

**TUBERCULOSIS
IN
UTAH
2013–2017**

November 2018



UTAH DEPARTMENT OF
HEALTH
Bureau of Epidemiology

Tuberculosis (TB) by Demographic Characteristics

Sex

Between 2013 and 2017, males accounted for 45% of the morbidity with 74% of males being non-US-born; and females accounted for 55% of the morbidity, with 83% being non-US-born (Table 2). In contrast, the distribution of TB cases in the United States in 2017 showed that 61% of the cases were male and 39% were females (1).

Age

From 2013 to 2017, adults aged 65 and older had the highest TB rate in Utah at 1.6 cases per 100,000 population, followed by adults aged 45–64 and 25–44 years, at rates of 1.3 and 1.2 cases per 100,000 population, respectively. Children 0–4 years had the next highest rate at 0.9 cases per 100,000 population, and the majority of these children were diagnosed with TB during a contact investigation (Table 3).

Over this five-year period, the distribution of TB cases reported in Utah by age group was as follows: 8% of the cases were 0–4 years of age; 6% of the cases were 5–14 years; 9% were 15–24 years; 35% were 25–44 years; 25% were 45–64 years; and 17% were 65 years or older (Figure 6, Table 3). This compares with the following 2017 distribution of TB cases reported in the United States: 3% were 0–4 years of age; 2% were 5–14 years; 9% were 15–24 years; 30% were 25–44 years; 30% were 45–64 years; and 25% were 65 years of age or older (1).

Children

Between 2013 and 2017, 14% of TB morbidity in Utah was among pediatric cases younger than 15 years of age (Figure 6, Table 3). Of the pediatric cases, 52% (11 of 21) were contacts to adults with infectious TB disease, including three children who were initially reported as TB cases, with the source adult cases being subsequently identified.

One of these children was treated as the first pediatric multidrug-resistant TB (MDR-TB) case in Utah, which is extremely challenging since most of the medications for MDR-TB are not commonly used in children and can be quite toxic; total treatment is typically two years; and an IV line is required for at least six months. Another case involved a newborn who contracted TB disease from its mother and died before treatment could be initiated.

The remaining ten children were either recent arrivals to the United States, were US-born children of non-US-born parents, and/or had lived in a country with a high incidence of TB (Figure 6).

Race/Ethnicity

From 2013 to 2017, Black/African Americans, Asians, and Native Hawaiian/Other Pacific Islanders had the highest TB rates in Utah with 10.2, 10.2, and 7.2 cases per 100,000 population, respectively. The next highest rates were reported among persons of Hispanic ethnicity and American Indian/Alaska Natives, with TB rates of 3.3 and 2.8 cases per 100,000 population. Whites had the lowest rate at 0.2 cases per 100,000 population and had a significantly lower TB rate than other race/ethnicities (Figure 7, Table 3).

Country of birth was a major risk factor for TB, and during this period, >90% of the Asian and Black/African American cases were non-US-born. Persons of Hispanic ethnicity had the largest percentage of cases during this time frame at 45%, and Asians had the second highest percentage at 23% (Figure 8, Table 3).

Nationally, Native Hawaiian/Pacific Islanders and Asians had the highest TB rate in 2017 at 19.1 and 17.7 cases per 100,000 population, respectively. Asians were the racial and ethnic group with the largest percentage of cases in the United States in 2017 with 36% of the cases, followed by persons of Hispanic ethnicity at 28% (1).

Origin of Birth

From 2013 to 2017, non-US-born persons* accounted for 79% of the TB cases in Utah. US-born persons with a foreign connection accounted for 12% of the cases (Figure 9, Table 4). Persons with foreign connections included individuals who had lived in countries with a high incidence of TB, US-born children who were contacts of non-US-born cases, or US-born cases with non-US-born parents.

In the United States in 2017, 70% of all TB cases occurred in non-US-born persons. Utah ranked 19 out of 50 states for its percentage of TB cases among non-US-born persons (1). These numbers show the importance of effectively screening and treating individuals from high TB prevalence areas.

Immigration Status at First Entry among Non-US-born Persons

Among non-US-born TB cases in Utah from 2013 to 2017, 34% had immigration visas upon first entry into the United States; 25% were refugees; 7% had student visas; 3.5% had employment visas; 2% had tourist visas; and 1% each were asylees/parolees, had family/fiancé visas, or refused to answer the question; and 26% had other immigration status[†] (Figure 10, Table 4).

Country of Birth

The distribution of the countries of birth among persons reported with TB in Utah illustrates the truly global nature of the disease. From 2013 to 2017, individuals diagnosed with TB in Utah reported 40 different countries of birth.

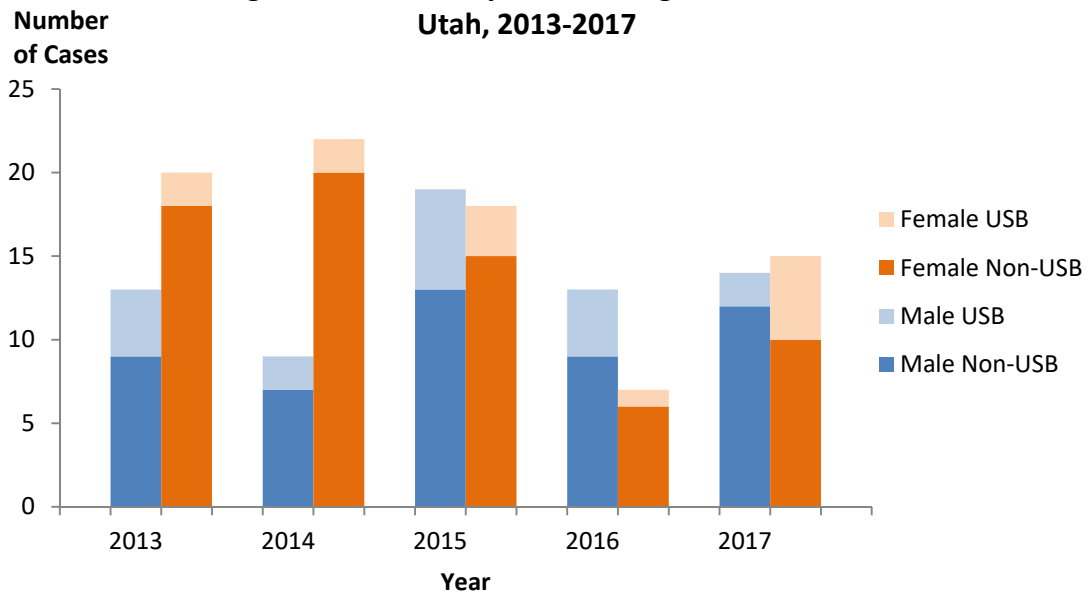
Among persons born outside the United States, the top five countries - Mexico, India, Peru, Philippines, and Somalia – span four continents and accounted for 52% of cases. The top 11

countries accounted for 72% of Utah's cases, and persons born in 28 other countries each accounted for less than two percent of the total but together accounted for 28% of persons born outside the United States who were reported with TB in Utah (Figure 11, Table 5).

* Non-US-born persons were born outside the United States and its territories (American Samoa, Guam, Commonwealth of the Northern Mariana Islands, Puerto Rico, or the US Virgin Islands) and did not have at least one parent who was a US citizen.

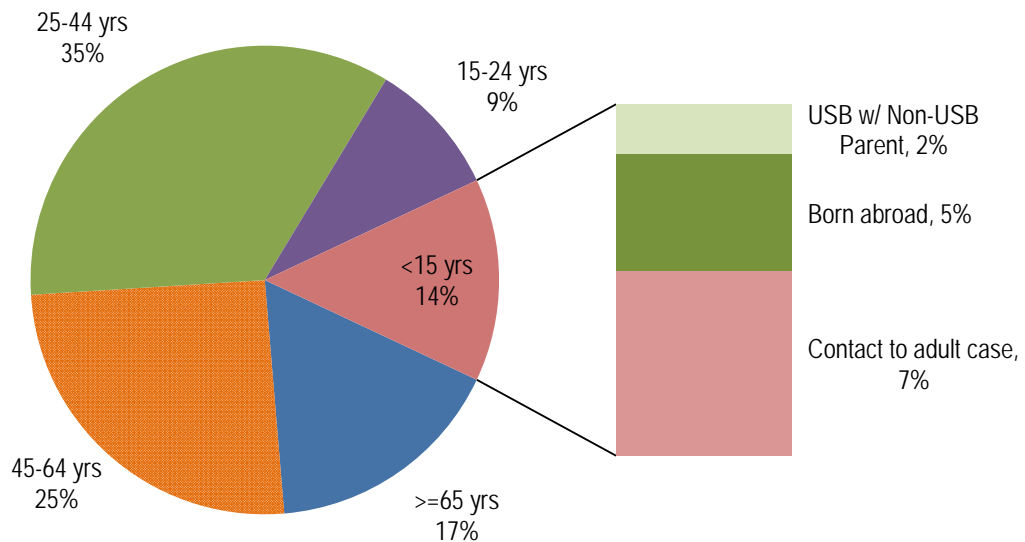
[†] Other immigration status includes (but is not limited to) non-US-born persons who were not required to obtain a visa or persons with no official immigration status.

Figure 5. TB Cases by Sex and Origin of Birth*, Utah, 2013-2017



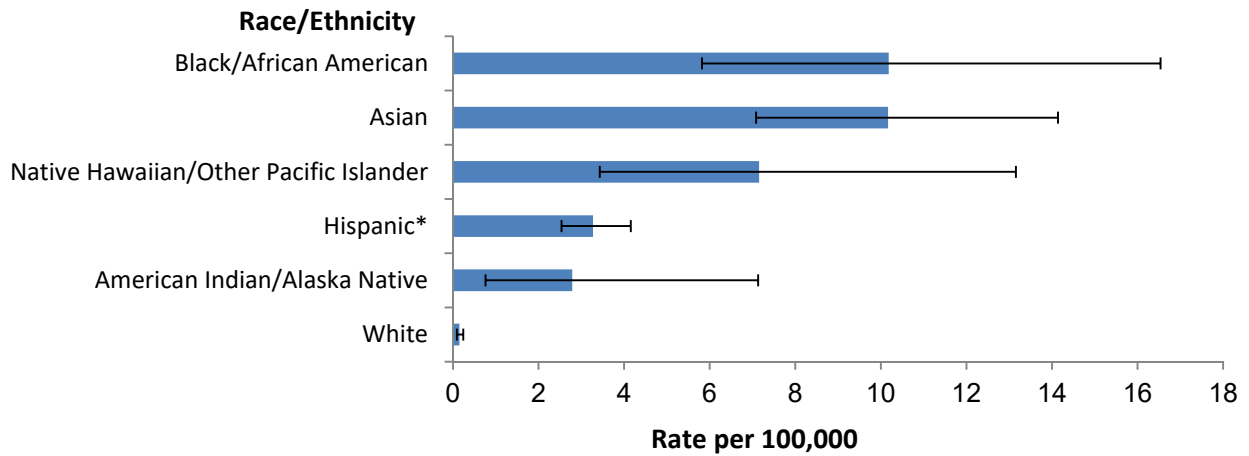
* USB=US-born ; Non-USB=Non-US-born. US-born persons were born in the United States, born outside the United States to at least one parent who was a US citizen, or born in a US territory. All other persons are non-US-born. See Table 2.

