



Tuberculosis Program 2018 to 2022 Annual Surveillance Report

SAINT LOUIS COUNTY DEPARTMENT OF PUBLIC HEALTH
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Contents

Saint Louis County Department of Public Health	3
Report Preparation	3
Introduction	4
Notes About the Data	5
The Tuberculosis Program	7
Tuberculosis Disease in Saint Louis County	8
Tuberculosis Disease by Country of Birth	10
Tuberculosis Disease by Race and Ethnicity	14
Tuberculosis Disease by Age and Age Group	16
Tuberculosis Disease by Risk Factors	18
Drug-Resistant Tuberculosis	19
Tuberculosis Infection	20
Nontuberculous Mycobacteria	21
Next Steps and Recommendations	22
References	23
Appendix A: CDC Global Regions	24
Appendix B: Useful Links	25

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.¹ 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.¹

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.² Data from the Centers for Disease Control and Prevention (CDC) show that in 2021, 78.8% of new TB cases were pulmonary.³ 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.³ 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.⁴ Data from the Centers for Disease Control and Prevention (CDC) show that the incidence of TB disease in the United States was 2.5 cases per 100,000 in 2022 with 600 reported deaths in 2020, the most recent year available.^{10, 3}

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*.^{4, 5}

According to the World Health Organization, globally, an estimated 25% of the population has TB infection.⁴ The CDC estimates roughly 13 million people within the United States have TB infection.⁵ 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 and Saint Louis County from 2018 to 2022.

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, 2021 American Community Survey 5-year Estimates and the Age and Sex, 2021 American Community Survey 1-year Estimate. National rates were derived from CDC's Division of Tuberculosis Elimination, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, annual report titled "Tuberculosis – United States, 2022." A link to this report can be found in [Appendix B](#).

This report presents data on the 2018 to 2022 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, these patients are not 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 surveillance and it ensures treatment completion regardless of a patient's initial residential jurisdiction. Risk factors and Chest Clinic statistics are the only sections of this report to include managed patients that are not 'countable'.

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, 15 cases of TB disease were reported in 2022, decreasing the case rate from 2.0 cases per 100,000 persons in 2021 to 1.5 cases per 100,000 persons in 2022. The TB disease rate in Saint Louis County failed to reach the National Target of 1.3 cases per 100,000 in 2022 by 15.4%.

The TB disease case rate within the non-U.S.-born population decreased by 38.2% after three consecutive years of increasing rates with 35.2% of this population being from South Asia. As for the U.S.-born population, there was a 66.7% increase in rates from 2021 to 2022.

The U.S.-born non-Hispanic Black TB disease case rate in Saint Louis County rebounded to a pre-pandemic rate of 1.3 cases per 100,000 after decreasing for the past two years. Although there was an increase, this population still achieved CDC's 2020 Target of being at or below 1.3 cases per 100,000. The non-Hispanic White TB disease case rate held steady at 0.3 cases per 100,000 persons in 2022.

In 2022, nine of the 15 counted and managed patients with TB disease had a known risk factor, with the majority of those with a risk factor of being smokers (77.8%, n=7).

In 2022, there was an equal proportion of cases among patients aged 25 to 44 (33.3%, n=5), 45 to 64 (33.3%, n=5), and 65+ (33.3%, n=5). 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 2022, Saint Louis County DPH saw an increase of 23.7% in reports of TB infection (n=480) compared to 2021 (n=388).

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 2022:

- The DPH Chest Clinic had **410** TB-related appointments scheduled
 - **170** unique individuals were seen at Chest Clinic
 - There was a **14.9%** increase in patients seen in chest clinic compared to 2021
 - **44** individuals were prescribed 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, workplaces, and other locations convenient for the patient.

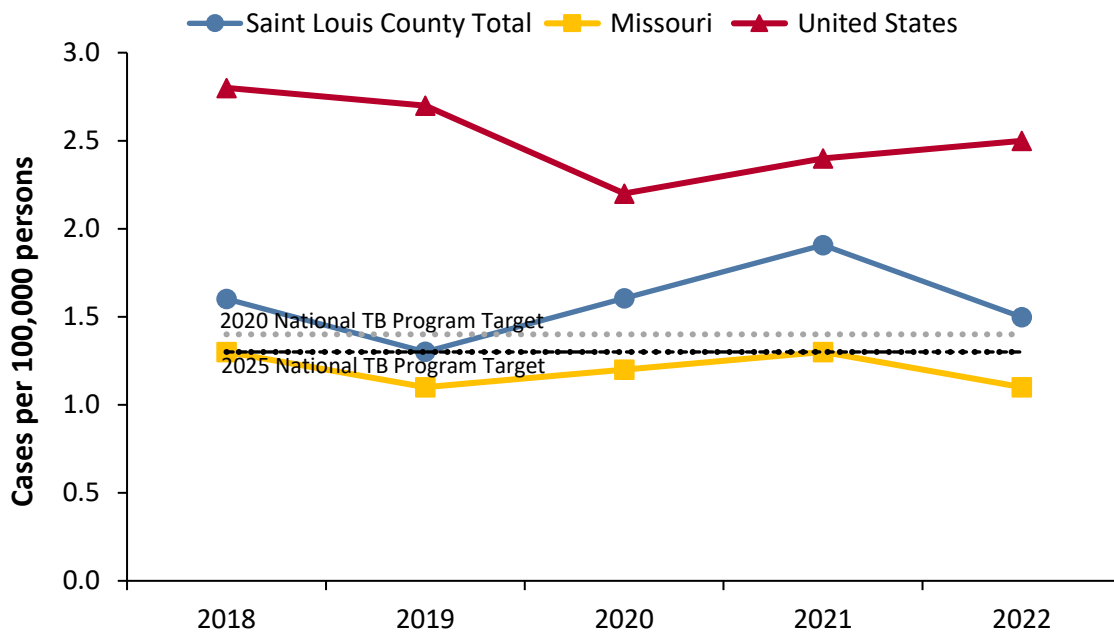
The TB Program works with the Epidemiology Program to conduct surveillance of TB disease, TB infection, and nontuberculous mycobacterial infection. Epidemiologists analyze TB trends, prepare surveillance reports, and update tracking systems to describe how TB impacts residents of Saint Louis County and 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 2022 regardless of counted jurisdiction or year.

