



Tuberculosis Program  
2016 to 2020  
Annual Surveillance Report

SAINT LOUIS COUNTY DEPARTMENT OF PUBLIC HEALTH  
6121 NORTH HANLEY ROAD, BERKELEY, MO 63134

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## Saint Louis County Department of Public Health

### Mission

To promote, protect, and improve the health and environment of the community.

### Vision

Healthy people, healthy environment, equitable communities.

### Values

We believe in:

- Being a public health leader in the community
- Providing equitable access to services and resources
- Being responsive to the changing needs of our community
- Operating in an ethical, transparent, and fiscally responsible manner
- Serving our community with dignity and respect

## Report Preparation

This report was prepared by the Saint Louis County Department of Public Health, Division of Communicable Disease Prevention and the Division of Communicable Disease Response.

- Epidemiology Program
- Tuberculosis Program

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## Introduction

### Tuberculosis Disease

Tuberculosis (TB) disease is caused by an infection with *Mycobacterium tuberculosis*. Transmission of TB occurs person-to-person through aerosolized bacteria from coughing, talking, or singing.<sup>1</sup> When an individual inhales the bacteria, the bacteria can settle and grow in the lungs causing symptoms or it can spread to other parts of the body.<sup>1</sup>

Symptomatic TB can be presented in two forms: pulmonary and extrapulmonary. Predominantly, TB is pulmonary, meaning it infects the lungs causing symptoms such as coughing, hemoptysis (coughing up blood), and chest pain.<sup>2</sup> Data from the Centers for Disease Control and Prevention (CDC) show that in 2020, 78.9% of new TB cases were pulmonary.<sup>3</sup> Extrapulmonary disease refers to TB disease presenting in parts of the body other than the lungs, such as the brain, spinal cord, lymphatic system, or joints, for example.<sup>3</sup> Symptoms for extrapulmonary disease vary based on where the infection is occurring and the disease may not transmit to others like a pulmonary infection.

According to the World Health Organization, globally, an estimated 10 million people are diagnosed with TB per year and 1.5 million die from TB per year.<sup>4</sup> Data from the Centers for Disease Control and Prevention (CDC) show that the incidence of TB disease in the United States was 2.2 cases per 100,000 in 2020 with 526 reported deaths in 2019, the most recent year available.<sup>3</sup>

Tuberculosis, whether pulmonary or extrapulmonary, can be prevented through screening high risk individuals and is treatable with a combination of antibiotics.

### Tuberculosis Infection

Unlike TB disease, TB infection is not infectious due to the inactivity of the *M. tuberculosis* bacteria in an individual's body. While a person with TB infection has the same bacteria as someone with TB disease, they do not have symptoms, are not sick with the disease, and will not transmit the disease to others. Many healthy people living with TB infection will never progress to TB disease, but 5 to 10% of people will develop the disease at some point in their lives. For half of those who develop TB disease, they will do so within the first two years of becoming infected with *M. tuberculosis*.<sup>4, 5</sup>

According to the World Health Organization, globally, an estimated 25% of the population has TB infection.<sup>4</sup> The CDC estimates roughly 13 million people within the United States have TB infection.<sup>5</sup> Screening and treating individuals for TB infection can reduce the global, national, and local incidence of TB disease.

## Notes About the Data

The Saint Louis County Department of Public Health (DPH) Tuberculosis (TB) Program utilizes the National TB Program Objectives and Performance Targets published by the Centers of Disease Control and Prevention (CDC) to evaluate TB within Saint Louis County, MO. The mission of the National Program is to promote health and quality of life by preventing, controlling, and eventually eliminating TB from the United States. CDC's National TB Program focuses on objectives for specific populations and sets these objectives to monitor the nation's progress and motivate change that will prevent further disease. Updated National TB Program Objectives and Performance Targets for 2020 and 2025 were released in August 2015 and September 2019, respectively. A link to these targets can be found in [Appendix B](#). Figures in this report depict both the 2020 and 2025 targets, as well as compare the key findings and accomplishments regarding the control and prevention of TB in the nation, Missouri, and Saint Louis County from 2016 to 2020.

Data regarding TB disease and infection cases were obtained from the Missouri Health and Surveillance Information System (WebSurv), which is maintained by the Missouri Department of Health and Senior Services (MDHSS). Missouri's communicable disease reporting law, 19 CSR 20-20.020, requires reporting of suspected or confirmed TB disease within twenty-four (24) hours and any TB infection cases within three (3) days, to the local health authority or to MDHSS.

Saint Louis County rates were calculated with population totals from the Selected Characteristics of the Native and Foreign-Born Population, 2019 American Community Survey 5-year Estimates and the Age and Sex, 2019 American Community Survey 5-year Estimates.

National rates were derived from CDC's Division of Tuberculosis Elimination, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, annual report titled "Reported Tuberculosis in the United States, 2020." A link to this report can be found in [Appendix B](#).

This report presents data on the 2016 to 2020 cohort of countable TB patients in Saint Louis County. To be considered 'counted', the patient must have a residential address within Saint Louis County when they test positive for TB disease. Saint Louis County DPH also manages patients, but these patients may not be considered 'countable'. Managed patients that are not 'counted' are those who were initially diagnosed in another jurisdiction then moved to Saint Louis County during their treatment period. This distinction between counted and managed patients helps prevent a patient being counted multiple times for TB disease and it also ensures that they finish their treatment regardless of their initial residential jurisdiction. The only section of this report that includes managed patients that are not countable is the risk factors section.

DPH, along with the Saint Louis County Department of Planning, established five Saint Louis County regions based on the social and demographic characteristics of the regions' residents. Using five County regions allows for sub-County-level comparisons, without the volatility or risk of individual identifiers which may be present in ZIP Code- or census tract-level comparisons.

## Executive Summary

In Saint Louis County, 16 cases of TB disease were reported in 2020, increasing the case rate from 1.3 cases per 100,000 persons in 2019 to 1.6 cases per 100,000 persons in 2020. The TB disease rate in Saint Louis County failed to attain the national target (1.3 cases per 100,000) in 2020 by 23.1%.

The TB disease case rate within the non-U.S.-born and the U.S.-born population both increased from 2019 to 2020 by 13.2% and 34.3%, respectively. The non-U.S.-born rate increased from 14.4 cases to 16.3 cases per 100,000 persons. The U.S.-born population had a slight increase from 0.3 cases to 0.4 per 100,000 in 2019 and 2020, respectively.

The U.S.-born non-Hispanic black TB disease case rate in Saint Louis County decreased from 2019 (1.3 cases per 100,000) to 2020 (0.4 cases per 100,000), a decrease of 69.2%, surpassing CDC's 2020 and 2025 goal of being at or below 1.5 and 1.0 cases per 100,000, respectively for this population. The non-Hispanic white TB disease case rate increased to 0.5 cases per 100,000 persons in 2020 (vs. 0.0 cases per 100,000 in 2019), the first time within 2016 to 2020 that this rate has been higher than that of the non-Hispanic black population in Saint Louis County.

In 2020, eight of the 17 counted and managed patients with TB disease had a known risk factor, with the majority of those with a risk factor being immunocompromised (non-HIV) (75.0%, n=6).

In 2020, the highest proportion of cases were among patients 65 years or older (37.5%, n=6). There were no cases of TB disease among children under the age of 15 years in Saint Louis County.

Screening for and treating TB infection is a priority for the TB program because the infection can progress into TB disease. In 2020, Saint Louis County DPH saw a slight decrease of 21.4% in reports of TB infection (n=411) compared to 2019 (n=523).