Figure 6. Percent of TB Cases by Age Group and Characteristics of Pediatric Cases, Utah, 2013-2017



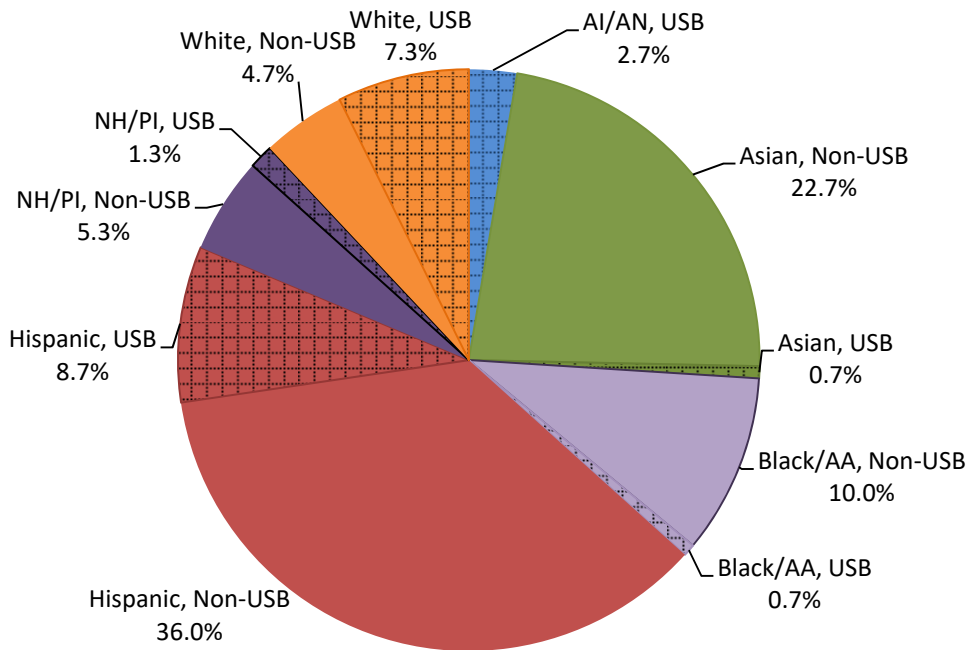
See Table 3.

Figure 7. TB Rates per 100,000 Population by Race/Ethnicity with 95% Confidence Intervals, Utah, 2013-2017



*Persons of Hispanic ethnicity can be of any race(s).
See Table 3.

Figure 8. Percent of TB Cases by Race/Ethnicity* and Origin of Birth†, Utah, 2013-2017

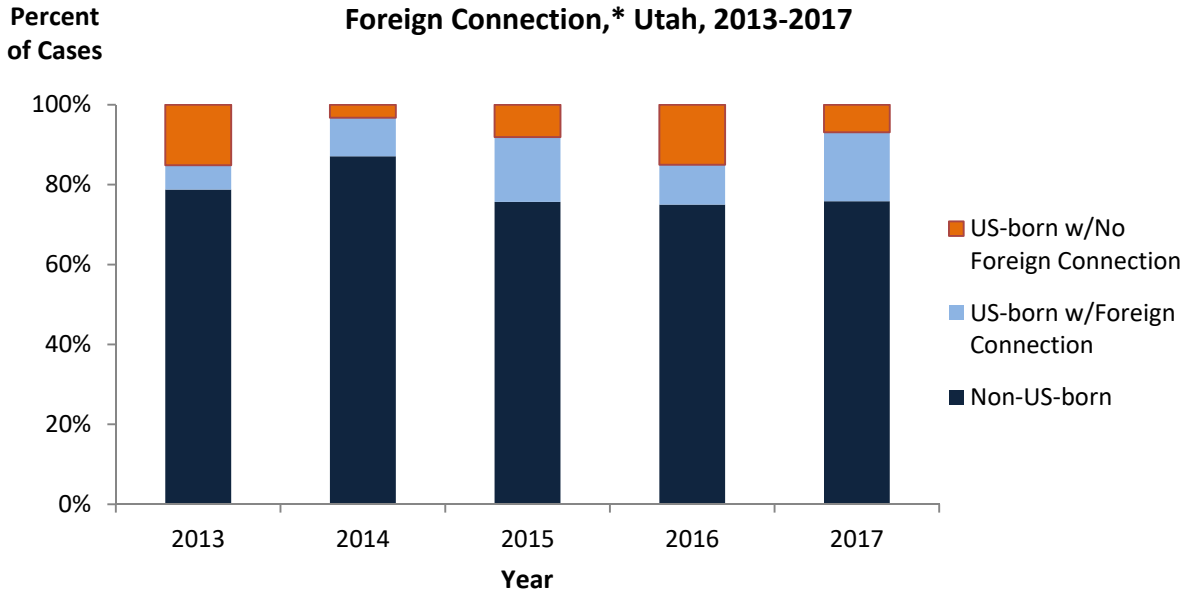


*AI/AN=American Indian/Alaska Native; Black/AA=Black/African American; NH/PI=Native Hawaiian/Other Pacific Islander; persons of Hispanic ethnicity can be of any race(s).

† USB=US-born; Non-USB=Non-US-born. US-born persons were born in the United States, born outside the United States to at least one parent who was a US citizen, or born in a US territory. All other persons are non-US-born.

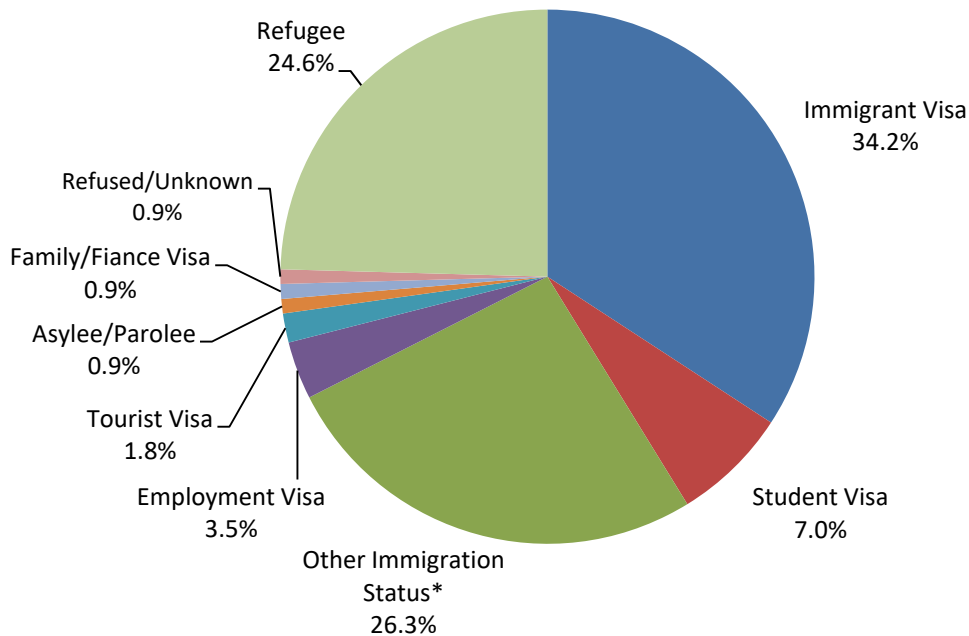
See Table 3.

Figure 9. Percent of TB Cases by Origin of Birth and Foreign Connection,* Utah, 2013-2017



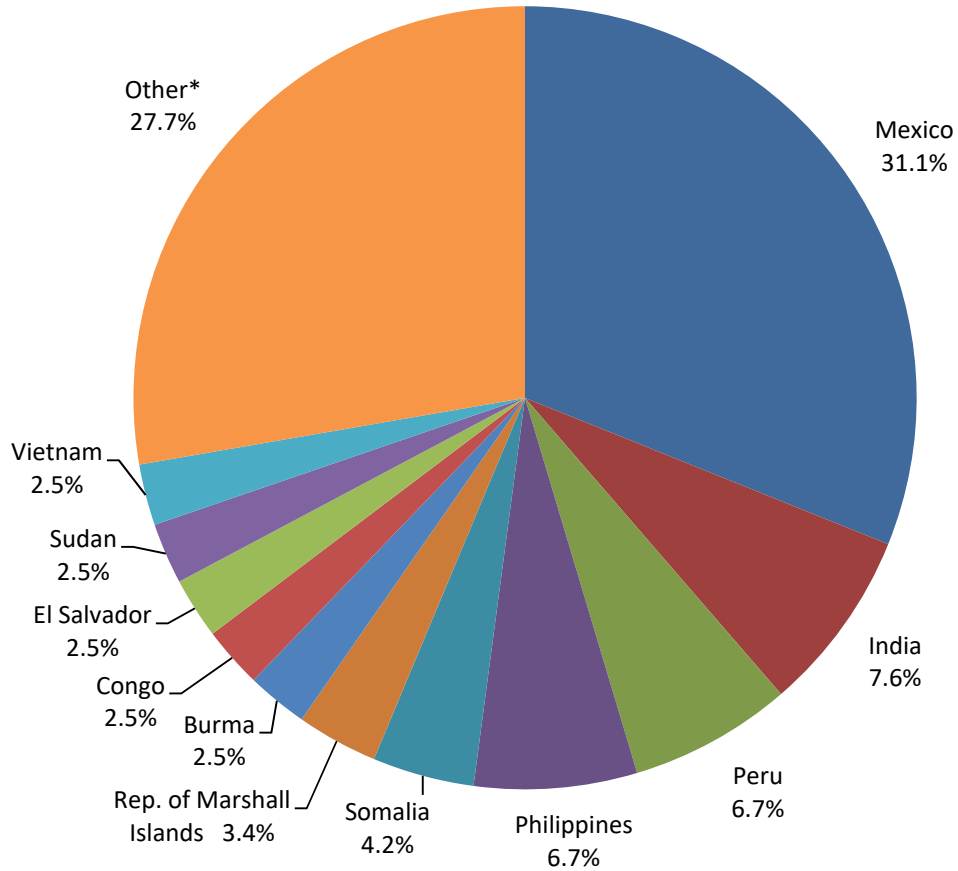
* US-born persons were born in the United States, born outside the United States to at least one parent who was a US citizen, or born in a US territory. All other persons are non-US-born. See Table 4.

