2022

ANNUAL TUBERCULOSIS
SURVEILLANCE REPORT

ALABAMA DEPARTMENT OF PUBLIC HEALTH (ADPH)

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Acknowledgement

We would like to thank the district health office TB managers and coordinators, county health department staff, and state TB surveillance staff who collected and reported the data used in this annual report.

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Data Sources

1) Surveillance data were obtained from the Alabama NEDSS-Based System (ALNBS) as of September 14, 2023; 2) Census data were obtained from the U.S Census Bureau via https://www.census.gov/quickfacts/fact/table/AL/PST045222

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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 future TB disease.

TB Screening and Treatment

There are two tests that can be used to help detect TB infection: 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. A person 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 hepatoxicity 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 65 TB cases were reported in Alabama in 2022, representing a 28.6% decrease from 91 cases in 2021. In 2022, Alabama had a TB incidence rate (number of TB cases per 100,000 persons) of 1.3, representing a 29.1% decrease from the previous year's (2021) incidence rate of 1.8. (Figure 1).

In 2022, TB incidence by public health district ranged from 0.8 cases per 100,000 persons in the Northern and Southeastern districts to 2.2 cases per 100,000 persons in the Northeastern district. Three health districts (Northeastern, West Central, and Jefferson) reported higher incidence rate than the overall state incidence rate in 2022 (Table 2). Northeastern and Jefferson districts reported 20 & 17 cases respectively in 2022, accounting for 43.1% of reported cases statewide (Table 2).

Of the 65 TB cases reported in Alabama in 2022, 28 (43.1%) were non-U.S.- born (Figure 8). The top four countries of origin for non-U.S.- born persons reported with TB disease in Alabama were Guatemala, India, Mexico, and Vietnam (Figure 9). TB cases among persons born in these countries accounted for over half (64.3%) of the total cases among non-U.S.- born persons in Alabama.

HIV status was reported for 96.9% of Alabama TB cases in 2022. Among the 64 cases with a known HIV status, none were reported as positive for HIV infection (Figure 10). Persons living in congregate settings such as prisons, long term care facilities, homeless shelters etc., are at high risk for TB exposure. In 2022, 8 cases (12.3%) cases reported experiencing homelessness within the twelve months before diagnosis. 6 cases (9.2%) were diagnosed with TB while residing in a correctional facility (Figure 10). In 2022, there was one case of multidrug-resistant TB (resistant to Isoniazid (INH), RIFAMPIN (RIF), Pyrazinamide (PZA), and Ethambutol (EMB)), one cases resistant to INH, and one case resistant to PZA diagnosed in Alabama (Table 4).

In 2022, Alabama completed 60 contact investigations. Among the 2,295 identified contacts of TB cases reported in 2022, 727 (31.7%) completed a medical evaluation, and 35 (4.8%) were diagnosed with latent tuberculosis infection (LTBI). Of the 35 contacts diagnosed with LTBI, 33 (94.3%) started LTBI treatment and, of those, 27 (81.8%) completed LTBI treatment. *

*All 2022 contact investigation data are preliminary

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 65 TB cases in 2022. This represents 28.6% decrease from the 91 TB cases reported in 2021 (Figure 1). The number of TB cases in Alabama has decreased by 74.8% since 2003 (Figure 2). The TB Incidence rate in Alabama for 2022 is 1.3 cases per 100,000 persons. This incidence is lower than the national incidence rate of 2.5 cases per 100,000 persons reported for 2022. According to CDC, Alabama ranked 20th highest for the number of new TB cases and ranked 24th highest for TB incidence rate (per 100,000 population) among the 50 reporting states for 2022.

Geographic Distribution

Among the 67 counties in Alabama, three counties in Alabama reported the highest number of TB cases in 2022: Jefferson (10 cases), Etowah (8 cases), and Montgomery (5 cases) (Table 2). These three counties accounted for a total of 35.4% of all TB cases reported in Alabama in 2022. Figure 3 shows the geographic distribution of TB cases by county in 2022.

Each of the eight public health districts have responsibility for TB control in their assigned counties. In 2022, the Northeastern district had the highest TB incidence rate with 2.2 cases per 100,000 population, followed by West Central district and Jefferson district with an incidence rate of 1.5 cases per 100,000 population (Table 2).

Sex and Age Distribution

In 2022, TB cases in Alabama occurred predominantly among males (69.2%), compared to females (30.8%) (Figure 4). When stratified by age, the highest proportion of TB cases occurred among persons between the ages of 45-64 (33.8%) (Table 6). Among persons 45-64 years old, 18 cases (81.8%) were male and 4 cases (18.2%) were female (Figure 4). The age range of 45-64 has the highest incidence rate (1.7 per 100,000 persons), while the lowest incidence rate among age groups was among 5-14-year-old (0.2 per 100,000 persons) (Table 6).

Race/Ethnicity Distribution and TB Disparities

In 2022, Hispanic, and non-Hispanic Blacks accounted for 27.7%, and 26.2% of TB cases in Alabama, respectively accounting for 4.9%, and 26.8% of Alabama's population. Non-Hispanic Asians contribute to 12.3% of TB cases in 2022 (Figure 5). Non-Hispanic Asians had the highest TB incidence rate among race/ethnic groups (11.5 per 100,000), followed by Hispanics (7.2 per 100,00), non-Hispanic Blacks (1.3 per 100,000), and non-Hispanic Whites (0.7 per 100,000) (Table 7).

High-Risk Populations

Non-U.S.-Born Persons

TB among persons born outside of the U.S. accounted for 56.9% of TB cases with a known country of origin in Alabama in 2022. The majority of the non-U.S.-born cases reported in 2022 came from Guatemala (32.1%), followed by India (10.7%), Mexico (10.7%), and Vietnam (10.7%) – all countries where TB is endemic (Table 7, Figure 8). The three public health districts that reported more than half (67.9%) of the total number of non-U.S.-born TB cases in Alabama were Jefferson (8 cases), Northeastern (6 cases), and Northern (5 cases).

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 65 cases reported in 2022, none of the TB cases tested positive for HIV or reported having HIV. HIV testing was reported in 96.9% of the TB cases, with 1 (1.6%) case not having a test performed belonged to the 65 years and older 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 exposure due to a shared airspace, environment, crowding, and poor ventilation. In 2022, 8 (12.3%) TB cases in Alabama experienced homelessness within the past 12 months and 6 cases (9.2%) were residing in a correctional facility at the time of diagnosis. All six cases who were residing in a correctional facility were in a state prison. (Table 3, Figure 10).

Persons with Reported Substance Abuse

Substance abuse is the most reported behavioral risk factor among patients with 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 transmission in the community. In 2022, 9 (13.9%) TB cases, reported abuse of either illicit drugs or alcohol (Table 3, Figure 10).

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 spread through their bloodstream and cause complications and deadlier forms of TB disease, such as TB meningitis and disseminated TB than older children and adults. Moreover, potentially lethal forms of 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 2022, children younger than the age of 15 years old comprised 3.1% of TB cases, in Alabama. One case (0.3 per 100,000) was reported in children less than 5 years of age and 1 case (0.2 per 100,000) was reported in children aged 5-14 years old (Table 6, Figure 4). There was 1 pediatric case of TB meningitis in a 3-year-old.

Diagnosis and Treatment Outcomes

Initial Diagnosis, Treatment, and DOT

In Alabama, most cases are initially diagnosed with 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 2022 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 49 eligible TB cases counted in 2022, a total of 46 cases (93.9%) completed treatment and 44 cases (89.8%) completed treatment within 12 months of diagnosis (Table 5, Figure 12). 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 56 cases with available data on treatment administration collect in 2022, 34 cases (60.7%) received TB treatment entirely by DOT only and 22 cases (39.3%) were treated by a combination of DOT and self-administered therapy (Figure 13).

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 2022, 51 (78.46%) of the 65 TB cases had pulmonary TB. Of the 51 pulmonary TB cases, 27 cases (52.9%) were sputum AFB smear-positive, and 6 cases (5.9%) had cavitary diagnosis.

Drug Resistance

Drug Resistance

Among the 59 culture positive TB cases in Alabama, 54 cases (91.5%) were tested for initial drug susceptibility to all four of the first-line anti-TB medications. Of the 54 tested isolates from cases with no previous history of TB, 1 case (1.5%) had primary resistance to INH only, 1 case (1.5%) had primary resistance to PZA only, and 1 case (1.5%) had multidrug-resistant (MDR)(Table 4).

MDR-TB is caused when the TB bacteria is resistant to at lease INH and RIF (Figure 11). 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 fluroquinolone 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 2020 - 2022, there were 16 clusters of various sizes in Alabama (Figure 14). Figure 15 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≤ 10, and a high alert is for clusters with LLRs ≥ 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.