## The Tuberculosis Program

The DPH Tuberculosis (TB) Program performs TB surveillance, prevention services, disease investigation, medical follow-up, treatment, clinical management, and case management for residents of Saint Louis County. Priorities of the Saint Louis County TB Program include:

### The TB Program in 2020:

- The DPH Chest Clinic had **243** TB-related appointments scheduled
  - **144** unique individuals were seen at Chest Clinic
  - There was a **46.3%** decrease in individual patients seen compared to 2019 due to the COVID-19 pandemic
  - **31** individuals began treatment for TB infection through Chest Clinic
- Identifying all individuals with suspected and confirmed TB disease and providing patient-centered care, including intensive case management services and appropriate treatment via directly observed therapy (DOT).
  - Completing contact investigations among contacts of patients with infectious TB disease, including TB screening, medical evaluations, and prophylactic therapy, if necessary.
  - Working in partnership with patients, hospitals, health care providers, and labs to diagnose, treat, and prevent further transmission of TB.
  - Collecting and analyzing TB epidemiological data.

### Services Provided by Saint Louis County DPH

DPH is the leading provider of TB care in Saint Louis County. The DPH Chest Clinic is available to any Saint Louis County resident with symptoms of TB disease, a positive test for TB infection, and contacts to individuals with TB disease. TB diagnostic services (such as bloodwork, sputum induction, and chest x-rays) and expert medical evaluation are provided on-site. The Chest Clinic supports equitable access to the full continuum of tuberculosis care, from diagnosis through treatment completion, regardless of financial resources, race, gender, age, language, legal status, religious beliefs, sexual orientation, culture, or co-morbidities.

The TB Program provides case management for residents diagnosed with TB disease, regardless of where they are receiving their TB care. Case management activities include patient education, comprehensive patient interviews, medical care coordination, contact elicitation, contact evaluation, and DOT. DOT is the standard of care for managing patients with suspected or confirmed TB disease; it ensures medications are taken appropriately and consistently until completion of treatment, allows for monitoring of treatment failure, and prompt reporting of side effects. DPH outreach workers traverse the entire county to perform DOT in patients' homes, work places, and other locations convenient for the patient.

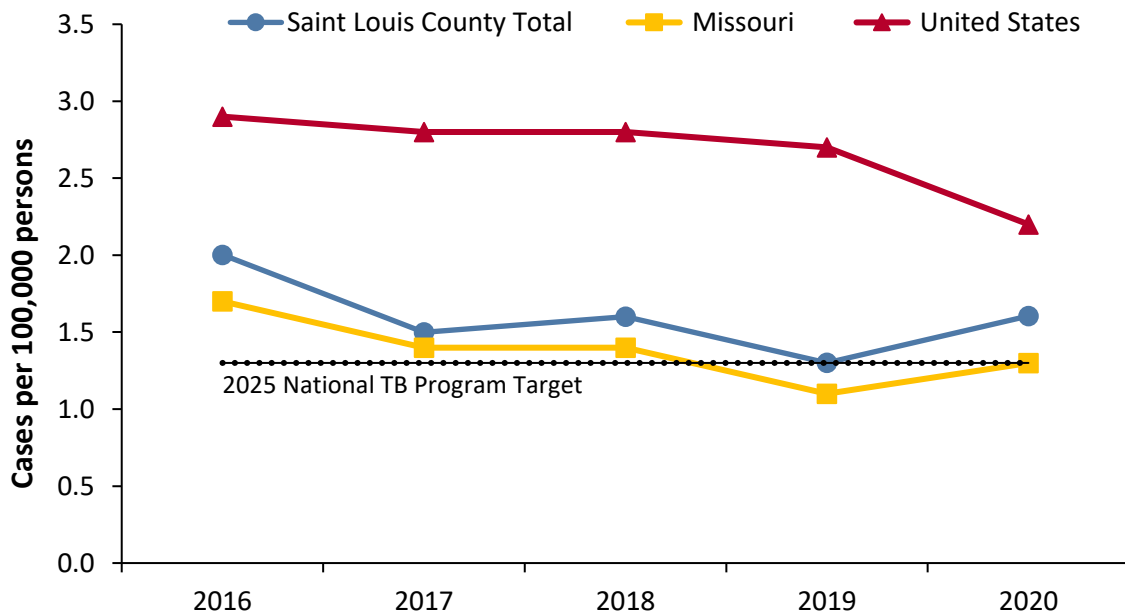
The TB Program works with the Epidemiology Program to conduct surveillance of TB disease, TB infection, and nontuberculous mycobacterial infection. Epidemiologists analyze TB trends, prepare surveillance reports, and update tracking systems to describe how TB impacts residents of Saint Louis County and to develop and revise strategies necessary to improve TB prevention and care within the community.

\*These numbers represent patients who were managed by Saint Louis County in 2020 regardless of counted jurisdiction or year.

## Tuberculosis Disease in Saint Louis County

Nationally, there were 7,174 cases of tuberculosis (TB) disease (2.2 cases per 100,000 persons) reported to the CDC in 2020. Sixteen individuals were diagnosed with TB disease in Saint Louis County in 2020, which corresponds to a case rate of 1.6 cases per 100,000. The state of Missouri had a rate of 1.3 per 100,000 persons (n=72) in 2020. CDC set a 2025 Performance Target of 1.3 TB disease cases per 100,000 persons or lower; the state of Missouri was able to achieve this target while the United States was unable to reach this target and Saint Louis County was 23.1% away from reaching the target. TB disease rates for the United States, Missouri, and Saint Louis County throughout the previous five years are shown in Figure 1, below.

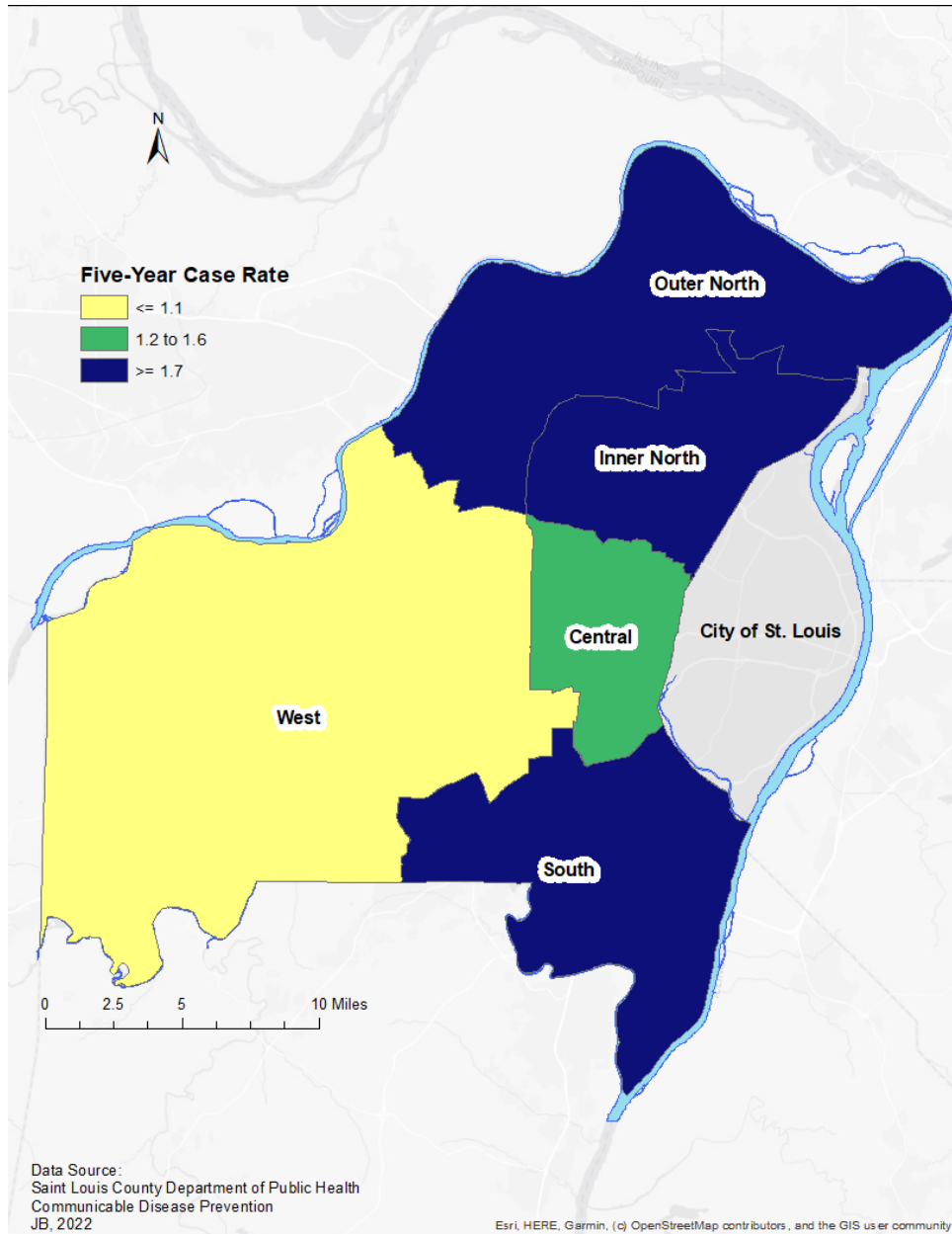
**Figure 1: Tuberculosis Case Rate**  
United States, Missouri, and Saint Louis County, 2016 to 2020





