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>> Tuberculosis Surveillance Report

Oregon 2016



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Acknowledgments

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Contents

» Introduction.....	4
» Executive summary.....	5
» Tuberculosis incidence.....	7
» Tuberculosis cases by county	8
» Tuberculosis by age group	9
» Tuberculosis by sex.....	10
» Tuberculosis by race/ethnicity	11
» Tuberculosis cases by place of origin	12
» Tuberculosis by region of birth.....	13
» Risk factors and tuberculosis disease	14
» Tuberculosis in the homeless.....	15
» Tuberculosis cases by major site of disease	16
» Drug resistance and tuberculosis	17
» HIV and tuberculosis	18
» Completion of tuberculosis treatment	19
» Delivery of tuberculosis therapy.....	20
» Technical notes	21
» Surveillance case definition for Oregon.....	21
» Endnotes	22

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 tracks the changing epidemiology of the disease within the state and measures 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 2016 and provides surveillance data on tuberculosis (TB) trends and outcomes. The data reflect the most complete information available as of Oct. 6, 2017. For additional details on definitions used in this report, please see "Technical notes" (page 21).

Executive summary

In 2016, 70 confirmed cases of TB disease were reported from among Oregon's 36 local counties, continuing a 20-year decline in case numbers with an 8% decrease from the previous year. Oregon TB incidence is 1.7 cases per 100,000 persons, which is consistently lower than the U.S. incidence of 2.9 cases per 100,000 persons (Figure 1).

Thirteen of Oregon's 36 counties reported at least one case of TB in 2016. The majority of cases were in Western Oregon counties (Figure 2), particularly in the Portland Metro area of Clackamas, 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 44 years old (Figure 3) and male (Figure 4). Five TB cases occurred among children under the age of 15; four of those were pediatric cases occurring in infants or toddlers under the age of 3 (Figure 3).

The greatest risk factor for developing TB disease is being foreign-born. In 2016, 50 of Oregon's 70 reported TB cases were foreign-born (Figure 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 2016, the strongest reported modifiable risk factors for TB disease were smoking (20% of cases) and excessive alcohol consumption (19% of cases) (Figure 8). Having a history of incarceration (Figure 8) or homelessness (Figure 9) were also notable risk factors.

Most new cases (71%) of TB reported in 2016 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 2016, drug susceptibility testing was performed on cultured isolates from 51 cases. Resistance to isoniazid, an important first-line TB drug, was detected in 16% of cases; this represents a spike over previous years (Figure 11). Only one case was multi-drug-resistant (MDR).

HIV status was known for 96% of new cases of TB in 2016 (Figure 12). Two TB cases were HIV positive, which is below the national rate of TB-HIV coinfection.

Due to the time to complete treatment for TB, 2016 treatment statistics are not yet final. In 2015, however, 89% 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. The rate of DOT has been rising since 1993 to the current high of 93% of cases in 2015.

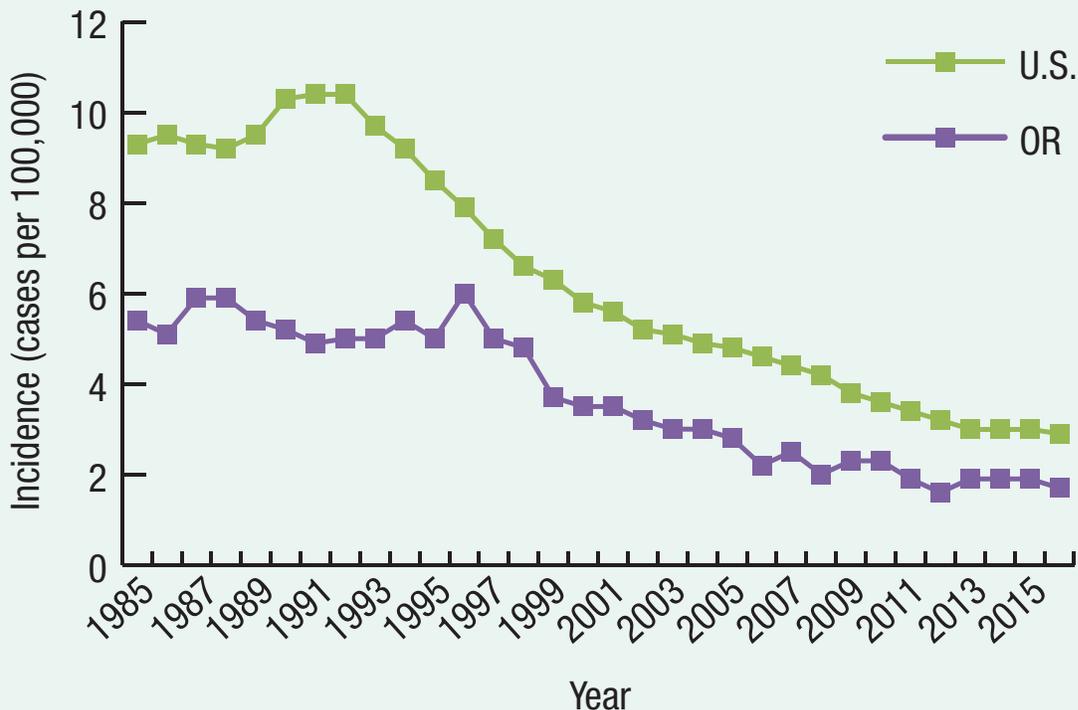
Tuberculosis incidence

Rates of tuberculosis (TB) disease have been dropping in Oregon and the United States since the early 1990s.

Oregon's rate of TB disease is lower than the U.S. rate. National rates dropped slightly to a new low of 2.9 cases per 100,000 persons in 2016. Oregon's 2016 TB disease rate was 1.7 cases per 100,000.