TABLES AND FIGURES

TABLE 1: TUBERCULOSIS (TB) CASES AND INCIDENCE RATES* BY COUNTY, 2021 - 2022

COUNTY	2021		2022	
	CASES	RATE*	CASES	RATE*
Autauga	0	0.0	0	0.0
Baldwin	1	0.4	0	0.0
Barbour	1	4.0	0	0.0
Bibb	0	0.0	0	0.0
Blount	0	0.0	0	0.0
Bullock	1	9.7	0	0.0
Butler	1	5.3	0	0.0
Calhoun	1	0.9	1	0.9
Chambers	1	2.9	0	0.0
Cherokee	0	0.0	0	0.0
Chilton	0	0.0	0	0.0
Choctaw	0	0.0	1	8.0
Clarke	0	0.0	2	8.9
Clay	1	7.0	0	0.0
Cleburne	0	0.0	0	0.0
Coffee	1	1.8	0	0.0
Colbert	0	0.0	0	0.0
Conecuh	0	0.0	0	0.0
Coosa	0	0.0	0	0.0
Covington	0	0.0	1	2.7
Crenshaw	0	0.0	0	0.0
Cullman	1	1.1	1	1.1
Dale	0	0.0	0	0.0
Dallas	0	0.0	1	2.7
DeKalb	1	1.4	1	1.4
Elmore	0	0.0	2	2.2
Escambia	0	0.0	0	0.0
Etowah	8	7.8	8	7.8
Fayette	0	0.0	1	6.2

TABLE 1: TUBERCULOSIS (TB) CASES AND INCIDENCE RATES* BY COUNTY, 2021 - 2022

COUNTY	2021		2022	
	CASES	RATE*	CASES	RATE*
Franklin	2	6.2	1	3.1
Geneva	0	0.0	0	0.0
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	2	1.9
Jackson	1	1.9	1	1.9
Jefferson	17	2.5	10	1.5
Lamar	1	7.3	0	0.0
Lauderdale	1	1.1	0	0.0
Lawrence	0	0.0	0	0.0
Lee County	4	2.3	2	1.1
Limestone	5	4.7	1	0.9
Lowndes	0	0.0	0	0.0
Macon	0	0.0	0	0.0
Madison	3	0.8	1	0.2
Marengo	0	0.0	0	0.0
Marion	1	3.4	0	0.0
Marshall	3	3.1	2	2.0
Mobile	10	2.4	4	1.0
Monroe	0	0.0	1	5.2
Montgomery	6	2.6	5	2.2
Morgan	2	1.6	2	1.6
Perry	1	12.0	0	0.0
Pickens	0	0.0	0	0.0
Pike	0	0.0	0	0.0
Randolph	0	0.0	0	0.0
Russell	1	1.7	0	0.0
Shelby	5	5.4	4	1.7

TABLE 1: TUBERCULOSIS (TB) CASES AND INCIDENCE RATES* BY COUNTY, 2021 - 2022

COUNTY	2021		2022	
	CASES	RATE*	CASES	RATE*
St. Clair	0	0.0	2	2.1
Sumter	0	0.0	0	0.0
Talladega	2	2.5	2	2.5
Tallapoosa	0	0.0	0	0.0
Tuscaloosa	4	1.8	3	1.3
Walker	1	1.5	3	4.7
Washington	0	0.0	0	0.0
Wilcox	0	0.0	0	0.0
Winston	1	4.2	0	0.0
TOTAL	91	1.8	65	1.3

*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 September 14, 2023). 2) Rates were calculated using population estimates for denominator obtained from the U.S. Census Bureau via https://data.census.gov/all?q=population+in+alabama+in+2021

TABLE 2: TUBERCULOSIS (TB) CASES AND INCIDENCE RATES* BY PUBLIC HEALTH DISTRICT, 2021 - 2022

PUBLIC HEALTH DISTRICT	2021		2022	
	CASES	INCIDENCE*	CASES	INCIDENCE*
Northern	20	1.8	9	0.8
Northeastern	18	2.2	18	2.2
West Central	7	1.5	7	1.5
East Central	13	1.8	8	1.1
Southwestern	1	0.2	5	1.2
Southeastern	5	1.3	3	0.8
Jefferson	17	2.5	10	1.5
Mobile	10	2.4	5	1.2
TOTAL	91	1.8	65	1.3

*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 September 14, 2023). 2) Rates were calculated using population estimates for denominator obtained from the U.S. Census Bureau via https://data.census.gov/all?q=population+in+alabama+in+2021

TABLE 3: PERCENTAGE OF TB CASES WITH KNOWN TB RISK FACTORS BY PUBLIC HEALTH DISTRICTS, 2022

PUBLIC HEALTH DISTRICT	NON - U.S.-BORN (%)	HOMELESS IN THE PAST YEAR (%)	*RESISDENCE OF CORRECTIONAL FACILITY AT DIAGNOSIS (%)	+LONG TERM CARE FACILITY AT DIAGNOSIS (%)	#REPORTED SUBSTANCE ABUSE (%)
Northern	55.6	22.2	11.1	0.0	0.0
Northeastern	33.3	16.7	0.0	0.0	16.7
West Central	42.9	0.0	0.0	0.0	0.0
East Central	87.5	0.0	62.5	0.0	0.0
Southwestern	100.0	0.0	0.0	0.0	20.0
Southeastern	66.7	33.3	0.0	0.0	33.3
Jefferson	20.0	10.0	0.0	0.0	30.0
Mobile	40.0	0.0	0.0	0.0	20.0
TOTAL	43.1	12.3	9.2	0.0	12.3

*Correctional Facility: Patients was incarcerated or detained in a jail, prison, or other detention center when TB diagnostic evaluations was performed or initiated.

+Long Term Care Facility: Patient was/or reside in a long-term care facility at time of diagnostic evaluation was performed of initiated.

#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.

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

TABLE 4: PRIMARY RESISTANCE TO FIRST-LINE ANTI-TB MEDICATIONS, 2022

STATE	Isoniazid (INH)		Pyrazinamide (PZA)		Multi-Drug (INH, RIF, PZA and EMB)	
	CASES	PRECENT*	CASES	PRECENT*	CASES	PRECENT*
Alabama	1	1.5	0	0	1	1.5

*Percent of cases with completed drug susceptibility testing and no prior treatment with anti-TB medications (N=65)

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

TABLE 5: COMPLETION OF TB TREATMENT BY PUBLIC HEALTH DISTRICT, 2022 (N=65)*

Public Health District	Completion of TB Treatment (%)	Completion of TB Treatment Within 12 Months (%)
Northern	100.0	100.0
Northeastern	100.0	100.0
West Central	100.0	85.7
East Central	100.0	66.7
Southwestern	100.0	100.0
Southeastern	66.7	66.7
Jefferson	75.0	75.0
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 September 14, 2023.

TABLE 6: TB INCIDENCE RATES* BY AGE GROUP, 2018 - 2022

Age (Years)	2018 (N = 90)	2019 (N = 87)	2020 (N = 72)	2021 (N = 91)	2022 (N = 65)
< 5	1.7	0.3	1.0	1.7	0.3
5 – 14	0.5	0	0	0.2	0.2
15- 24	1.4	1.1	0.8	1.8	1.2
25 – 44	2.4	2.7	2.0	1.6	1.4
45 – 64	1.4	2.0	1.5	2.3	1.7
65+	3.3	2.4	2.1	2.6	1.6

*Rate per 100,000 population
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.
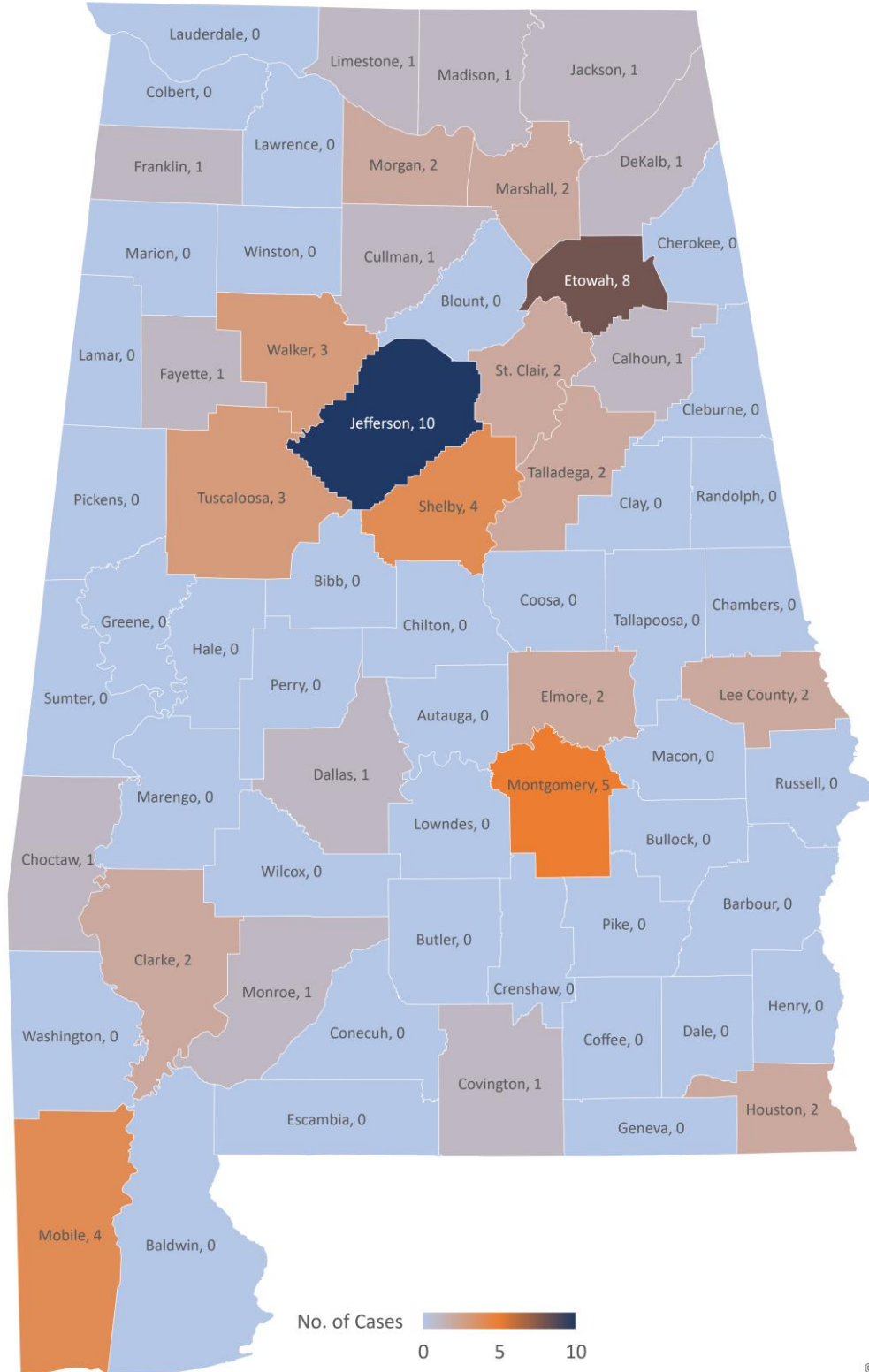
TABLE 7: TB CASE INCIDENCE* BY RACE/ETHNICITY, 2018-2022

