

2023

ANNUAL TUBERCULOSIS SURVEILLANCE REPORT

ALABAMA DEPARTMENT OF PUBLIC HEALTH (ADPH)



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Data Sources

- 1) Surveillance data were obtained from the Alabama NEDSS-Based System (ALNBS) as of March 4, 2024; 2) Population data were obtained from the Alabama Department of Public Health Vital Statistics Division that is reported annually to the U.S Census Bureau July of the following year

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Tuberculosis: Brief Overview and Quick Facts

Description and Background

Tuberculosis (TB) is a disease caused by the bacterium, *Mycobacterium tuberculosis*, and can spread from person to person through droplets of saliva after a person infected with active TB coughs, sings, talk, or projects their voice in any other way. TB typically affects the lungs, but it can also affect other parts of the body, such as the brain, bone, kidneys, or other soft tissues or organs. A person with active TB can die if treatment is not provided. Not everyone that is infected with the TB bacteria becomes sick with disease. Persons who do have symptoms- such as a cough, fever, night sweats, weight loss, chest pain, or fatigue – are most likely suffering from TB disease. Those with TB disease may be infectious. Prompt treatment is essential to end symptoms and prevent disability or death. Those who are infected with TB bacteria but do not have any symptoms and have a normal chest radiograph have latent TB infection (LTBI). Those with LTBI still require treatment to decrease the risk of developing active TB disease.

TB Screening and Treatment

There are two tests that can be used to help detect the presence of TB bacteria within host: a tuberculin skin test (TST) or an interferon gamma release assay (IGRA) blood test. The TST is performed by injecting a small amount of tuberculin purified protein derivative (PPD) into the skin in the forearm. Tested individuals must return 48 to 72 hours to have a trained health care worker look for a reaction on the arm and determine if the TST is positive or negative for TB infection. In recent years, blood tests known as interferon gamma release assays (IGRAs) have been developed to screen for TB. White blood cells release interferon gamma (IFN-g) in response to contact with TB antigens. If the test result is positive, there is an immune response indicating the presence of TB bacteria.

Treating TB disease generally requires up to four medications given for a minimum of six months. Treating individuals with drug-resistant TB requires costly medications that may be used for an extended period. LTBI can be treated with one of the short course regimens listed below:

- Six or nine months of daily INH (6H/9H)
- Three months of once-weekly isoniazid plus rifapentine (3HP)
- Four months of daily rifampin (4R)
- Three months of daily isoniazid plus rifampin (3HR)

Short-course treatment regimens for LTBI given over 3-4 months tend to have higher completion rates and less hepatotoxicity than 6-9 months of Isoniazid (INH) monotherapy (6H/9H). Treatment of persons suspected of TB varies according to the outcome of their diagnostic tests.

Executive Summary

A total of 92 active TB cases were reported in Alabama in 2023, representing a 41.5% increase from 65 cases in 2022. In 2023, Alabama had a TB incidence rate of 1.8 TB cases per 100,000 persons, representing a 38.5% increase from the previous year's (2022) incidence rate of 1.3 TB cases per 100,000 persons. (Figure 1).

In 2023, TB incidence rates by public health district ranged from 0.5 cases per 100,000 persons in the Southwestern public health district to 2.7 cases per 100,000 persons in the Northern public health district. Three health districts (Northern, Southeastern, and East Central) reported higher incidence rate than the overall state incidence rate for 2023 (Table 2). Northern and East Central public health districts reported 31 & 16 cases respectively in 2023, accounting for 51.1% of reported cases statewide (Table 2).

Of the 92 active TB cases reported in Alabama in 2023, 39 (42.39%) were non-U.S.- born (Figure 7). The top four countries of origin for non-U.S.- born persons reported with active TB disease in Alabama were Mexico, Guatemala, India, and Vietnam (Figure 8). Active TB cases among persons born in these countries accounted for over 75% (76.9%) of the total cases among non-U.S.- born persons in Alabama.

HIV status was reported for 98.9% of Alabama active TB cases in 2023. Among the 89 cases with a known HIV status, 3 were reported as positive for HIV infection (Figure 9).

Persons living in congregate settings such as prisons, long term care facilities, homeless shelters etc., are at high risk for TB bacteria exposure. In 2023, 8 cases (8.7%) cases reported experiencing homelessness within the twelve months before diagnosis, 2 cases (2.2%) were diagnosed with active TB while residing in a correctional facility, and 16 cases reported substance abuse (17.4%) (Figure 10). In 2023, there was zero cases of multidrug-resistant TB (resistant to Isoniazid (INH), RIFAMPIN (RIF), Pyrazinamide (PZA), and Ethambutol (EMB), 2 cases resistant to INH, and 2 case resistant to PZA diagnosed in Alabama (Table 4).

In 2023, Alabama completed 78 contact investigations on active TB cases. Among the 1,011 individuals identified as contacts of active TB cases reported, 488 (48.2%) completed a medical evaluation, and 68 (6.7%) were diagnosed with latent tuberculosis infection (LTBI). Of the 68 contacts diagnosed with LTBI, 61 (89.7%) started LTBI treatment and, of those, 43 (70.5%) completed LTBI treatment. * (Table 8)

*All 2023 contact investigation data is preliminary until March 2025

TB Surveillance in Alabama

TB is a nationally notifiable disease. All Alabama physicians, laboratories, and other health care providers are required by law to immediately report clinical and laboratory-confirmed TB cases under their care to Alabama public health authorities. TB cases may be directly reported to a county health department, a district health office, or to the state TB program central office. The TB epidemiology section of the ADPH is responsible for the systematic collection of all reported TB cases in the state. Immediate reporting of TB cases enables public health staff to follow up with patients, administer directly observed therapy (DOT), monitor TB treatment until completion, evaluate, and screen contacts of a TB case, and control TB outbreaks.

TB cases in Alabama are reported electronically through Alabama NEDSS-Based System (ALNBS), a secure web-based surveillance software specific to ADPH.

Public health authorities collect demographic, clinical, and risk factor data for reported TB cases and their contacts. Cases are counted in the jurisdiction in which they reside at the time of diagnosis. Total case counts may change slightly as information is verified. These data are analyzed to describe the distribution of the disease, trends in morbidity, mortality & drug resistance, treatment outcomes, clusters of TB cases, and infection rates among high-risk groups and contacts to TB cases in the state. These data are used at the state and local level to guide policy and decision making, set priorities for program interventions, evaluate program performance for the prevention and control of TB in Alabama, and educate key stakeholders and the general public on TB. Alabama's TB surveillance data are transmitted electronically to the U.S. Centers for Disease Control and Prevention (CDC) through the report of verified case of TB (RVCT) form and become part of the national TB surveillance database.

TB Case Definitions for Public Health Surveillance

ADPH utilizes the 2009 Council of State and Territorial Epidemiologist (CSTE) case definition for tuberculosis (Position Statement 09-ID-65) that can be accessed at: <https://ndc.services.cdc.gov/case-definitions/tuberculosis-2009/>.

Clinical Description

A chronic bacterial infection caused by *Mycobacterium tuberculosis*, usually characterized pathologically by the formation of granulomas. The most common site of infection is the lung, but other organs may be involved.

Clinical Criteria

A case that meets all the following criteria:

- A positive tuberculin skin test or positive interferon gamma release assay for *M. tuberculosis*
- Signs and symptoms compatible with TB (abnormal chest radiograph, abnormal chest imaging study or clinical evidence of current disease)
- Treatment with two or more anti-TB medications
- A complete diagnostic evaluation

Laboratory Criteria for Diagnosis

- Isolation of *M. tuberculosis* complex on a culture from a clinical specimen,
- Demonstration of *M. tuberculosis* complex from a clinical specimen by nucleic acid application test
- Demonstration of acid-fast bacilli (AFB) in a clinical specimen when a culture has not been or cannot be obtained, is falsely negative, or contaminated

Case Classification

- A case that meets the clinical definition or is laboratory confirmed.

Epidemiology of TB in Alabama

Alabama reported 92 active TB cases in 2023. This represents 41.5% increase from the 65 active TB cases reported in 2022 (Figure 1). The overall TB case incidence rate has decreased by 61.7% since 2004 (Figure 2). The TB Incidence rate in Alabama for 2023 is 1.8 cases per 100,000 persons. This incidence rate is lower than the national incidence rate of 2.9 cases per 100,000 persons reported for 2023 by the CDC. According to CDC, Alabama ranked 22nd highest for the number of new active TB cases and ranked 28th highest for TB incidence rate (per 100,000 population) among the 501 reporting states and jurisdictions for 2023.

Geographic Distribution

Among the 67 counties in Alabama, three counties in Alabama reported the highest number of TB cases in 2023: Jefferson (11 cases), Madison (9 cases), and Montgomery (8 cases) (Table 1). These three counties accounted for a total of 30.4% of all TB cases reported in Alabama in 2023. Figure 3 shows the geographic distribution of active TB cases by county in 2023.

Each of the eight public health districts have responsibility for TB control in their assigned counties. In 2023, the Southeastern district had the highest TB incidence rate with 2.6 cases per 100,000 population, followed by Northern district with an incidence rate of 2.4 cases per 100,000 population, and West Central district with an incidence rate of 2.2 cases per 100,000 population (Table 2).

Sex and Age Distribution

In 2023, active TB cases in Alabama occurred predominantly among males (70.7%), compared to females (29.4%) (Figure 4). When stratified by age, the highest proportion of TB cases occurred among persons between the ages of 45-64 (31.5%). Among persons 45-64 years old, 18 cases (62.1%) were male and 11 cases (37.9%) were female (Figure 4). The age range of 65+ has the highest incidence rate (2.5 cases per 100,000 persons), while the lowest incidence rate among age groups was among 5-14 age group (0.0 per 100,000 persons) (Table 6).

Race/Ethnicity Distribution and TB Disparities

In 2023, Hispanic, and non-Hispanic Blacks accounted for 28.3%, and 37% of active TB cases in Alabama, respectively. Non-Hispanic Asians contribute to 12% of TB cases in 2023 (Figure 5). Non-Hispanic Asians had the highest active TB incidence rate among race/ethnic groups (13.5 per 100,000), followed by Hispanics (8.9 per 100,000), non-Hispanic Blacks (2.5 per 100,000), and non-Hispanic Whites (0.6 per 100,000) (Table 7).

High-Risk Populations

Non-U.S.-Born Persons

Active TB among persons born outside of the U.S. accounted for 41.4% of active TB cases with a known country of origin in Alabama in 2023. Majority of the non-U.S.-born cases reported in 2023 came from Mexico (30.8%), followed by Guatemala (23%), Vietnam (10.3%) and India (12.8%) – all countries where TB is endemic (Figure 8). The two public health districts in Alabama that reported having the highest number of non-US-born cases Northern (12 cases) and East Central (11 cases) (Table 3).

Persons with HIV Co-Infection

HIV testing should be performed for all TB cases, as TB treatment may change if antiretroviral therapy for HIV is given concurrently. Active TB often accelerates the natural progression of HIV infection to AIDS. Of the 92 reported TB cases in 2023, 89 of the active TB cases reported having HIV results recorded in the RVCT with 3 cases reported being positive for HIV. HIV testing was reported in 98.9% of the active TB cases, with 1 (1.1%) case not having a test performed belonged to the less than 5 years old age group.

Persons in Congregate Settings

Persons residing in crowded congregate settings such as homeless shelters, prisons, and nursing homes have a higher risk of TB bacteria exposure due to a shared airspace, environment, crowding, and poor ventilation. In 2023, 8 (8.7%) active TB cases in Alabama experienced homelessness within the past 12 months and 2 cases (2.2%) were residing in a correctional facility at the time of diagnosis. One case resided in the county jail and one case resided in a state prison at the time of diagnosis. (Table 3, Figure 10).

Persons with Reported Substance Abuse

Substance abuse is the most reported behavioral risk factor among patients with active TB, in the U.S. TB patients who abuse substances, such as drugs or alcohol, often experience treatment failure and can remain infectious longer, which, extends the infectious period risking continued TB bacteria growth and transmission in the community. In 2023, 16 (17.4%) active TB cases, reported abuse of either illicit drugs or alcohol (Table 3, Figure 10).