Fifteen ZIP Codes in Saint Louis County had a five-year TB case rate of over 2.0 per 100,000 persons (63137, 63138, 63125, 63132, 63141, 63033, 63136, 63043, 63146, 63123, 63088, 63117, 63130, 63042, 63128). Map 1 represents the TB disease case rate for the previous five years visualized over the five regions of Saint Louis County: Inner North, Outer North, West, Central, and South. In the past five years, Outer North, Inner North, and the South regions have had the highest rate of TB of greater than or equal to 1.7 per 100,000 persons.

**Map 1: Tuberculosis Case Rate per 100,000 Persons by Saint Louis County Region, 2016 to 2020, Saint Louis County, n = 80**



\*Case rates are based on the total Saint Louis County population of the ZIP Codes in each region.

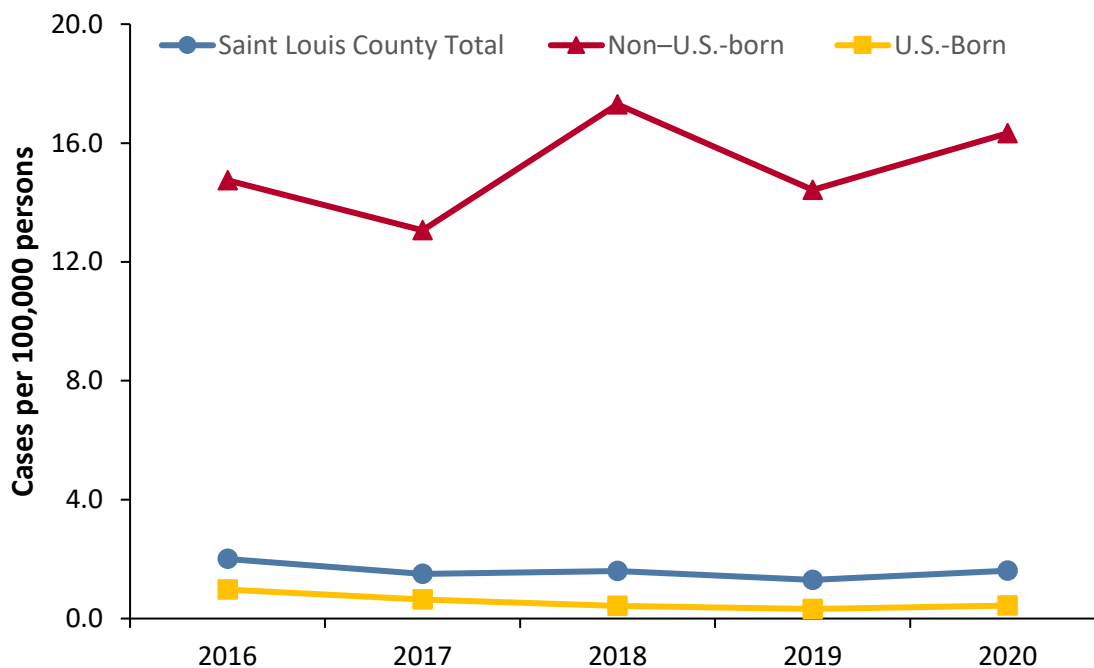
## Tuberculosis Disease by Country of Birth

Because many other countries experience higher rates of tuberculosis (TB) compared with the U.S., many of the individuals seen and treated for TB disease by the TB Program are non-U.S.-born. Because of this, being non-U.S.-born is considered the greatest risk factor for exposure to *Mycobacterium tuberculosis*. Table 2 depicts TB disease among U.S.-born and non-U.S.-born residents in Saint Louis County from 2016 to 2020. The TB disease case rate among non-U.S.-born residents has consistently been higher than the rate among U.S.-born residents throughout the previous five years, as seen in Figure 2. During 2016 to 2020, 32.5% (n=26) of individuals with TB disease were U.S.-born, compared to 67.5% (n=54) of individuals being non-U.S.-born residents. The proportion of TB disease cases per year that were U.S.-born ranged from a high of 45.0% (n=9) in 2016 to a low of 23.1% (n=3) in 2019.

**Table 1: Tuberculosis Cases and Case Rate in U.S.-Born and Non-U.S.-Born Residents, Saint Louis County, 2016 to 2020**

Case Year	U.S.-Born Residents		Non-U.S.-Born Residents	
	TB Case Count	TB Case Rate per 100,000	TB Case Count	TB Case Rate per 100,000
2016	9	1.0	11	14.7
2017	6	0.6	9	13.1
2018	4	0.4	12	17.3
2019	3	0.3	10	14.4
2020	4	0.4	12	16.3

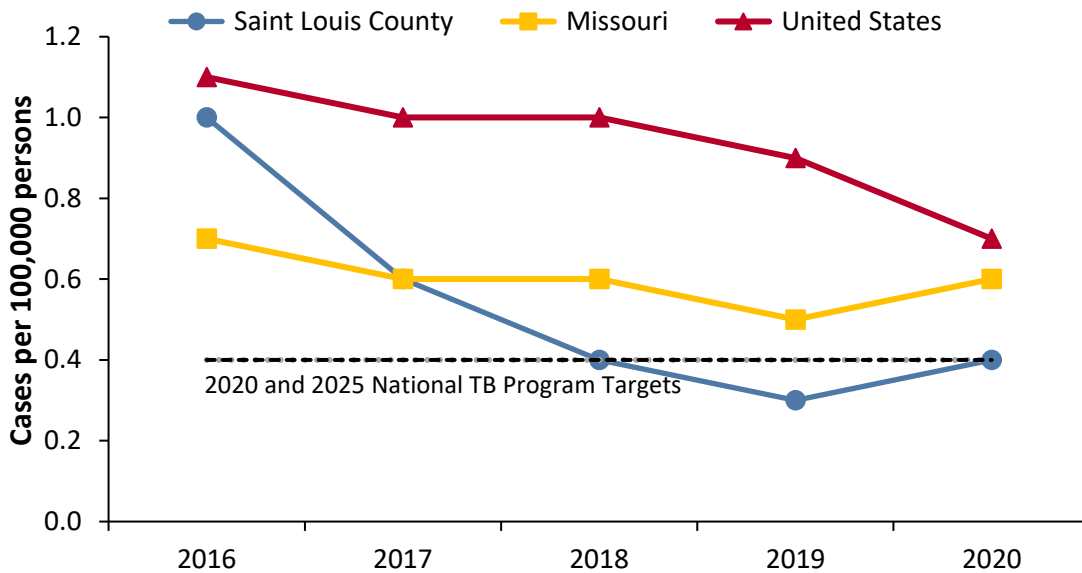
**Figure 2: Tuberculosis Case Rate in U.S.-Born and Non-U.S.-Born Residents, Saint Louis County, 2016 to 2020**



CDC’s 2020 and 2025 Performance Targets called for maintaining the TB disease case rate among U.S.-born persons at 0.4 cases per 100,000 persons or lower.