	INCIDENCE RATE				
RACE/ETHNICITY	2018 (N = 90)	2019 (N = 87)	2020 (N = 72)	2021 (N = 91)	2022 (N = 65)
Asian, Non-Hispanic	18.4	22.7	15.0	17.4	11.5
Black, Non – Hispanic	2.5	2.3	2.5	2.8	1.3
White, Non – Hispanic	0	0	1.0	0.4	0.7
Multiracial, Non – Hispanic	0.8	0.6	0.4	0.7	0.7
Hispanic	9.0	9.1	5.3	8.0	7.2

*Rate per 100,000 population

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

Figure 1: TB CASES AND INCIDENCE RATES*, 2003 - 2022

*Rate per 100,000 population

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.
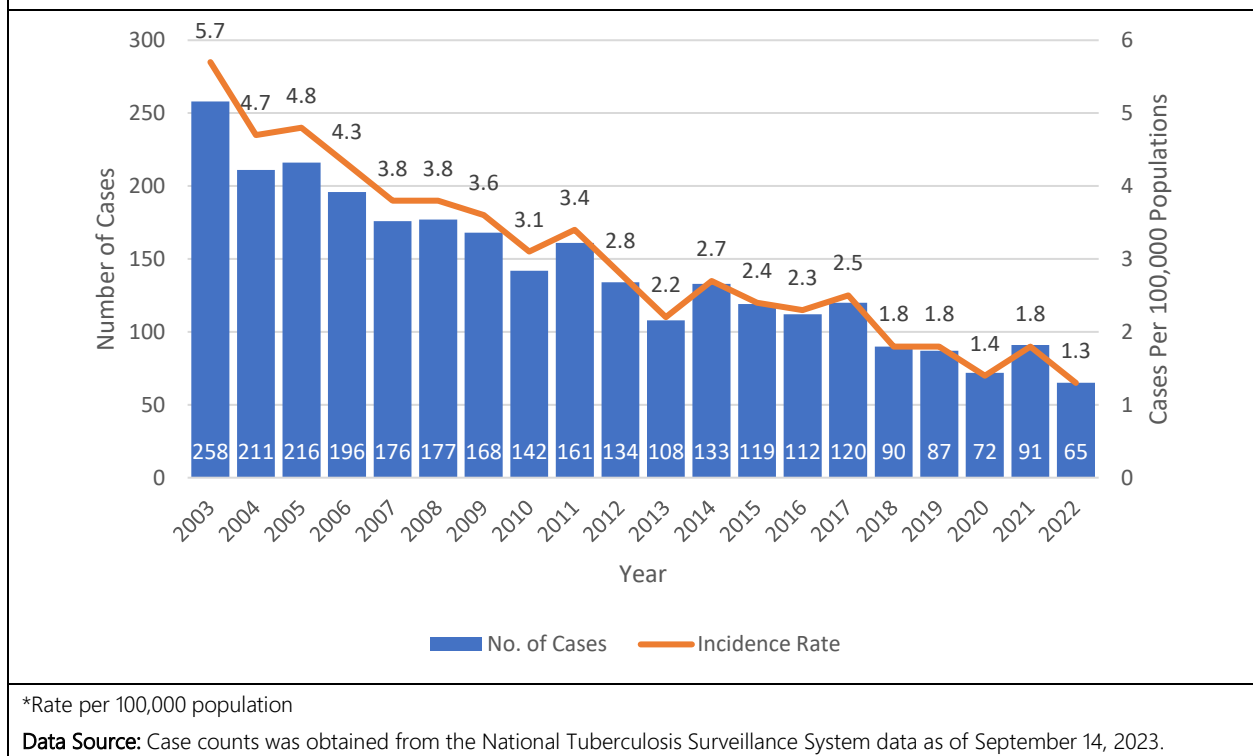
FIGURE 2: ALABAMA TB INCIDENCE RATES COMPARED TO UNITED STATES, 2003 - 2022
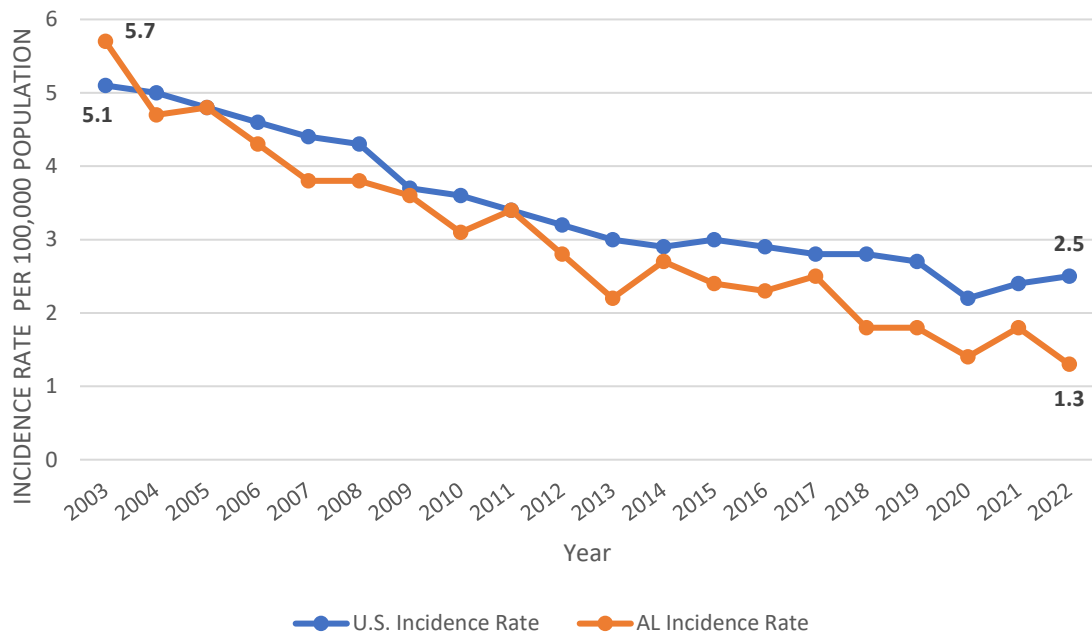
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023. United States incidence rate was obtained from the CDC at cdc.gov/tb/statistics/tbcases.htm as of September 14, 2023.