Figure 10. Percent of Non-US-born TB Cases by Immigration Status at First Entry to the United States, Utah, 2013-2017



*Includes (but is not limited to) non-US-born persons who were not required to obtain a visa or persons with no official immigration status. See Table 4.

**Figure 11. Percent of TB Cases by Country of Birth
Among Persons Born Outside the United States, Utah, 2013-2017**



*Other countries include: Afghanistan, Argentina, Bhutan, Bolivia, Bosnia and Herzegovina, Cambodia, Cuba, Dominican Republic, Ecuador, Egypt, Ethiopia, Guatemala, Indonesia, Iraq, Israel, Kenya, Korea-Republic of, Kuwait, Laos, Nepal, Papua New Guinea, Taiwan, Tanzania, Thailand, Tonga, Uganda, Vanuatu, and Yugoslavia.
See Table 5.

Tuberculosis (TB) by Risk Factor

HIV Testing and Coinfection

Knowledge of a TB patient's human immunodeficiency virus (HIV) status is critical to ensuring the optimal drug regimen is selected and for referring patients to HIV primary care if a positive result is newly detected.

Therefore, all TB cases should be tested for HIV. Knowledge of a TB patient's HIV status also guides the conduct of contact investigations because persons infected with HIV have the greatest risk for progression to TB disease once they are infected with *Mycobacterium tuberculosis*.

Between 2013 and 2017, 98% (147 of 150) of persons with TB in Utah reported a positive or negative HIV test result. Testing was refused in one case; and two persons were not offered HIV testing as they were dying at the time of TB diagnosis (Figure 12, Table 6).

From 2013 to 2017, 5% of TB cases in Utah were coinfecting with HIV (Table 6), which is similar to the national HIV coinfection percentage for patients for whom HIV test results were available in 2017 (1).

Additional Risk Factors

There are a number of additional conditions that increase the risk that a person infected with TB will progress to TB disease. From 2013 to 2017, diabetes was the most common risk factor among TB cases in Utah (17% of cases). The next most common risk factors were being a contact to an infectious TB case in the preceding two years (10%) and immunosuppression (5%). Fifty-seven percent of cases did not report any risk factors (Figure 13, Table 6). This compares with the following 2017 proportion of TB cases in the United States reporting these risk factors: 20% had diabetes, 8% were contacts to an infectious TB case, and 7% were immunosuppressed (1).

Residence at Diagnosis

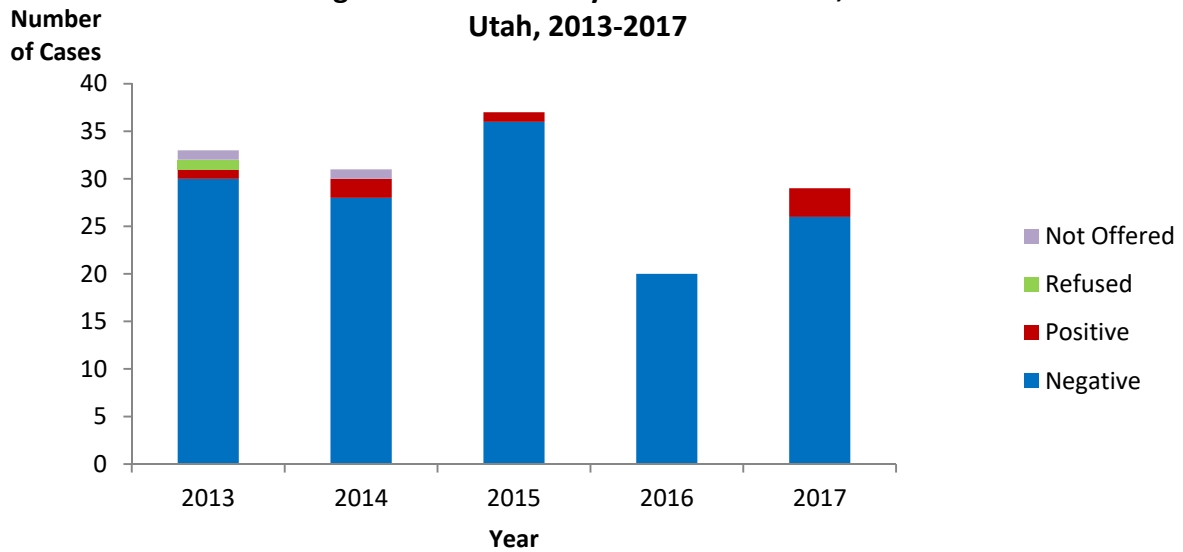
The majority of TB cases reported in Utah were among persons living in a private residence at the time of diagnosis. From 2013 to 2017, 95% of the TB cases in Utah were living in a private residence at the time of their diagnosis, 2% were homeless at the time of their TB diagnosis, and the remainder of the cases had other living arrangements (Table 6).

Adult Homelessness and Substance Abuse

Only a small percentage of the TB cases in Utah reported being homeless, abusing drugs, and/or abusing alcohol. From 2013 to 2017, 4% of adult cases (≥ 15 years) reported being homeless in the 12 months prior to their TB diagnosis. In terms of substance abuse in the 12 months prior to TB diagnosis for this five-year period, 5% reported excess alcohol use and no cases reported injection or non-injection drug use (Figure 14, Table 7).

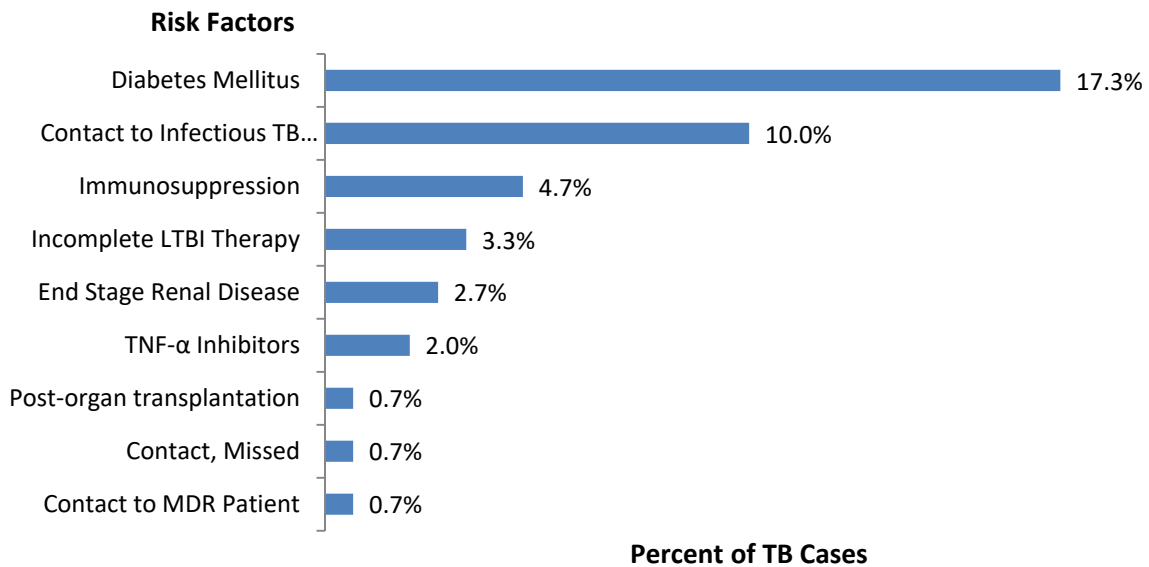
In the United States in 2017, the percentage of TB cases aged 15 years or older reporting homelessness and/or substance abuse in the 12 months prior to TB diagnosis, where this information was known, was higher than that of Utah; 5% of the national cases were homeless, 9% reported excess alcohol use, 7% reported non-injection drug use, and 1% reported injection drug use (1).

Figure 12. TB Cases by HIV Test Results*, Utah, 2013-2017



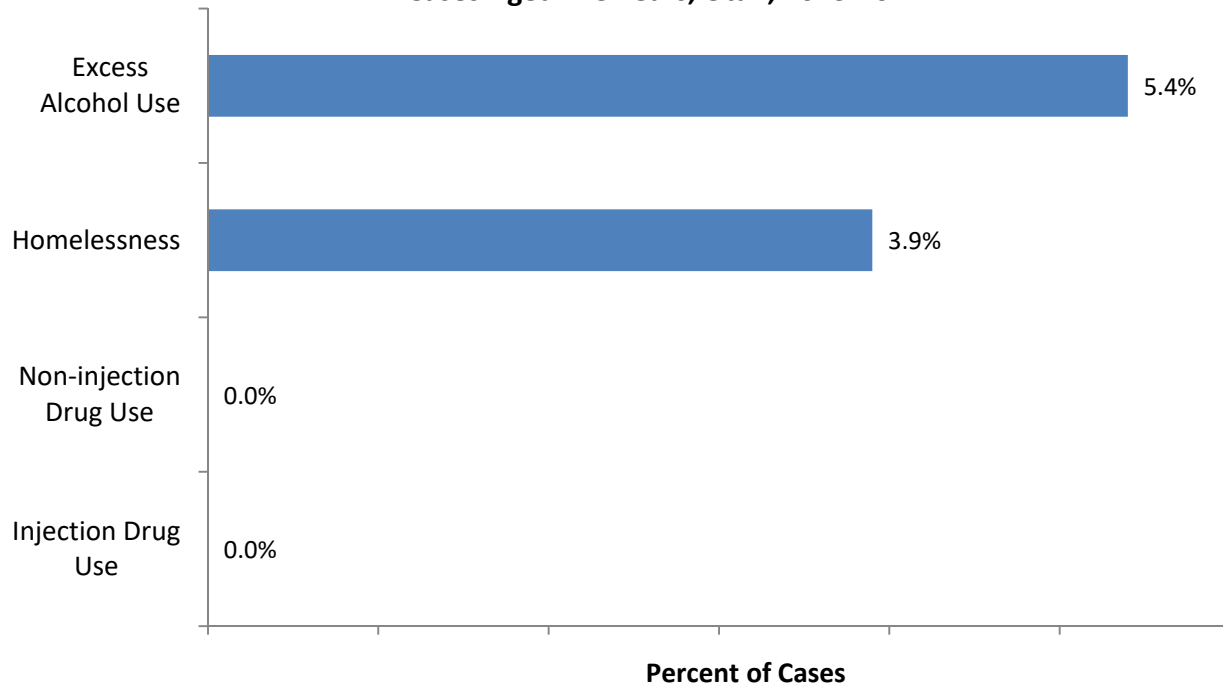
*No cases had indeterminate results.
See Table 6.