In 2020, Saint Louis County had a rate of 0.4 cases per 100,000 among the U.S.-born persons, a 33.3% increase compared to 2019 (0.3 cases per 100,000) but still meeting the 2020 and 2025 national targets. The state of Missouri had a rate of 0.6 cases per 100,000 persons and CDC reports the 2020 national case rate as 0.7 cases per 100,000 persons. Missouri and the United States were unable to reach the 2020 and 2025 targets, as seen in Figure 3.

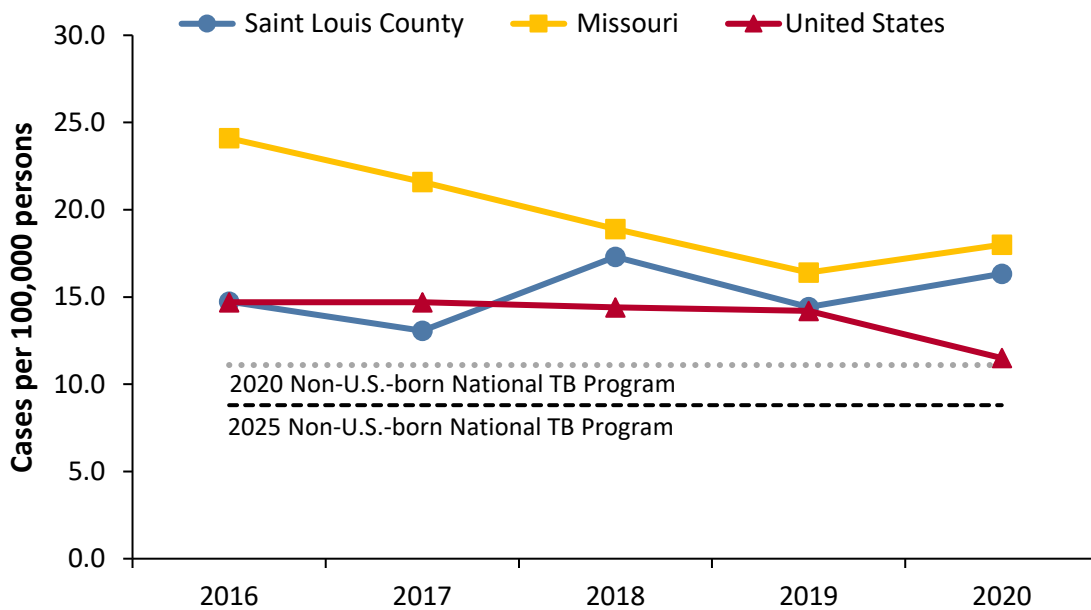
**Figure 3: Tuberculosis Case Rate in U.S.-Born Residents, United States, Missouri, and Saint Louis County, 2016 to 2020**



CDC’s 2020 and 2025 Performance Targets called for reducing the TB disease case rate among non-U.S.-born persons to 11.1 cases and 8.8 cases per 100,000 persons, respectively.

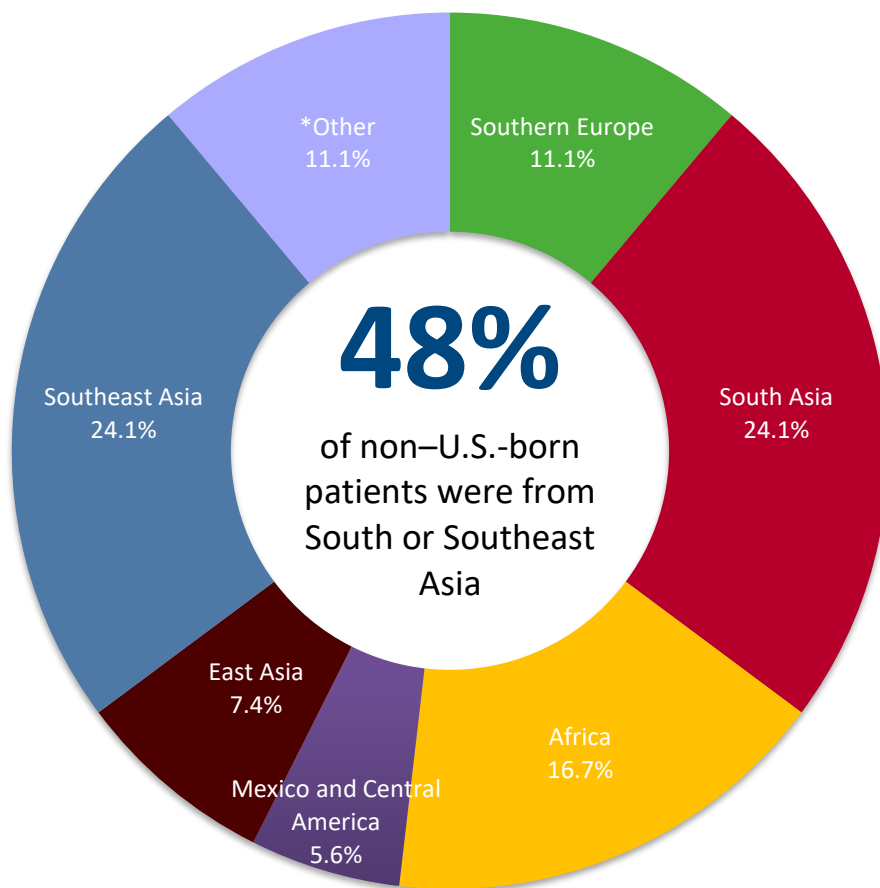
In 2020, the TB disease case rate among non–U.S.-born residents in Saint Louis County was above both the 2020 and 2025 national targets, at 16.3 cases per 100,000 persons, a 13.2% increase from 2019. The 2020 national TB disease case rate was 11.5 cases per 100,000 persons, slightly above the 2020 target. Missouri had a rate that was greater than both the local and national rates (18.0 cases per 100,000 persons). Neither the state of Missouri nor the United States was able to achieve the 2020 or 2025 Performance Targets, as seen in Figure 4, although the United States was only 3.6% away from reaching their 2020 target.

**Figure 4: Tuberculosis Case Rate in Non–U.S.-Born Residents, United States, Missouri, and Saint Louis County, 2016 to 2020**



During 2016 to 2020, there were 54 cases of TB disease among non-U.S.-born residents. Twenty-four point one percent (n=13) of cases were born in South Asia and 24.1% (n=13) of cases occurred among residents born in Southeast Asia. Figure 5 depicts the origins of TB disease cases in non-U.S.-born residents for the previous five years by regions. These regions are pre-defined by the CDC and used by DPH to de-identify patients. See [Appendix A](#) for the complete list of countries and territories included in each CDC region.