# Figure 3: TB CASES BY COUNTY, 2022 (N = 65)

Lauderdale, 0
Limestone, 1
Madison, 1
Jackson, 1
Colbert, 0
Lawrence, 0
Morgan, 2
DeKalb, 1
Franklin, 1
Marshall, 2
Marion, 0
Winston, 0
Cullman, 1
Cherokee, 0
Etowah, 8
Blount, 0
Lamar, 0
Walker, 3
St. Clair, 2
Calhoun, 1
Fayette, 1
Cleburne, 0
Jefferson, 10
Pickens, 0
Tuscaloosa, 3
Shelby, 4
Talladega, 2
Clay, 0
Randolph, 0
Bibb, 0
Coosa, 0
Tallapoosa, 0
Chambers, 0
Greene, 0
Chilton, 0
Hale, 0
Perry, 0
Elmore, 2
Lee County, 2
Sumter, 0
Autauga, 0
Macon, 0
Russell, 0
Marengo, 0
Dallas, 1
Montgomery, 5
Choctaw, 1
Lowndes, 0
Bullock, 0
Wilcox, 0
Barbour, 0
Pike, 0
Butler, 0
Clarke, 2
Monroe, 1
Crenshaw, 0
Henry, 0
Washington, 0
Conecuh, 0
Coffee, 0
Dale, 0
Covington, 1
Houston, 2
Escambia, 0
Geneva, 0
Mobile, 4
Baldwin, 0

No. of Cases

0   5   10

© GeoNames, Micros

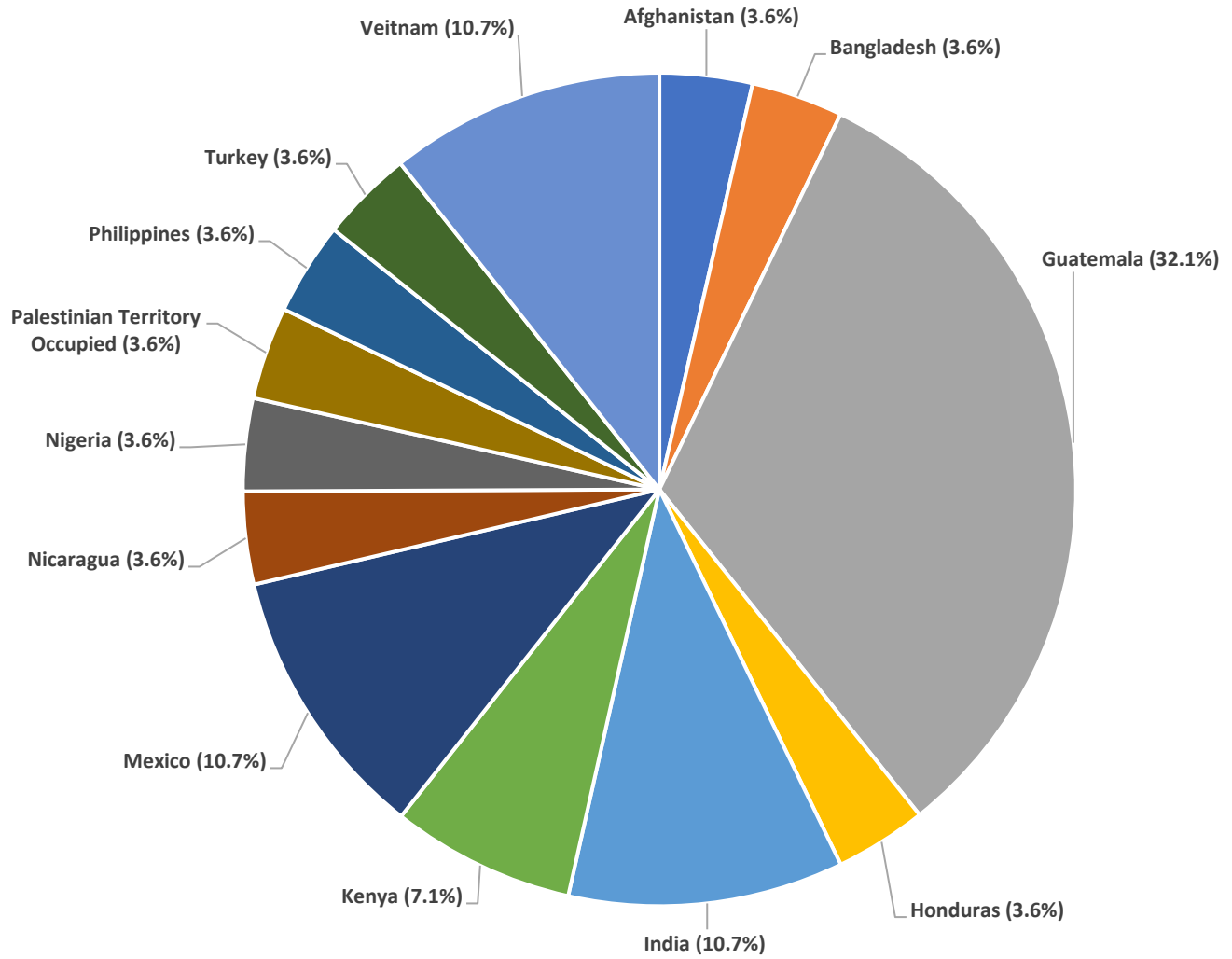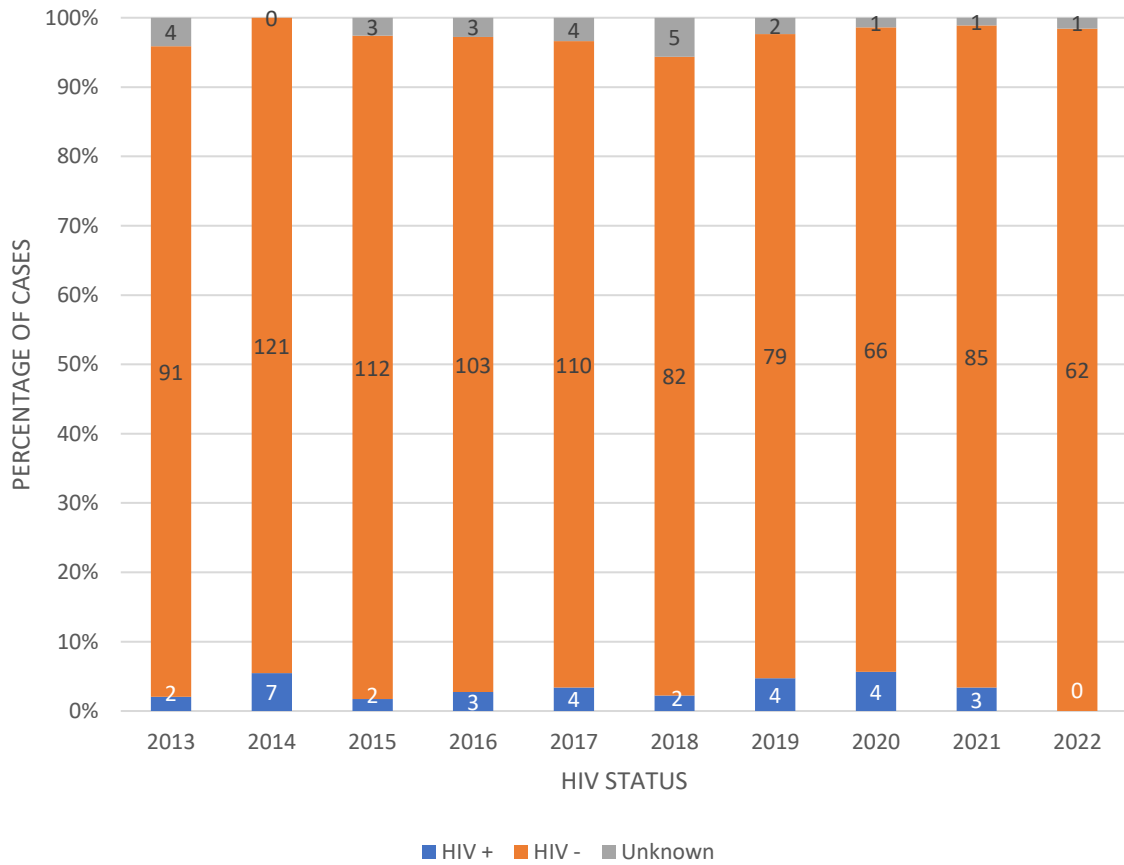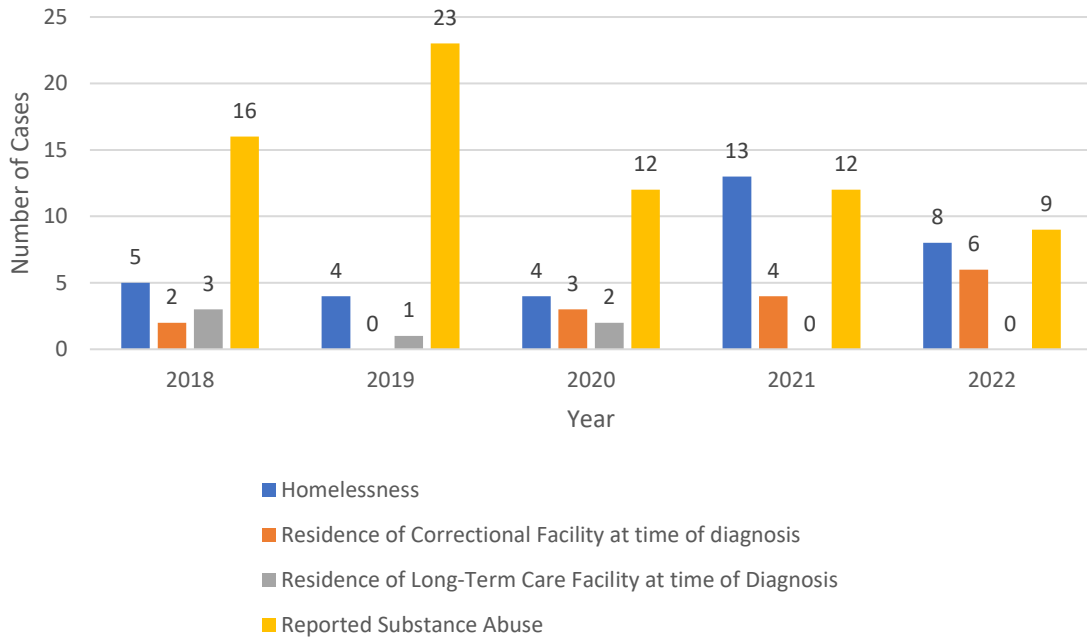**Data Source:** Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