Tuberculosis Disease in Saint Louis County

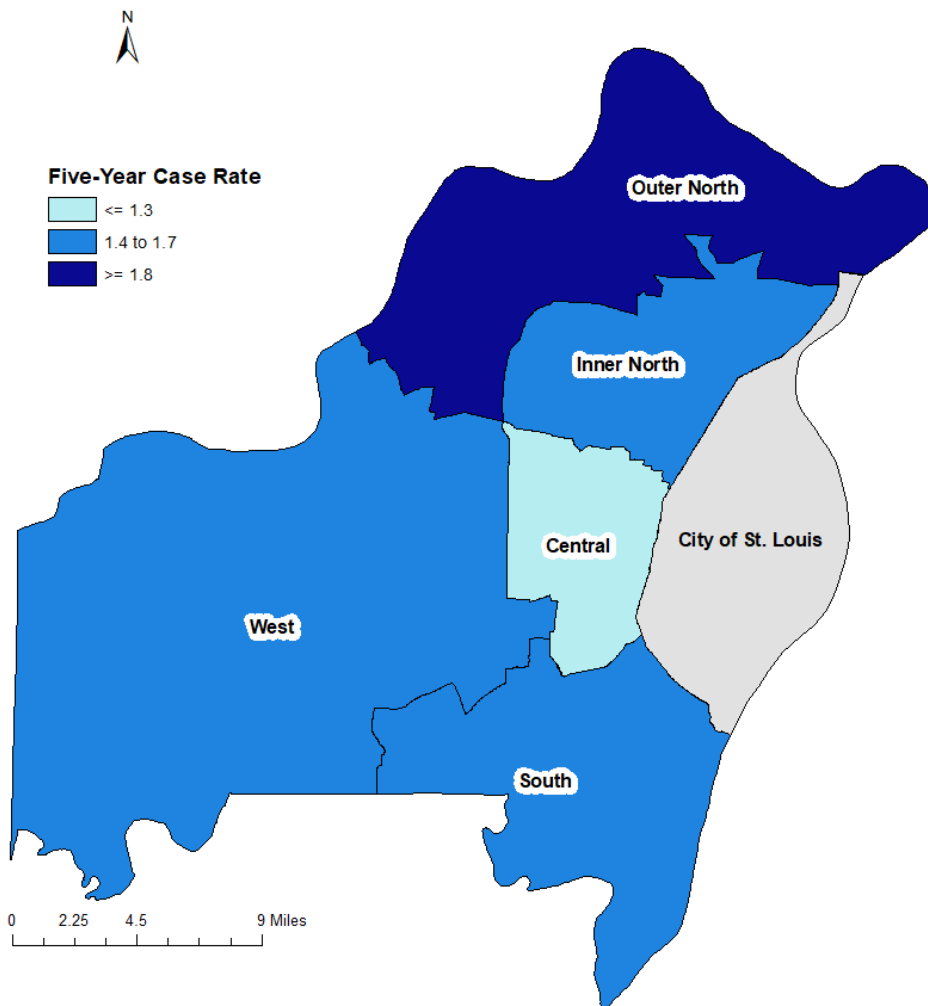
From 2018 to 2022, the peak rate of reported tuberculosis (TB) disease cases was in 2021 for Saint Louis County with 1.9 cases per 100,000. Reported cases decreased in 2022 by 21.1%, resembling pre-pandemic rates after seeing an increase in 2021. Nationally, there were 8,300 cases of TB disease (2.4 cases per 100,000 persons) provisionally reported to the Centers for Disease Control and Prevention (CDC) in 2022 while Missouri saw a 15.4% decrease from 2021 to 2022 (1.3 to 1.1 cases per 100,000, respectively). CDC had a 2020 and 2025 Performance Target of 1.4 and 1.3, respectively, TB disease cases per 100,000 persons or lower; the state of Missouri was able to achieve these targets in 2022, the United States was unable to reach these targets and Saint Louis County was 15.4% above the 2025 target. TB disease rates for the United States, Missouri, and Saint Louis County are shown in Figure 1, below.

Figure 1: Tuberculosis Case Rate
United States, Missouri, and Saint Louis County, 2018 to 2022



Fourteen ZIP Codes in Saint Louis County had a five-year TB case rate of over 2.0 per 100,000 (63141, 63138, 63125, 63132, 63114, 63033, 63043, 63146, 63123, 63088, 63117, 63120, 63017, 63042). 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 has had the highest rate of TB of greater than or equal to 1.8 per 100,000 persons.

Map 1: Tuberculosis Case Rate per 100,000 Persons by Saint Louis County Region, 2018 to 2022, Saint Louis County, n = 79



Data Source:
Saint Louis County Department of Public Health
Communicable Disease Prevention
JB, 2023

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

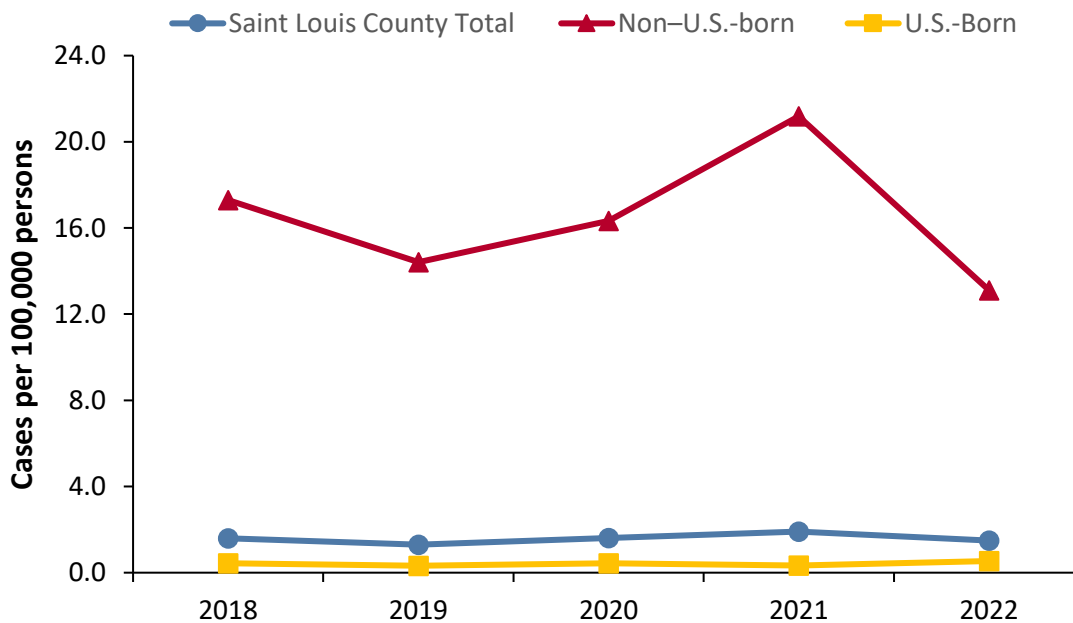
Tuberculosis Disease by Country of Birth