Figure 13. Percent of TB Cases by Additional TB Risk Factors*, Utah, 2013-2017



* A single case may have more than one risk factor.
LTBI=Latent TB infection; TNF=Tumor necrosis factor; MDR=Multidrug-resistant.
See Table 6.

**Figure 14. Percent of Homelessness and Substance Abuse*
in TB Cases Aged ≥15 Years, Utah, 2013-2017**



* Homelessness and substance abuse in the 12 months prior to TB diagnosis; categories are not mutually exclusive. See Table 7.

Tuberculosis (TB) by Clinical Information

Primary Reason for TB Evaluation

There are a variety of reasons that bring patients into the health care system resulting in their eventual TB diagnosis. From 2013 to 2017, 63% of the TB cases in Utah had TB symptoms as the primary reason for being evaluated for TB. Abnormal chest x-rays (14% of cases), contact investigations (8%) and incidental lab results (7%) were the next highest reasons for TB evaluation (Figure 15, Table 7). Nationally, these were also the most common primary reasons for TB evaluation, with 57% of cases having TB symptoms, 19% with abnormal chest x-rays, 11% with incidental lab results, and 4% as a result of a contact investigation (1).

Case Verification

From 2013 to 2017, 72% of TB cases reported in Utah were confirmed by isolation of *M. tuberculosis* from a laboratory culture. During this time frame, 24% of the cases met the clinical case definition of TB and 3% were verified by provider diagnosis.[‡] Of the remaining cases, 1% was verified by a positive sputum or tissue smear (Figure 16, Table 7).

The case verification in Utah compares with the following case verification in the United States in 2017: 78% of the cases were confirmed by laboratory culture, 14% by clinical case definition, 5% by provider diagnosis, 2% by positive NAAT, and less than 1% by positive smear/tissue (1).

Site of Disease

Although it is widely known as a pulmonary disease, TB can affect other parts of the body, including the lymphatic system, bones and/or joints, the meninges, and the genitourinary

system. Between 2013 and 2017, 53% of the reported TB cases in Utah were pulmonary, 14% were pulmonary and extrapulmonary, and 33% were extrapulmonary alone (Figure 17, Table 8). By comparison, 69% of the TB cases reported in the United States in 2017 were pulmonary, 10% were pulmonary and extrapulmonary, and 21% were extrapulmonary alone (1).

Of the extrapulmonary sites of disease reported in Utah during this five-year period, the most common site was cervical lymph nodes (23%), followed by pleura (19%), eye and/or ear appendages (14%), and bones and/or joints (10%) (Table 8). A TB case may have more than one extrapulmonary site of disease.

Drug Susceptibility Testing and Results

Ensuring patients are given the correct treatment requires a specimen from each culture-confirmed TB case be tested for drug resistance, and the regimen adjusted accordingly. From 2013 to 2017, drug susceptibility testing was completed on 100% of the isolates of TB cases confirmed by laboratory culture. Of these isolates, 14% had resistance to one or more anti-TB medications, 7% had resistance to at least isoniazid (INH), and 3% were resistant to at least INH and rifampin (RIF), i.e., MDR-TB (Table 9). This is consistent with national trends; 9% of the reported cases in the United States in 2017 with reported drug susceptibility results were resistant to at least INH and 2% was confirmed with MDR-TB (1).

Directly Observed Therapy

Directly observed therapy (DOT) involves the direct visual observation by a health care provider or other reliable person of a patient's ingestion of medication. Because TB treatment is typically administered for a minimum of six months, DOT is necessary not only to ensure effective therapy and monitor for side effects but also to prevent acquired drug resistance. In Utah, DOT is usually administered by LHD staff.

DOT figures are reported for the five-year period from 2012 to 2016 as many 2017 patients are still on treatment. During this time frame, 97% of patients treated for TB in Utah had all doses of their medications given by DOT, and 2%

[‡] Clinical cases are defined as cases that have a positive TB skin test or interferon gamma release assay (IGRA) for *Mycobacterium tuberculosis*, have other signs and symptoms compatible with TB, are treated with two or more anti-TB medications, and have completed a diagnostic evaluation. When patients meet neither the laboratory nor clinical case definition, they may be verified TB cases based on provider diagnosis.

completed their treatment utilizing a combination of directly observed and self-administered therapy (Table 10). Reasons for the combination of directly observed and self-administered therapy included patients being permitted to travel out of state for employment but who did not follow through with instructions to contact out-of-state health departments, partner agencies not starting DOT, and patients out of the country. One case had all doses administered by a family member, which is considered self-administered treatment.

The percentage of cases utilizing DOT in Utah is higher than the national average. The most recent national statistics available regarding the percentage of cases given treatment by DOT are from 2015. In that year, 65% of the cases completed treatment using only DOT and 29% utilized both directly observed and self-administered therapy (1).

Completion of Treatment

Of the 158 TB cases reported in Utah between 2012 and 2016, 154 cases started TB treatment. Three cases were reported at death, and one patient did not start treatment as the patient entered hospice shortly after their TB diagnosis. Of the patients who started treatment, 94% completed therapy, 5% died, one patient was uncooperative or refused treatment, and one person moved out of the country (Table 10). Of the seven patients who died, three died of causes unrelated to TB disease.

Utah completion of treatment compares with the following 2015 national distribution of completion of treatment reasons: 88% completed treatment, 6% died, 1% lost, 1% refused, less than 1% had adverse events, and 4% unknown (1).

TB Cases, Suspects, and Rule Outs

In addition to managing counted TB cases, the Utah TB Control Program managed non-countable cases, including cases where TB was recurrent (diagnosed within a year of completion of treatment), where the TB diagnosis was reversed, and cases moving to Utah — whether from other states or countries. These interjurisdictional cases were provided TB

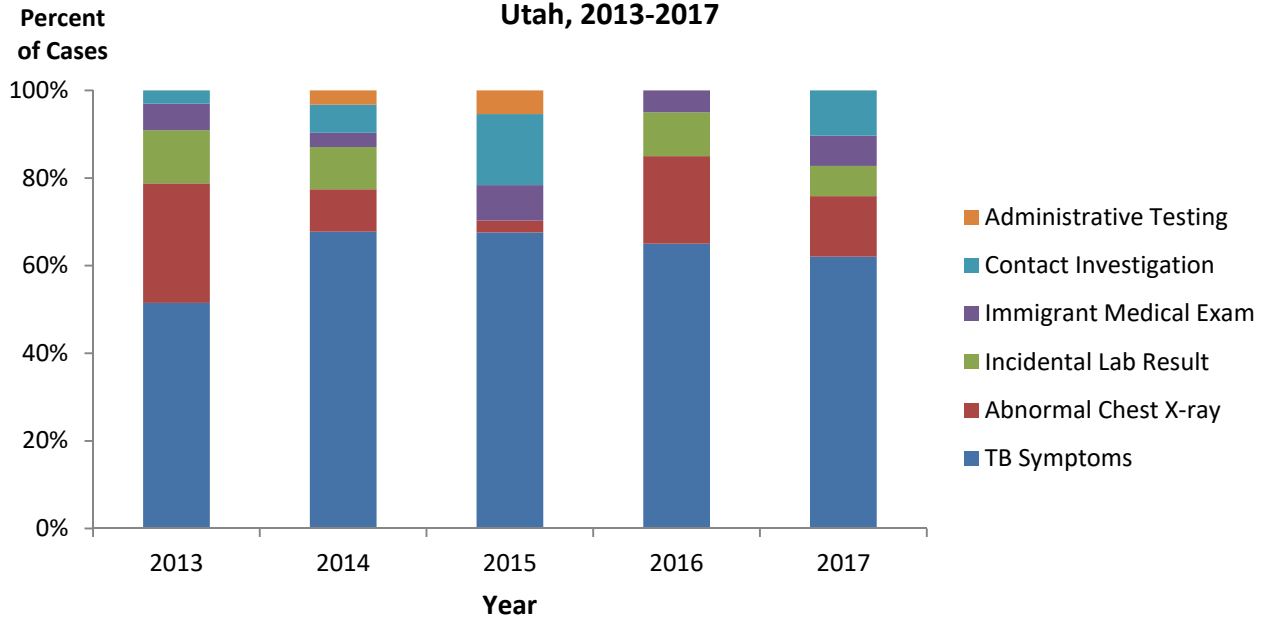
medications using DOT during their residence in Utah.

All persons suspected of having TB, including those with a positive acid-fast bacillus (AFB) smear and/or culture laboratory result, were entered into UT-NEDSS; but TB was ruled out for many of these individuals. Mycobacterium other than tuberculosis (MOTT) laboratory results were also entered into UT-NEDSS, whether the results were a follow-up to a positive AFB culture or a direct rule-out of TB. Additionally, all immigrant and refugee arrivals with an abnormal chest x-ray abroad were also considered to be suspect for TB disease. Each person suspected of having TB was monitored by a public health agency to ensure the completion of a diagnostic evaluation for TB or to ensure an interjurisdictional referral was made for out-of-state suspect or confirmed cases of TB.

From 2013 to 2017, a total of 1,657 people were reported as either confirmed or suspected of having TB in Utah. During this time frame, 9% (150 of 1,657) of persons suspected of having TB were diagnosed with TB disease and counted as a case in Utah. In addition, the Utah TB Control Program processed laboratory results of an additional 232 persons where TB was directly ruled out and provided case management for 17 incoming interjurisdictional transfer cases of persons diagnosed with TB disease (Figure 18, Table 11).