FIGURE 4: TB CASES BY AGE AND SEX, 2022 (N = 65)
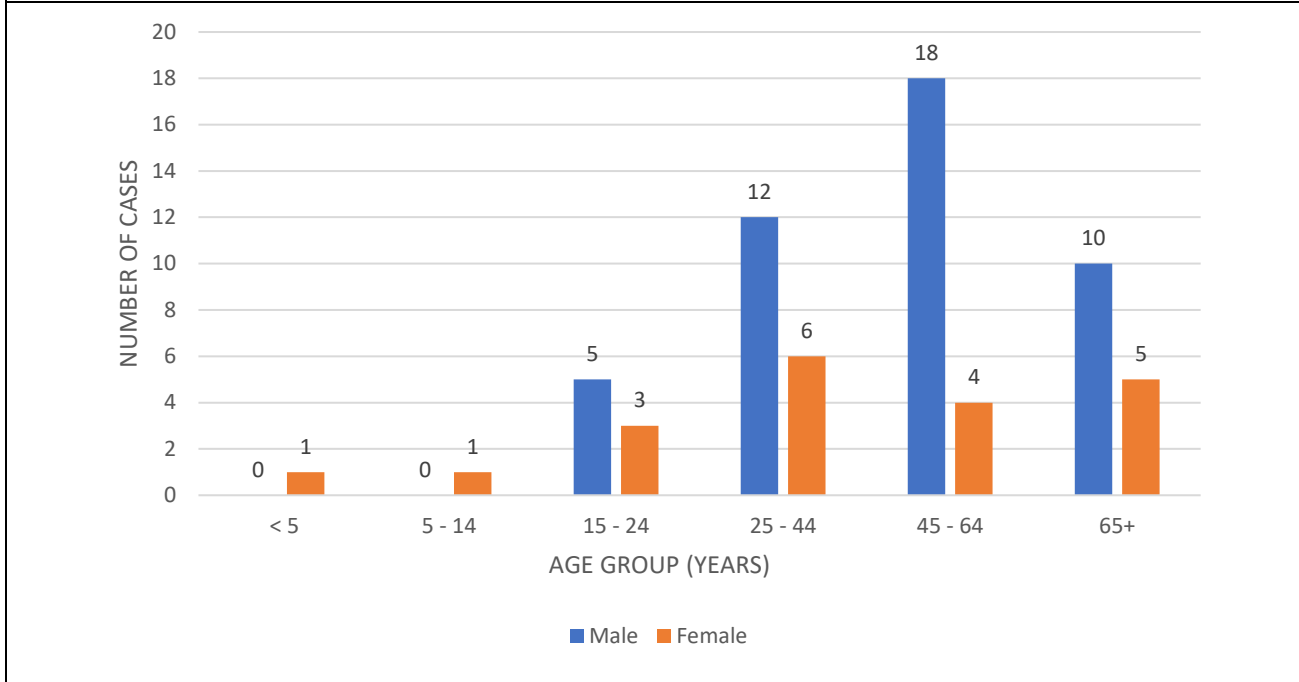
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

FIGURE 5: TB CASES BY RACE/ETHNICITY, 2022 (N = 65)
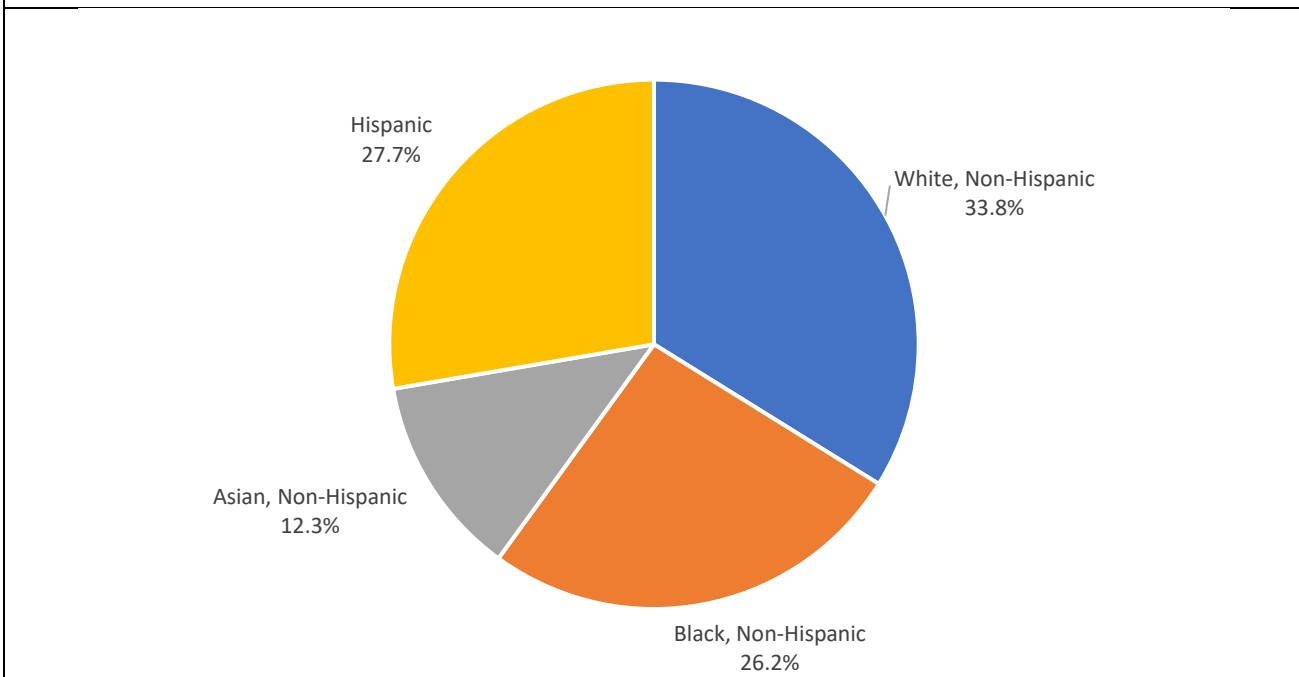
Hispanic
27.7%

White, Non-Hispanic
33.8%

Asian, Non-Hispanic
12.3%

Black, Non-Hispanic
26.2%

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

FIGURE 6: TB INCIDENCE RATES*AMONG NON-HISPANIC BLACK AND NON-HISPANIC WHITE PERSONS, 2013 - 2022
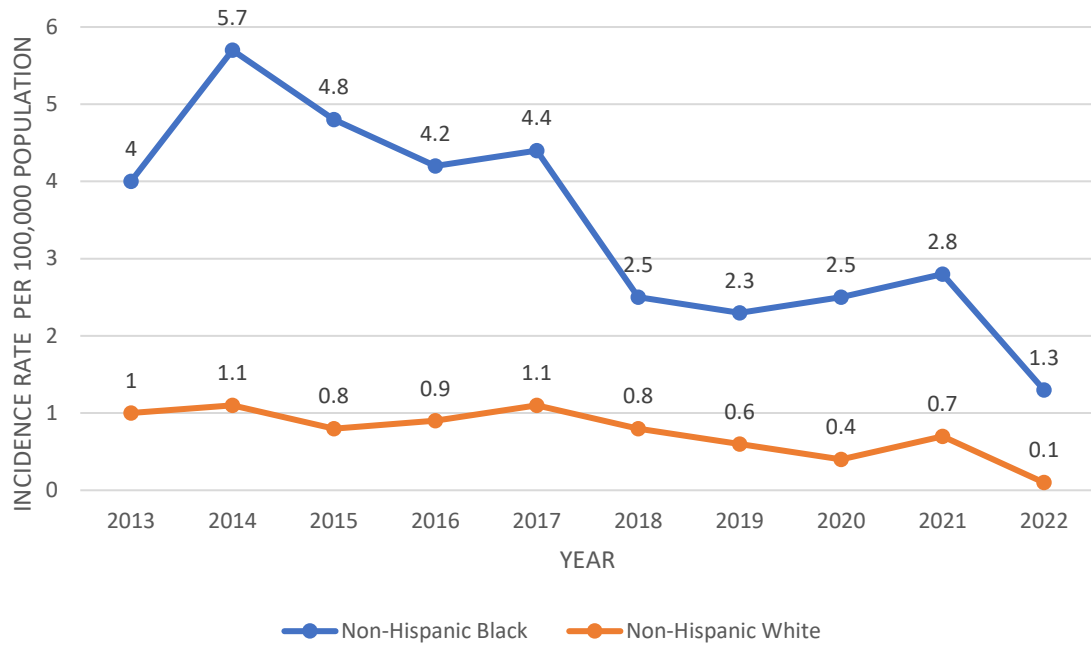
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