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, making being born in a country with higher rates of TB disease 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 2018 to 2022. The TB disease case rate among non-U.S.-born residents has consistently been higher than that of U.S.-born residents throughout the previous five years, as seen in Figure 2. During 2018 to 2022, 24.1% (n=19) of individuals with TB disease were U.S.-born, compared to 75.9% (n=60) 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 33.3% (n=5) in 2022 to a low of 15.8% (n=3) in 2021.

Table 1: Tuberculosis Cases and Case Rate in U.S.-Born and Non-U.S.-Born Residents, Saint Louis County, 2018 to 2022

Case Year	U.S.-Born Residents	Non-U.S.-Born Residents
	TB Case Rate per 100,000	TB Case Rate per 100,000
2018	0.4	17.3
2019	0.3	14.4
2020	0.4	16.3
2021	0.3	21.2
2022	0.5	13.1

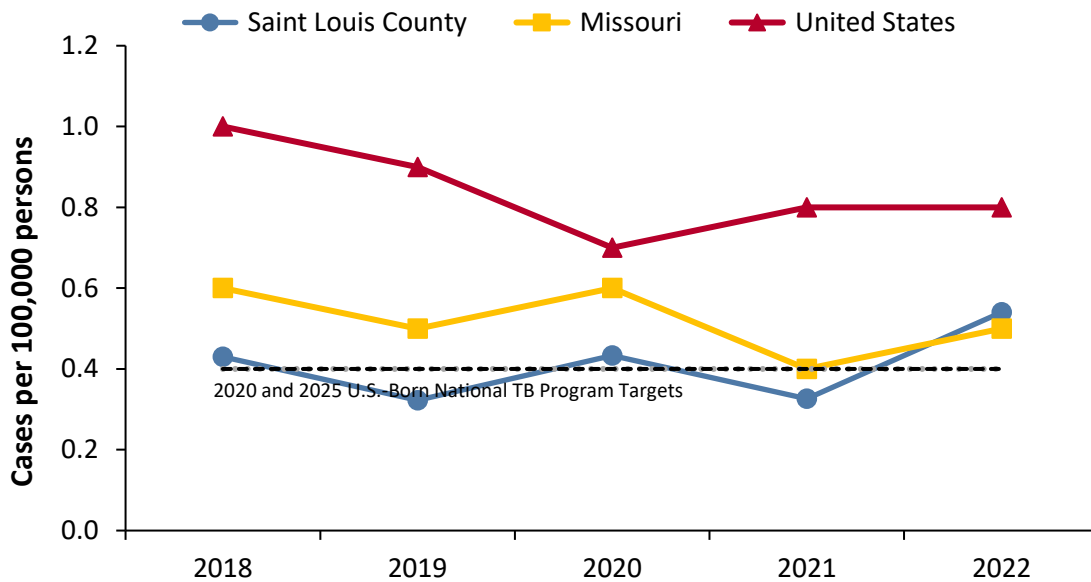
Figure 2: Tuberculosis Case Rate in U.S.-Born and Non-U.S.-Born Residents, Saint Louis County, 2018 to 2022



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 2022, Saint Louis County had an incidence rate of 0.5 cases per 100,000 among U.S.-born persons, a 66.7% increase compared to 2021 (0.3 cases per 100,000), no longer meeting the 2020 and 2025 National Targets. Missouri saw a 25.0% increase, also not meeting the National Targets. CDC reported the 2022 national case rate as 0.8 cases per 100,000 persons, although unable to reach their 2020 and 2025 targets, as seen in Figure 3, the rate was maintained from 2021.

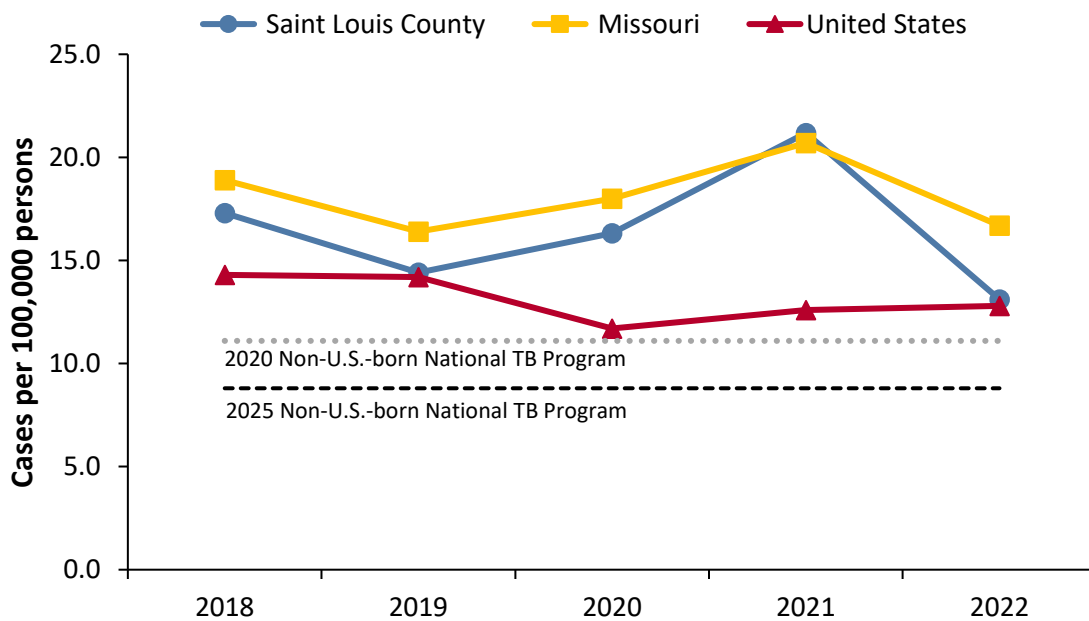
Figure 3: Tuberculosis Case Rate in U.S.-Born Residents, United States, Missouri, and Saint Louis County, 2018 to 2022



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.