There were 70 TB disease cases reported in Oregon in 2016, compared to 76 cases in 2015 and 77 cases in 2014. 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, 1985–2016

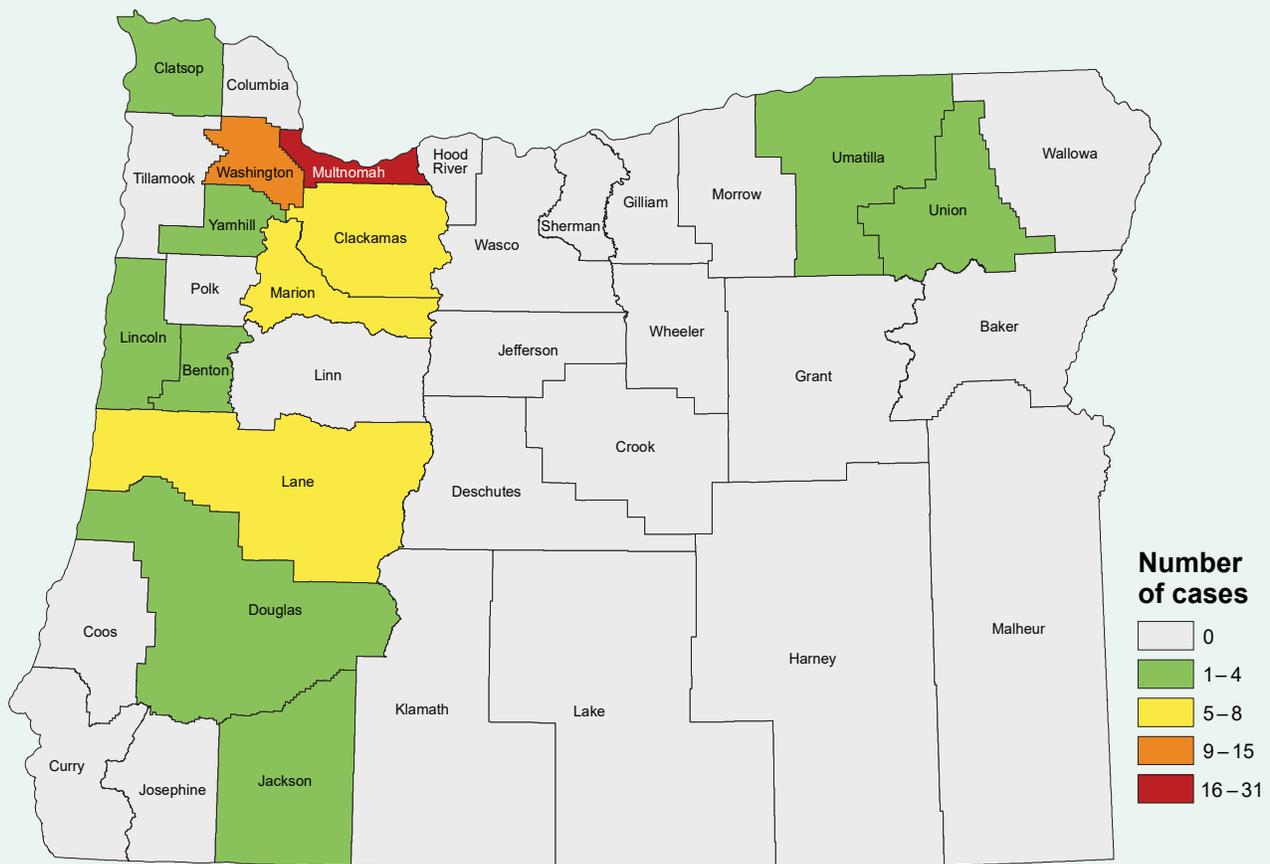


Tuberculosis cases by county

In 2016, Oregon counties reported 70 cases of TB disease. The three counties with the most cases were Multnomah (n=25), Washington (n=16) and Lane (n=8). Thirteen counties reported at least one case. Most cases were in the western portion of the state.

Figure 2. TB cases by county, Oregon, 2016

Most 2016 cases of TB disease were in Multnomah, Washington and Lane counties.



Tuberculosis by age group

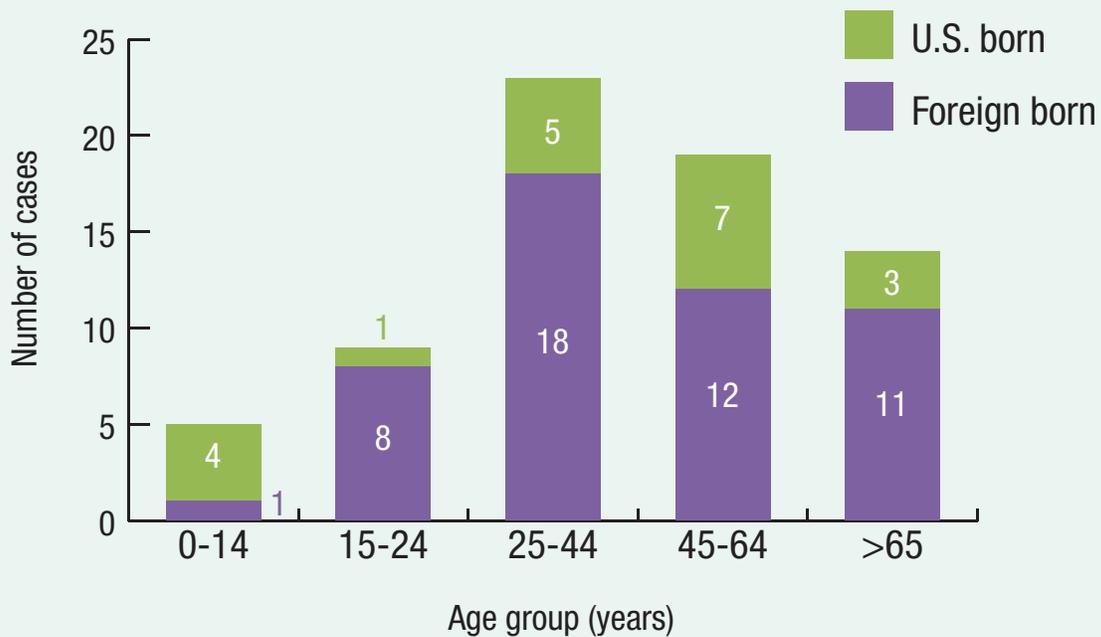
In 2016, most TB disease cases were in adults age 25 or older. The largest number of cases was seen in 25–44-year-olds (n=23). The highest percentage of adult U.S.-born cases occurred in the 45–64-year-old age group (U.S.-born, 35%).