FIGURE 7: U.S.-BORN AND NON-U.S.-BORN TB CASES, 2013 - 2022
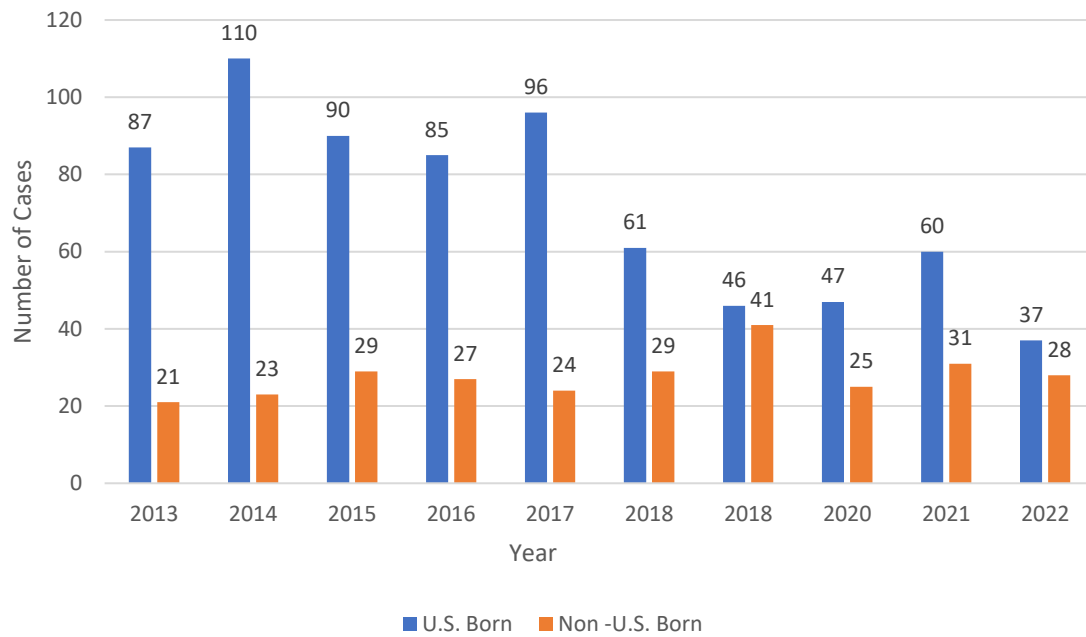
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

FIGURE 8: COUNTRY OF ORGIN FOR NON-U.S.-BORN TB CASES, 2022 (N=28)

Veitnam (10.7%)
Afghanistan (3.6%)
Bangladesh (3.6%)
Turkey (3.6%)
Philippines (3.6%)
Palestinian Territory Occupied (3.6%)
Guatemala (32.1%)
Nigeria (3.6%)
Nicaragua (3.6%)
Mexico (10.7%)
Honduras (3.6%)
Kenya (7.1%)
India (10.7%)

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

FIGURE 9: HIV STATUS OF TB CASES, 2013-2022
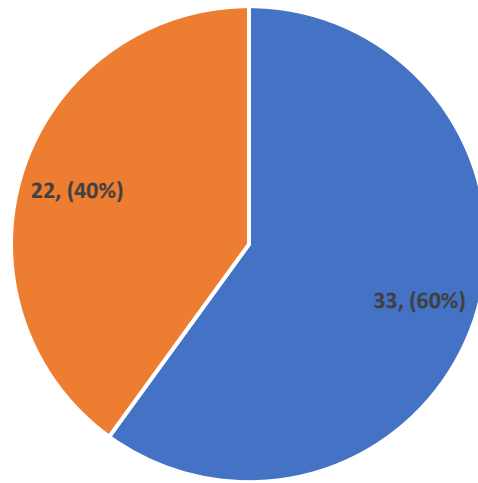

PERCENTAGE OF CASES

HIV STATUS

■ HIV +   ■ HIV -   ■ Unknown

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

Figure 10: RISK FACTORS AMONG TB PATIENTS, 2018-2022

Number of Cases (y-axis)
Year (x-axis)

Year	Homelessness	Residence of Correctional Facility at time of diagnosis	Residence of Long-Term Care Facility at time of Diagnosis	Reported Substance Abuse
2018	5	2	3	16
2019	4	0	1	23
2020	4	3	2	12
2021	13	4	0	12
2022	8	6	0	9

Legend:
- ■ Homelessness
- ■ Residence of Correctional Facility at time of diagnosis
- ■ Residence of Long-Term Care Facility at time of Diagnosis
- ■ Reported Substance Abuse

*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 September 14, 2023.

FIGURE 11: PRIMARY DRUG RESISTANCE (INH-R)* AND MULTI-DRUG RESISITANT TB (MDR-TB)**, 2018-2022
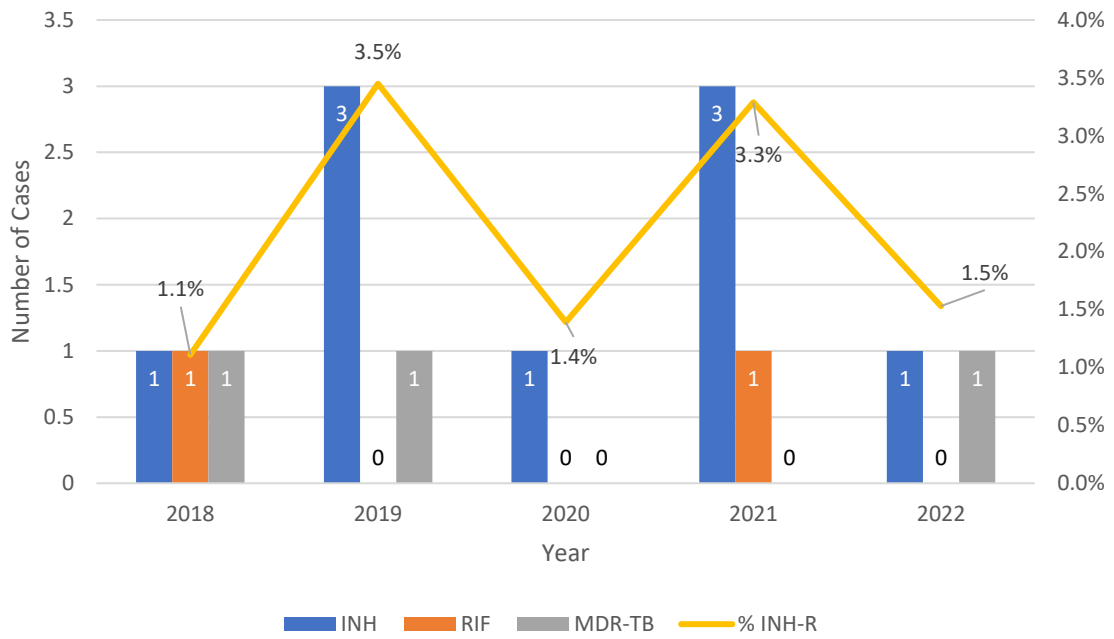
*Having no previous diagnosis of TB and having resistance of INH at first occurrence of disease; **having resistance to at least INH and RIF

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

# FIGURE 12: COMPLETION OF THERAPY, 2013 - 2022
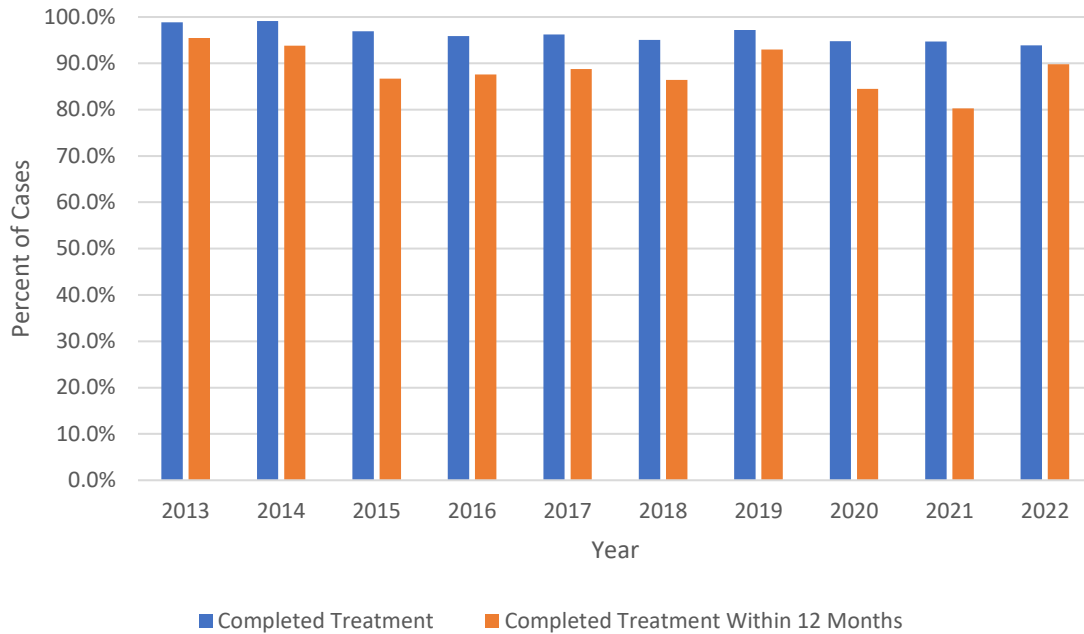
Note: Completion of therapy include the completion of total prescribe medication in which TB is fully treated and prevents further spreading of M. tuberculosis. Figure includes persons alive at time of diagnosis, with initial drug regimen of one or more drugs prescribed, who did not die within one year 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 September 14, 2023.