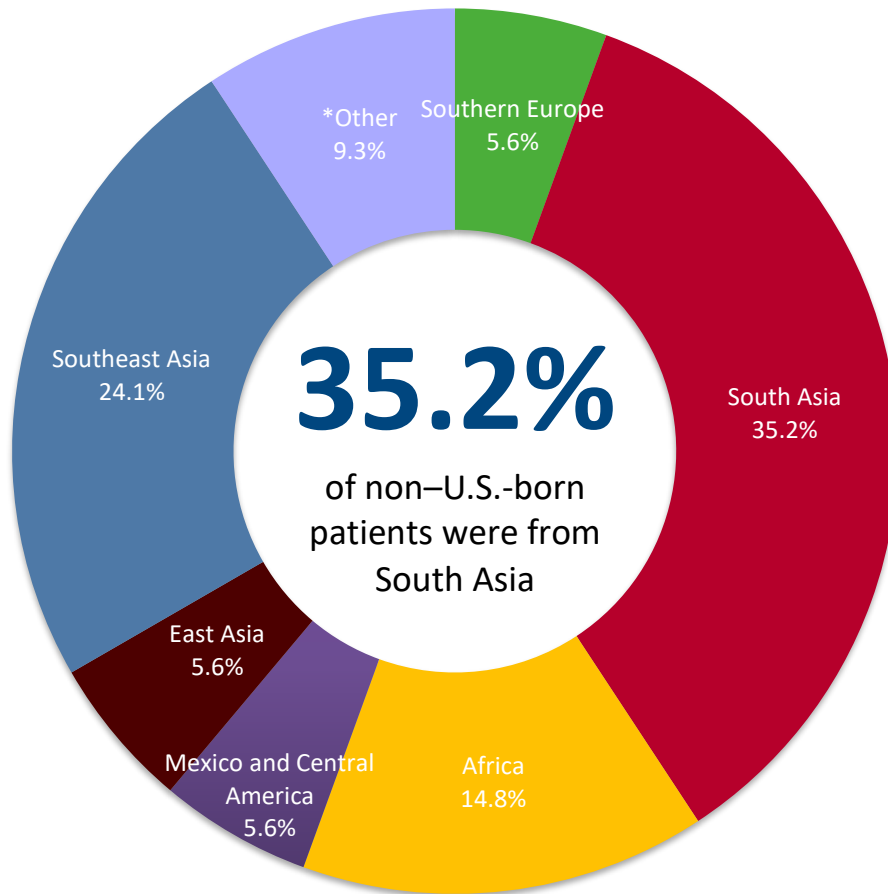
In 2022, DPH saw a 38.2% decrease among non–U.S.-born residents in Saint Louis County compared to 2021, however, the 2022 rate was above both the 2020 and 2025 National Targets, at 13.1 cases per 100,000 persons. While this decrease sounds prominent, Figure 4 shows that the 2022 rate is returning to a pre-pandemic level. This drop can also be seen with Missouri going from a rate of 20.7 in 2021 to 16.7 cases per 100,000 in 2022. Regardless, these high rates continue to stress the importance of screening and treatment of our non-U.S.-born population to protect them from progressing to TB disease. The 2022 national TB disease case rate was 12.8 cases per 100,000 persons; above the 2020 target.

Figure 4: Tuberculosis Case Rate in Non–U.S.-Born Residents, United States, Missouri, and Saint Louis County, 2018 to 2022



During 2018 to 2022, there were 60 cases of TB disease among non–U.S.-born residents, with 35.2% of those individuals being from South 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, 2018 to 2022



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

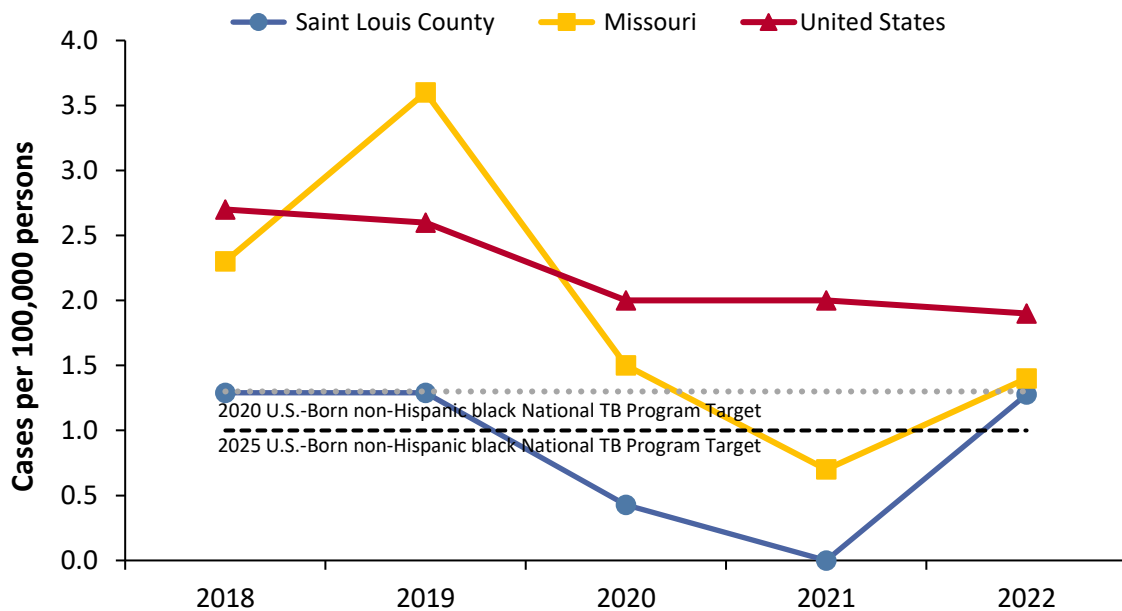
Tuberculosis Disease by Race and Ethnicity

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.