The mean and median case age was 44 years (range: 0.3 to 88 years).

There were five pediatric cases (<15 years of age) reported in 2016. Four of these were U.S.-born. Four pediatric cases occurred in infants or toddlers below the age of 3.

Figure 3. Number of TB cases by age group and foreign-born status, Oregon, 2016

Most 2016 cases of TB disease were in Multnomah, Washington and Lane counties.

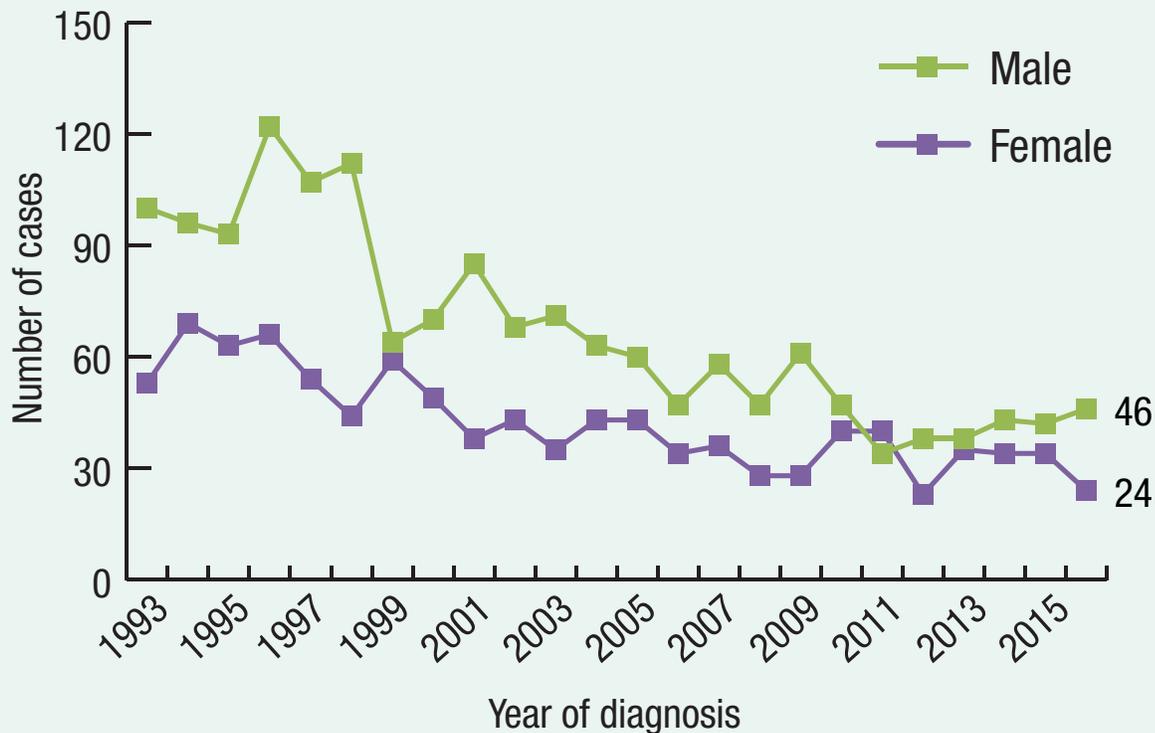


Tuberculosis by sex

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 such as homelessness and substance abuse.

In 2016, two-thirds of TB cases in Oregon occurred in men (66%, n=46, 2.3 cases per 100,000 men). Women made up 34% of cases (n=24, 1.2 cases per 100,000 women). Based on 2016 population numbers, the incidence of TB in men was nearly double the rate in women.

Figure 4. Number of TB cases by sex, Oregon, 1993–2016



Tuberculosis by race/ethnicity

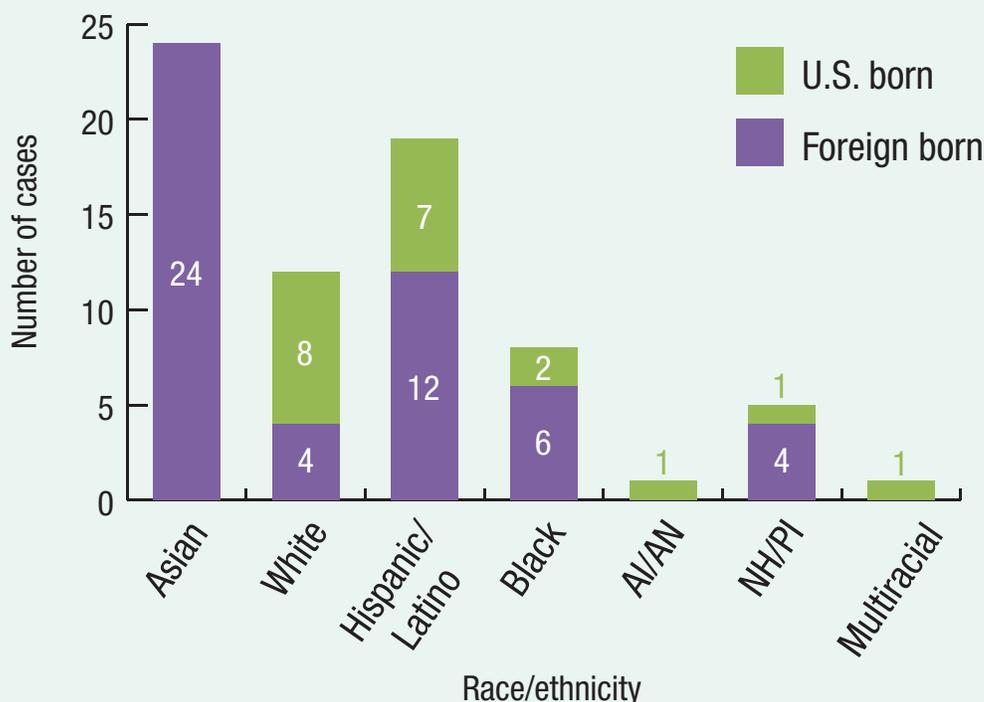
During 2016, 24 cases (34%) of TB disease occurred among people identifying as Asian. Twenty-one cases were reported among non-Hispanic Whites (30%), and eight cases identified as non-Hispanic Blacks (11%). Overall, 83% of Oregon's TB cases identify as a racial or ethnic minority, although racial and ethnic minorities make up only 24% of Oregon's population.(1)