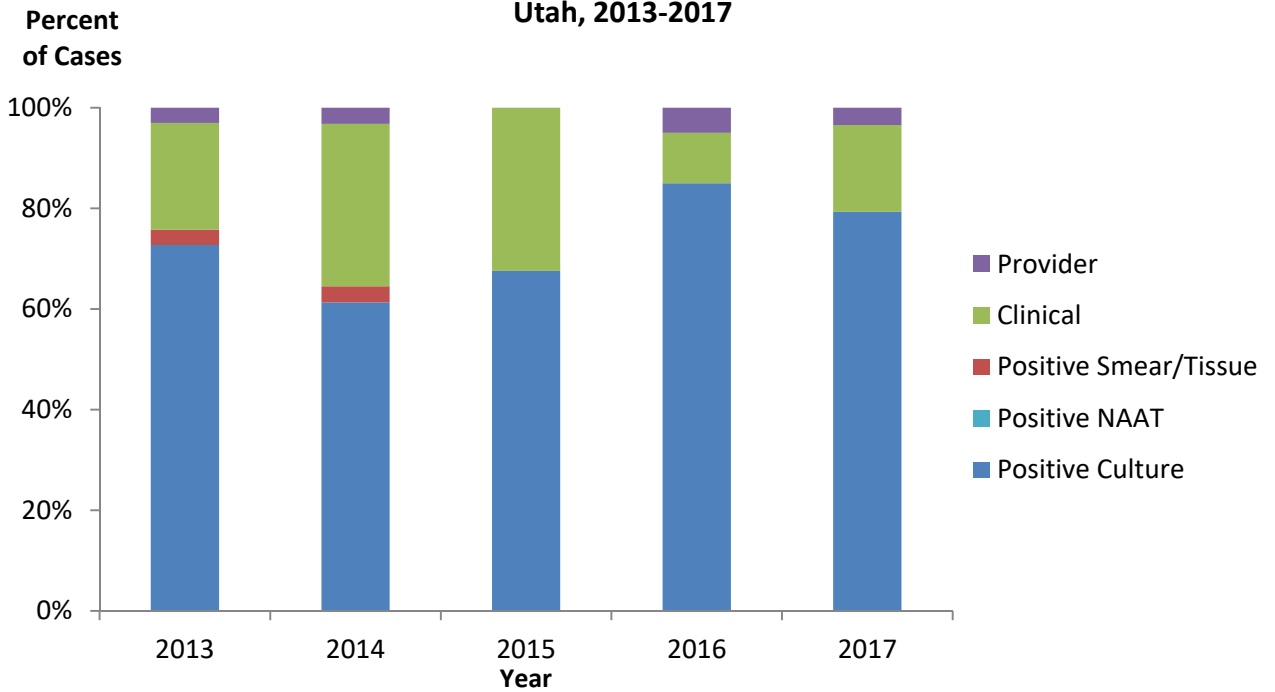
It is important for health care providers to consider TB as a possible diagnosis, even if an increase in suspect TB cases also means increased public health resources will be necessary to evaluate suspect cases. Due to its airborne mode of transmission, early detection and treatment of TB is essential to control the spread of the disease and to prevent outbreaks.

Figure 15. Percent of TB Cases by Primary Reason for TB Evaluation, Utah, 2013-2017



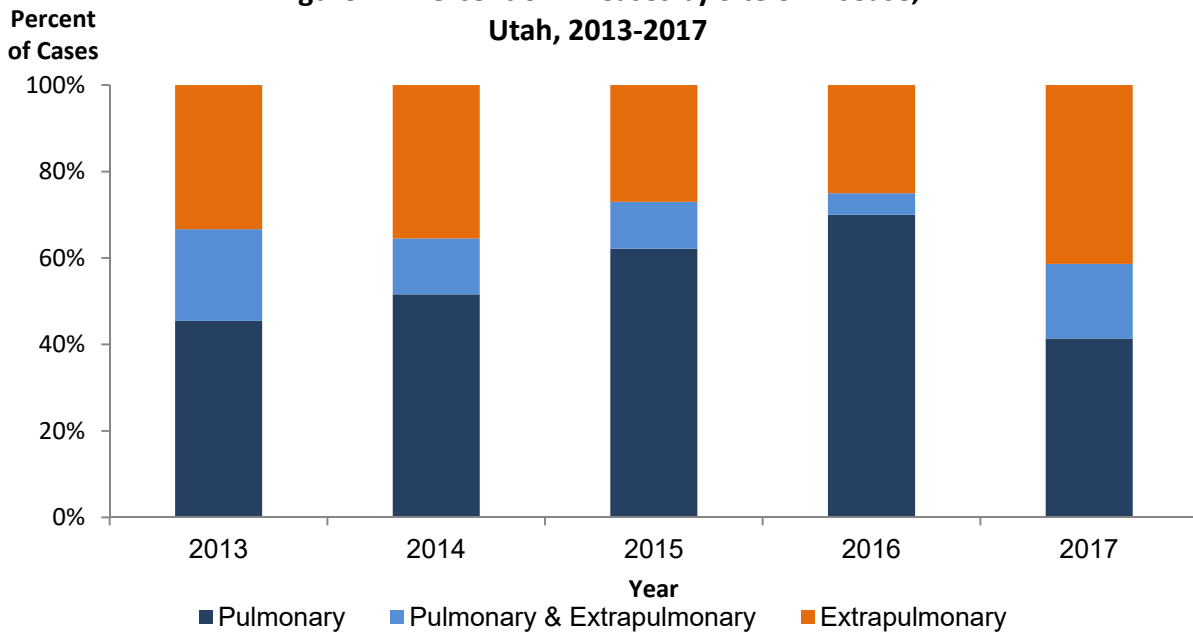
See Table 7.

Figure 16. Percent of TB Cases by Case Verification, Utah, 2013-2017



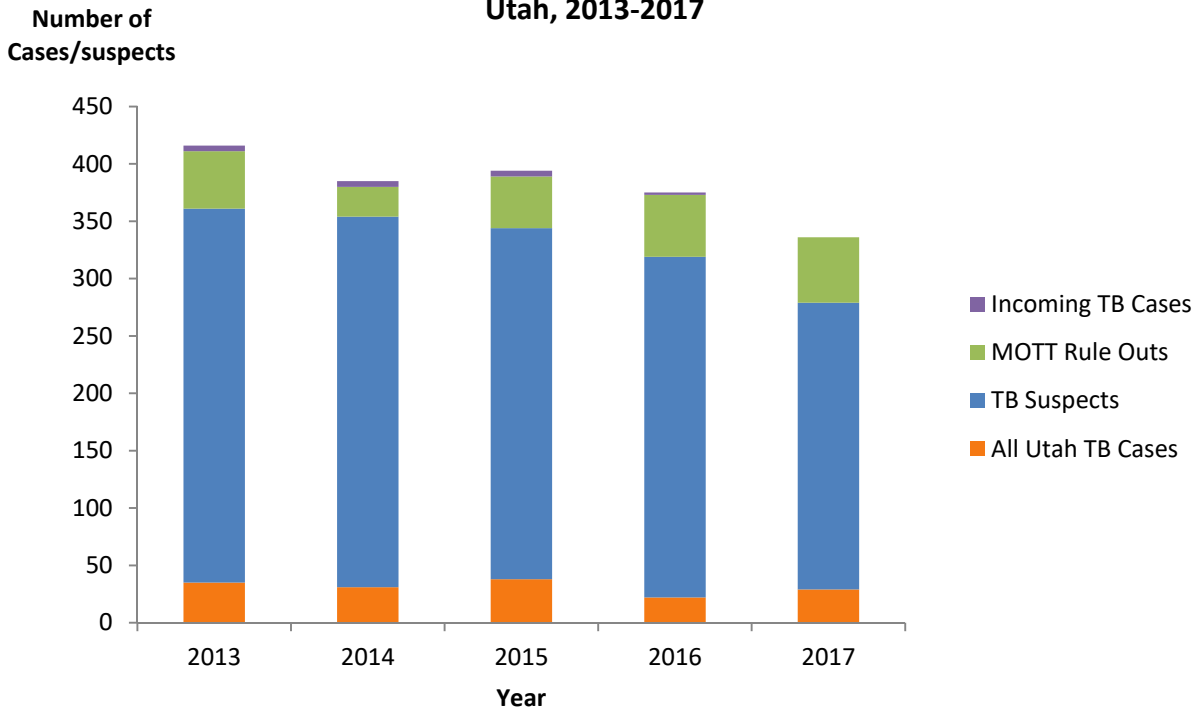
NAAT=Nucleic acid amplification test.
See Table 7.

Figure 17. Percent of TB Cases by Site of Disease, Utah, 2013-2017



See Table 8.

Figure 18. TB Cases and Suspects by Final Classification*, Utah, 2013-2017



*'All Utah TB cases' includes countable and non-countable cases.
MOTT=Mycobacterium other than TB.
See Table 11.

Tuberculosis (TB) Program Evaluation

The CDC sets national TB program objectives and targets to assist TB control programs in evaluating their performance. The UDOH TB Control Program works together with LHDs throughout the state to meet the national targets. This section compares the performance of the Utah TB Control Program from 2013 to 2017 with the 2020 National TB Program Objectives (6). The table on page 20 summarizes the national objectives and Utah's performance.

TB Case Rates

Utah is a low-incidence TB state, and case rates among the populations identified in the national objectives are generally below target rates. Between 2013 and 2017, Utah met the 2020 national target rates for the statewide rate and the rate for US-born persons. Among non-US-born persons, Utah was below the target except in 2015 when the rate was 11.4 per 100,000 population, which was slightly over the target rate of 11.1. Among US-born non-Hispanic Black/African Americans, Utah had one case in 2013, which resulted in exceeding the target rate due to the low population numbers. Among children aged <5 years, Utah exceeded the target rate in all five years but only had one or two cases each year except in 2015 and 2017, when four and two children aged <5 years, respectively, were diagnosed with TB as part of contact investigations of infectious family members.

TB Case Management/Lab Reporting

The most important strategy for TB control is to rapidly diagnose and treat to completion cases of TB disease. The eight national TB objectives related to case management and lab reporting ensure that TB patients are started on an appropriate treatment regimen as soon as possible, are monitored to ensure that the regimen is effective, and complete treatment in a timely manner.

The Utah TB Control Program generally met or exceeded the 2015 National TB Program Objective targets, but the targets have all been

raised for 2020. The program performed at 100% from 2013 to 2017 for the Drug-susceptibility Testing and was under the target for one out of five years for the following objectives: Known HIV Status, Treatment Initiation, Sputum Culture Conversion, and Universal Genotyping.