**Figure 5: Tuberculosis Cases in Non-U.S.-Born Residents by Country of Birth, Saint Louis County, 2016 to 2020**



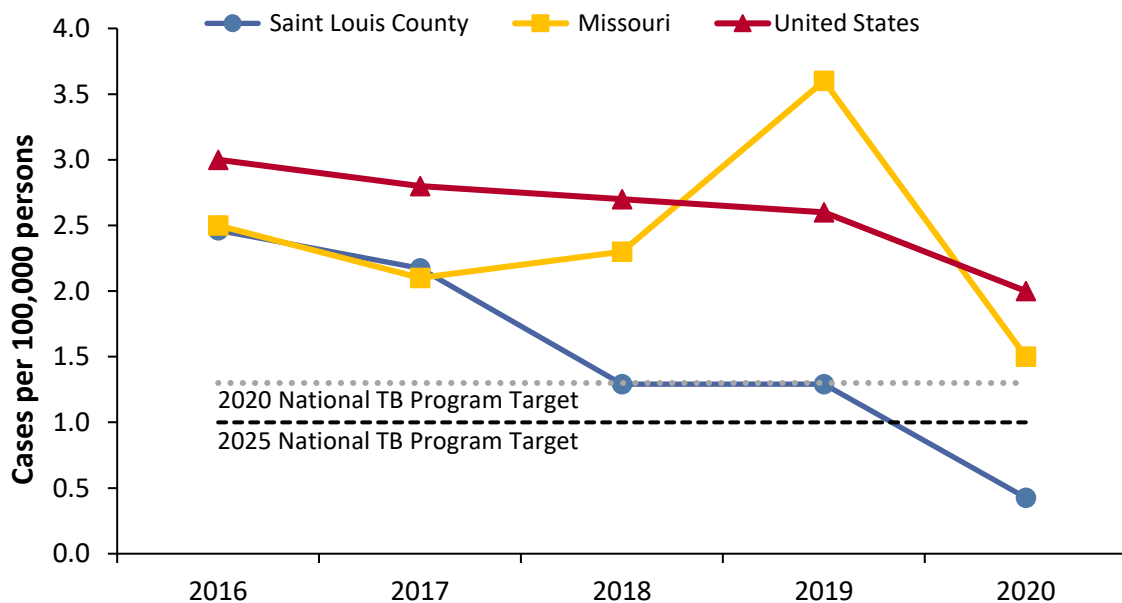
\*Includes: Caribbean, West/Central Asia, Middle East, and Eastern, Western, and Northern Europe.

## Tuberculosis Disease by Race and Ethnicity

Saint Louis County is actively working to address racial and ethnic health disparities and improve the health of persons disproportionately affected by tuberculosis (TB). This can be seen through the availability of Chest Clinic and case management services to all County residents, regardless of financial resources, race, gender, age, language, legal status, religious beliefs, sexual orientation, culture, or co-morbidities.

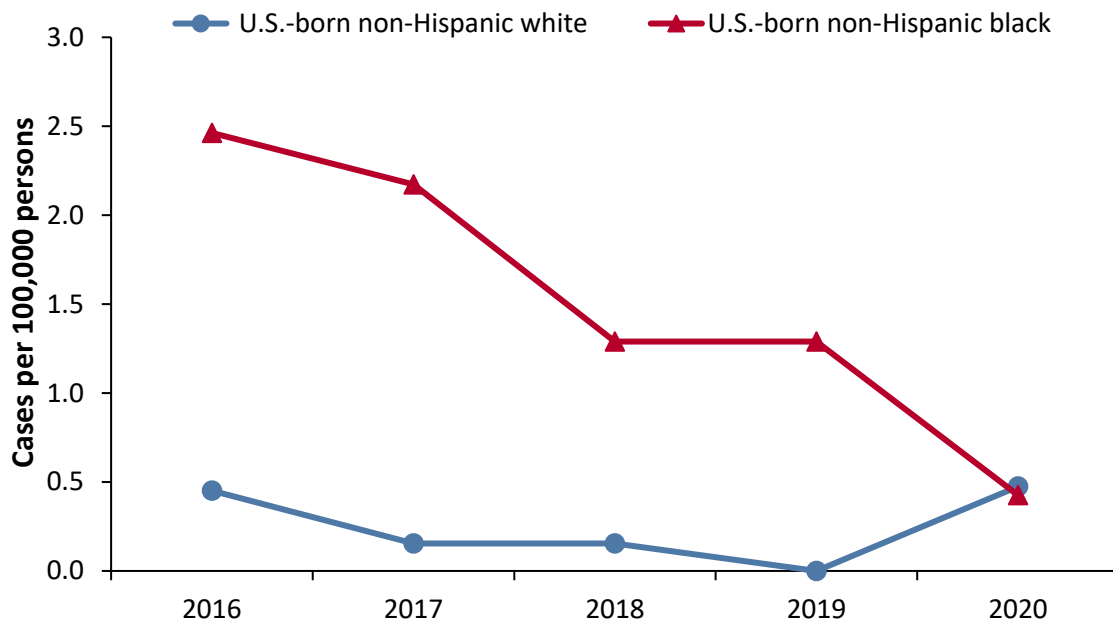
During 2020, the Saint Louis County TB disease rates for the U.S.-born non-Hispanic black population drastically declined compared to 2019 by 69.2% and met both the 2020 and 2025 Performance Targets (1.3 and 1.0 cases per 100,000 persons, respectively). The 2020 national case rate was 2.0 cases per 100,000 persons, a slight decrease from the 2019 rate (2.6 cases per 100,000 persons) while Missouri saw a large decrease of 58.3% between 2019 and 2020 (3.6 to 1.5 cases per 100,000). Overall, the United States has seen a continual decrease in TB disease rates among this population for the past five years but, along with the state, was unable to meet their 2020 and 2025 Performance Targets, as seen in figure 6.

**Figure 6: Tuberculosis Case Rate in U.S.-Born Non-Hispanic Black Residents, United States, Missouri, and Saint Louis County, 2016 to 2020**



While the U.S.-born non-Hispanic black case rate has historically been higher than that of the U.S.-born non-Hispanic white case rate in Saint Louis County, in 2020 we saw this pattern change. The US-born non-Hispanic case rate increased from 0.0 in 2019 to 0.5 in 2020, 20% higher than the U.S.-born non-Hispanic black case rate, as seen in Figure 7. While this may reflect a truly higher TB case rate among non-Hispanic white residents compared with non-Hispanic Black residents, it is also possible that other factors (e.g., healthcare-seeking behavior or additional pandemic-related issues) may have played a role.

**Figure 7: Tuberculosis Case Rate in U.S.-Born Non-Hispanic Black Residents and U.S.-Born Non-Hispanic White Residents,**  
Saint Louis County, 2016 to 2020