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

Hispanic or Latino ethnicity was reported for 17 cases (24%), 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, 2016



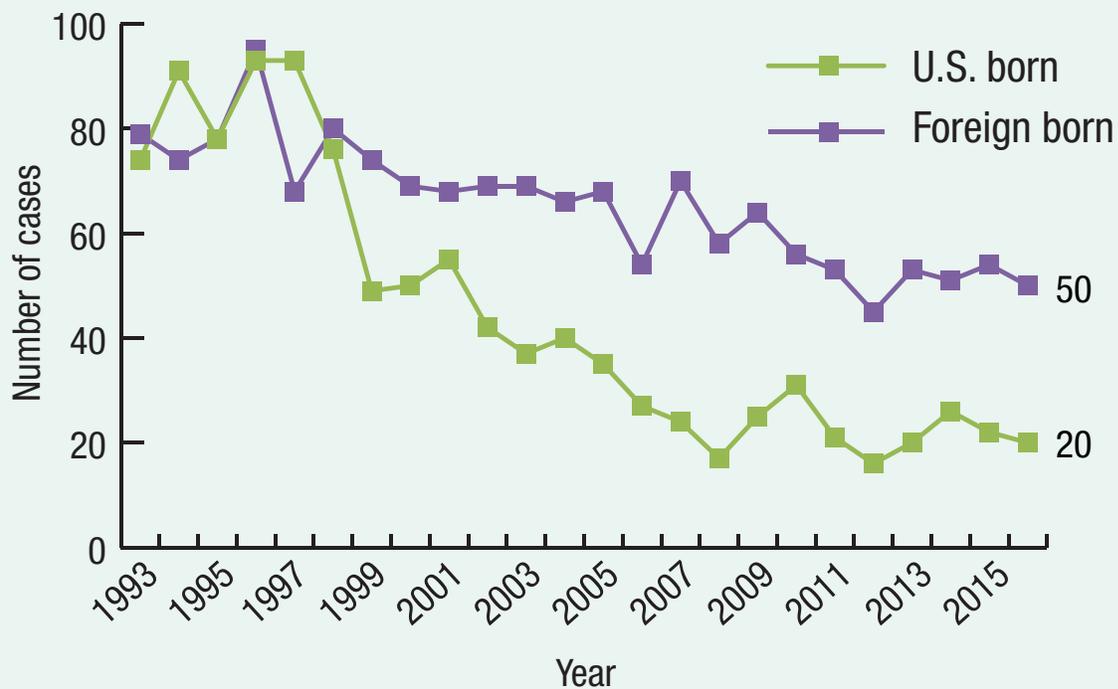
Tuberculosis cases by place of origin

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

Since 2008, the percentage of TB cases among foreign-born persons has ranged from 64% to 77%. In 2016, 50 cases (71%) were among foreign-born persons.

Figure 6. Number of TB cases in foreign-born and U.S.-born residents, Oregon, 1993–2016

In 2016, 71% of Oregon's TB cases occurred among among foreign-born persons.



Tuberculosis by region of birth

In 2016, 71% of Oregon's TB disease cases were reported as foreign-born (n=50).

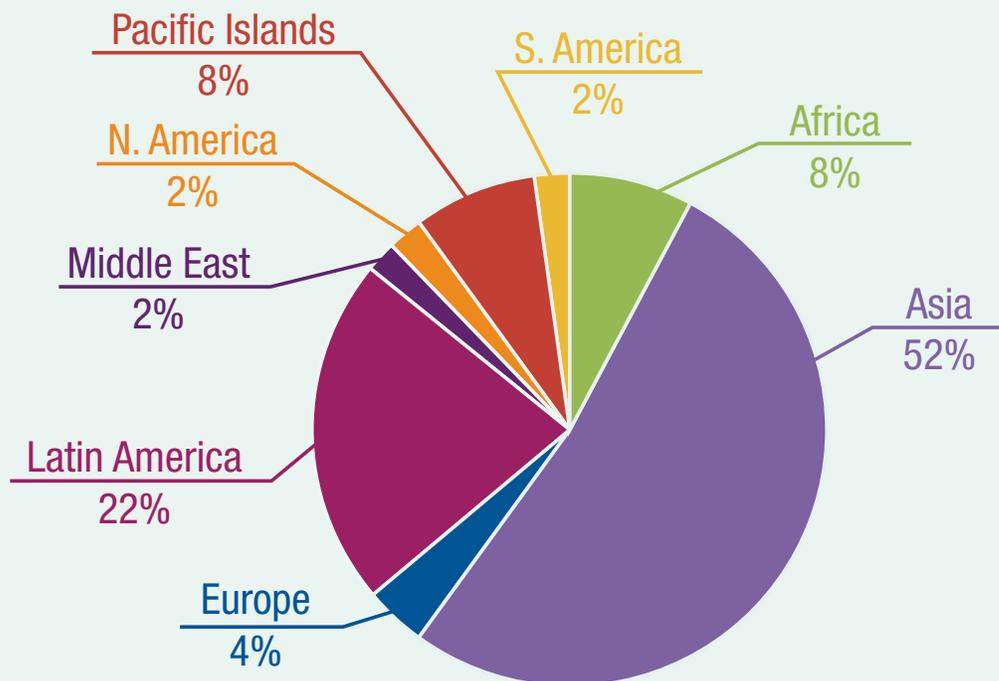
The majority of foreign-born 2016 cases were from Asia (52%, n=26). Cases born in Asia included 10 from Vietnam, five from India, three from China and two from Indonesia. The remaining Asian cases were from Afghanistan, Cambodia, South Korea, Myanmar, the Philippines and Taiwan.

Four cases in 2016 were from Africa (8%); three were from Ethiopia and one from Burundi.

Eleven cases came from Latin America (22%). Nine were from Mexico, one was from El Salvador and one was from Guatemala. This year's data continue the trend of a declining proportion of cases from Latin America.

Two cases were from Europe (Romania and Russia), one case was from the Middle East (Iran) and one case was from South America (Peru).