Medical Risk Factors

Certain conditions or treatments that weaken the immune system can increase the risk of TB bacteria becoming active. Among the cases of active TB for Alabama, 21 cases had diabetes mellitus, 1 case

diagnosed post organ transplant, 7 cases are non-HIV immunosuppressed individuals, 2 cases have end stage renal disease, and 3 cases were previously diagnosis with TB, all were previously treated. (Figure 11)

Pediatric TB

TB in children is considered a sentinel public health event as it often indicates recent transmission from an infectious adult case. Children younger than 5 years of age are more likely to develop life-threatening forms of TB disease. Young children are more likely to have TB bacteria spread through their bloodstream and cause complications and deadlier forms of active TB infections, such as TB meningitis and disseminated TB than older children and adults. Moreover, potentially lethal forms of active TB disease, such as TB meningitis or disseminated TB, can develop in very young children since the infection is more likely to spread through the bloodstream in young children and cause complications. In 2023, children younger than the age of 15 years old comprised 2.17% of active TB cases, in Alabama. Two cases (0.7 per 100,000) was reported in children less than 5 years of age. There was 0 pediatric case of TB meningitis in pediatric cases for 2023.

Diagnosis and Treatment Outcomes

Initial Diagnosis, Treatment, and DOT

In Alabama, most cases are initially diagnosed with active TB in a hospital or outside clinic and are followed up by TB staff in the health district in with the patient resides after discharge to continue their TB treatment. Treatment outcome was analyzed for eligible 2023 cases. Eligible cases include persons alive at time of diagnosis, initial drug regimen of one or more anti-TB drugs, and who did not die within one year of initiating treatment, excluding cases are those with RIF-resistant isolates, cases with bone and/or joint listed as site of disease, cases with meningeal TB, pediatric patients (ages 0 - 14 years) with disseminated TB disease, and those who moved out of the country within one year of initiating treatment. Among the 73 eligible active TB cases counted in 2023, a total of 67 cases (91.8%) completed treatment and 65 cases (89.0%) completed treatment within 12 months of diagnosis (Table 5, Figure 13). District TB staff provided directly observed therapy (DOT) to TB patients, which entails watching the patient swallow every dose of their TB treatment for the duration of their treatment. Of the 73 cases with available data on treatment administration collect in 2023, 57 cases (78.1%) received TB treatment entirely by DOT only and 16 cases (21.9%) were treated by a combination of DOT and self-administered therapy (Figure 14).

Pulmonary TB

Cases with pulmonary or laryngeal TB have a greater potential to spread the TB bacteria and infect others. Infectiousness is higher if a case's sputum smear is positive for acid-fast bacilli (AFB), or cavity lesions are present on chest radiography. In 2023, 78 (84.78%) of the 92 active TB cases had pulmonary TB. Of the 77 active pulmonary TB cases, 39 cases (50.7%) were sputum AFB smear positive.

Drug Resistance

Drug Resistance

Among the 78 culture positive TB cases in Alabama, 76 cases (97.4%) were tested for initial drug susceptibility to all four of the first-line anti-TB medications. Of the 76 tested isolates from cases with no previous history of TB, 2 case (2.2%) had primary resistance to INH only, 2 case (2.2%) had primary resistance to PZA only, and zero case had multidrug-resistant (MDR)(Table 4).

MDR-TB is caused when the TB bacteria is resistant to at least INH and RIF (Figure 12). MDR-TB cases often require longer and more complicated treatment, which can be costly for patients and TB programs. Patients treated for MDR-TB can experience serious side effects including hearing loss, hepatitis, kidney impairment, and psychological changes.

The average cost of treating a TB patient increases as drug resistance increases. On average, the direct cost of treating a patient with drug-susceptible TB in 2020 was \$20,000, compared to \$568,000 for a patient with extensively drug resistant TB (XDR-TB, i.e. TB resistant to INH and RIF, a fluoroquinolone and a second-line injectable, bedaquiline, or linezolid). Funding mechanisms are available to patients with treatment costs but can add additional strain to TB programs. More information about drug-resistant TB can be found on CDC's Division of TB Elimination website at

<https://www.cdc.gov/TB/topic/drTB/>.

Molecular Epidemiology

TB genotyping is a laboratory method that determines the genetic relatedness of TB strains among different cases with culture-positive TB disease. Identical genotyping among persons with TB disease suggest recent person-to-person transmission. The state TB program routinely analyzes TB genotyping clusters, which are comprised of two or more TB cases with identical genotypes, to identify recent TB transmission, describe risk factors for transmission, identify possible sources of transmission, and determine ways to mitigate transmission.

Between 2021 - 2023, there were 8 clusters of various sizes in Alabama (Figure 15). Figure 16 displays the number of genotype cluster alerts by alert levels. According to CDC, alert level is determined by the log likelihood ratio (LLR) for a given cluster, identifying higher than expected geospatial concentrations for a TB genotype cluster in a specific county, compared to the national distribution of that genotype. The Tuberculosis Genotyping Information Management System (TB GIMS) generates low and medium alert level notifications with a LLR between $5 \leq 10$, and a high alert is for clusters with $LLRs \geq 10$. Large Outbreak of Tuberculosis in the United States (LOTUS) alerts are generated when clusters of ≥ 10 genotype-matched cases within a 3-year period that are related by recent transmission are identified.

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TABLE 1: TUBERCULOSIS (TB) CASES AND INCIDENCE RATES* BY COUNTY, 2022 - 2023

	2022		2023	
COUNTY	CASES	RATE*	CASES	RATE*
Autauga	0	0.0	0	0.0
Baldwin	0	0.0	2	0.8
Barbour	0	0.0	0	0.0
Bibb	0	0.0	0	0.0
Blount	0	0.0	1	1.7
Bullock	0	0.0	0	0.0
Butler	0	0.0	0	0.0
Calhoun	1	0.9	1	4.0
Chambers	0	0.0	1	2.9
Cherokee	0	0.0	0	0.0
Chilton	0	0.0	0	0.0
Choctaw	1	8.0	0	0.0
Clarke	2	8.9	0	0.0
Clay	0	0.0	0	0.0
Cleburne	0	0.0	0	0.0
Coffee	0	0.0	3	5.5
Colbert	0	0.0	5	8.6
Conecuh	0	0.0	0	0.0
Coosa	0	0.0	1	9.8
Covington	1	2.7	0	0.0
Crenshaw	0	0.0	0	0.0
Cullman	1	1.1	0	0.0
Dale	0	0.0	1	2.0
Dallas	1	2.7	0	0.0
DeKalb	1	1.4	0	0.0
Elmore	2	2.2	0	0.0
Escambia	0	0.0	0	0.0
Etowah	8	7.8	5	4.9
Fayette	1	6.2	0	0.0

TABLE 1: TUBERCULOSIS (TB) CASES AND INCIDENCE RATES* BY COUNTY, 2022 - 2023

	2022		2023	
COUNTY	CASES	RATE*	CASES	RATE*
Franklin	1	3.1	2	6.3
Geneva	0	0.0	1	3.7
Greene	0	0.0	0	0.0
Hale	0	0.0	0	0.0
Henry	0	0.0	0	0.0
Houston	2	1.9	3	2.8
Jackson	1	1.9	0	0.0
Jefferson	10	1.5	11	1.7
Lamar	0	0.0	0	0.0
Lauderdale	0	0.0	4	4.2
Lawrence	0	0.0	2	6.0
Lee County	2	1.1	3	1.7
Limestone	1	0.9	1	0.9
Lowndes	0	0.0	0	0.0
Macon	0	0.0	2	10.8
Madison	1	0.2	9	2.2
Marengo	0	0.0	0	0.0
Marion	0	0.0	0	0.0
Marshall	2	2.0	6	6.0
Mobile	4	1.0	4	1.0
Monroe	1	5.2	0	0.0
Montgomery	5	2.2	8	3.5
Morgan	2	1.6	1	0.8
Perry	0	0.0	2	24.9
Pickens	0	0.0	0	0.0
Pike	0	0.0	2	6.1
Randolph	0	0.0	0	0.0
Russell	0	0.0	0	0.0
Shelby	4	1.7	2	0.9

TABLE 1: TUBERCULOSIS (TB) CASES AND INCIDENCE RATES* BY COUNTY, 2022 - 2023

	2021		2023	
COUNTY	CASES	RATE*	CASES	RATE*
St. Clair	2	2.1	1	1.1
Sumter	0	0.0	1	8.4
Talladega	2	2.5	0	0.0
Tallapoosa	0	0.0	1	2.4
Tuscaloosa	3	1.3	5	2.1
Walker	3	4.7	0	0.0
Washington	0	0.0	0	0.0
Wilcox	0	0.0	0	0.0
Winston	0	0.0	1	4.2
TOTAL	65	1.3	92	1.8

*Rate per 100,000 population; Reported cases and calculated rates in these counties exclude cases from corresponding prisons and detention centers; Denominators for prison and detention centers are unknown

Data Sources: 1) Case counts for numerator was obtained from the National Tuberculosis Surveillance System Reports as of October 15, 2024). 2) Rates were calculated using population estimates for denominator obtained from the Alabama Department of Public Health Vital Statistics Division that is reported to the U.S. Census Bureau

TABLE 2: TUBERCULOSIS (TB) CASES AND INCIDENCE RATES* BY PUBLIC HEALTH DISTRICT, 2022 - 2023

PUBLIC HEALTH DISTRICT	2022		2023	
	CASES	INCIDENCE*	CASES	INCIDENCE*
Northern	9	0.8	31	2.4
Northeastern	18	2.2	10	1.5
West Central	7	1.5	8	1.7
East Central	8	1.1	16	2.2
Southwestern	5	1.2	2	0.5
Southeastern	3	0.8	10	2.6
Jefferson	10	1.5	11	1.7
Mobile	5	1.2	4	1.0
TOTAL	65	1.3	92	1.8

*Incidence per 100,000 population; Reported cases and calculated rates in these counties exclude cases from corresponding prisons and detention centers; Denominators for prisons and detention centers are unknown

Data Sources: 1) Case counts for numerator was obtained from the National Tuberculosis Surveillance System Reports as of October 15, 2024). 2) Rates were calculated using population estimates for denominator obtained from the Alabama Department of Public Health Vital Statistics Division that is reported to the U.S. Census Bureau

TABLE 3: PERCENTAGE OF TB CASES WITH KNOWN TB RISK FACTORS BY PUBLIC HEALTH DISTRICTS, 2023

PUBLIC HEALTH DISTRICT	NON - U.S.-BORN (%)	HOMELESS IN THE PAST YEAR (%)	*RESIDENCE OF CORRECTIONAL FACILITY AT DIAGNOSIS (%)	*LONG TERM CARE FACILITY AT DIAGNOSIS (%)	#REPORTED SUBSTANCE ABUSE (%)
Northern	38.7	6.45	0.0	0.0	16.1
Northeastern	20.0	20.0	10.0	0.0	30.0
West Central	37.5	0.0	0.0	0.0	0.0
East Central	68.9	6.3	6.3	0.0	0.0
Southwestern	50.0	0.0	0.0	0.0	0.0
Southeastern	30.0	30.0	0.0	0.0	90.0
Jefferson	45.5	0.0	0.0	0.0	36.4
Mobile	25	0.0	0.0	0.0	0.0
TOTAL	41.3	8.7	2.2	0.0	22.8
<p>*Correctional Facility: Patients was incarcerated or detained in a jail, prison, or other detention center when TB diagnostic evaluations was performed or initiated.</p> <p>*Long Term Care Facility: Patient was/or reside in a long-term care facility at time of diagnostic evaluation was performed of initiated.</p> <p>*Substance Abuse: Consist of patients who use noninjecting drugs and injecting drugs in the past 12 months that is not prescribe by a medical practitioner or heavy alcohol consist of patients who binge drink 5 or more days in a month.</p> <p>Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.</p>					

TABLE 4: PRIMARY RESISTANCE TO FIRST-LINE ANTI-TB MEDICATIONS, 2023

STATE	Isoniazid (INH)		Pyrazinamide (PZA)		Multi-Drug (INH, RIF, PZA and EMB)	
	CASES	PERCENT*	CASES	PERCENT*	CASES	PERCENT*
Alabama	2	2.6	2	2.6	0	0
<p>*Percent of cases with completed drug susceptibility testing and no prior treatment with anti-TB medications (N=78) positive culture</p> <p>Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.</p>						

TABLE 5: COMPLETION OF TB TREATMENT BY PUBLIC HEALTH DISTRICT, 2023 (N=92) *

Public Health District	Completion of TB Treatment (%)	Completion of TB Treatment Within 12 Months (%)
Northern	96.0	92.0
Northeastern	87.5	87.5
West Central	100.0	100.0
East Central	100.0	100.0
Southwestern	100.0	100.0
Southeastern	87.5	87.5
Jefferson	77.8	66.7
Mobile	100.0	100.0

*Denominator includes persons alive at time of diagnosis, with initial drug regimen of one or more drugs prescribed, who did not die within one year of initiating treatment; excluding persons with initial rifampin-resistant isolates, patients, or pediatric patients (ages 0 – 14 years) with disseminated TB disease, and those who moved out of the country within one year of initiating treatment.