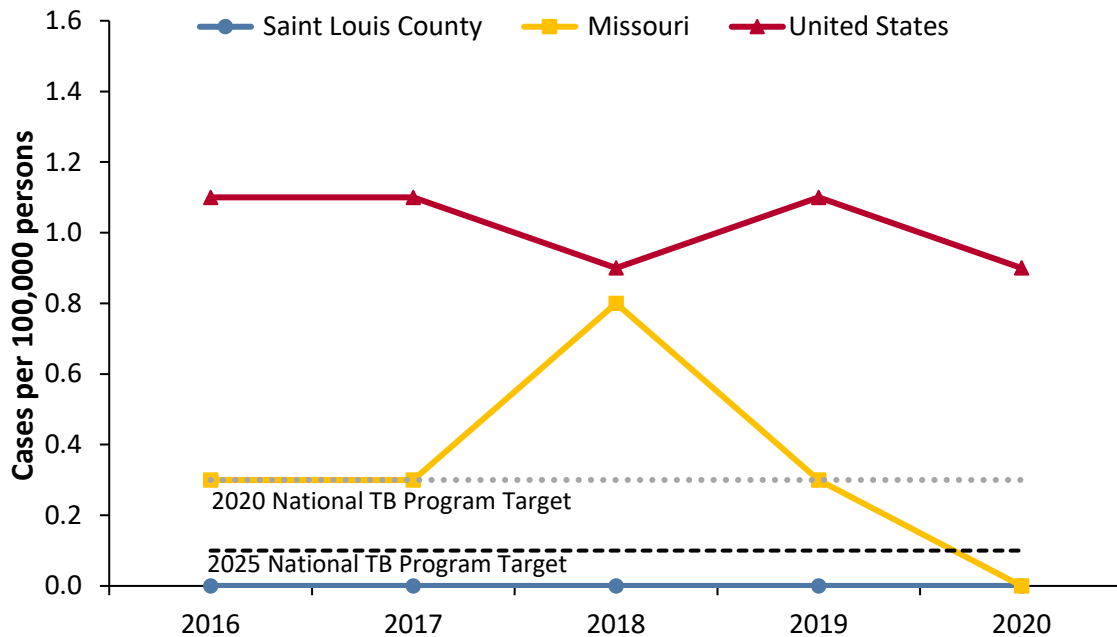


## Tuberculosis Disease by Age and Age Group

Children between the ages of 0 to 4 years are more likely than older children and adults to develop life-threatening forms of tuberculosis (TB) disease due to their developing immune systems.<sup>7</sup> The Saint Louis County TB Program works diligently to find and treat residents within this age group to prevent TB disease from developing or becoming life-threatening.

One goal of CDC’s Performance Targets for 2020 and 2025 is to reduce the burden of TB for children under 5 years old to fewer than 0.3 and 0.1 cases per 100,000 persons, respectively. For the past five years, Saint Louis County has had no cases of TB disease among children under the age of 5, resulting in a case rate below the Performance Target, as seen in Figure 8. The state of Missouri saw a decrease of TB disease among this age group with a case rate of 0.0 per 100,000 in 2020 compared to 0.3 per 100,000 in 2019. The United States saw a 18.2% decrease of TB disease among this age group from 2019 to 2020.

**Figure 8: Tuberculosis Case Rates in Children 0-4 Years Old, United States, Missouri, and Saint Louis County, 2016 to 2020**





During the last five years, Saint Louis County residents with TB disease ranged in age from 6 to 90 years, with a median age of 54 years. Overall, for the past five years, the majority of individuals with TB disease in Saint Louis County have been adults in the 45 to 64 (n=29) and the 25 to 44 (n=25) age range. Case rates among those 65+ years and older are generally similar to those among people 25 to 44 years and 45 to 64 years, and were the highest of all age groups in 2020

**Figure 9: Tuberculosis Case Rate by Age Group, Saint Louis County, 2016 to 2020**

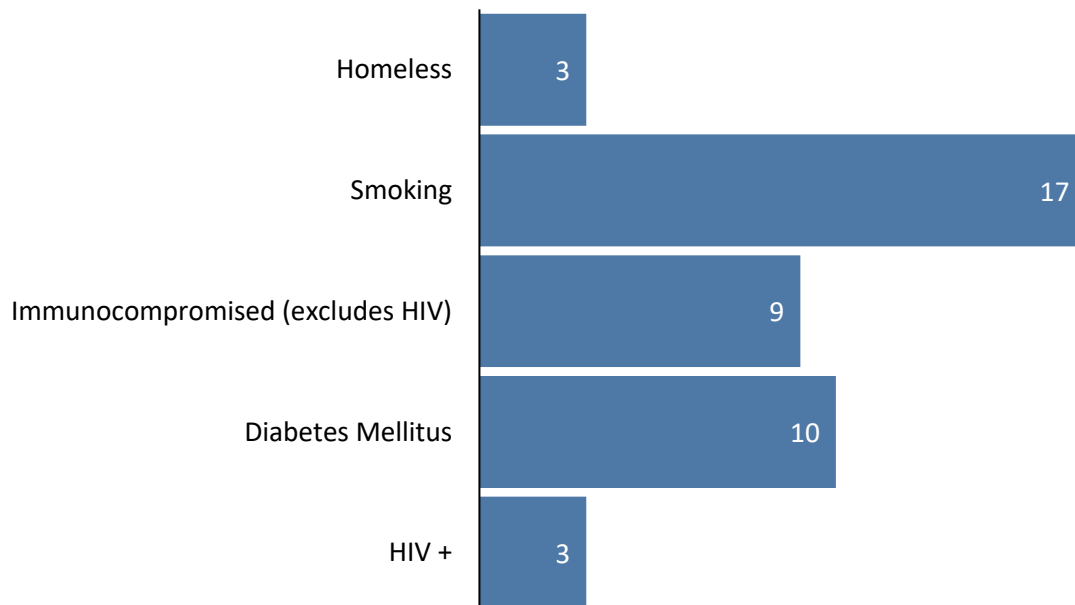


## Tuberculosis Disease by Risk Factors

Risk factors for developing active tuberculosis (TB) disease fall into two categories: those which increase the likelihood of exposure to *M. tuberculosis* (e.g., close proximity to someone with TB disease, immigration from parts of the world with higher TB disease rates, or homelessness), and those which increase the risk of progression to TB disease (e.g., HIV infection, diabetes, being immunocompromised, and smoking). Although CDC and the World Health Organization (WHO) define many risk factors for the development of TB disease (see the link provided in [Appendix B](#) for more information), with the exception of being non-U.S.-born, the risk factors represented in Figure 10 were chosen because they encompass the factors mentioned in CDC’s annual TB report and by WHO as comorbidities that could lead to the progression or severity of TB disease.

Of the five risk factors presented in Figure 10, TB and HIV coinfection is arguably the most serious throughout the world. People with TB infection who are coinfecting with HIV are more likely to develop TB disease; TB disease then increases the likelihood of death among people living with HIV.<sup>8</sup> The National TB Program Objectives and Performance Targets for 2025 includes a goal to increase the number of patients with TB disease being tested for HIV to 99.0%. In 2020, Saint Louis County was able to test 100.0% (n=17) of individuals with TB disease for HIV. Of the 85 individuals whose TB treatment was managed by Saint Louis County between 2016 and 2020, 31.8% (n=27) had a single risk factor and 9.4% (n=8) had more than one risk factor. The two most common risk factors from 2016 to 2020 in this population were smoking (40.5%, n=17) and diabetes (23.8, n=10), as seen in Figure 10.

**Figure 10: Total Tuberculosis Cases by Risk Factor within the Last Five Years, Saint Louis County, 2016 to 2020**



\*Cases with multiple risk factors are counted more than once

\*Managed patients are included regardless of counted jurisdiction.

## Drug-Resistant Tuberculosis

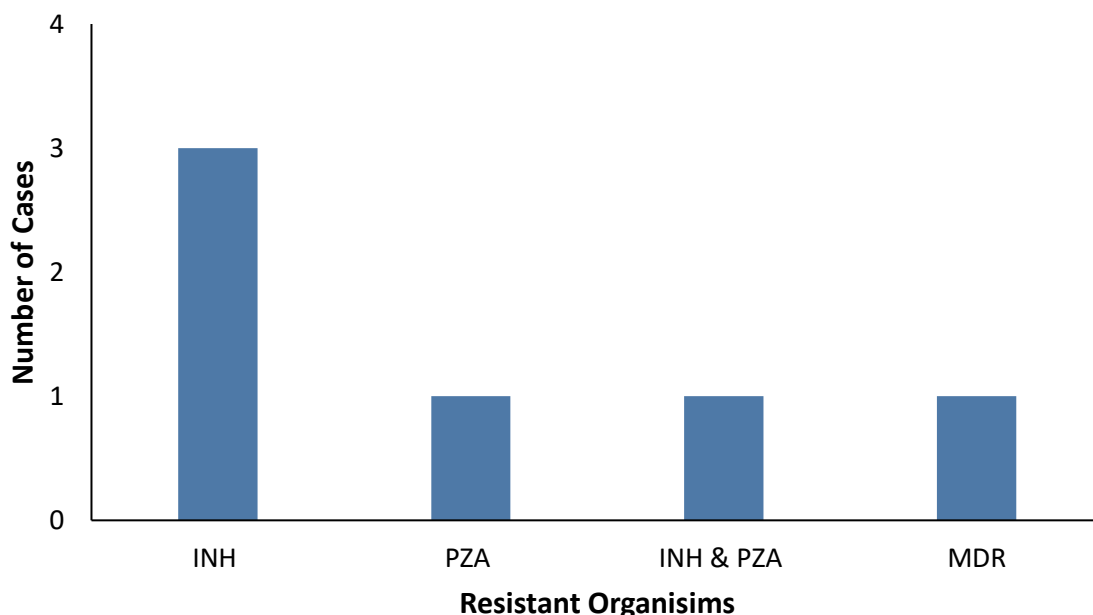
A drug resistance test is completed on every TB patient to ensure the appropriate therapy is being used for treatment. TB bacteria can have no resistance, multidrug-resistance, mono-resistance, or poly-resistance.