Saint Louis County and Missouri saw the U.S.-born non-Hispanic Black population rate rebound to a pre-pandemic level in 2022. From 2021 to 2022, the County rates increased from 0.0 to 1.3 cases per 100,000 persons respectively, meeting the 2020 Performance Target (1.3 cases per 100,000 persons). Missouri saw an increase from 0.7 to 1.4 cases per 100,000 persons, just missing the 2020 National Target.

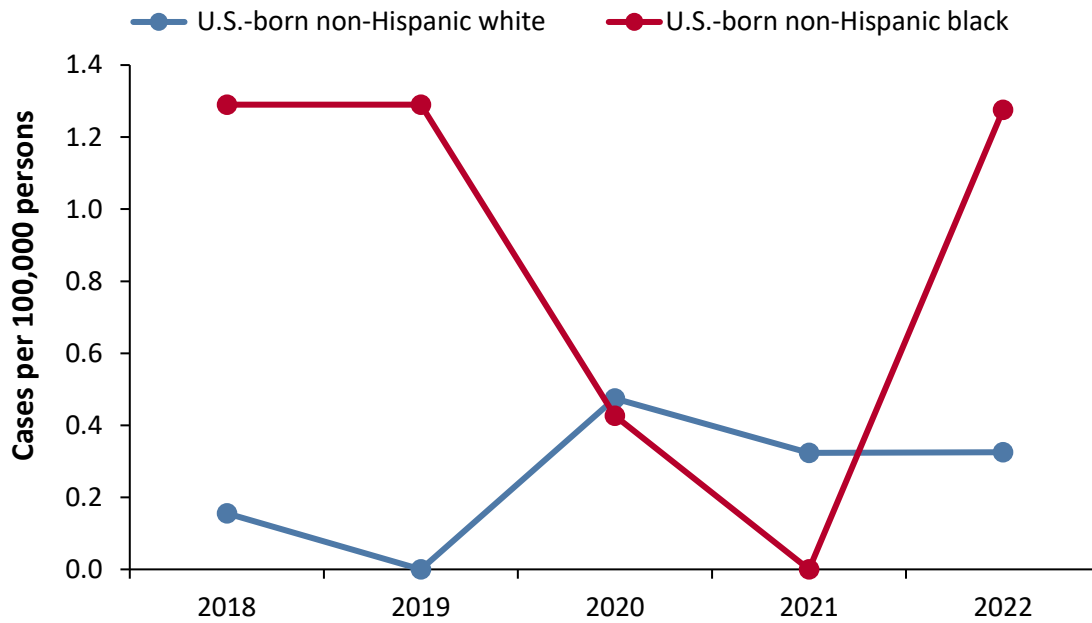
The 2022 national case rate was 1.9 cases per 100,000 persons, a 5.0% decrease from the 2021 rate (2.0 cases per 100,000 persons). Overall, the United States has seen a continual decrease in TB disease rates among this population for the past five years but was unable to meet their 2020 and 2025 Performance 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, 2018 to 2022



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 and continue through 2021. As previously mentioned, the U.S.-born non-Hispanic Black case rate rebounded in 2022 to a pre-pandemic level (1.3 cases per 100,000 persons) whereas the U.S.-born non-Hispanic White case rate remained steady at 0.3 cases per 100,000 persons, as seen in Figure 7.

Figure 7: Tuberculosis Case Rate in U.S.-Born Non-Hispanic Black Residents and U.S.-Born Non-Hispanic White Residents, Saint Louis County, 2018 to 2022

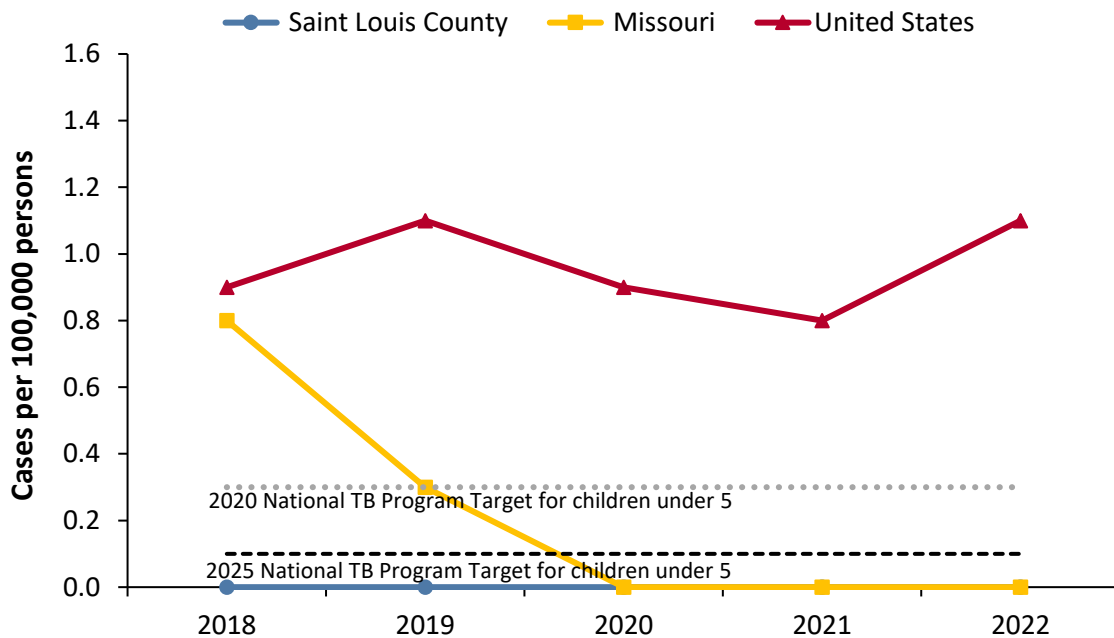


Tuberculosis Disease by Age and Age Group

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.⁷ 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.