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

TABLE 6: TB INCIDENCE RATES* BY AGE GROUP, 2019 - 2023

Age (Years)	2019 (N = 87)	2020 (N = 72)	2021 (N = 91)	2022 (N = 65)	2023 (N = 92)
< 5	0.3	1.0	1.7	0.3	0.7
5 – 14	0.0	0.0	0.2	0.2	0.0
15- 24	1.1	0.8	1.8	1.2	1.6
25 – 44	2.7	2.0	1.6	1.4	2.1
45 – 64	2.0	1.5	2.3	1.7	2.3
65+	2.4	2.1	2.6	1.6	2.5

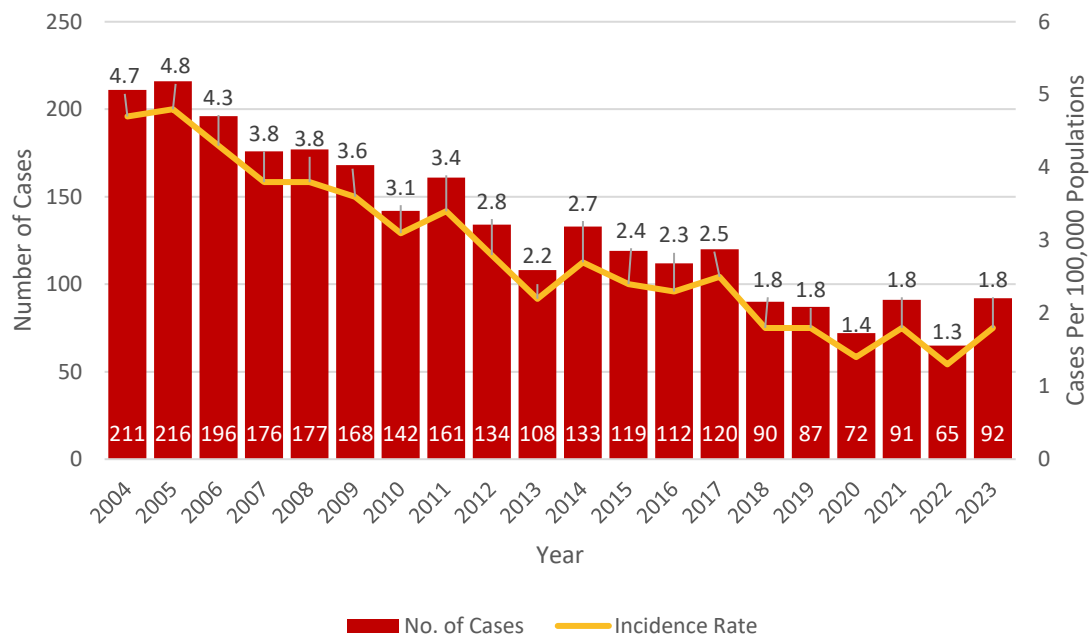
*Rate per 100,000 population

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

TABLE 7: TB CASE INCIDENCE* BY RACE/ETHNICITY, 2019-2023					
INCIDENCE RATE					
RACE/ETHNICITY	2019 (N = 87)	2020 (N = 72)	2021 (N = 91)	2022 (N = 65)	2023 (N = 92)
Asian, Non-Hispanic	22.7	15.0	17.4	11.5	13.5
Black, Non – Hispanic	2.3	2.5	2.8	1.3	2.5
White, Non – Hispanic	0	1.0	0.4	0.7	0.6
Multiracial, Non – Hispanic	0.6	0.4	0.7	0.7	0.7
Hispanic	9.1	5.3	8.0	7.2	8.9
*Rate per 100,000 population					
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024					

TABLE 8: CONTACT INVESTIGATION, 2022 - 2023		
	Final 2022	*Preliminary 2023
Number of Contacts	2,553	1,011
Number of Cases without Contacts	6	11
U.S. Born	136	140
Non-U.S.-Born	14	50
Evaluated	2,114	488
TST	-	54
IGRA	-	434
TB Disease	8	7
LTBI Diagnosis	137	68
Started Treatment	136	61
Completed Treatment	127	43
*Current year data is preliminary until March the following year. Previous year data is final.		
Data Source: Data was collected from the CDC National Tuberculosis Indicators Project ARPE Report as of October 15, 2024.		

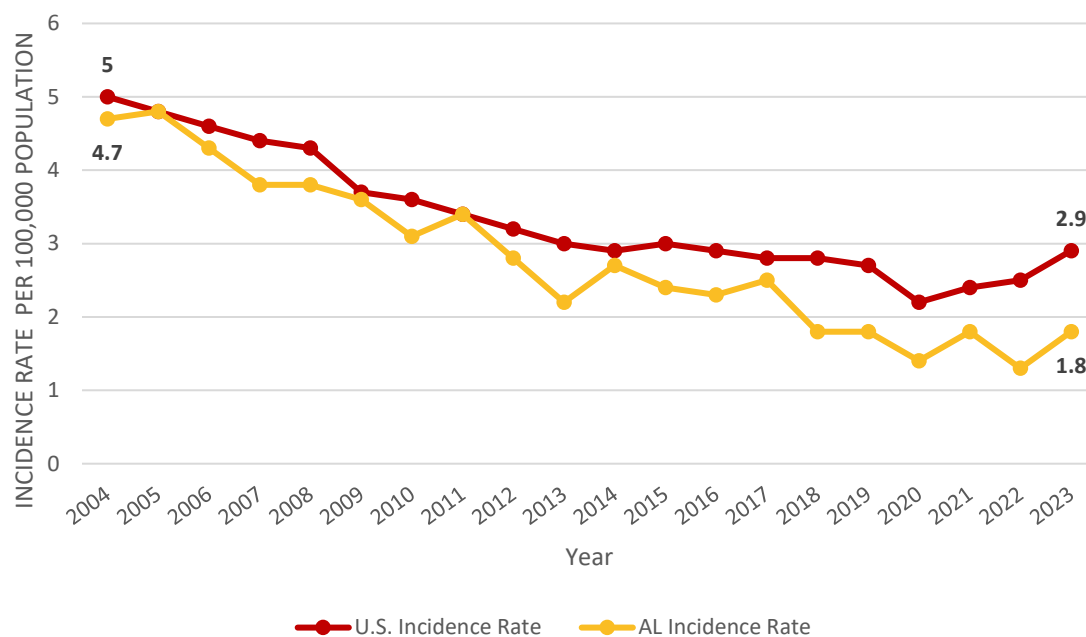
Figure 1: TB CASES AND INCIDENCE RATES*, 2004 - 2023



*Rate per 100,000 persons population

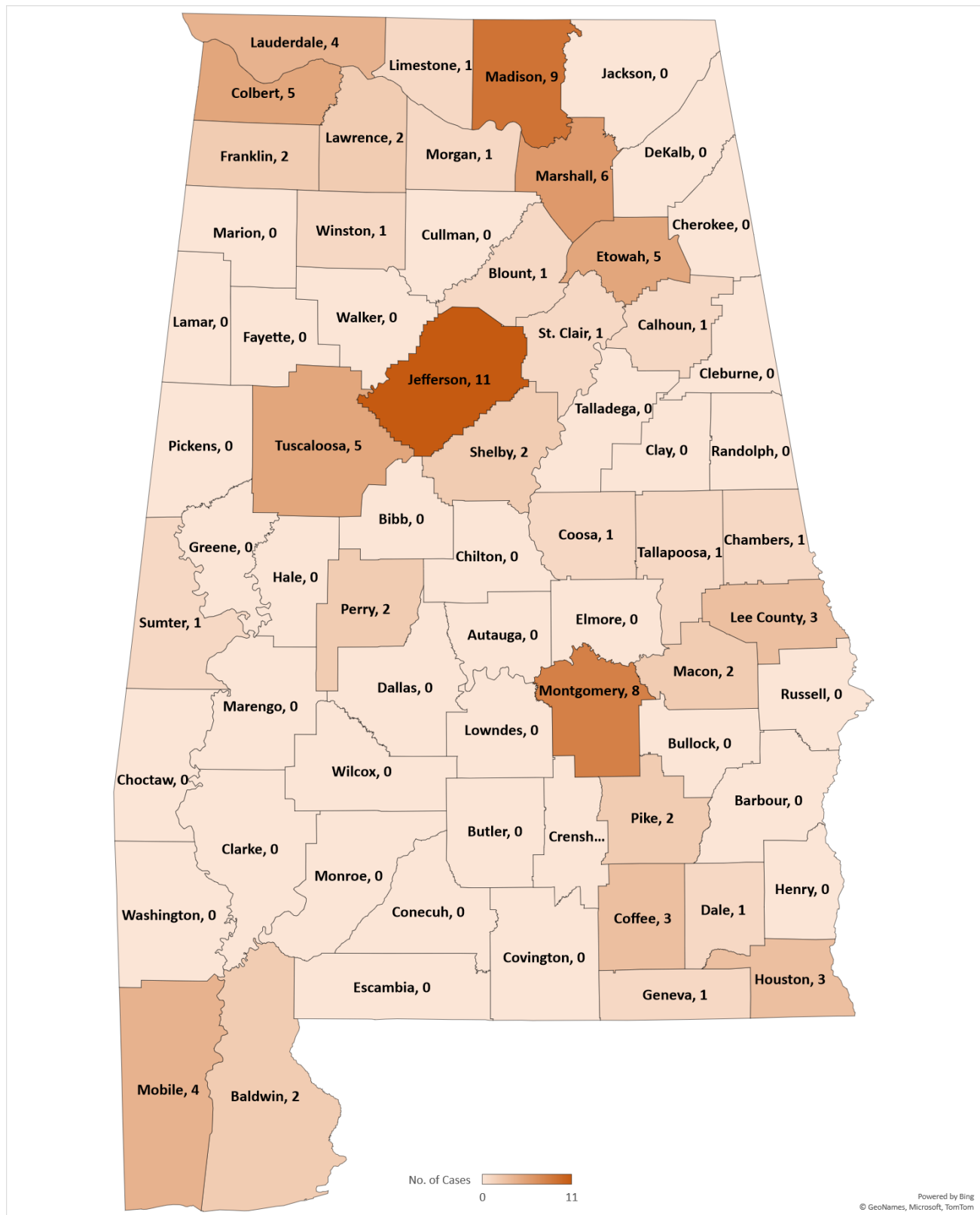
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024

FIGURE 2: ALABAMA TB INCIDENCE RATES COMPARED TO UNITED STATES, 2004 - 2023



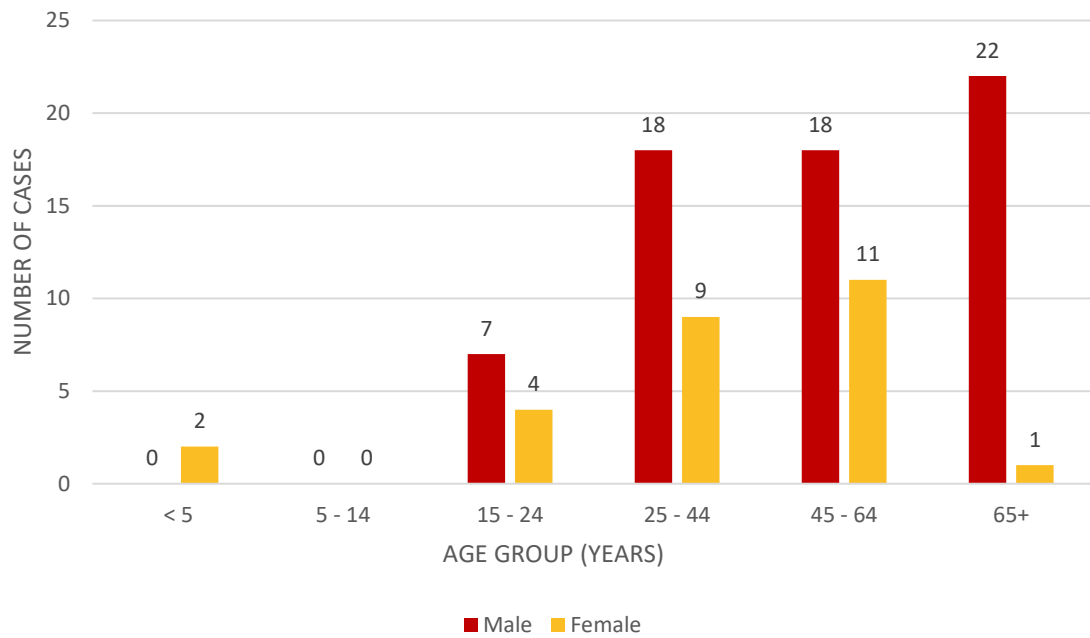
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024. United States incidence rate was obtained from the CDC at cdc.gov/tb/statistics/tbcases.htm as of October 15, 2024.