According to the CDC, multidrug-resistant tuberculosis (MDR-TB) can be defined as a TB organism that is resistant to two of the main medications used to treat TB: isoniazid (INH) and rifampin (RIF).<sup>9</sup> There are two ways an individual can attain MDR-TB: primary or acquired. Primary MDR-TB occurs from the direct transmission of drug resistant TB from one person to another. Acquired MDR-TB occurs when there is a complication with the prescribed regimen, resulting in the typical organism developing a resistance to the medication. In Saint Louis County, from 2016 to 2020, there has been one case of acquired MDR-TB.

TB disease as a result of organisms that demonstrate *in vitro* drug resistance to one medication is referred to as mono-resistant TB. In Saint Louis County from 2016 to 2020, there were four cases of mono-resistant TB, with resistance to INH observed in 75.0% (n=3) of cases. Mono-resistance to pyrazinamide (PZA) was observed in 25.0% (n=1) of all the mono-resistant cases, as seen in Figure 11.

TB disease, as a result of organisms that demonstrate *in vitro* drug resistance to more than one anti-TB medication (but not the combination of INH and RIF), is referred to as poly-resistant TB. From 2016 to 2020, there was one case of poly-resistant, INH and PZA. In continued efforts to prevent further drug-resistance, the TB Program works diligently to ensure patients complete their therapy through directly observed therapy (DOT) and proactive case management.

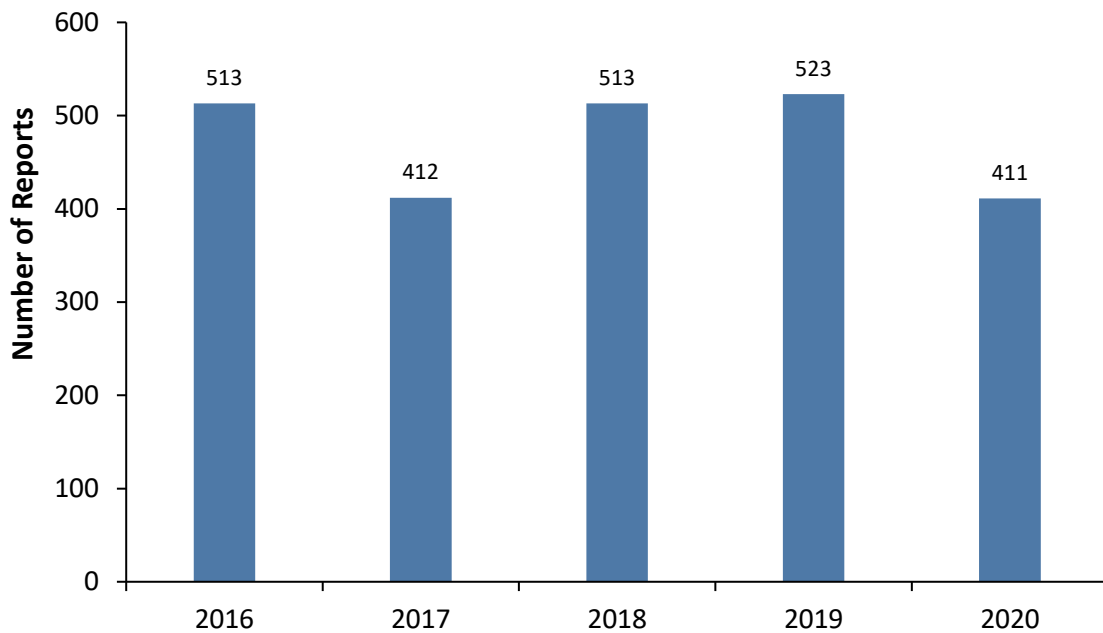
**Figure 11: Drug-Resistant Tuberculosis,**  
Saint Louis County, 2016 to 2020



## Tuberculosis Infection

Achieving tuberculosis (TB) elimination will require expanded efforts to identify and treat individuals with TB infection. To treat and prevent progression to TB disease, the state of Missouri requires positive TB screenings to be reported to local health departments. In 2020, there was a 21.4% decrease in the number of positive TB infection screenings reported to Saint Louis County DPH compared to 2019. Figure 12 represents the previous five years' worth of reported TB infections.

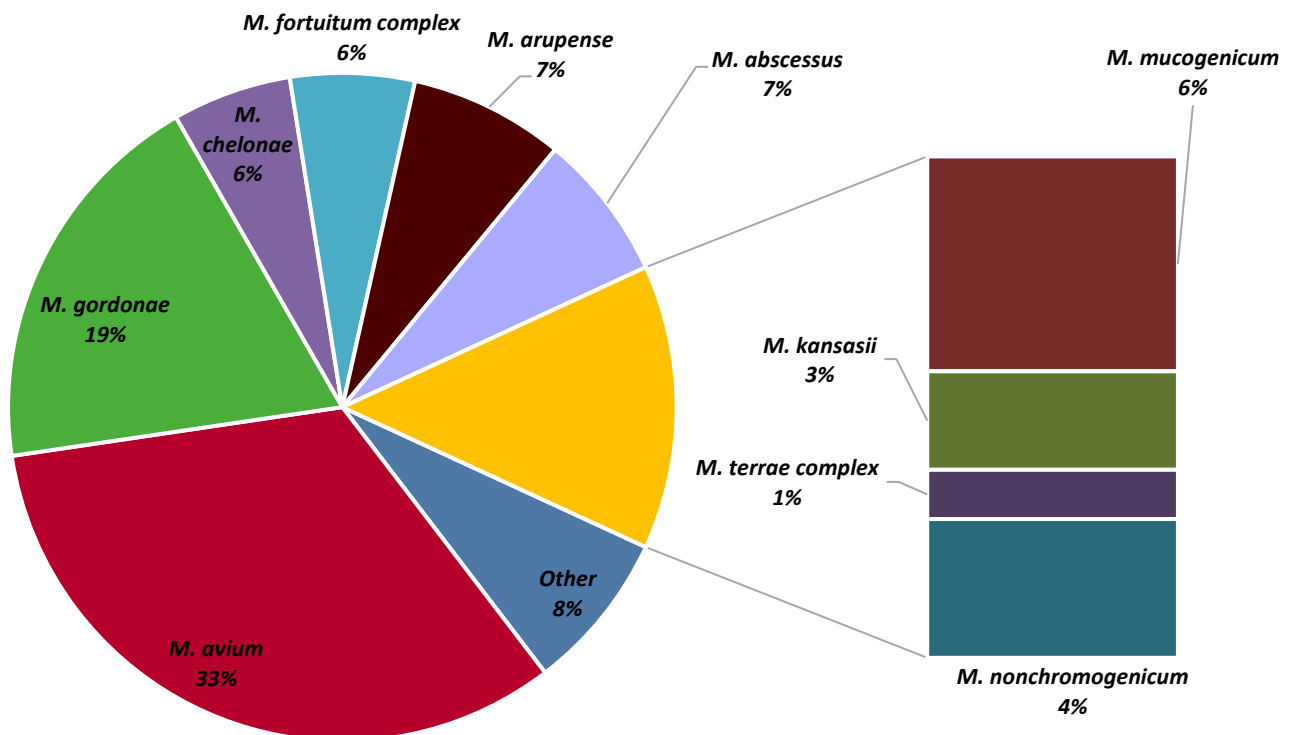
**Figure 12: Tuberculosis Infection Cases, Saint Louis County, 2016 to 2020**