Figure 7. Percentage of foreign-born cases by region of birth, Oregon, 2016

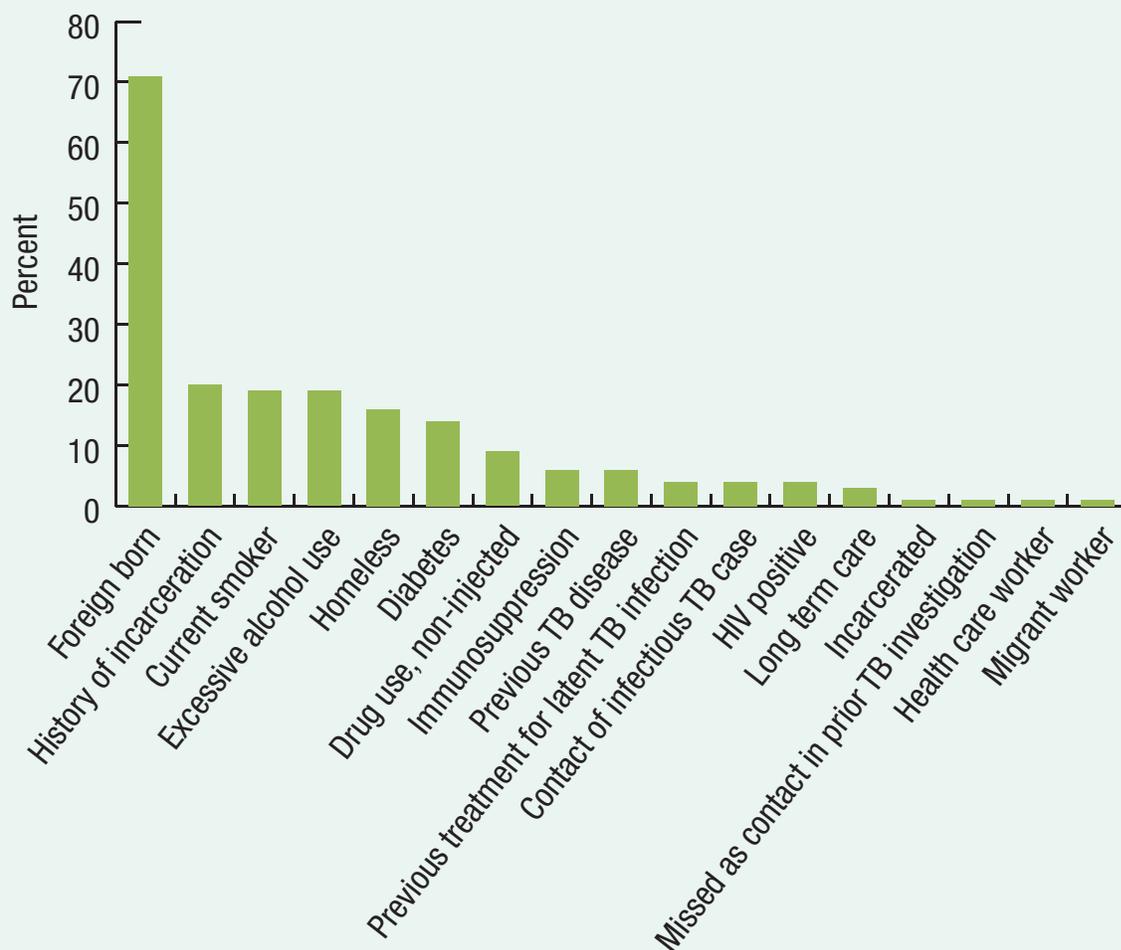


Risk factors and tuberculosis disease

In 2016, as in previous years, the most common risk factor among Oregon's TB disease cases was foreign-born status, found in 71% of all cases (n=50). Smoking was a risk factor in 20% (n=14) of cases; excessive alcohol use factored in 19% (n=13) of cases; and homelessness factored in 16% (n=11) of cases. Incarceration, both previous (n=13) and current (n=3), were also notable risk factors. Medical risk factors included diabetes (10 cases), immunosuppression (four cases), and HIV infection (two cases). See other risk factors in Figure 8. Risks are not mutually exclusive; cases can have simultaneous multiple risk factors.