Figure 3: TB CASES BY COUNTY, 2023 (N = 92)



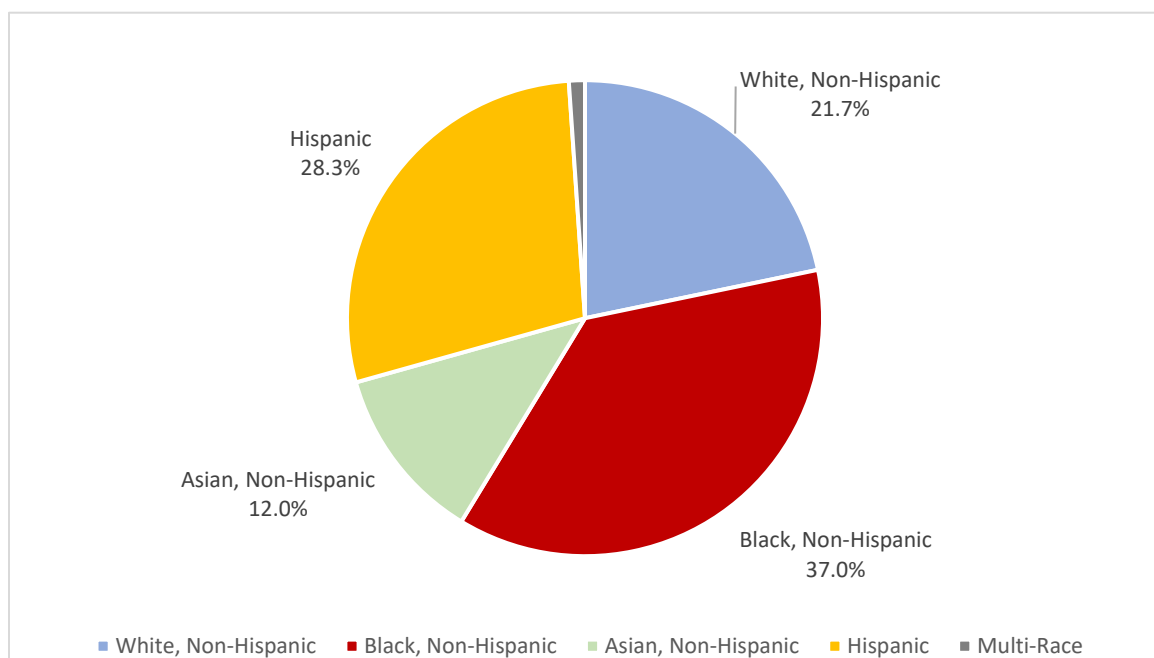
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

FIGURE 4: TB CASES BY AGE AND SEX, 2023 (N = 92)



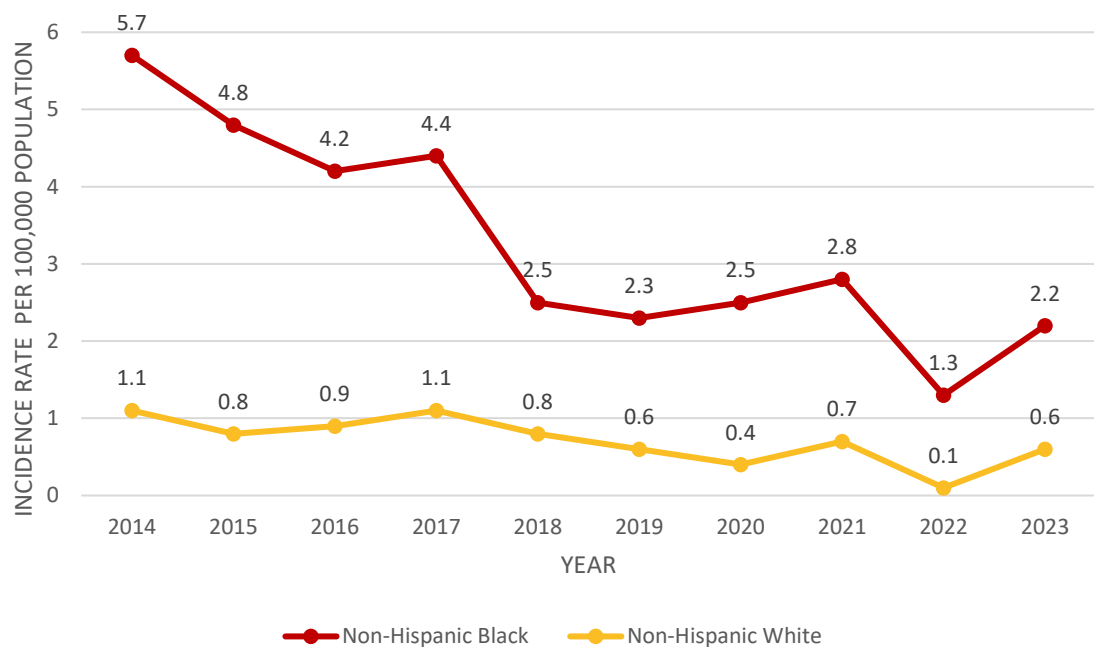
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

FIGURE 5: TB CASES BY RACE/ETHNICITY, 2023 (N = 92)



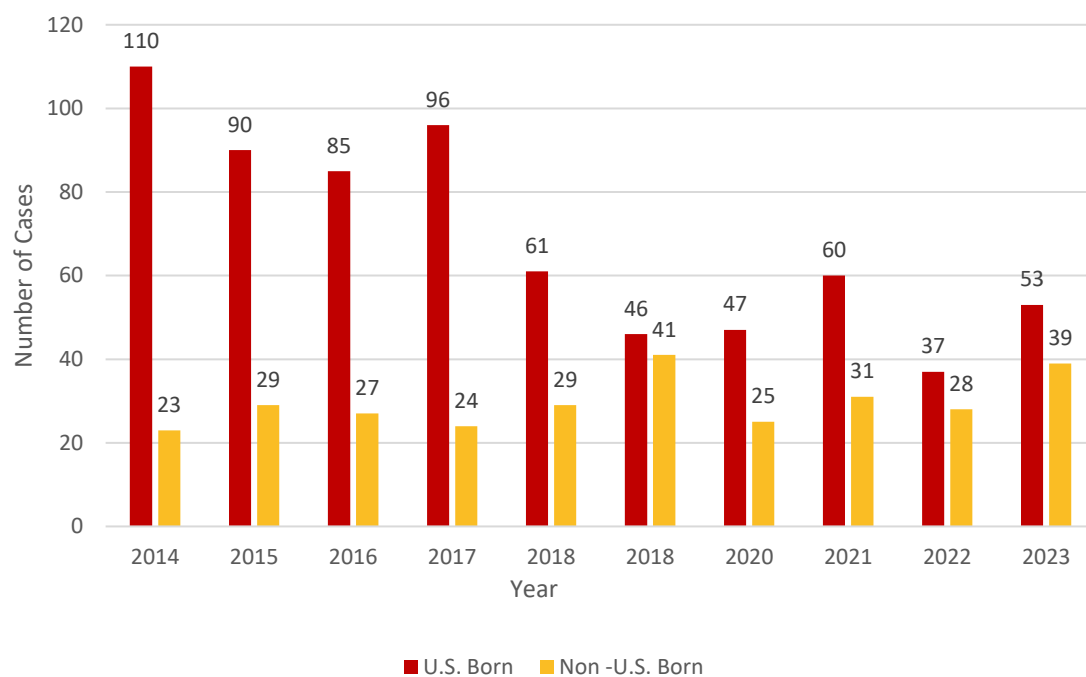
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

FIGURE 6: TB INCIDENCE RATES*AMONG NON-HISPANIC BLACK AND NON-HISPANIC WHITE PERSONS, 2014 - 2023



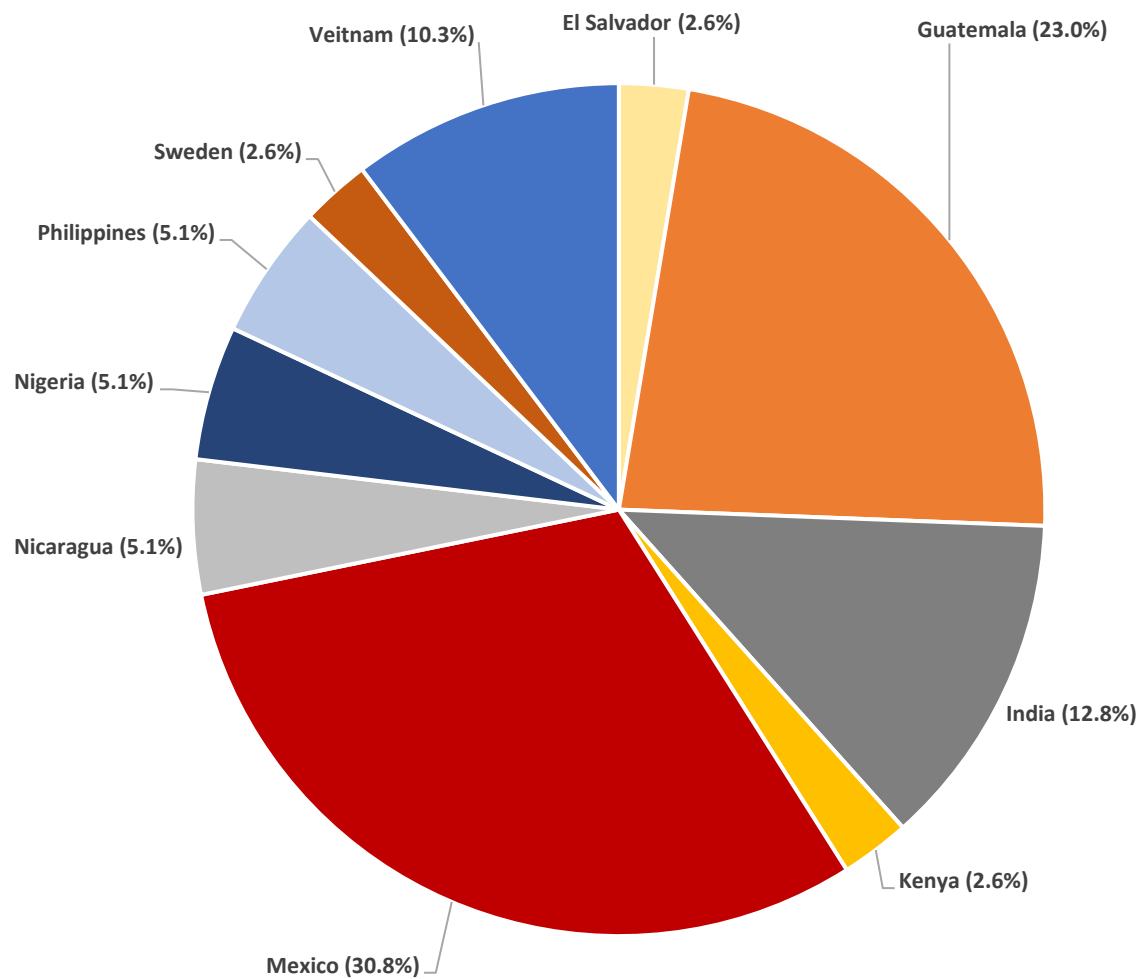
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