FIGURE 13: MODE OF TREATMENT ADMINISTRATION AMONG PERSONS REPORTED WITH TB, 2022 (N=56*)

- Totally Directly Observed
- Both Directly Observed and Self Administered
- Self-Administered

*Excludes 9 cases with unknown or missing treatment administration data

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

FIGURE 14: TB GENOTYPE CLUSTERS* BY CLUSTER SIZE, 2020 - 2022
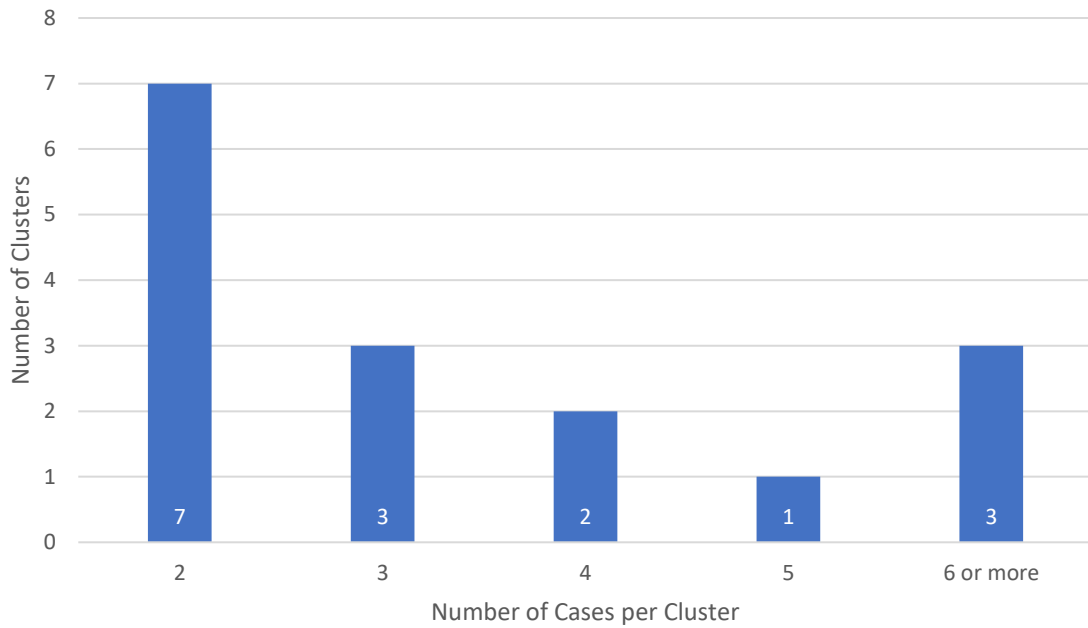
*Genotype clusters are defined as two or more cases with matching spoligotype and 24-locus MIRU-VNTR (GENType) within the specified 3-year period

Data Source: Case counts was obtained from the Tuberculosis Genotyping Information Management System (TB GIMS) data as of September 14, 2023.

FIGURE 15: TB GENOTYPE CLUSTER ALERTS BY TB GIMS* ALERT LEVEL, 2020 - 2022
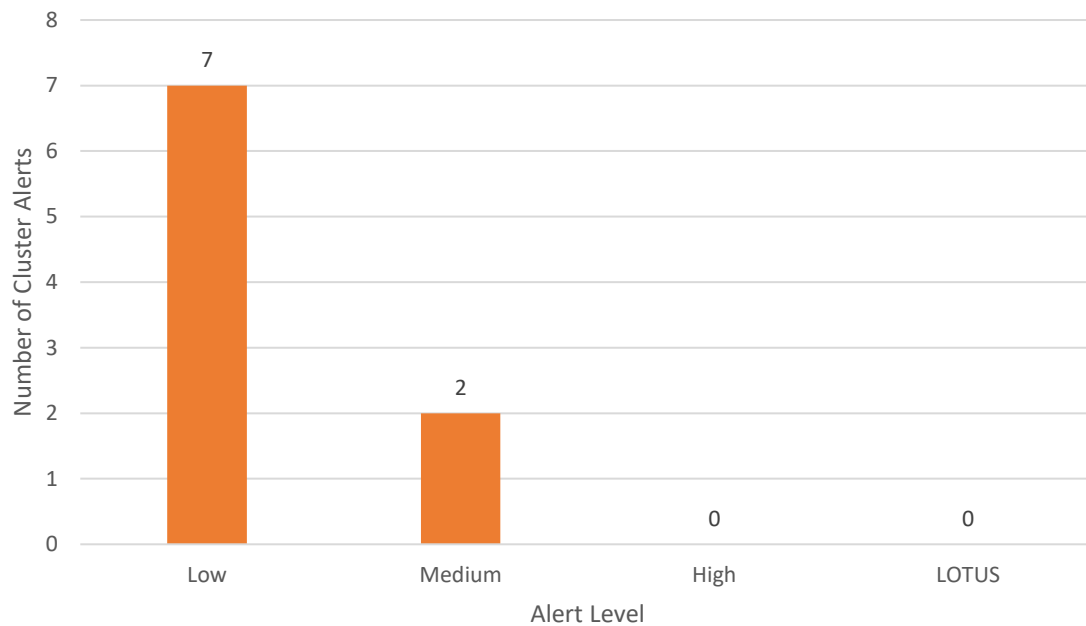
*Tuberculosis Genotyping Information Management System; According to the CDC, alert level is determined by the log likelihood ratio (LLR) for a given cluster, identifying higher than expected geospatial concentrations for a TB genotype cluster in a specific county, compared to the national distribution of that genotype. The Tuberculosis Genotyping Information Management System (TB GIMS) generates alert level notifications between 5≤ 10, and "high" alert is for clusters with LLRs ≥ 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 September 14, 2023.