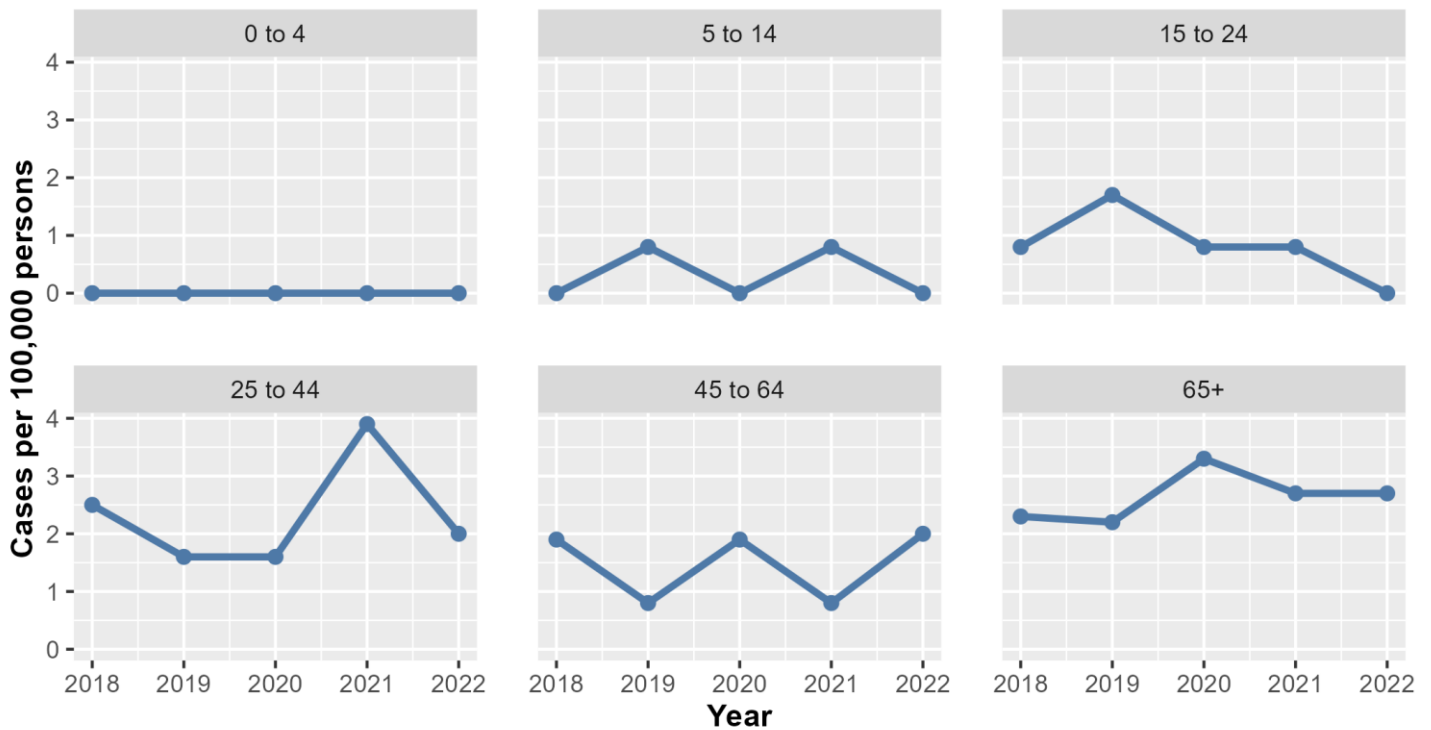
One goal of CDC’s Performance Targets for 2020 and 2025 is to reduce the burden of TB for children under 5 years old to fewer than 0.3 and 0.1 cases per 100,000 persons, respectively. For the past five years, Saint Louis County has had no cases of TB disease among children under the age of 5 and Missouri hasn’t seen a case within this population since 2019, resulting in a case rate below the Performance Target, as seen in Figure 8. The United States saw a 37.5% increase of TB disease among this age group from 2021 to 2022.

Figure 8: Tuberculosis Case Rates in Children 0-4 Years Old, United States, Missouri, and Saint Louis County, 2018 to 2022



During the last five years, Saint Louis County residents with TB disease ranged in age from 6 to 88 years, with a median age of 47 years. Overall, for the past five years, the majority of individuals with TB disease in Saint Louis County have been adults in the 25 to 44 (n=29) and the 65+ (n=24) age range. The 25 to 44 age range saw a 50.0% decrease in cases in 2022, returning to pre-pandemic levels. In 2022, there was an equal proportion of cases among patients aged 25 to 44 (33.3%, n=5), 45 to 64 (33.3%, n=5), and 65+ (33.3%, n=5).