From 2013 to 2016, the program did not meet the target for two of the four years for Completion of Treatment; 2017 data is not yet reported as some patients are still on treatment. In 2015, two patients did not complete treatment within 12 months; one refused to finish treatment and the other patient was a clinically-diagnosed patient who was a known contact to a MDR-TB case, requiring extended treatment. In 2016, one patient had treatment extended due to persistent lymph node enlargement.

Recommended Initial Therapy was one of the two objectives where the program did not consistently meet the national target. The objective measures whether patients initiated the 4-drug regimen of isoniazid, rifampin or rifabutin, pyrazinamide, and ethambutol. Cases not meeting this objective had legitimate reasons for not starting the 4-drug regimen, e.g., where drug resistance was already known or suspected, contacts of cases where the drug susceptibility results of the index case were known, or having medical reasons for not starting with the 4-drug regimen.

Sputum-culture Reported, which measures the percentage of TB patients 12 years or older with pleural or respiratory site of disease who had sputum culture results reported, was the other objective that was not consistently met. Utah cases not meeting the objective were either unable to produce sputum or did not have sputum collected. In the instances where sputum was not collected, one-on-one training was conducted with providers.

Contact Investigations

Conducting contact investigations is the second most important strategy for controlling TB in the United States, and the Utah TB Rule requires contact investigations be conducted by the

patient's LHD for all confirmed TB patients and for persons suspected of having TB who may be infectious (3). Patients are interviewed to determine with whom they have been in contact, and these contacts are evaluated for TB infection and disease. Contacts are at a high risk for being infected with TB, and if recently infected, a contact is at a high risk of progressing from TB infection to TB disease. Therefore, it is critical to identify, evaluate, and treat TB contacts.

The national objectives evaluate program performance on contact investigations of sputum AFB smear-positive TB cases — the most infectious cases. The Utah TB Control Program has consistently met the objective related to the elicitation of contacts, which it did for 100% of cases during the five years. It has not consistently met the national targets for the examination, treatment initiation, and treatment completion. In an effort to achieve national targets, the UDOH TB Control Program selected the treatment initiation and completion of contacts newly diagnosed with TB infection as a focus area for improvement and has encouraged case managers to utilize short-course LTBI treatment regimens for contacts newly-diagnosed with LTBI.

Evaluation of Immigrants and Refugees

All refugees and US immigrant visa applicants living outside the United States are required to undergo an overseas medical examination that includes evaluation for TB. Departure to the United States is postponed for persons found to have infectious TB. For persons with overseas abnormal chest x-rays suggestive of TB, follow-up is conducted upon arrival in the United States. The national TB objectives in this section measure whether the evaluation of the newly-arriving refugee or immigrant was initiated and completed within specified time frames, and if found to have latent TB infection, whether treatment was initiated and completed.

National targets were newly set for 2020 for the examination of immigrants and refugees. During the past year, the program conducted data quality assurance and entered missing data into CDC's Electronic Disease Notification (EDN) database. Utah's performance in the National TB

Indicators Project database indicates that the state is consistently above the national average for the objectives in this section except for Treatment Initiation. The program will continue to strive to achieve the national targets by 2020.

Data Reporting

The CDC collects data on each case of TB from state and LHDs throughout the United States using the RVCT form. Aggregate data regarding TB contact investigations are reported using the Aggregate Report of Program Evaluation (ARPE) form. Lastly, data regarding the evaluation and treatment of newly-arriving refugees and immigrants with abnormal overseas chest x-rays suggestive of TB is reported using EDN.

Accurate and complete data is needed to determine local as well as national TB trends. Therefore, the national TB objectives include a section on data reporting, and the 2020 national TB objectives newly include a target for EDN data.

The Utah TB Control Program has generally met the national targets for data reporting with a few exceptions. Due to the low case counts, when one case has incomplete data, e.g. when treatment was not started due to a patient being on hospice, this can lead to the Program missing the national target. The Program works closely with Utah's LHDs that provide TB case management to collect the necessary information.

2020 National TB Program Objective Status, Utah, 2013-2017

National Objective	2020					
	Nt'l Target	2013	2014	2015	2016	2017
TB CASE RATES (rate per 100,000 population): Decrease the TB case rate in the following populations to below target rates.						
<u>TB Incidence Rate</u>	1.4	1.1	1.1	1.2	0.7	1.0
<u>US-born persons</u>	0.4	0.3	0.1	0.3	0.2	0.2
<u>Foreign-born persons</u>	11.1	10.8	10.7	11.4	6.0	8.9
<u>US-born non-Hispanic Black/African Americans</u>	1.5	4.7	0.0	0.0	0.0	0.0
<u>Children <5 years of age</u>	0.3	0.8	0.8	1.6	0.4	1.2
TB CASE MANAGEMENT AND TREATMENT (%) :						
<u>Known HIV Status</u> : Increase the proportion of TB cases with positive or negative HIV test results reported.	98	93.9	100.0	100.0	100.0	100.0
<u>Treatment Initiation</u> : Increase the proportion of TB patients with positive acid-fast bacillus (AFB) sputum-smear results who initiate treatment within 7 days of specimen collection.	97	85.7	100.0	100.0	100.0	100.0
<u>Recommended Initial Therapy</u> : Increase the proportion of patients who are started on the recommended initial 4-drug regimen when suspected of having TB disease.	97	96.9	93.1	91.9	90.0	96.6
<u>Sputum Culture Result Reported</u> : Increase the proportion of TB cases with a pleural or respiratory site of disease in patients ages 12 years or older that have positive or negative sputum-culture result reported.	98	90.5	94.4	95.2	100.0	93.3
<u>Sputum Culture Conversion</u> : Increase the proportion of TB patients with positive sputum culture results who have documented conversion to sputum culture-negative within 60 days of treatment initiation.	73	92.9	66.7	86.7	92.3	75.0
<u>Completion of Treatment</u> : For patients with newly-diagnosed TB for whom 12 months or less of treatment is indicated, increase the proportion of patients who complete treatment within 12 months.	95	100.0	100.0	93.5	94.4	—
LAB REPORTING (%) :						
<u>Drug-susceptibility Result</u> : Increase the proportion of culture-positive TB cases with initial drug-susceptibility result reported.	100	100.0	100.0	100.0	100.0	100.0
<u>Universal Genotyping</u> : Increase the proportion of culture-confirmed TB cases with a genotyping result reported.	100	100.0	100.0	96.0	100.0	100.0
CONTACT INVESTIGATIONS (%) :						
<u>Contact Elicitation</u> : Increase the proportion of TB patients with positive AFB sputum-smear results who have contacts elicited.	100	100.0	100.0	100.0	100.0	100.0
<u>Examination</u> : Increase the proportion of contacts to sputum AFB smear-positive TB patients who are examined for infection and disease.	93	85.7	87.6	91.8	89.9	78.3
<u>Treatment Initiation</u> : Increase the proportion of contacts to sputum AFB smear-positive TB patients with newly diagnosed latent TB infection (LTBI) who start treatment.	91	95.0	73.0	96.8	81.3	75.6
<u>Treatment Completion</u> : For contacts to sputum AFB smear-positive TB patients who have started treatment for their newly diagnosed LTBI, increase the proportion who complete treatment.	81	89.5	80.4	75.4	88.5	—
EVALUATION OF IMMIGRANTS AND REFUGEES (%) :						
<u>Examination Initiation</u> : For immigrants and refugees with abnormal chest x-rays (CXRs) read overseas as consistent with TB, increase the proportion who initiate medical examination within 30 days of notification	84	84.0	78.1	70.4	81.6	75.3
<u>Examination Completion</u> : For immigrants and refugees with abnormal CXRs read overseas as consistent with TB, increase the proportion who complete medical examination within 90 days of notification	76	87.0	78.1	80.0	76.7	71.8
<u>Treatment Initiation</u> : For immigrants and refugees with abnormal CXRs read overseas as consistent with TB and who are diagnosed with LTBI or have radiographic findings consistent with prior pulmonary TB during their examination in the US, increase the proportion who start treatment.	93	75.7	36.4	67.6	67.5	72.7
<u>Treatment Completion</u> : For immigrants and refugees with abnormal CXRs read overseas as consistent with TB, who are diagnosed with LTBI or have radiographic findings consistent with prior pulmonary TB during their examination in the US, and who start treatment, increase the proportion who complete LTBI treatment.	83	78.6	83.3	65.2	74.1	—
DATA REPORTING (%) :						
<u>RVCT</u> : Increase the completeness of each core Report of Verified Case of Tuberculosis (RVCT) data item reported.	100	99.7	100.0	100.0	100.0	—
<u>ARPEs</u> : Increase the completeness of each core Aggregated Reports of Program Evaluation (ARPEs) data items reported.	100	100.0	100.0	100.0	100.0	—
<u>EDN</u> : Increase the completeness of each core Electronic Disease Notification (EDN) system data item reported.	93	95.8	96.1	92.6	95.4	—

Note: '—' =Data not yet available.

Source: CDC National TB Indicators Project.

TABLES

TABLE 1. TB Cases and Rates per 100,000 Population, Utah and United States, 1993–2017

Year	Utah		US
	Cases	Rate	Rate
1993	47	2.5	9.7
1994	56	2.9	9.2
1995	48	2.4	8.5
1996	58	2.8	7.9
1997	36	1.7	7.2
1998	52	2.4	6.6
1999	40	1.8	6.3
2000	49	2.2	5.8
2001	35	1.5	5.6
2002	31	1.3	5.2
2003	39	1.7	5.1
2004	36	1.5	5.0
2005	29	1.2	4.8
2006	34	1.3	4.6
2007	39	1.5	4.4
2008	27	1.0	4.2
2009	37	1.4	3.8
2010	20	0.7	3.6
2011	34	1.2	3.4
2012	37	1.3	3.2
2013	33	1.1	3.0
2014	31	1.1	3.0
2015	37	1.2	3.0
2016	20	0.7	2.9
2017	29	0.9	2.8

Sources: Utah Cases - Utah Department of Health, Bureau of Epidemiology; US Case Rates - Centers for Disease Control and Prevention (CDC); Population Estimates - National Center for Health Statistics (NCHS) through a collaborative agreement with the US Bureau of the Census.
See: Figures 1 and 2.