## Nontuberculous Mycobacteria

Nontuberculosis mycobacteria (NTM) is a reportable condition in the state of Missouri. The TB program at Saint Louis County will follow patients who had specimens collected for mycobacterial species until their culture results are reported positive with tuberculosis or an NTM. NTM's are not monitored or treated through Saint Louis County. During 2016 to 2020, there were 814 infections due to NTM's reported to Saint Louis County. The greatest proportion of these infections were due to *Mycobacterium avium*, which caused 33.0% (n=269) of new NTM reports over the past five years. Figure 13 presents the top 10 NTM species that were reported for the previous five years and all remaining species included in the variable 'other.'

**Figure 13: Top 10 Nontuberculous Mycobacterial Species, Saint Louis County, 2016 to 2020**



\*Other includes: blank, other rapid grower, *M. xenopi*, *M. smegmatis*, *M. simiae*, *M. chimaera*, *P. peregrinum*, *M. marinum*, *M. goodii*, *M. parascrofulaceum*, *M. intracellulare*, *M. porcinum*, *M. neworleansense*, *M. neoaurum*, *M. phocaicum*, *M. immunogenum*, *M. lentiflavum*, *M. wolinskyi*, *M. sphagni*, *M. scrofulaceum*, and *M. szulgai*, *M. nocardia brasiliensis*, *M. branderi*, *M. paraffinicum*, *M. aurum*, *M. interjectum*, *M. asiaticum*, *M. bovis*.

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## Appendix A: CDC Global Regions

The Saint Louis County Department of Public Health utilizes CDC global regions to further de-identify report data. The countries/territories included in each CDC region are provided below.

CDC Region	Countries/ Territories Included
Africa	Algeria, Angola, Botswana, Benin, Bassas Da India, Burundi, Chad, Congo, Cameroon, Comoros, Central African Republic, Cape Verde, Djibouti, Dahomey [Benin], Egypt, Equatorial Guinea, Eritrea, Ethiopia, Europa Island, French Territory of The Affars and Issas, The Gambia, Gabon, Ghana, Glorioso Islands, Guinea, Cote D' Ivoire, Kenya, Liberia, Lesotho, Libya, Madagascar, Spanish North Africa, Mayotte, Malawi, Mali, Morocco, Mauritius, Mauritania, Mozambique, Niger, Nigeria, Guinea-Bissau, Reunion, Southern Rhodesia, Rwanda, Seychelles, South Africa, Senegal, Saint Helena, Sierra Leone, Somalia, South Sudan, Spanish Sahara, Sudan, Tromelin Island, Togo, Sao Tome and Principe, Tunisia, Tanzania, Uganda, Burkina Faso, Namibia, Western Sahara, Swaziland, Zambia, Zimbabwe
East Asia	China, Hong Kong, Japan, North Korea, South Korea, Macau, Mongolia, Taiwan, Southern Ryukyu Islands
South Asia	Bangladesh, Bhutan, Sri Lanka, India, Maldives, Nepal, Pakistan, Sikkim
Southeast Asia	Burma, Brunei, Cambodia, Indonesia, Laos, Malaysia, Paracel Islands, Spratly Islands, Papua New Guinea, Timor, Philippines, Singapore, Thailand, East Timor, Vietnam, North Vietnam, South Vietnam
West/Central Asia	Afghanistan, Azerbaijan, Armenia, Georgia, Kyrgyzstan, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan
Australia/Oceania	Australia, Ashmore and Cartier Islands, Cocos (Keeling) Islands, Coral Sea Islands, Norfolk Island, New Zealand
Caribbean (except Haiti)	Aruba, Antigua And Barbuda, Anguilla, Barbados, Bermuda, The Bahamas, Cayman Islands, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Jamaica, Martinique, Montserrat, Netherlands Antilles, Saint Kitts And Nevis, Saint Lucia, Swan Islands, Trinidad And Tobago, Turks And Caicos Islands, Saint Vincent and the Grenadines, British Virgin Islands
Eastern Europe	Belarus, Bulgaria, Czechoslovakia, Estonia, Czech Republic, Hungary, Latvia, Lithuania, Slovakia, Moldova, Poland, Romania, Russia, Ukraine, and Union Of Soviet Socialist Republics
Southern Europe	Albania, Andorra, Bosnia And Herzegovina, Gibraltar, Greece, Croatia, Italy, F.Y.R.O. Macedonia, Malta, Portugal, Slovenia, San Marino, Spain, Holy See (Vatican City), Yugoslavia
Western and Northern Europe	Austria, Belgium, Denmark, East Berlin, Ireland, Finland, France, Guernsey, Germany, Iceland, Isle Of Man, Jersey, Jan Mayen, Liechtenstein, Luxembourg, Monaco, Netherlands, Norway, Svalbard, Sweden, Switzerland, United Kingdom, West Berlin
Haiti	Haiti
Mexico & Central America	Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Panama Canal Zone
Middle East	United Arab Emirates, Bahrain, Cyprus, Gaza Strip, Iran, Israel, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, Turkey, West Bank, Yemen
North America	Canada, Greenland, and Saint Pierre and Miquelon
Pacific Islands	Solomon Islands, Central And Southern Line Islands, Cook Islands, Jarvis Island, Canton And Enderberry Islands, Fiji, Federated States Of Micronesia, Faroe Islands, French Polynesia, Gilbert and Ellice Islands, Gilbert Islands, Heard Island And Mcdonald Islands, Howland Island, Clipperton Island, U.S. Miscellaneous Pacific Islands, Johnston Island, Juan De Nova Island, Kiribati, Christmas Island, Palmyra Atoll, Midway Island, New Caledonia, Niue, Vanuatu, Nauru, Pitcairn Island, Palau, Marshall Islands, Tokelau, Tonga, Tuvalu, Trust Territory Of The Pacific Islands, Wallis And Futuna, Wake Island, and Samoa
South America	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Falkland Islands, Guyana, Suriname, Paraguay, Peru, Uruguay, Venezuela
Other/Unknown	Antarctica, Bouvet Island, French Southern and Antarctic Lands, British Indian Ocean Territory, South Georgia and The South Sandwich Islands, and unknown countries

## Appendix B: Useful Links

The following links are useful tools DPH referenced throughout this report.

Centers for Disease Control and Prevention TB Risk Factors can be found at:

<https://www.cdc.gov/tb/topic/basics/risk.htm>

Missouri Department of Health and Senior Services TB reports can be found at:

<http://health.mo.gov/living/healthcondiseases/communicable/tuberculosis/data.php>

National TB Program Objectives & Performance Targets for 2025 can be found at:

<https://www.cdc.gov/tb/programs/Evaluation/Indicators/default.htm>

Reported Tuberculosis in the United States, 2020:

[https://www.cdc.gov/tb/statistics/reports/2020/Exec\\_Commentary.html](https://www.cdc.gov/tb/statistics/reports/2020/Exec_Commentary.html)

World Health Organization TB Comorbidity and Risk Factors can be found at:

<https://www.who.int/news-room/fact-sheets/detail/tuberculosis>