Figure 9: Tuberculosis Case Rate by Age Group, Saint Louis County, 2018 to 2022

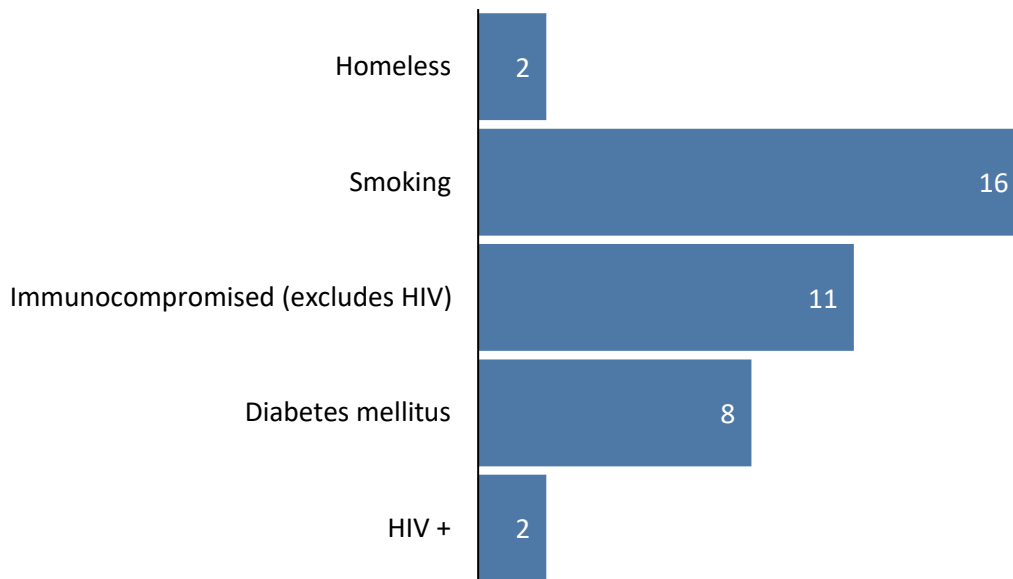


Tuberculosis Disease by Risk Factors

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 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.⁸ 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%. From 2018 to 2022, Saint Louis County was able to test 92.4% (n=73) of the countable individuals with TB disease for HIV. Of the 84 individuals whose TB treatment was managed by Saint Louis County between 2018 and 2022, 26.2% (n=22) had a single risk factor and 9.5% (n=8) had more than one risk factor. The two most common risk factors from 2018 to 2022 in this population were smoking (41.0%, n=16) and being immunocompromised (excluding HIV) (28.2% n=11), as seen in Figure 10.

Figure 10: Total Tuberculosis Cases by Risk Factor within the Last Five Years, Saint Louis County, 2018 to 2022



*Cases with multiple risk factors are counted more than once

*Managed patients are included regardless of counted jurisdiction.

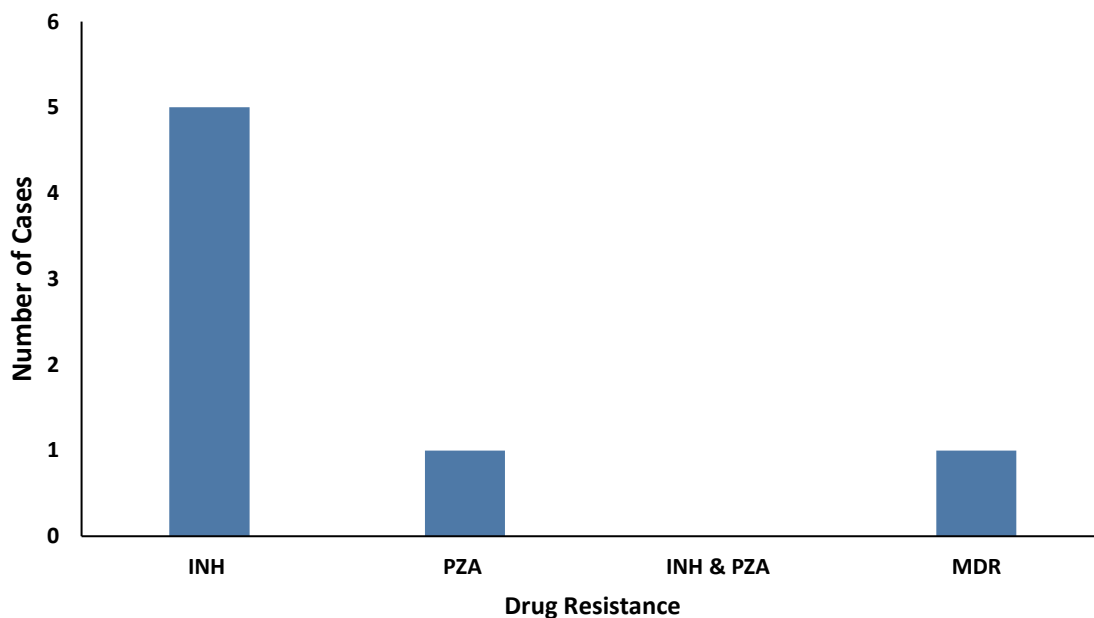
Drug-Resistant Tuberculosis

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).⁹ 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 2018 to 2022, there has been one case of 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. Resistance to two or more medications but remains susceptible to either INH or RIF is considered poly-resistance. In Saint Louis County from 2018 to 2022, there were six cases of mono-resistant TB, with resistance to INH observed in 83.3% (n=5) of cases. Mono-resistance to pyrazinamide (PZA) was observed in 16.7% (n=1) of all the mono-resistant cases and there were no case of poly-resistant TB, as seen in Figure 11. In continued efforts to prevent further drug-resistance, the TB Program works diligently to provide proactive case management by ensuring patients are prescribed the recommended regimen and complete their therapy through directly observed therapy (DOT).

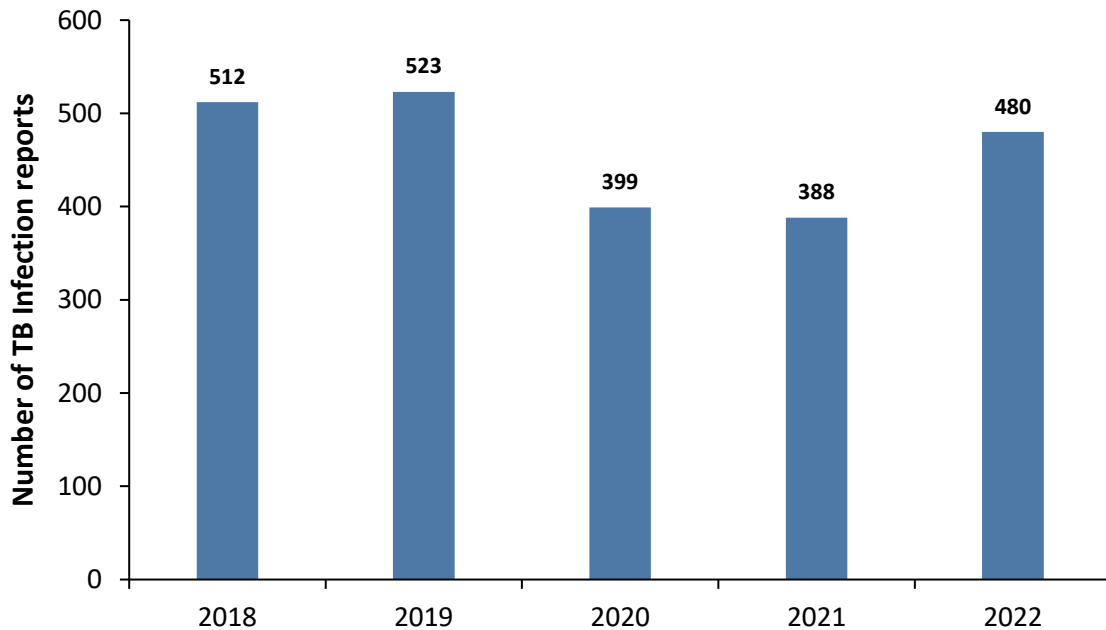
Figure 11: Drug-Resistant Tuberculosis,
Saint Louis County, 2018 to 2022