Figure 8. Risk factors for TB disease, Oregon, 2016

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



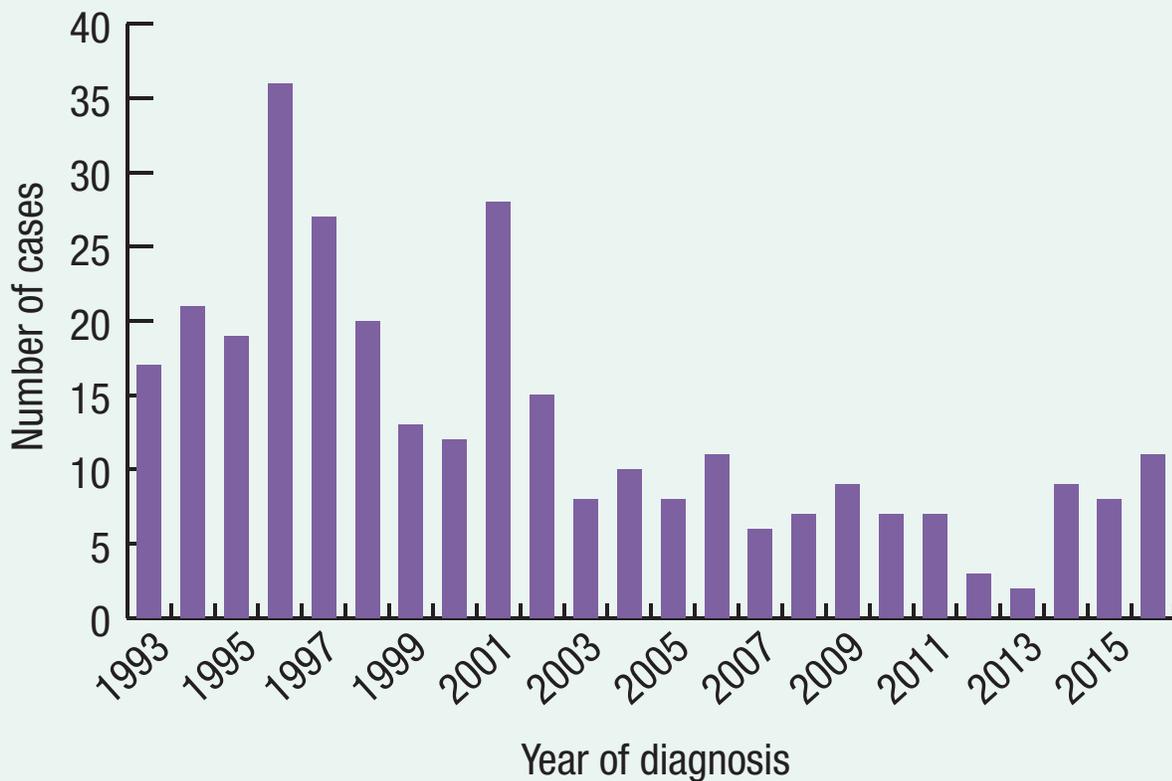
Tuberculosis in the homeless

The number of Oregon TB disease cases among the homeless has declined over time, but in 2016, 11 cases (16%) reported homelessness in the year prior to diagnosis.

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. No cases with a matching genotype have been reported since 2012.

Figure 9. Number of homeless cases, Oregon, 1993–2016



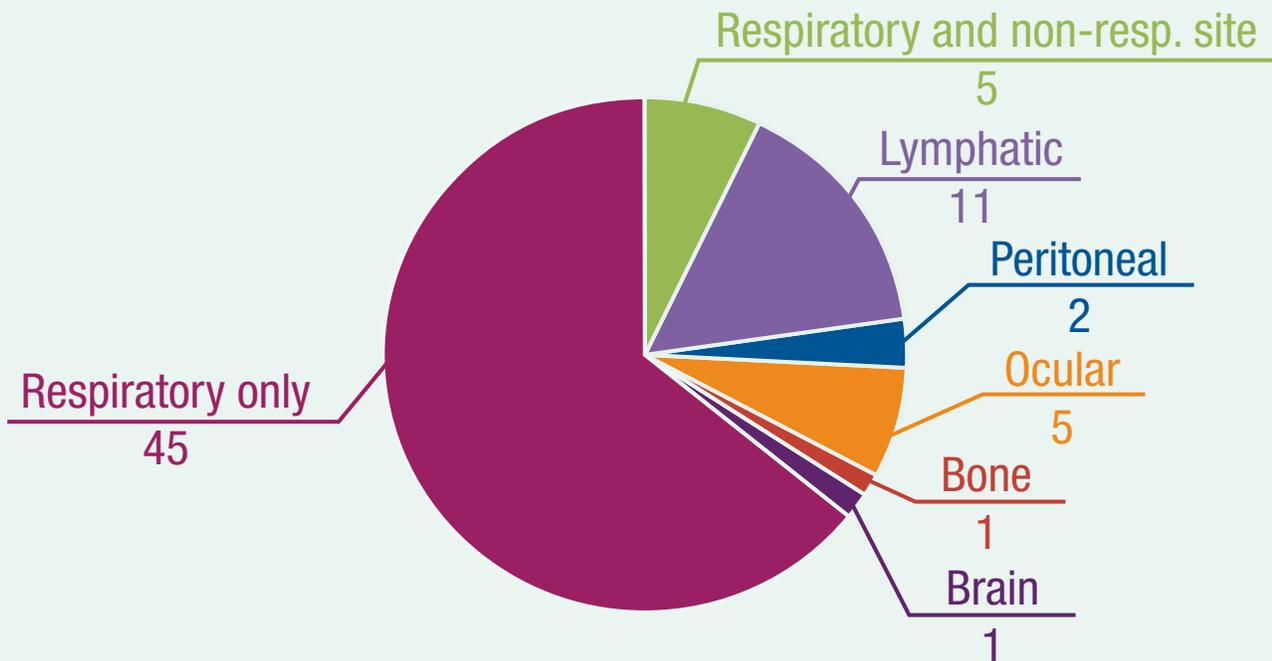
Tuberculosis cases by major site of disease

In 2016, 45 (64%) of Oregon's 70 TB disease cases had TB in a respiratory site only (any combination of pulmonary, pleural or laryngeal disease). Another five cases (7%) had both respiratory and non-respiratory sites of disease. There were 11 lymphatic cases (16%), and nine cases with TB in other sites.

Among the 50 cases with any type of respiratory involvement, 17 were sputum-smear positive, meaning that microscopic examination, using a specific type of staining technique called acid-fast staining, revealed the presence of bacilli in the sputum. Eleven cases 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 2016