FIGURE 7: U.S.-BORN AND NON-U.S.-BORN TB CASES, 2014 - 2023



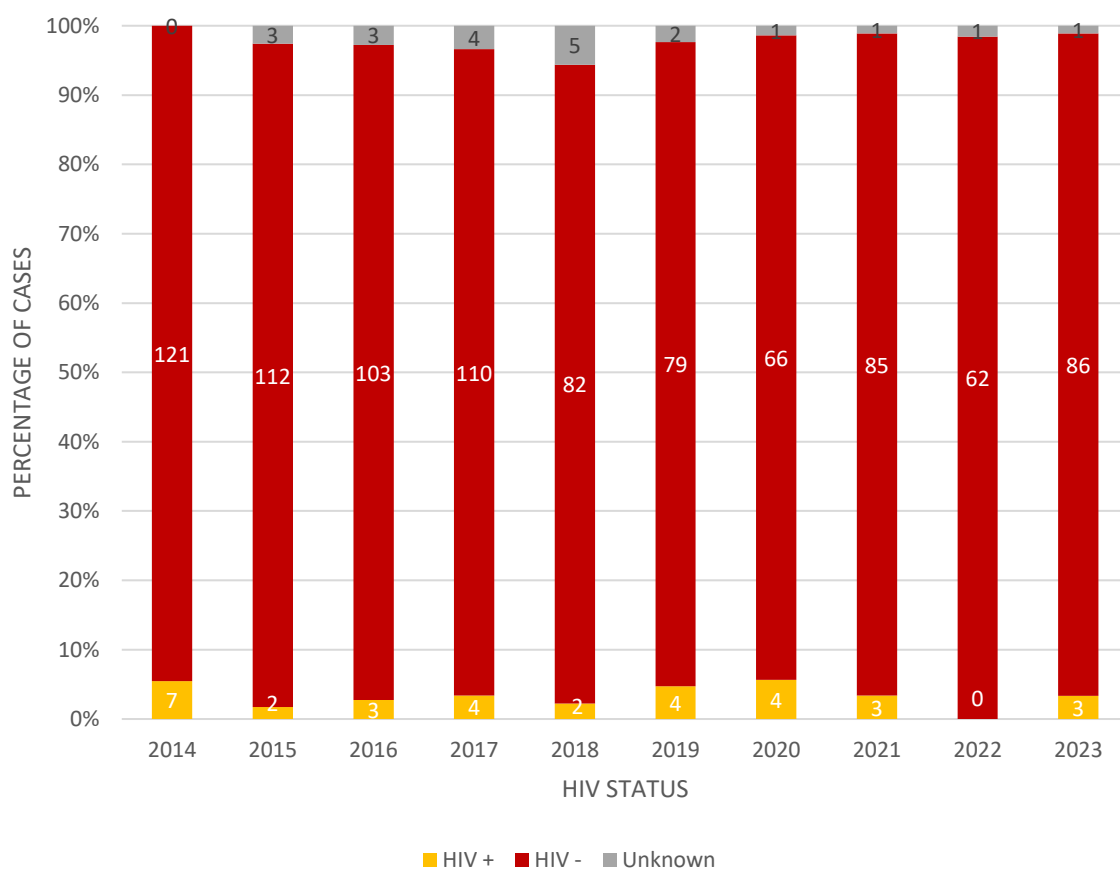
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

FIGURE 8: COUNTRY OF ORIGIN FOR NON-U.S.-BORN TB CASES, 2023 (N=39)



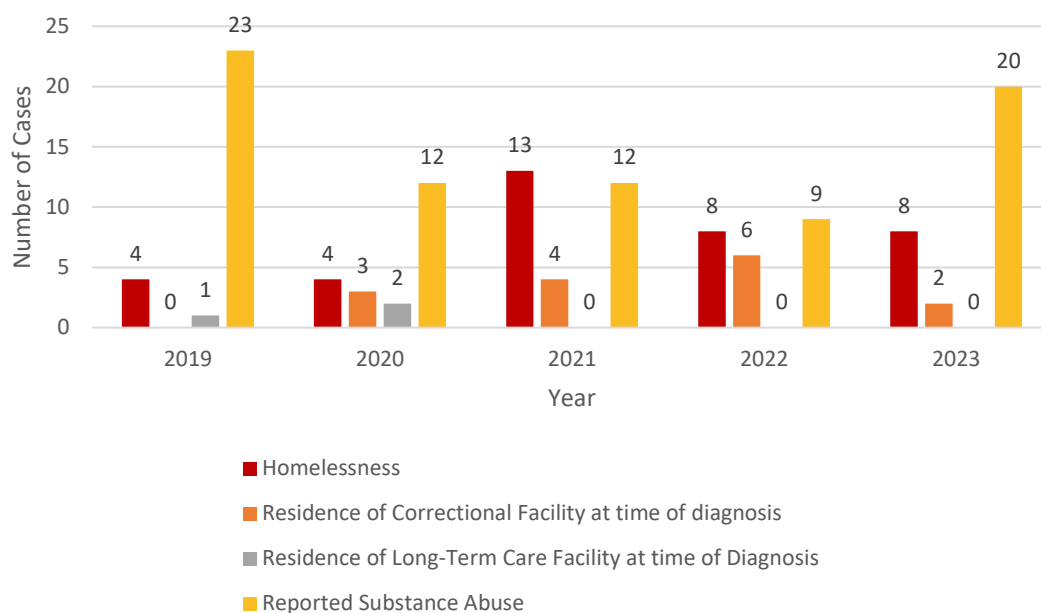
Data Source: Case counts were obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

FIGURE 9: HIV STATUS OF TB CASES, 2014-2023



Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

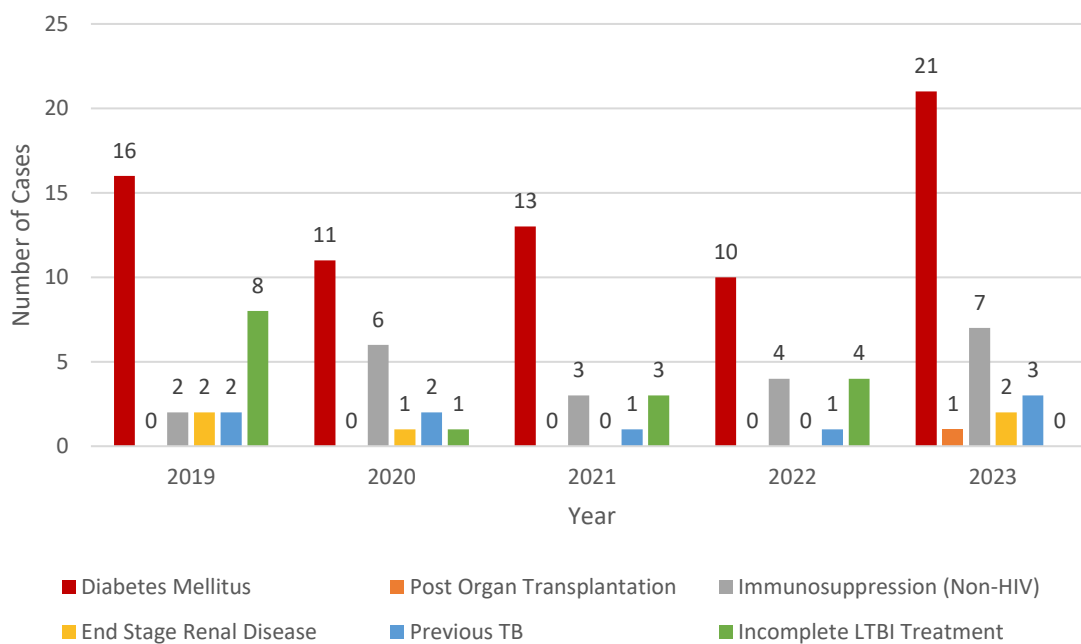
Figure 10: SOCIAL RISK FACTORS AMONG TB PATIENTS, 2019-2023



*Substance abuse consist of heavy alcohol use, non-injecting drugs use and injecting drug uses within the past 12 months prior to TB diagnosis

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

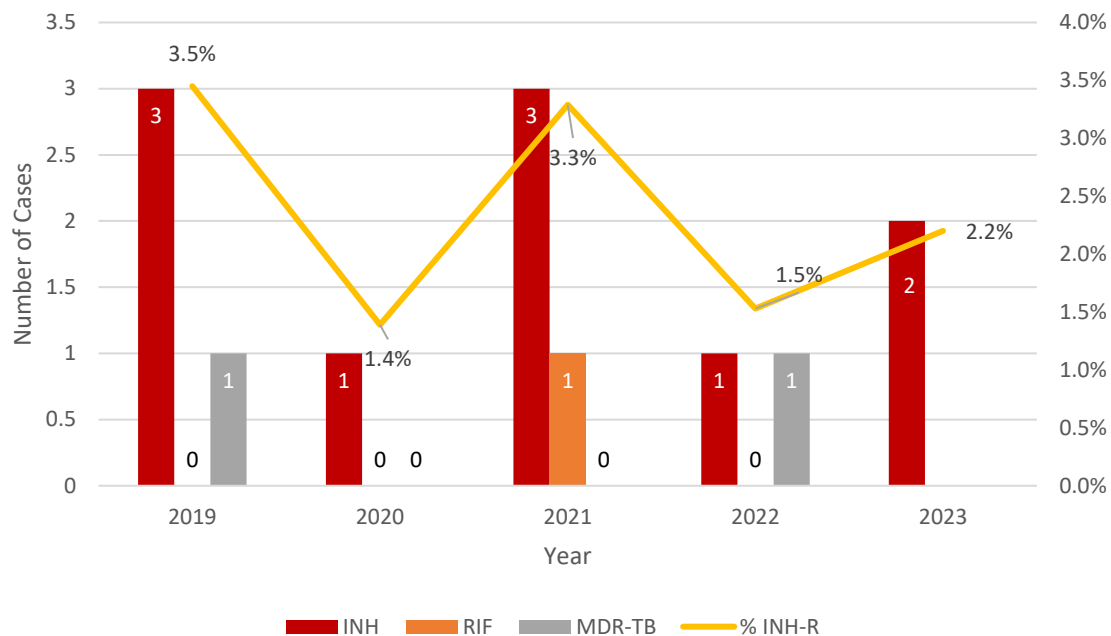
Figure 11: MEDICAL RISK FACTORS AMONG TB PATIENTS, 2019-2023



*Substance abuse consist of heavy alcohol use, non-injecting drugs use and injecting drug uses within the past 12 months prior to TB diagnosis

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

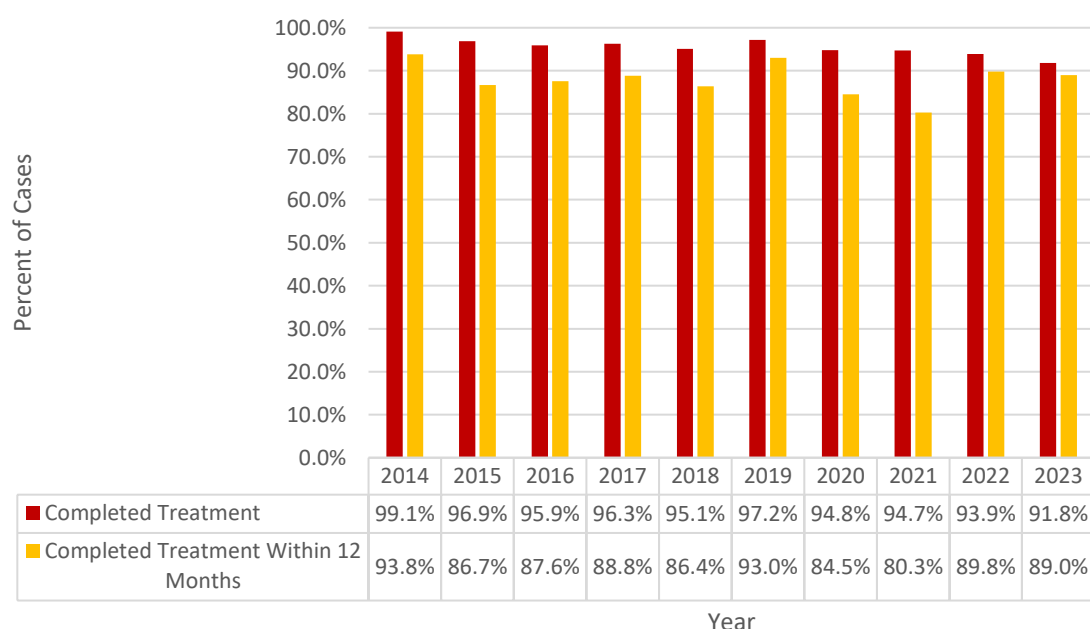
FIGURE 12: PRIMARY DRUG RESISTANCE (INH-R)* AND MULTI-DRUG RESISTANT TB (MDR-TB), 2019-2023**