Table 2. TB Cases, Percentages, and Rates per 100,000 Population by Local Health District*, Sex and Origin of Birth†, Utah, 2013–2017

Variable	2013		2014		2015		2016		2017		2013–2017		
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Rates‡
Local Health District													
Bear River	1	3.0	1	3.2	1	2.7	1	5.0	0	0.0	4	2.7	0.5
Central	0	0.0	1	3.2	0	0.0	0	0.0	0	0.0	1	0.7	0.3
Davis	1	3.0	0	0.0	0	0.0	2	10.0	3	10.3	6	4.0	0.4
Salt Lake	23	69.7	24	77.4	31	83.8	14	70.0	22	75.9	114	76.0	2.1
San Juan	0	0.0	0	0.0	0	0.0	1	5.0	0	0.0	1	0.7	1.3
Southeast	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Southwest	0	0.0	3	9.7	1	2.7	0	0.0	1	3.4	5	3.3	0.4
Summit	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Tooele	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
TriCounty	2	6.1	1	3.2	0	0.0	0	0.0	0	0.0	3	2.0	1.0
Utah	1	3.0	0	0.0	2	5.4	1	5.0	3	10.3	7	4.7	0.2
Wasatch	0	0.0	0	0.0	1	2.7	0	0.0	0	0.0	1	0.7	0.7
Weber-Morgan	5	15.2	1	3.2	1	2.7	1	5.0	0	0.0	8	5.3	0.6
Total	33	100.0	31	100.0	37	100.0	20	100.0	29	100.0	150	100.0	1.0
Sex/Origin of Birth													
Male	13	39.4	9	29.0	19	51.4	13	65.0	14	48.3	68	45.3	0.9
Non-US-born	9	69.2	7	77.8	13	68.4	9	69.2	12	85.7	50	73.5	
US-born	4	30.8	2	22.2	6	31.6	4	30.8	2	14.3	18	26.5	
Female	20	60.6	22	71.0	18	48.6	7	35.0	15	51.7	82	54.7	1.1
Non-US-born	17	85.0	20	90.9	15	83.3	6	85.7	10	66.7	68	82.9	
US-born	3	15.0	2	9.1	3	16.7	1	14.3	5	33.3	14	17.1	
Total	33	100.0	31	100.0	37	100.0	20	100.0	29	100.0	150	100.0	1.0

* In 2015, Southeastern Utah District Health Department divided into San Juan Health Department and Southeast Utah Health Department.

† US-born persons were born in the United States, born outside the United States to at least one parent who was a US citizen, or born in a US territory. All other persons are Non-US-born.

‡ In low population areas, small case counts can result in high rates; therefore, these rates should be interpreted with caution.

Note: Percentages may not sum to 100 due to rounding.

Source: Cases – Utah Dept of Health, Bureau of Epidemiology, TB Control Pgm; Population Estimates – National Center for Health Statistics (NCHS) through a collaborative agreement with the US Bureau of the Census.

See Figures 3, 4, and 5.

Table 3. TB Cases, Percentages, and Rates per 100,000 Population by Age Group*, Race/Ethnicity and Origin of Birth†, Utah, 2013–2017

Variable	2013		2014		2015		2016		2017		2013–2017		
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Rate
Age Group (in years)													
0-4	2	6.1	2	6.5	4	10.8	1	5.0	3	10.3	12	8.0	0.9
5-14	1	3.0	0	0.0	3	8.1	1	5.0	4	13.8	9	6.0	0.4
15-24	3	9.1	2	6.5	5	13.5	2	10.0	2	6.9	14	9.3	0.6
25-44	15	45.5	11	35.5	11	29.7	4	20.0	11	37.9	52	34.7	1.2
45-64	7	21.2	9	29.0	11	29.7	3	15.0	8	27.6	38	25.3	1.3
>=65	5	15.2	7	22.6	3	8.1	9	45.0	1	3.4	25	16.7	1.6
Total	33	100.0	31	100.0	37	100.0	20	100.0	29	100.0	150	100.0	1.0
Race and Ethnicity‡/Origin of Birth													
AI/AK Native	0	0.0	1	3.2	0	0.0	2	10.0	1	3.4	4	2.7	2.8
Non-US-born	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	
US-born	0	0.0	1	100.0	0	0.0	2	100.0	1	100.0	4	100.0	
Asian	8	24.2	8	25.8	10	27.0	4	20.0	5	17.2	35	23.3	10.2
Non-US-born	8	100.0	8	100.0	9	90.0	4	100.0	5	100.0	34	97.1	
US-born	0	0.0	0	0.0	1	10.0	0	0.0	0	0.0	1	2.9	
Black/African American	5	15.2	4	12.9	4	10.8	1	5.0	2	6.9	16	10.7	10.2
Non-US-born	4	80.0	4	100.0	4	100.0	1	100.0	2	100.0	15	93.8	
US-born	1	20.0	0	0.0	0	0.0	0	0.0	0	0.0	1	6.3	
Hispanic	13	39.4	13	41.9	18	48.6	8	40.0	15	51.7	67	44.7	3.3
Non-US-born	12	92.3	12	92.3	12	66.7	7	87.5	11	73.3	54	80.6	
US-born	1	7.7	1	7.7	6	33.3	1	12.5	4	26.7	13	19.4	
NH/PI	2	6.1	0	0.0	1	2.7	3	15.0	4	13.8	10	6.7	7.2
Non-US-born	1	50.0	0	0.0	1	100.0	3	100.0	3	75.0	8	80.0	
US-born	1	50.0	0	0.0	0	0.0	0	0.0	1	25.0	2	20.0	
White	5	15.2	5	16.1	4	10.8	2	10.0	2	6.9	18	12.0	0.2
Non-US-born	1	20.0	3	60.0	2	50.0	0	0.0	1	50.0	7	38.9	
US-born	4	80.0	2	40.0	2	50.0	2	100.0	1	50.0	11	61.1	
Total	33	100.0	31	100.0	37	100.0	20	100.0	29	100.0	150	100.0	1.0

*Age groups were based on age at report.

†US-born persons were born in the United States, born outside the United States to at least one parent who was a US citizen, or born in a US territory (American Samoa, Guam, Commonwealth of the Northern Mariana Islands, Puerto Rico, US Virgin Islands). All other persons are Non-US-born.

‡AI/AK Native=American Indian/Alaska Native; NH/PI=Native Hawaiian/Other Pacific Islander; persons of Hispanic ethnicity can be of any race category.

Note: Percentages may not sum to 100 due to rounding.

Source: Cases – Utah Dept of Health, Bureau of Epidemiology, TB Control Pgm; Population Estimates – National Center for Health Statistics (NCHS) through a collaborative agreement with the U.S. Bureau of the Census.

See Figures 6, 7, and 8.

Table 4. TB Cases and Percentages by Origin of Birth and Immigration Status at First Entry to the United States, Utah, 2013–2017

Variable	2013		2014		2015		2016		2017		2013–2017	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Origin at Birth												
Non-US-born	26	78.8	27	87.1	28	75.7	15	75.0	22	75.9	118	78.7
USB with Foreign Connection	2	6.1	3	9.7	6	16.2	2	10.0	5	17.2	18	12.0
USB without Foreign Connection	5	15.2	1	3.2	3	8.1	3	15.0	2	6.9	14	9.3
Total	33	100.0	31	100.0	37	100.0	20	100.0	29	100.0	150	100.0
Immigration Status at First Entry to the United States												
Asylee or Parolee	0	0.0	1	3.7	0	0.0	0	0.0	0	0.0	1	0.9
Employment Visa	2	7.7	0	0.0	1	3.6	1	7.1	0	0.0	4	3.5
Family/Fiance Visa	0	0.0	0	0.0	0	0.0	0	0.0	1	5.3	1	0.9
Immigrant Visa	8	30.8	10	37.0	9	32.1	4	28.6	8	42.1	39	34.2
Refugee	7	26.9	7	25.9	6	21.4	3	21.4	5	26.3	28	24.6
Student Visa	3	11.5	3	11.1	1	3.6	1	7.1	0	0.0	8	7.0
Tourist Visa	0	0.0	1	3.7	0	0.0	0	0.0	1	5.3	2	1.8
Other Immigration Status [†]	6	23.1	5	18.5	10	35.7	5	35.7	4	21.1	30	26.3
Refused/Unknown	0	0.0	0	0.0	1	3.6	0	0.0	0	0.0	1	0.9
Total	26	100.0	27	100.0	28	100.0	14	100.0	19	100.0	114	100.0

* US-born persons were born in the United States, born outside the United States to at least one parent who was a US citizen, or born in a US territory. All other persons are Non-US-born.

† Includes (but is not limited to) non-US-born persons who were not required to obtain a visa or persons with no official immigration status.

Note: Percentages may not sum to 100 due to rounding.

Source: Utah Dept of Health, Bureau of Epidemiology.

See Figures 9 and 10.

Table 5. TB Cases and Percentages by Country of Birth Among Persons Born Outside the United States, Utah, 2013–2017

Country of Birth	Cases	%
Mexico	37	31.1
India	9	7.6
Peru	8	6.7
Philippines	8	6.7
Somalia	5	4.2
Republic of Marshall Islands	4	3.4
Burma	3	2.5
Congo	3	2.5
El Salvador	3	2.5
Sudan	3	2.5
Vietnam	3	2.5
Other*	33	27.7
Total	119	100.0

*Other countries include: Afghanistan, Argentina, Bhutan, Bolivia, Bosnia and Herzegovina, Cambodia, Cuba, Dominican Republic, Ecuador, Egypt, Ethiopia, Guatemala, Indonesia, Iraq, Israel, Kenya, Korea-Republic of, Kuwait, Laos, Nepal, Papua New Guinea, Taiwan, Tanzania, Thailand, Tonga, Uganda, Vanuatu, and Yugoslavia.

Note: Percentages may not sum to 100 due to rounding.

Source: Utah Dept of Health, Bureau of Epidemiology.

See Figure 11.