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



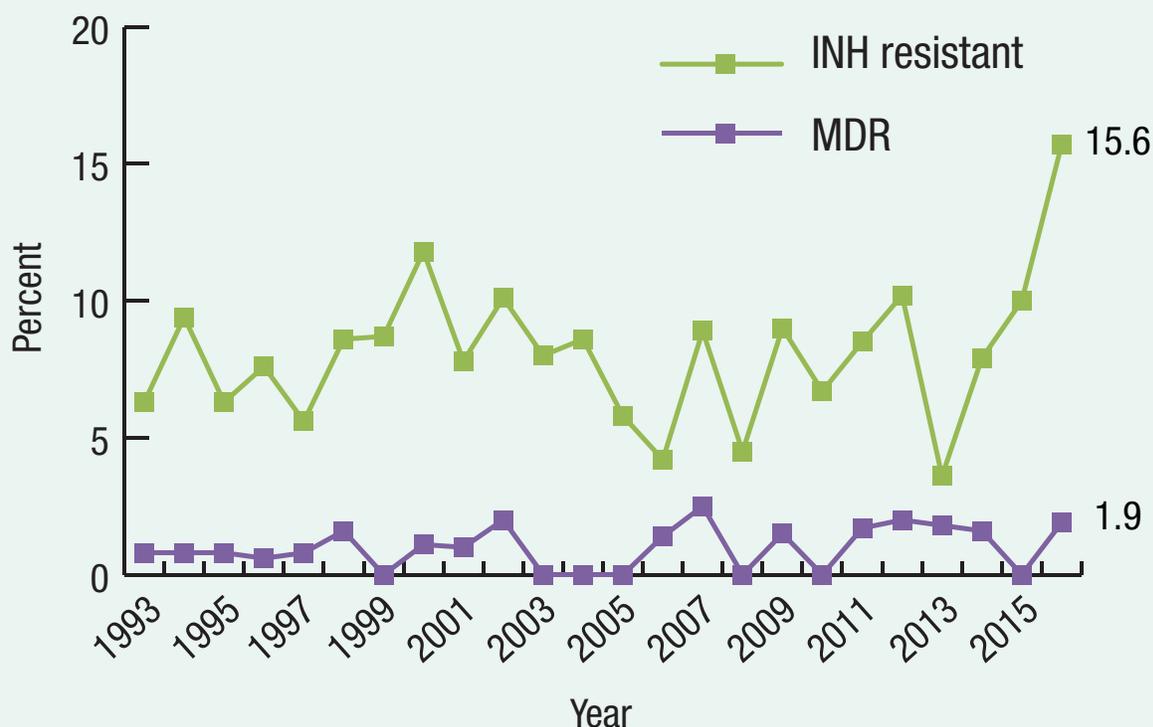
Drug resistance and tuberculosis

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 eight out of 51 cases with drug susceptibility results* were resistant to INH. The U.S. average in 2015 was 9.0%.(2)

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 (3), somewhat lower than Oregon's rate. One MDR case was reported in Oregon in 2016 (1.9%).

* INH and MDR resistance numbers are not mutually exclusive.

Figure 11. INH drug resistance and MDR rate, Oregon, 1993–2016

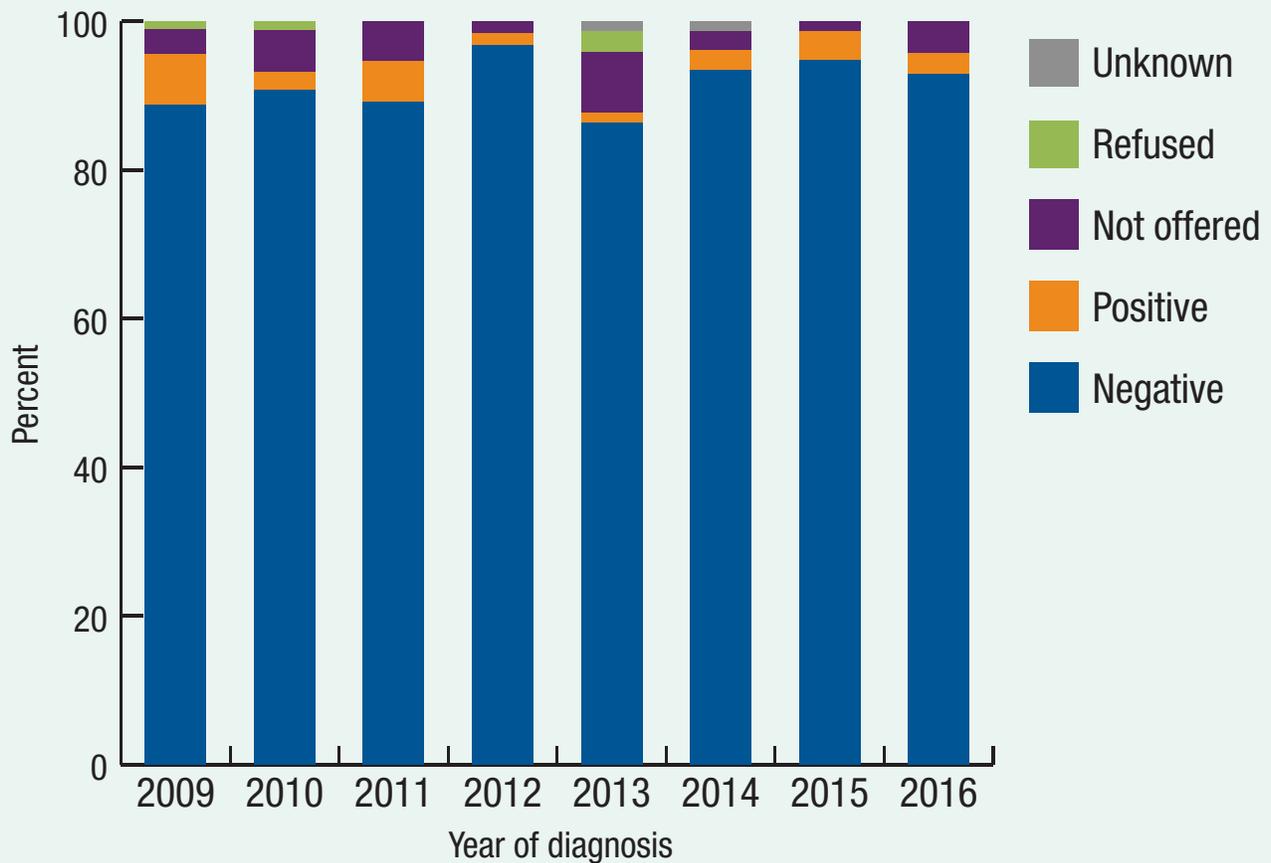


HIV and tuberculosis

HIV status was known for 67 (96%) of the TB disease cases reported in Oregon in 2016. Two cases (2.7%) were HIV positive, which is below the national rate for TB/HIV coinfection (5.8% in 2016).⁽⁴⁾

Three cases were not offered tests; two of these cases were infants or toddler children, and one case died prior to HIV testing.