*Having no previous diagnosis of TB and having resistance of INH at first occurrence of disease; **having resistance to at least INH and RIF

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

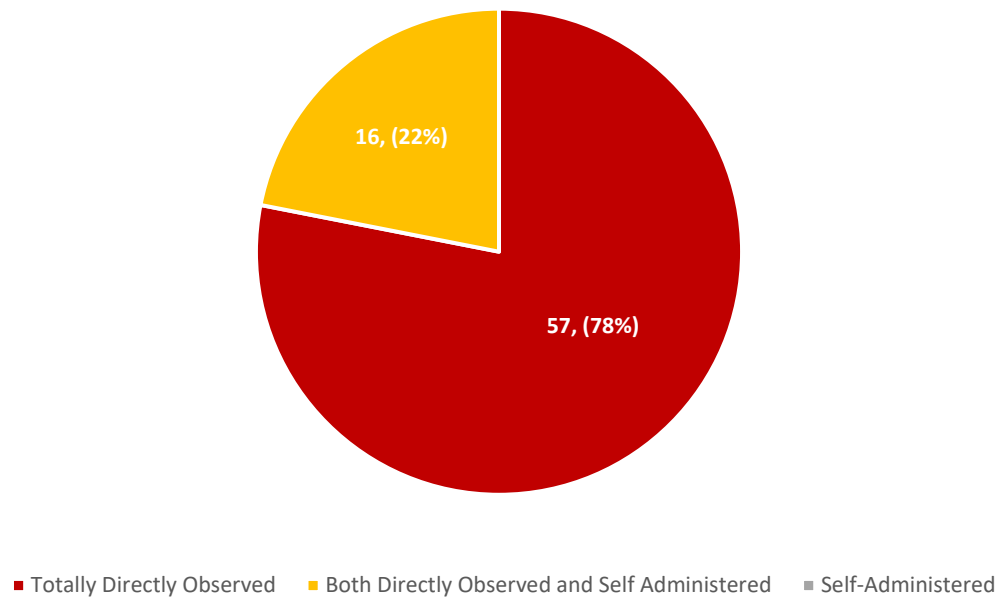
FIGURE 13: COMPLETION OF THERAPY, 2014 - 2023



Note: Completion of therapy include the completion of total prescribe medication in which TB is fully treated and prevents further spreading of *M. tuberculosis*. Figure includes persons alive at time of diagnosis, with initial drug regimen of one or more drugs prescribed, who did not die within one year of initiating treatment; excluding persons with initial rifampin-resistant isolate, patients with bone and joint diseases, meningeal disease of the central nervous system, or pediatric patients (ages 0 – 14 years) with military disease or positive blood culture nucleic acid amplification test on a blood specimen, and those who moved out of the country within one year of initiating treatment

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

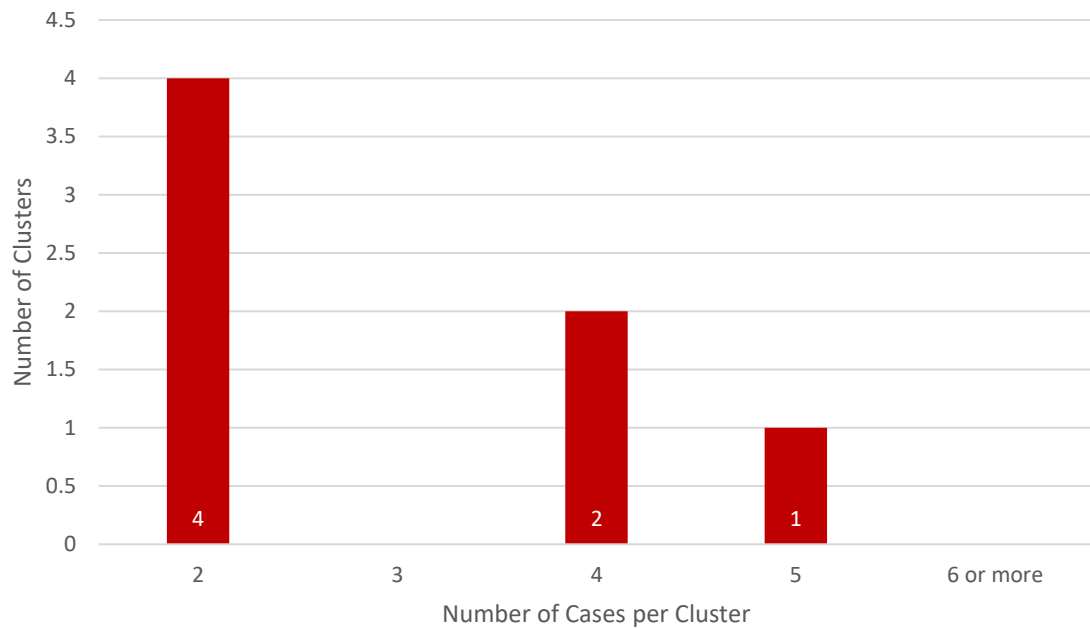
FIGURE 14: MODE OF TREATMENT ADMINISTRATION
AMONG PERSONS REPORTED WITH TB, 2023 (N=73*)



*Lab confirmed cases, non-clinically diagnosed cases

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of October 15, 2024.

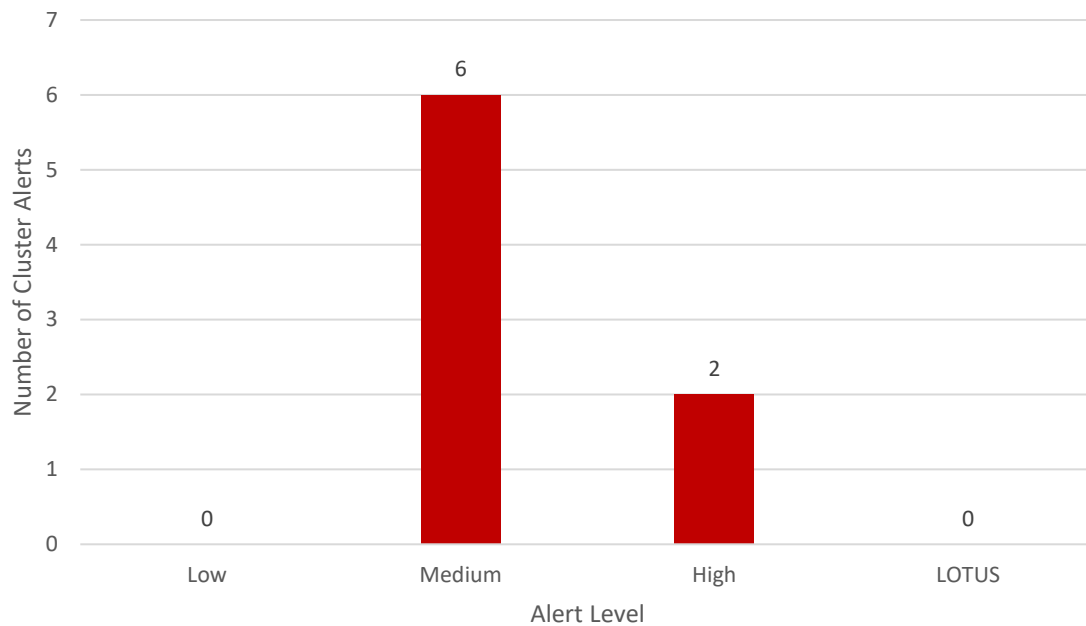
FIGURE 15: TB GENOTYPE CLUSTERS* BY CLUSTER SIZE, 2021 - 2023



*Genotype clusters are defined as two or more cases with matching spoligotype and 24-locus MIRU-VNTR (GENType) within the specified 3-year period in a geographic concentration of a county genotype cluster compared with the national average.

Data Source: Case counts was obtained from the Tuberculosis Genotyping Information Management System (TB GIMS) data as of October 15, 2024

**FIGURE 16: TB GENOTYPE CLUSTER ALERTS BY TB GIMS*
ALERT LEVEL, 2021-2023**



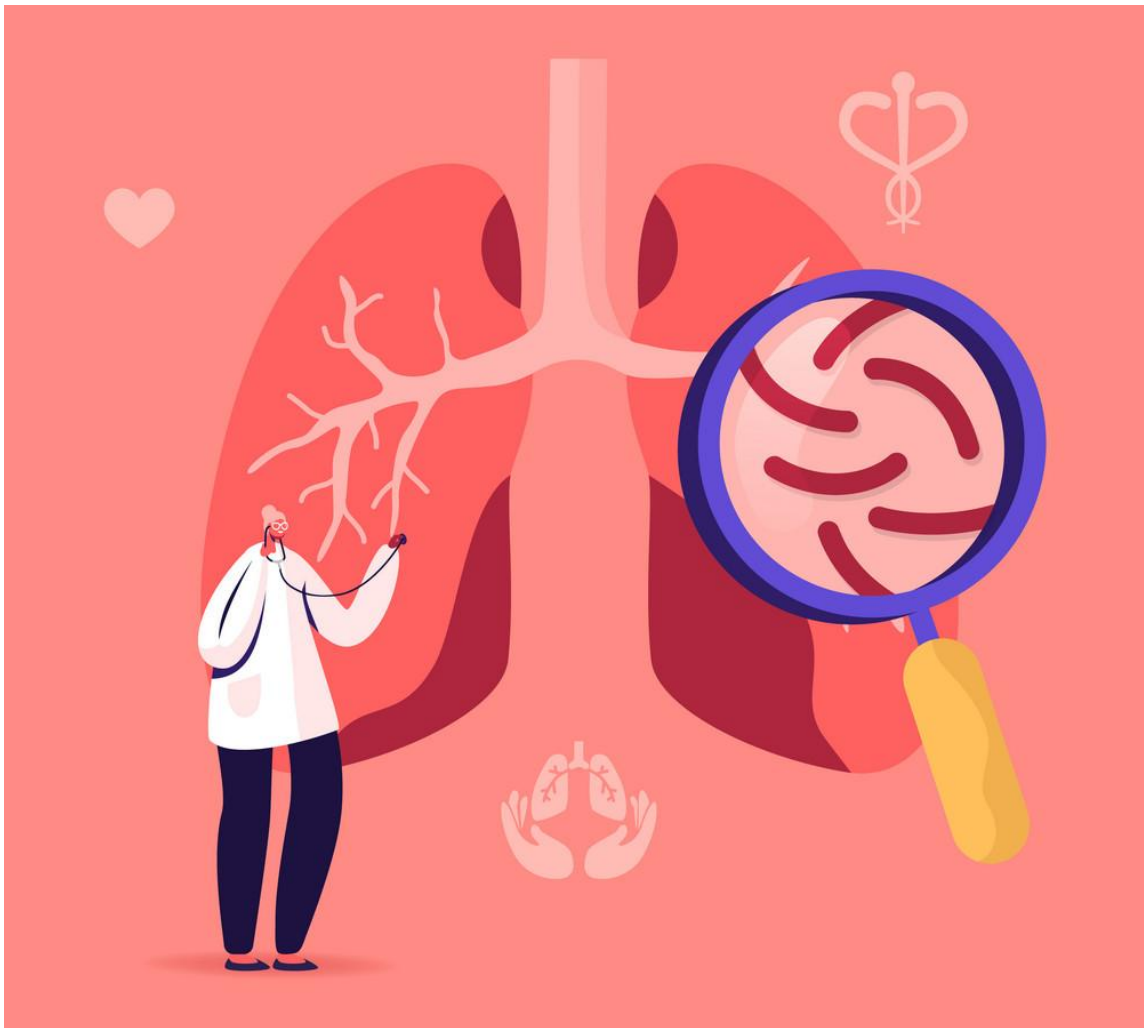
*Tuberculosis Genotyping Information Management System; According to the CDC, alert level is determined by the log likelihood ratio (LLR) for a given cluster, identifying higher than expected geospatial concentrations for a TB genotype cluster in a specific county, compared to the national distribution of that genotype. The Tuberculosis Genotyping Information Management System (TB GIMS) generates alert level notifications between $5 \leq 10$, and "high" alert is for clusters with $LLRs \geq 10$. LOTUS (Large Outbreak of Tuberculosis in the United States) alerts are generated when clusters of ≥ 10 genotype-matched cases within a 3-year period that related by recent transmission are identified.