Table 6. TB Cases and Percentages by HIV Test Results, Additional Risk Factors, and Residence at Time of Diagnosis, Utah, 2013–2017

Variable	2013		2014		2015		2016		2017		2013–2017	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
HIV Test Results												
Negative	30	90.9	28	90.3	36	97.3	20	100.0	26	89.7	140	93.3
Positive	1	3.0	2	6.5	1	2.7	0	0.0	3	10.3	7	4.7
Indeterminate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Refused	1	3.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.7
Not Offered	1	3.0	1	3.2	0	0.0	0	0.0	0	0.0	2	1.3
Total	33	100.0	31	100.0	37	100.0	20	100.0	29	100.0	150	100.0
Additional Risk Factors*												
Contact to Infectious TB Patient	3	9.1	2	6.5	5	13.5	1	5.0	4	13.8	15	10.0
Contact to MDR Patient	0	0.0	0	0.0	1	2.7	0	0.0	0	0.0	1	0.7
Contact, Missed	0	0.0	0	0.0	0	0.0	1	5.0	0	0.0	1	0.7
Diabetes Mellitus	4	12.1	3	9.7	8	21.6	7	35.0	4	13.8	26	17.3
End Stage Renal Disease	2	6.1	1	3.2	0	0.0	1	5.0	0	0.0	4	2.7
Immunosuppression	3	9.1	2	6.5	1	2.7	0	0.0	1	3.4	7	4.7
Incomplete LTBI Therapy	1	3.0	3	9.7	0	0.0	1	5.0	0	0.0	5	3.3
Post-organ transplantation	1	3.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.7
TNF-α Inhibitors	0	0.0	1	3.2	1	2.7	1	5.0	0	0.0	3	2.0
Other	2	6.1	4	12.9	2	5.4	1	5.0	1	3.4	10	6.7
None	21	63.6	17	54.8	19	51.4	10	50.0	19	65.5	86	57.3
Residence At Time of Diagnosis												
Private Residence	32	97.0	29	93.5	33	89.2	19	95.0	29	100.0	142	94.7
Homeless	1	3.0	0	0.0	2	5.4	0	0.0	0	0.0	3	2.0
Corrections	0	0.0	0	0.0	0	0.0	1	5.0	0	0.0	1	0.7
Long Term Care	0	0.0	1	3.2	0	0.0	0	0.0	0	0.0	1	0.7
Other	0	0.0	1	3.2	2	5.4	0	0.0	0	0.0	3	2.0
Total	33	100.0	31	100.0	37	100.0	20	100.0	29	100.0	150	100.0

*A single case may have more than one risk factor. MDR=Multidrug resistant; LTBI=Latent TB infection; TNF=Tumor necrosis factor.

Note: Percentages may not sum to 100 due to rounding.

Source: Utah Dept of Health, Bureau of Epidemiology.

See Figures 12 and 13.

Table 7. TB Cases and Percentages by Adult Homelessness and Substance Abuse, Primary Reason for TB Evaluation, and Case Verification, Utah, 2013–2017

Variable	2013		2014		2015		2016		2017		2013–2017	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Adult Homelessness and Substance Abuse*												
Homelessness	1	3.3	1	3.4	2	6.7	1	5.6	0	0.0	5	3.9
Injection Drug Use	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Noninjection Drug Use	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Excess Alcohol Use	1	3.3	0	0.0	4	13.3	1	5.6	1	4.5	7	5.4
Total Number of Cases ≥15 years	30	N/A	29	N/A	30	N/A	18	N/A	22	N/A	129	N/A
Primary Reason for TB Evaluation												
TB Symptoms	17	51.5	21	67.7	25	67.6	13	65.0	18	62.1	94	62.7
Abnormal Chest X-ray	9	27.3	3	9.7	1	2.7	4	20.0	4	13.8	21	14.0
Incidental Lab Result	4	12.1	3	9.7	0	0.0	2	10.0	2	6.9	11	7.3
Immigrant Medical Exam	2	6.1	1	3.2	3	8.1	1	5.0	2	6.9	9	6.0
Contact Investigation	1	3.0	2	6.5	6	16.2	0	0.0	3	10.3	12	8.0
Administrative Testing	0	0.0	1	3.2	2	5.4	0	0.0	0	0.0	3	2.0
Health Care Worker	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Targeted Testing	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	33	100.0	31	100.0	37	100.0	20	100.0	29	100.0	150	100.0
Case Verification												
Positive Culture	24	72.7	19	61.3	25	67.6	17	85.0	23	79.3	108	72.0
Positive NAAT [†]	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Positive Smear/Tissue	1	3.0	1	3.2	0	0.0	0	0.0	0	0.0	2	1.3
Clinical	7	21.2	10	32.3	12	32.4	2	10.0	5	17.2	36	24.0
Provider Diagnosis	1	3.0	1	3.2	0	0.0	1	5.0	1	3.4	4	2.7
Total	33	100.0	31	100.0	37	100.0	20	100.0	29	100.0	150	100.0

*Homelessness and substance abuse in the 12 months prior to TB diagnosis; categories are not mutually exclusive.

[†]NAAT=Nucleic acid amplification test.

Note: Percentages may not sum to 100 due to rounding.

Source: Utah Dept of Health, Bureau of Epidemiology.

See Figures 14, 15, and 16.

Table 8. TB Cases and Percentages by Site of Disease and Extrapulmonary Sites of Disease, Utah, 2013–2017

Variable	2013		2014		2015		2016		2017		2013–2017	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Site of Disease												
Pulmonary	15	45.5	16	51.6	23	62.2	14	70.0	12	41.4	80	53.3
Pulmonary and Extrapulmonary	7	21.2	4	12.9	4	10.8	1	5.0	5	17.2	21	14.0
Extrapulmonary	11	33.3	11	35.5	10	27.0	5	25.0	12	41.4	49	32.7
Total	33	100.0	31	100.0	37	100.0	20	100.0	29	100.0	150	100.0
Extrapulmonary Sites of Disease*												
Pleural	4	20.0	2	11.8	2	12.5	3	42.9	4	20.0	15	18.8
Lymph Cervical	7	35.0	2	11.8	2	12.5	1	14.3	6	30.0	18	22.5
Lymph Axillary	0	0.0	1	5.9	0	0.0	0	0.0	3	15.0	4	5.0
Lymph Intrathoracic	1	5.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.3
Lymph Other	1	5.0	0	0.0	2	12.5	1	14.3	0	0.0	4	5.0
Bone and/or Joint	1	5.0	2	11.8	3	18.8	0	0.0	2	10.0	8	10.0
Genitourinary	1	5.0	2	11.8	1	6.3	0	0.0	0	0.0	4	5.0
Meningeal	0	0.0	3	17.6	1	6.3	0	0.0	1	5.0	5	6.3
Peritoneal	2	10.0	0	0.0	0	0.0	0	0.0	1	5.0	3	3.8
Laryngeal	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Eye and Ear Appendages	1	5.0	4	23.5	3	18.8	1	14.3	2	10.0	11	13.8
Other†	2	10.0	1	5.9	2	12.5	1	14.3	1	5.0	7	8.8
Total Extrapulmonary Sites	20	100.0	17	100.0	16	100.0	7	100.0	20	100.0	80	100.0

*A case may have more than one extrapulmonary site of disease.

†Other sites of diseases included: brain, breast, colon, ear and mastoid cells, liver, pericardium, spleen, subcutaneous tissue, tongue, and other sites of disease.

Note: Cases were classified by count date. Percentages may not sum to 100 due to rounding.

Source: Utah Dept of Health, Bureau of Epidemiology.

See Figure 17.

Table 9. Culture-positive TB Cases and Percentages by Drug Susceptibility Testing (DST) and Results, Utah, 2013–2017

Year	Culture Positive Cases	Cases with DST Results		Resistance*					
				>= 1 Drug		At Least INH		At Least INH & RIF	
				No.	%	No.	%	No.	%
2013	24	24	100.0	3	12.5	0	0.0	0	0.0
2014	19	19	100.0	2	10.5	1	5.3	1	5.3
2015	25	25	100.0	5	20.0	4	16.0	1	4.0
2016	17	17	100.0	3	17.6	2	11.8	1	5.9
2017	23	23	100.0	2	8.7	1	4.3	0	0.0
Total	108	108	100.0	15	13.9	8	7.4	3	2.8

*A single case can be reported in more than one category.

Note: Percentages may not sum to 100 due to rounding.

Source: Utah Dept of Health, Bureau of Epidemiology.

Table 10. TB Cases and Percentages by Directly Observed Therapy (DOT) and Completion of Treatment Status, Utah, 2012–2016

Variable	2012		2013		2014		2015		2016		2012–2016	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Reported Cases	37		33		31		37		20		158	
Cases Starting Treatment	36		32		29		37		20		154	
Directly Observed Therapy (DOT)												
DOT	35	97.2	30	93.8	29	100.0	37	100.0	19	95.0	150	97.4
DOT & Self-administered	1	2.8	1	3.1	0	0.0	0	0.0	1	5.0	3	1.9
Self-administered	0	0.0	1	3.1	0	0.0	0	0.0	0	0.0	1	0.6
Total Number of Cases ≥15 years	36	100.0	32	100.0	29	100.0	37	100.0	20	100.0	154	100.0
Completion of Treatment												
Completed	33	91.7	31	96.9	27	93.1	35	94.6	19	95.0	145	94.2
Died	3	8.3	1	3.1	2	6.9	1	2.7	0	0.0	7	4.5
Uncooperative or Refused	0	0.0	0	0.0	0	0.0	1	2.7	0	0.0	1	0.6
Adverse Event	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Lost	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Refused	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other	0	0.0	0	0.0	0	0.0	0	0.0	1	5.0	1	0.6
Still on Treatment	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	36	100.0	32	100.0	29	100.0	37	100.0	20	100.0	154	100.0

Note: Percentages may not sum to 100 due to rounding.
Source: Utah Dept of Health, Bureau of Epidemiology.

Table 11. TB Cases, Suspects, and Rule Outs by Final Classification, Utah, 2013–2017

Case/Suspect Category*	2013	2014	2015	2016	2017	2013–2017
TB Cases, Utah						
Counted	33	31	37	20	29	150
Noncountable: Recurrent TB	0	0	0	0	0	0
Noncountable: TB Diagnosis Reversed	2	0	1	2	0	5
Subtotal	35	31	38	22	29	155
TB Suspects, Evaluated in Utah						
TB Suspects: LTBI	70	50	47	48	47	262
TB Suspect: MOTT	122	145	122	121	80	590
TB Suspects: Not TB	113	109	123	116	103	564
TB Suspects: Out of State TB Cases	1	3	2	0	5	11
TB Suspects: Out of State TB Suspects	20	16	12	12	15	75
Subtotal	326	323	306	297	250	1,502
Total Cases and Suspects	361	354	344	319	279	1,657
MOTT: Rule Outs						
Total MOTT Rule Out	50	26	45	54	57	232
TB Cases, Interjurisdictional						
Burden: Transfer In, Interstate	4	4	4	2	0	14
Burden: Transfer In, Foreign	1	1	1	0	0	3
Total Burden Cases	5	5	5	2	0	17
Grand Total	416	385	394	375	336	1,906

*LTBI=Latent TB infection; MOTT=Mycobacterium other than tuberculosis.

Note: TB cases were classified by count date.

Source: Utah Department of Health, Bureau of Epidemiology.

See Figure 17.

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