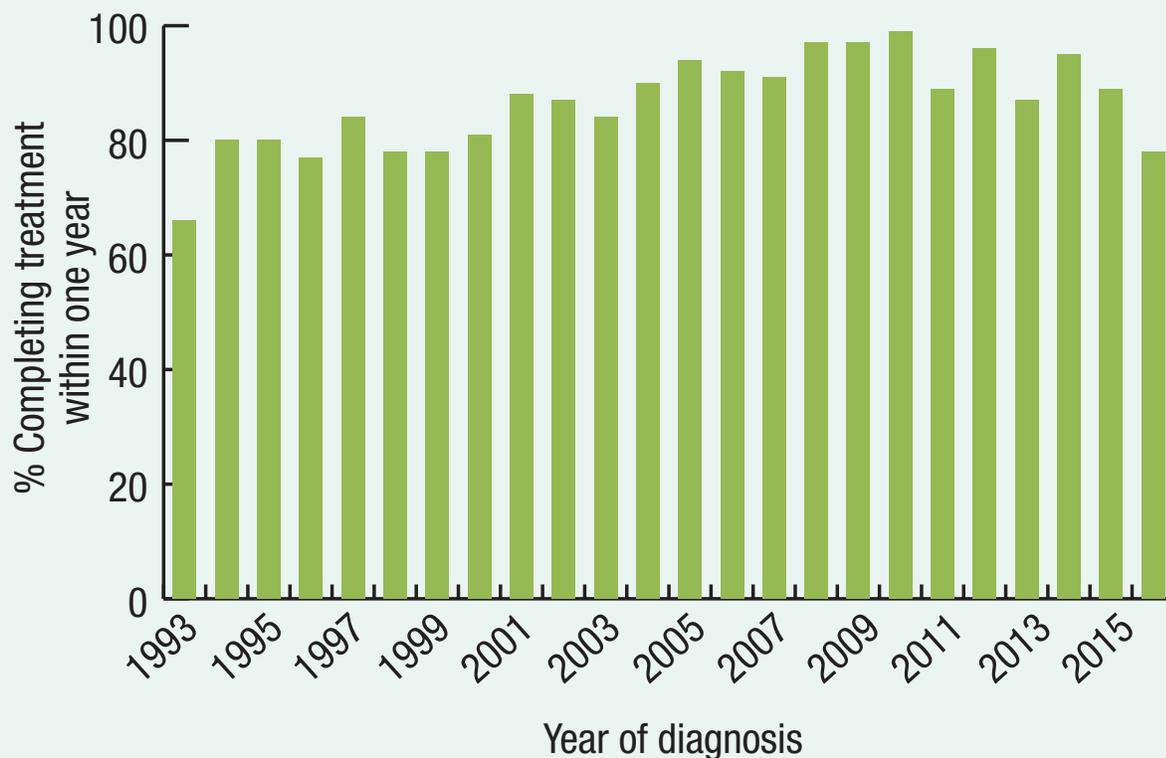
# Completion of tuberculosis treatment

In 2016, 78% of eligible cases (46 of 59) completed treatment within one year.

2017 treatment data are not yet final.

Patients who died before starting or during treatment and patients who moved out of the country were excluded from the calculation. Patients with resistance to rifampin, meningeal TB (regardless of age), TB in bone or the skeletal system, TB in the central nervous system, and children under the age of 15 with TB disseminated throughout the body (with evidence of miliary disease on chest X-ray and/or positive blood culture) were also excluded due to expected longer duration of treatment.

**Figure 13. Percent completion of treatment within one year for eligible cases,\* Oregon 1993–2016**



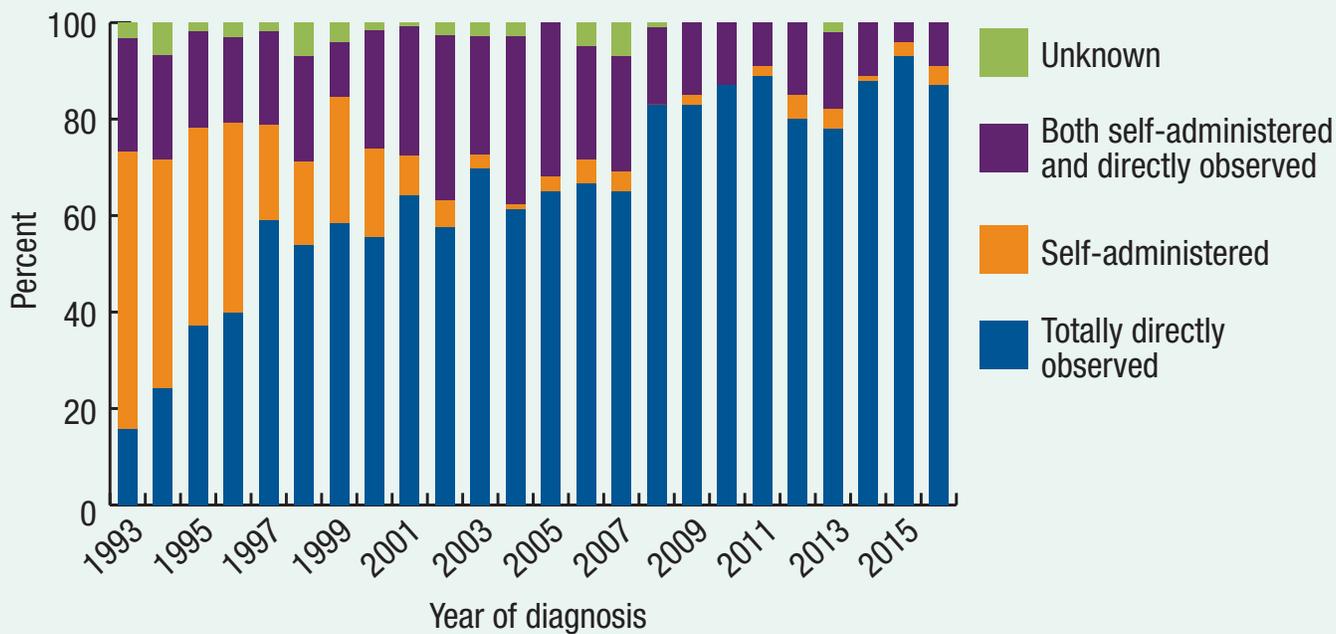
\*Patients included in Figure 13 are patients for whom less than one year of treatment was clinically indicated.