Data Source: Case counts was obtained from the Tuberculosis Genotyping Information Management System (TB GIMS) data as of October 15, 2024

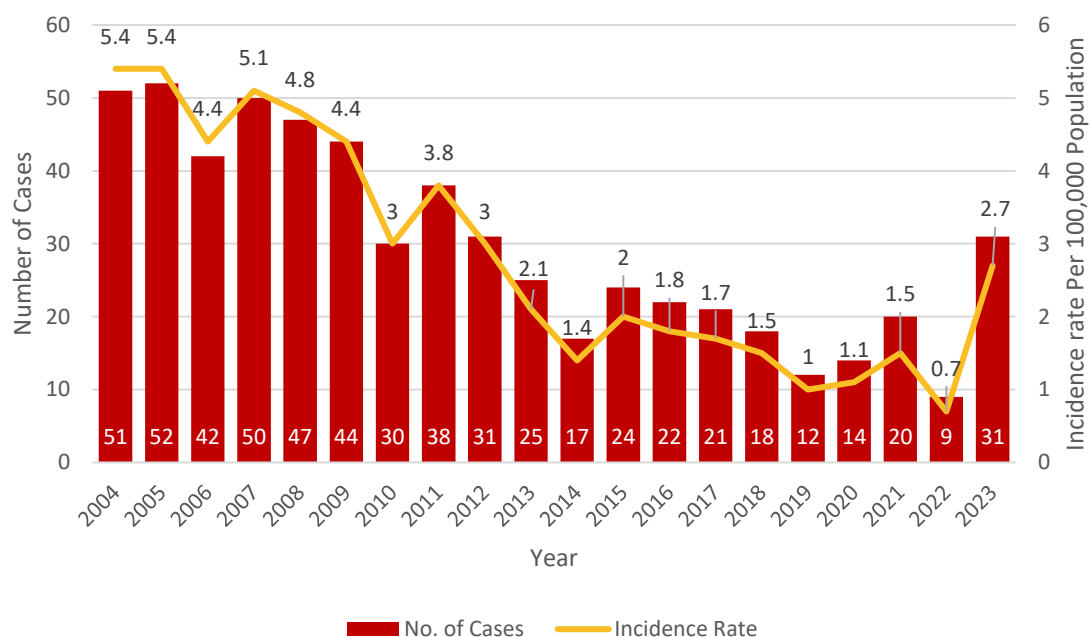
2004 – 2023

TUBERCULOSIS MORBIDITY TRENDS

BY PUBLIC HEALTH DISTRICT



NORTHERN PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2004 – 2023, N=31



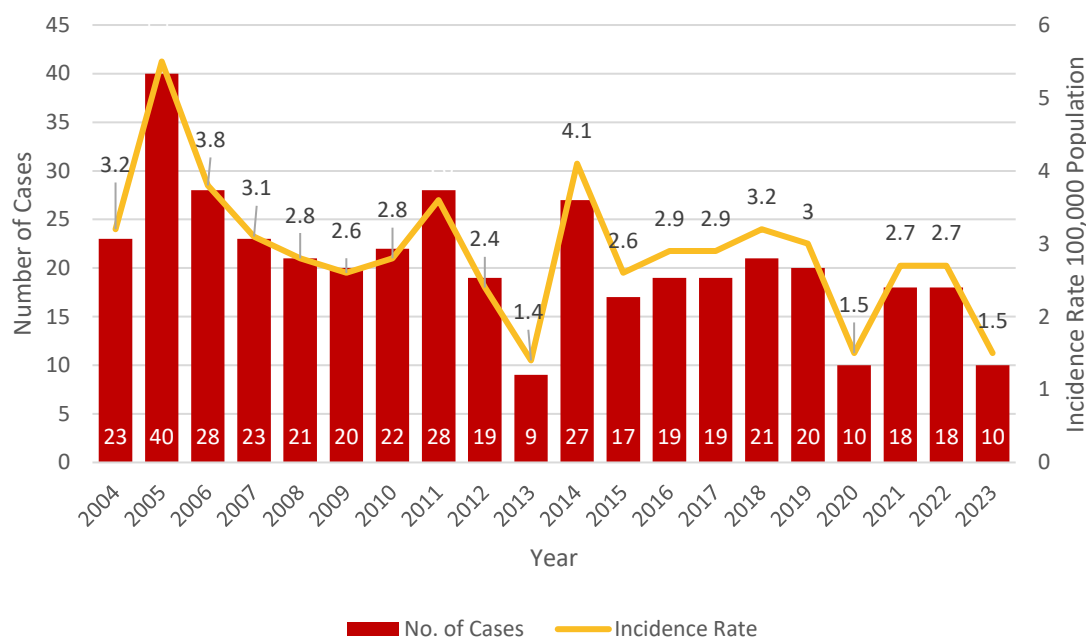
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

DEMOGRAPHICS AND RISK FACTORS, 2023

Sex		Nativity		SITE	
Male	22	U.S. Born	19	Pulmonary	31
Female	9	Non – U.S.-Born	12	Extra-Pulmonary	0
Age		Risk			
< 5	1	Homeless with 12 Months of Diagnosis			2
5-14	-	Resident of Correctional Facility at Diagnosis			0
15-24	7	Resident of Long-Term Care Facility at Diagnosis			0
25-44	10	Injecting Drug Use			0
45-64	8	Non-injecting Drug Use			4
65+	5	Heavy Alcohol Use			1
RACE/ETHNICITY					
Asian		4	Multi-Race	0	
Black		9	Hispanic	8	
White		10			

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

NORTHEASTERN PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2004 – 2023, N=10



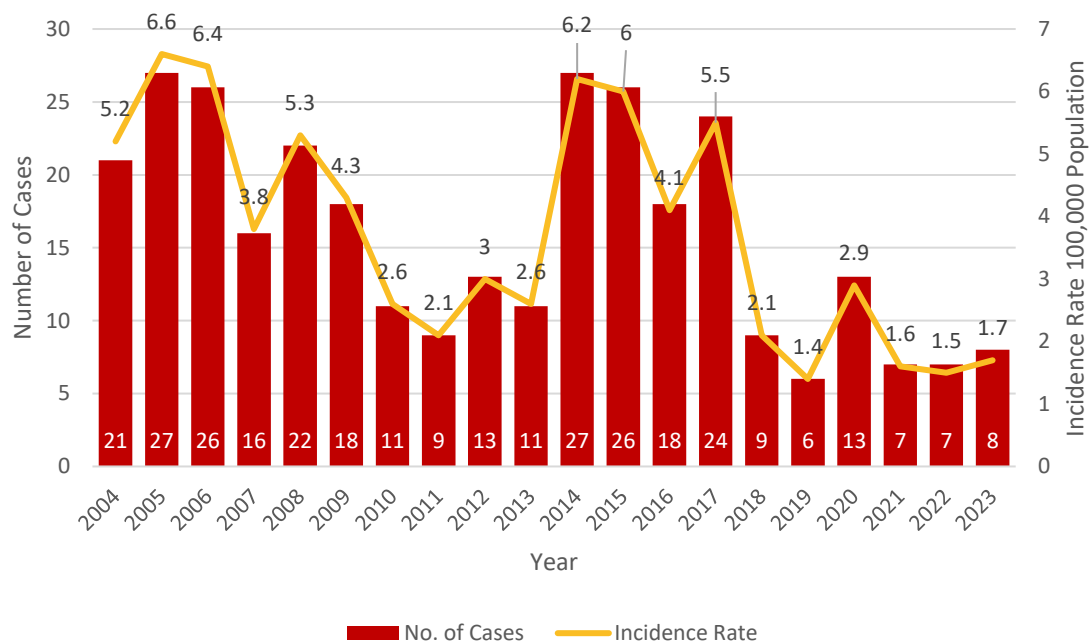
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

DEMOGRAPHICS AND RISK FACTORS, 2023

Sex		Nativity		SITE	
Male	8	U.S. Born	8	Pulmonary	9
Female	2	Non – U.S.-Born	2	Extra-Pulmonary	1
Age		Risk			
< 5	-	Homeless with 12 Months of Diagnosis			2
5-14	-	Resident of Correctional Facility at Diagnosis			1
15-24	-	Resident of Long-Term Care Facility at Diagnosis			0
25-44	2	Injecting Drug Use			0
45-64	3	Non-injecting Drug Use			2
65+	5	Heavy Alcohol Use			1
RACE/ETHNICITY					
Asian		0	Multi-Race	0	
Black		5	Hispanic	2	
White		3			

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

WEST CENTRAL PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2004 – 2023, N=8



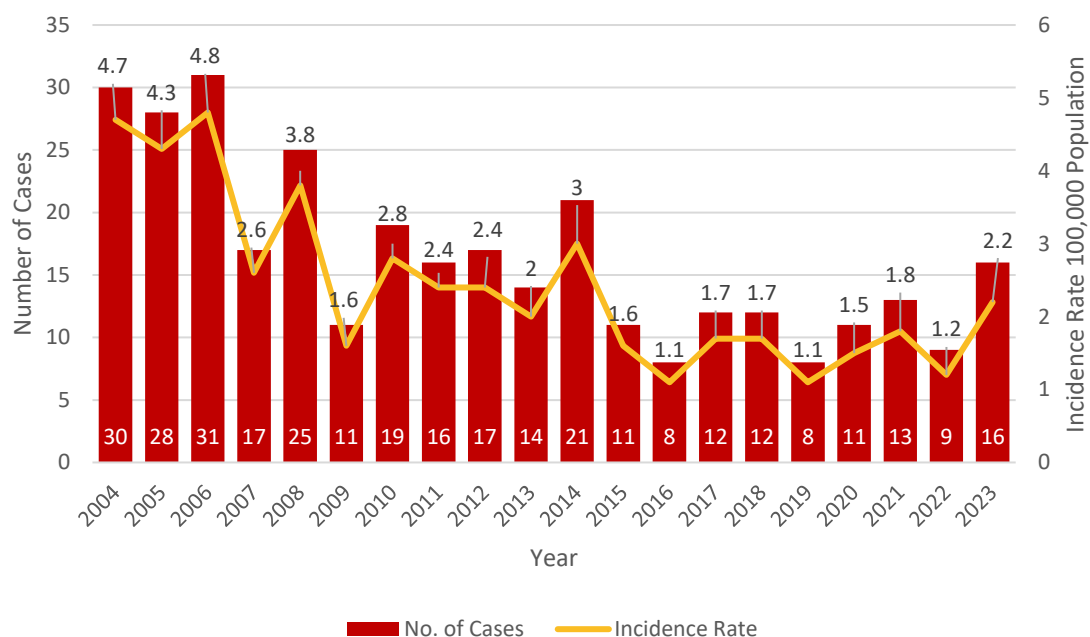
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

DEMOGRAPHICS AND RISK FACTORS, 2023

Sex		Nativity		SITE	
Male	6	U.S. Born	5	Pulmonary	7
Female	2	Non – U.S.-Born	3	Extra-Pulmonary	1
Age		Risk			
< 5	-	Homeless with 12 Months of Diagnosis			0
5-14	-	Resident of Correctional Facility at Diagnosis			0
15-24	1	Resident of Long-Term Care Facility at Diagnosis			0
25-44	0	Injecting Drug Use			0
45-64	5	Non-injecting Drug Use			0
65+	2	Heavy Alcohol Use			0
RACE/ETHNICITY					
Asian	1	Multi-Race	0		
Black	5	Hispanic	2		
White	0				

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

EAST CENTRAL PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2004 – 2023, N=16