Figure 12. TB cases by HIV status, Oregon, 2009–2014



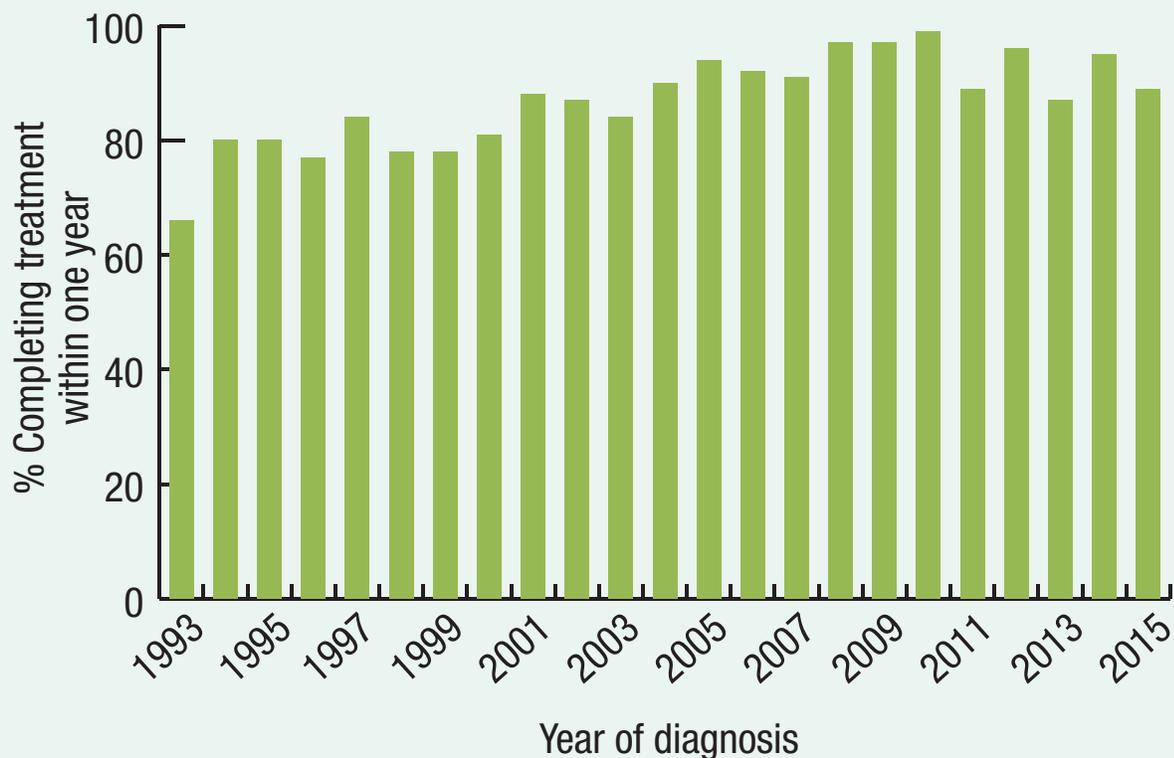
Completion of tuberculosis treatment

In 2015, 89% (57 of 64) of eligible cases completed treatment within one year.

2016 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 military 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 1993–2015



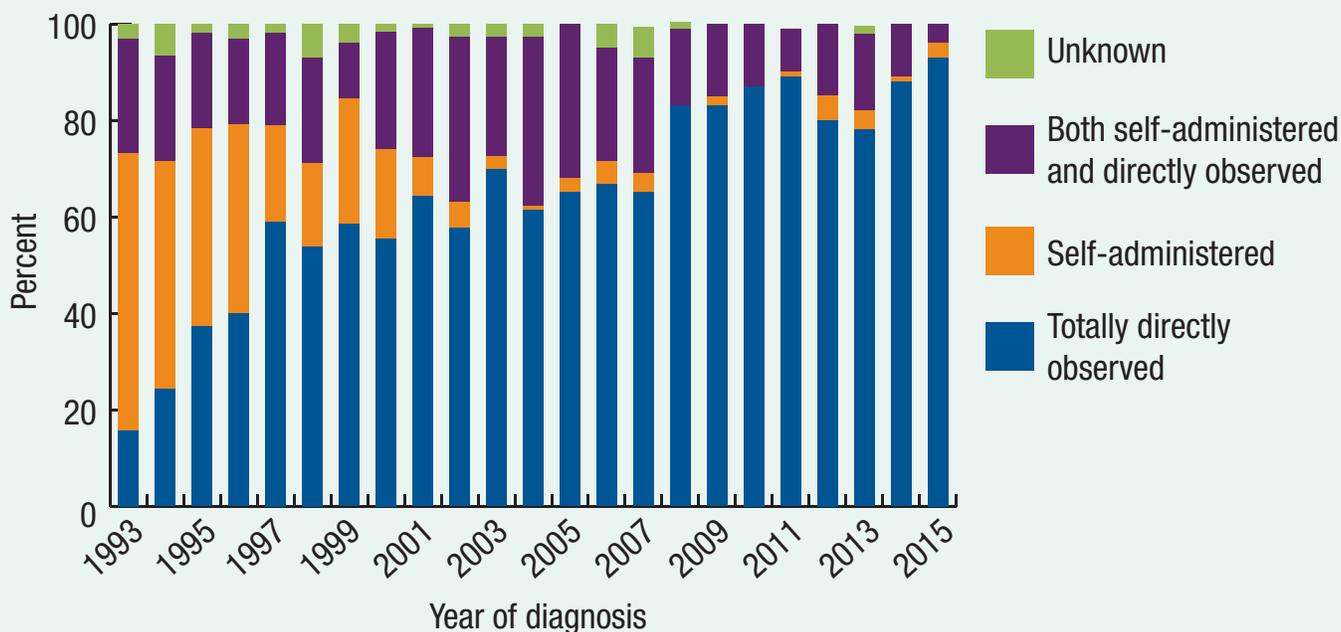
*Patients included in Figure 13 are patients for whom less than one year of treatment was clinically indicated.

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 the current 2015 high of 93%. In general, as case numbers decrease, rates of directly observed treatment have increased.

In 2015, a supervised DOT regimen was provided for 93% (n=64) of all cases starting therapy (n=69). Four percent (n=3) received a combination of both DOT and self-administered therapy. Two cases (3%) were on self-administered therapy alone.

Figure 14. Mode of TB therapy, Oregon, 1993–2015



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 October 2017.

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 2017 Nov 22]. 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, 1993–2015. [cited 2017 Nov 22]. Available from: https://www.cdc.gov/tb/statistics/reports/2015/pdfs/2015_Surveillance_Report_table8.pdf.
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4. Schmit KM, Wansaula Z, Pratt R, Price SF, Langer AJ. Tuberculosis — United States, 2016. *MMWR Morb Mortal Wkly Rep* 2017;66:289–294. [cited 2017 Nov 27]. Available from: <http://dx.doi.org/10.15585/mmwr.mm6611a2>.



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