# Delivery of tuberculosis therapy

Directly observed therapy, or DOT, is the standard of care in Oregon for treatment of TB. The use of DOT for treatment of TB disease has generally increased since 1993, rising from 16% to a high of 93% in 2015. In general, as case numbers decrease, rates of directly observed treatment have increased. Recent improvements in mobile communications and video technology have also enabled technology-driven solutions to some challenges involved with DOT. Newer technologies like video- or electronic-DOT offer case managers more flexible DOT options while ensuring adherence to the treatment regimen.

In 2016, a supervised DOT regimen was provided for 87% (n=58) of all cases starting and completing therapy (n=67). Nine percent (n=6) received a combination of both DOT and self-administered therapy. Three cases (4%) were on self-administered therapy alone. In certain situations, DOT may not be possible and these situations may cause the rate of DOT to fluctuate.

Figure 14. Mode of TB therapy, Oregon, 1993–2016



# Technical notes

The data presented in this report come from the Oregon Public Health Epidemiology User System (Orpheus, data collected starting in 2009) and Oregon's Tuberculosis Information Management System (TIMS, data through 2008). Data are current as of September 2018.

Percentages may not sum to 100 due to rounding.

Age is calculated based on date case is reported to the local health department.

## Surveillance case definition for Oregon

### 1. Laboratory case definition

a. Isolation of *M. tuberculosis* from a culture of a clinical specimen

**or**

b. Identification of *M. tuberculosis* from a clinical specimen using an FDA-approved nucleic acid amplification test (NAAT)

### 2. Clinical case definition\*

a. Full diagnostic evaluation including:

i. Tuberculin skin test (TST) or interferon gamma release assay (IGRA) test

ii. Chest X-ray/imaging

iii. Clinical specimens for culture/NAAT

iv. Risk factor evaluation: Host factors (e.g., documented immunosuppression) and environmental factors (e.g., contact to an active case, born in a country with endemic TB, travel to endemic country)

**and**

b. Lab test indicative of infection:

i. Positive TST and/or

ii. Positive IGRA or

iii. Negative TST or IGRA with reason for not positive (e.g., immunosuppression)

**and**

c. Signs or symptoms compatible with TB disease

**and**

d. Improvement of signs or symptoms after treatment with two or more anti-TB drugs.

\*Factors including pretest risk, other potential diagnoses, opportunity to improve on TB treatment, and site of disease (pulmonary vs extrapulmonary) may also be considered in the decision to confirm a clinical case.

## Endnotes

1. United States Census Bureau. Quick facts: Oregon [cited 2018 Sept 11]. Available from: <https://www.census.gov/quickfacts/OR>.
2. Centers for Disease Control and Prevention. Table 8: Tuberculosis cases and percentages, by resistance to isoniazid (INH), origin of birth, and previous history of TB: United States, 1993-2016. [cited 2018 Sept 12]. Available from: <https://www.cdc.gov/tb/statistics/reports/2016/pdfs/P-2016-Surveillance-Report-table8.pdf>
3. Centers for Disease Control and Prevention. Table 9: Tuberculosis cases and percentages, by multidrug resistance, origin of birth, and previous history of TB: United States, 1993-2016. [cited 2018 Sep 12]. Available from: <https://www.cdc.gov/tb/statistics/reports/2016/pdfs/H-2016-Surveillance-Report-table9.pdf>
4. Stewart RJ, Tsang CA, Pratt RH, Price SF, Langer AJ. Tuberculosis — United States, 2017. *MMWR Morb Mortal Wkly Rep* 2018;67:317–323. DOI: <http://dx.doi.org/10.15585/mmwr.mm6711a2>



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