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 2022, there was a 23.7% increase in the number of positive TB infection screenings reported to Saint Louis County DPH compared to 2021. Figure 12 represents the previous five years' worth of reported TB infections. While these individuals are reported to DPH, only a small number of individuals seek treatment through the chest clinic; some seek treatment through their private provider and others don't seek treatment at all.

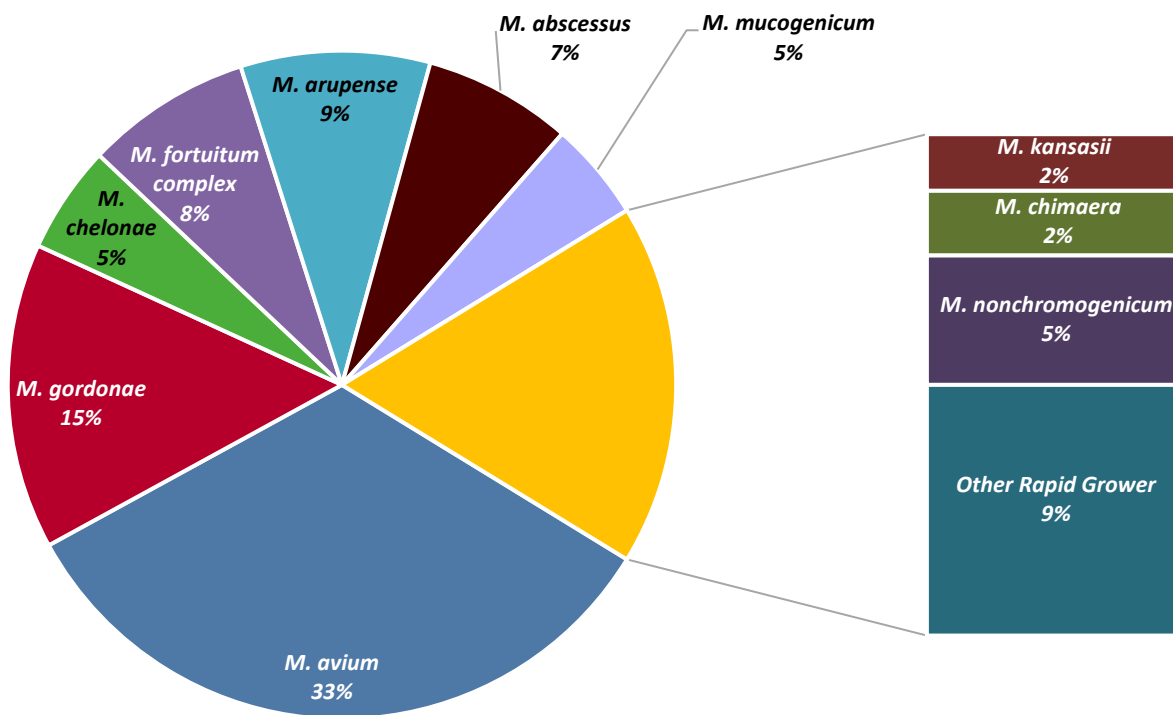
Figure 12: Tuberculosis Infection Cases, Saint Louis County, 2018 to 2022



Nontuberculous Mycobacteria

Infection with mycobacterial species other than *Mycobacterium tuberculosis*, referred to as nontuberculosis mycobacteria (NTM) is a reportable condition in the state of Missouri. The TB program at Saint Louis County follows patients who had specimens collected for mycobacterial species until their culture results are reported positive with tuberculosis or an NTM. NTMs are not monitored or treated through Saint Louis County. During 2018 to 2022, there were 709 infections due to NTMs reported to Saint Louis County. The greatest proportion of these infections were due to *Mycobacterium avium*, which caused 33.0% (n=236) of 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 rapid grower.'

Figure 13: Top 10 Nontuberculous Mycobacterial Species, Saint Louis County, 2018 to 2022



*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 braziliensis*, *M. branderi*, *M. paraffinicum*, *M. aurum*, *M. interjectum*, *M. asiaticum*, *M. bovis*.

Next Steps and Recommendations

The Tuberculosis (TB) program at the Saint Louis County Department of Public Health (DPH) will continue to work with patients, healthcare providers, and partners to reduce the progression to and transmission of tuberculosis. DPH recommends:

- Screening individuals at high-risk for TB: people who were born in or who frequently travel to a country where TB is common (high TB rate); healthcare providers who work in a setting with high risk for TB transmission; people who live in or have lived in large group settings (homeless shelters, congregate settings); people who recently spent time with someone who has active TB disease; or people who have a weaker immune system because of certain medications or health conditions, for example.
- Timely reporting of positive screenings (e.g., positive TB skin test, positive blood test).
- Individuals with a positive screening should follow up with their primary care provider, DPH, or a physician knowledgeable about tuberculosis.
- Individuals should start and complete treatment for TB infection if treatment is deemed necessary.
- Individuals positive with TB disease should follow the CDC recommended treatment regimen and complete treatment.

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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>

Tuberculosis—United States, 2022:

<http://dx.doi.org/10.15585/mmwr.mm7212a1>

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

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