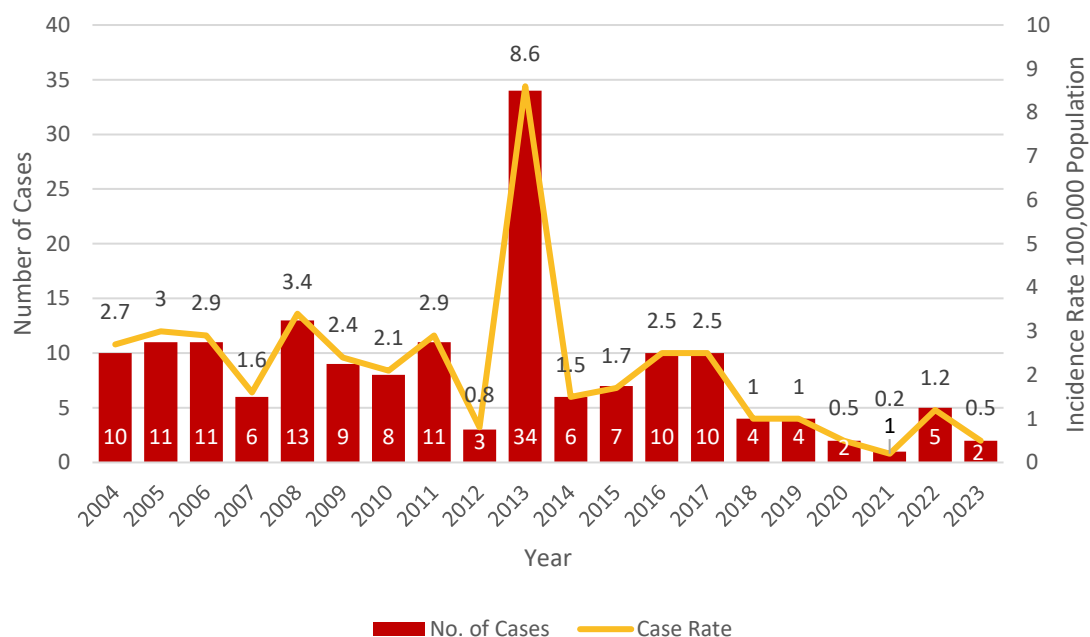
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

DEMOGRAPHICS AND RISK FACTORS, 2023

Sex		Nativity		SITE	
Male	9	U.S. Born	5	Pulmonary	13
Female	7	Non – U.S.-Born	11	Extra-Pulmonary	3
Age		Risk			
< 5	-	Homeless with 12 Months of Diagnosis			1
5-14	-	Resident of Correctional Facility at Diagnosis			1
15-24	3	Resident of Long-Term Care Facility at Diagnosis			0
25-44	6	Injecting Drug Use			0
45-64	4	Non-injecting Drug Use			0
65+	3	Heavy Alcohol Use			0
RACE/ETHNICITY					
Asian		4	Multi-Race		0
Black		5	Hispanic		6
White		1			

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

SOUTHWESTERN PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2004 – 2024, N=2



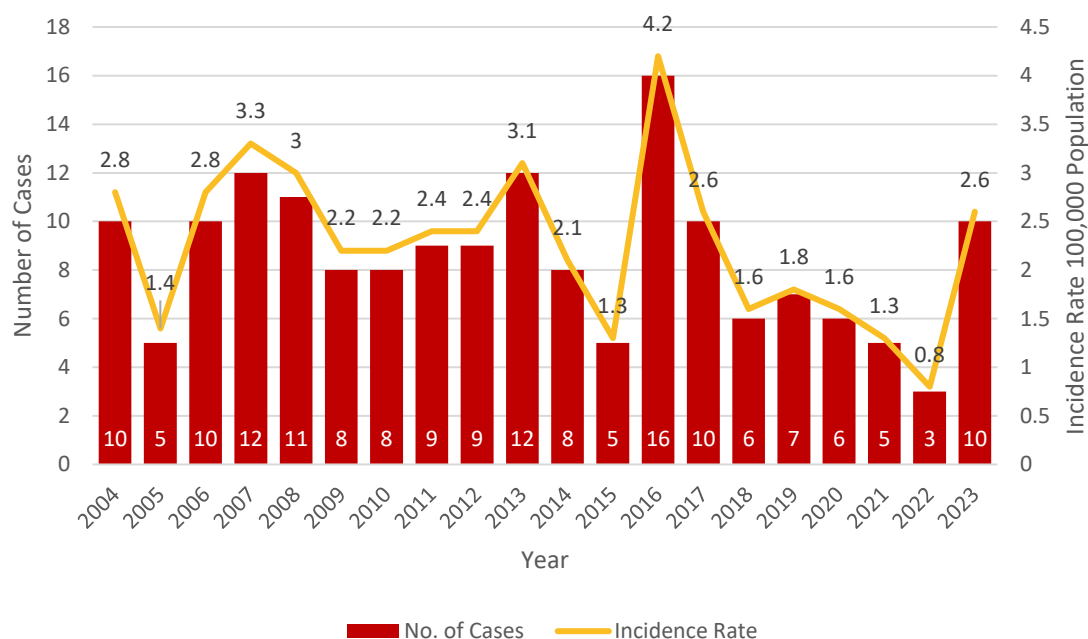
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

DEMOGRAPHICS AND RISK FACTORS, 2023

Sex		Nativity		SITE	
Male	2	U.S. Born	1	Pulmonary	2
Female	0	Non – U.S.-Born	1	Extra-Pulmonary	0
Age		Risk			
< 5	-	Homeless with 12 Months of Diagnosis			0
5-14	-	Resident of Correctional Facility at Diagnosis			0
15-24	-	Resident of Long-Term Care Facility at Diagnosis			0
25-44	-	Injecting Drug Use			0
45-64	-	Non-injecting Drug Use			0
65+	2	Heavy Alcohol Use			0
RACE/ETHNICITY					
Asian		0	Multi-Race	0	
Black		0	Hispanic	1	
White		1			

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

SOUTHEASTERN PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2004 – 2023, N=10



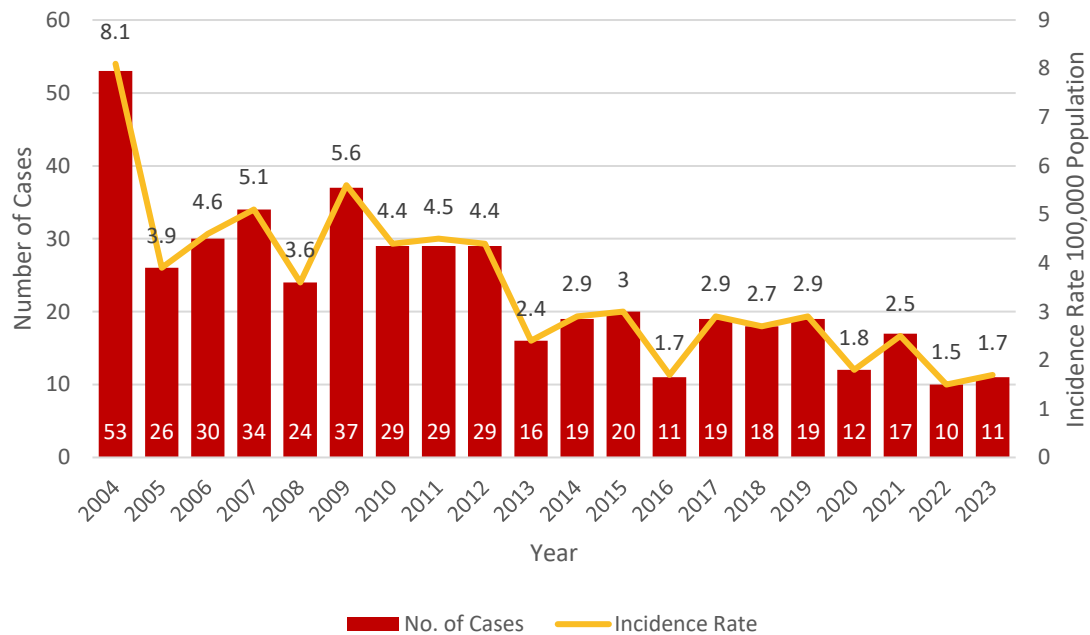
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

DEMOGRAPHICS AND RISK FACTORS, 2023

Sex		Nativity		SITE	
Male	6	U.S. Born	7	Pulmonary	8
Female	4	Non – U.S.-Born	3	Extra-Pulmonary	2
Age		Risk			
< 5	1	Homeless with 12 Months of Diagnosis			3
5-14	0	Resident of Correctional Facility at Diagnosis			0
15-24	0	Resident of Long-Term Care Facility at Diagnosis			0
25-44	4	Injecting Drug Use			0
45-64	4	Non-injecting Drug Use			4
65+	1	Heavy Alcohol Use			5
RACE/ETHNICITY					
Asian		1	Multi-Race		0
Black		5	Hispanic		3
White		1			

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

JEFFERSON PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2004 – 2024, N=11



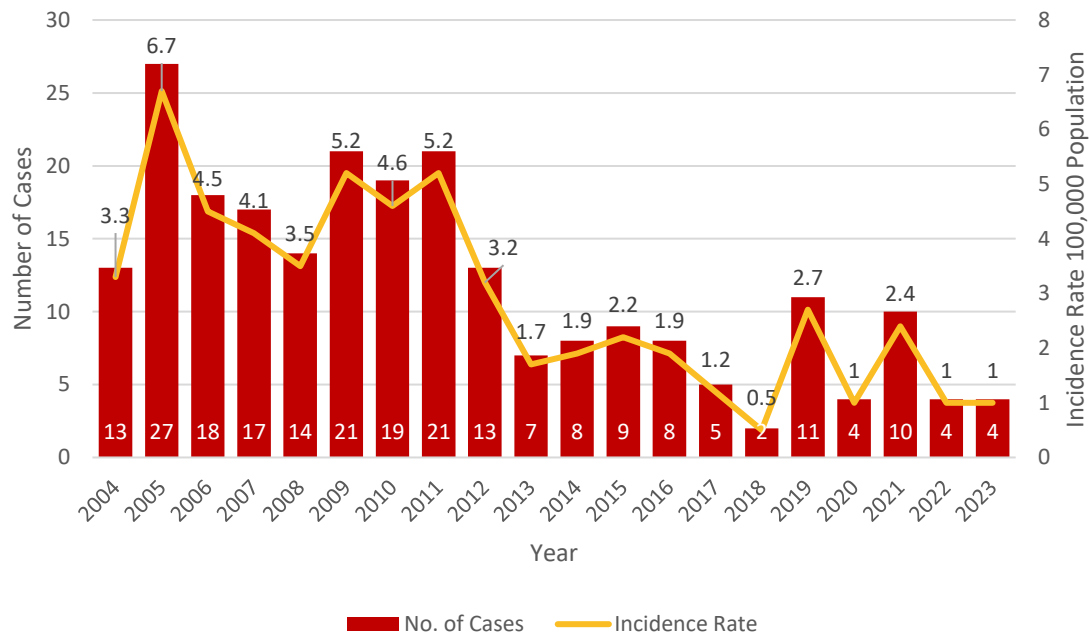
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

DEMOGRAPHICS AND RISK FACTORS, 2023

Sex		Nativity		SITE	
Male	8	U.S. Born	6	Pulmonary	8
Female	3	Non – U.S.-Born	5	Extra-Pulmonary	3
Age		Risk			
< 5	-	Homeless with 12 Months of Diagnosis			0
5-14	-	Resident of Correctional Facility at Diagnosis			0
15-24	-	Resident of Long-Term Care Facility at Diagnosis			0
25-44	5	Injecting Drug Use			0
45-64	3	Non-injecting Drug Use			2
65+	3	Heavy Alcohol Use			2
RACE/ETHNICITY					
Asian	0	Multi-Race	1		
Black	4	Hispanic	3		
White	3				

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

MOBILE PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2004 – 2023, N=4



Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.

DEMOGRAPHICS AND RISK FACTORS, 2023

Sex		Nativity		SITE	
Male	4	U.S. Born	2	Pulmonary	3
Female	0	Non – U.S.-Born	2	Extra-Pulmonary	1
Age		Risk			
< 5	-	Homeless with 12 Months of Diagnosis			0
5-14	-	Resident of Correctional Facility at Diagnosis			0
15-24	-	Resident of Long-Term Care Facility at Diagnosis			0
25-44	-	Injecting Drug Use			0
45-64	2	Non-injecting Drug Use			0
65+	2	Heavy Alcohol Use			0
RACE/ETHNICITY					
Asian		1	Multi-Race	0	
Black		1	Hispanic	1	
White		1			

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of March 4, 2024.