2013 – 2022

TUBERCULOSIS MORBIDITY TRENDS

BY PUBLIC HEALTH DISTRICT
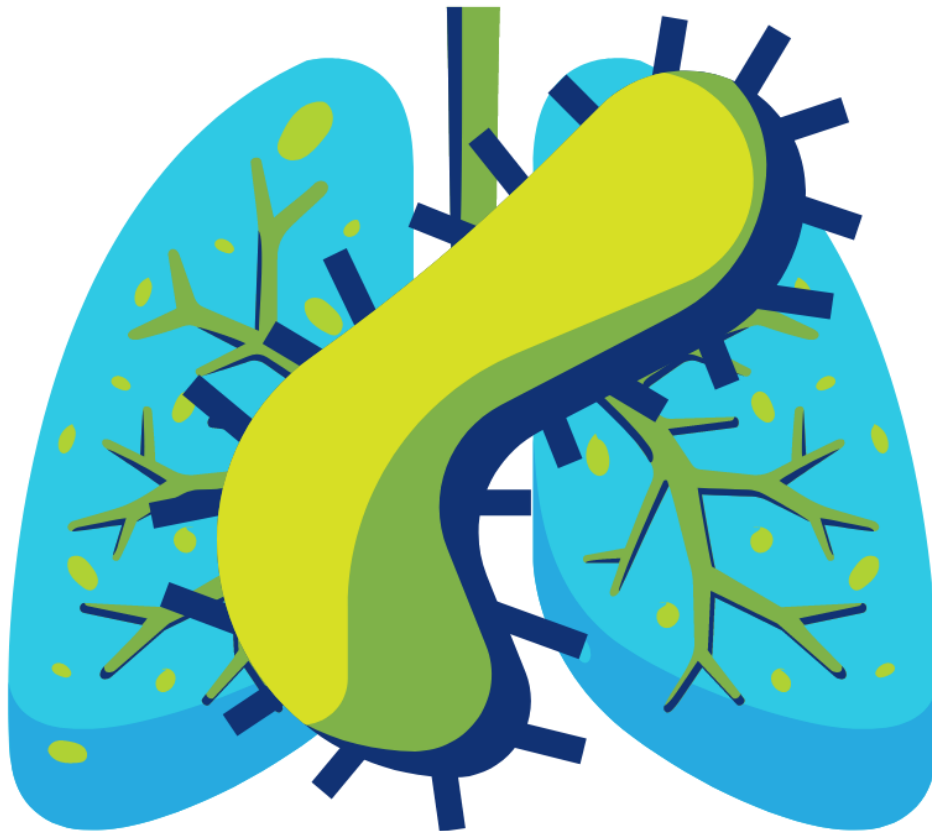
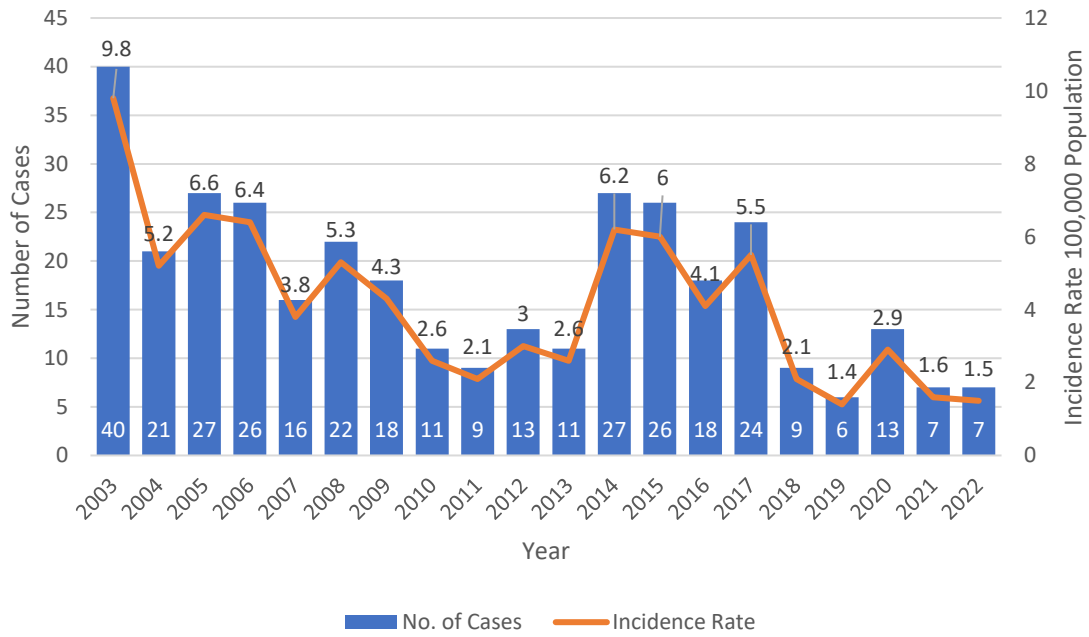# NORTHERN PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2013 - 2022
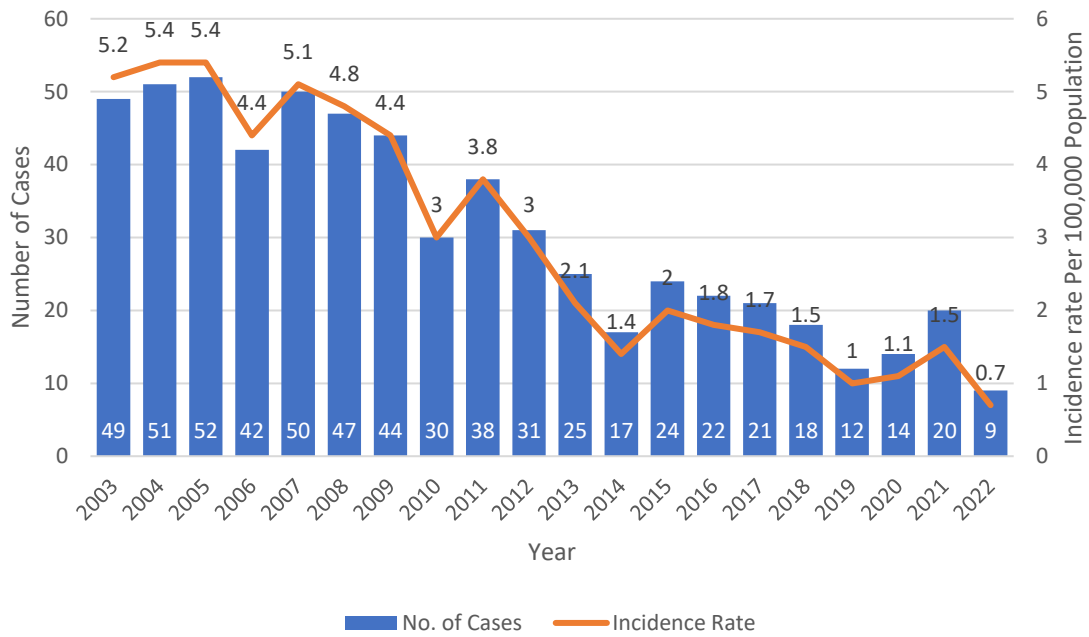
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

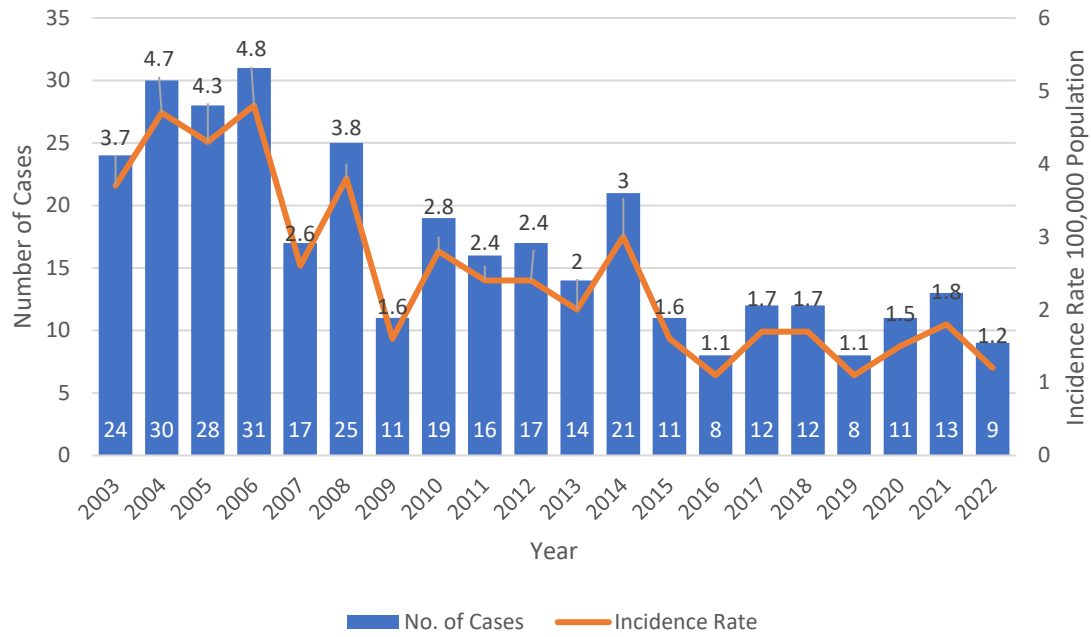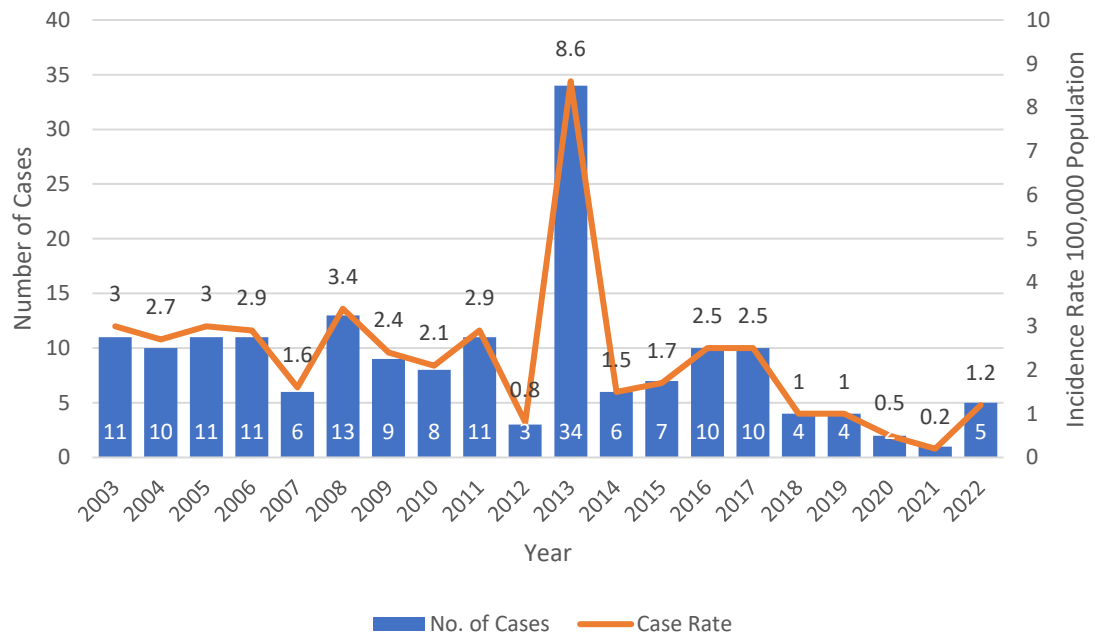# NORTHEASTERN PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2013 - 2022
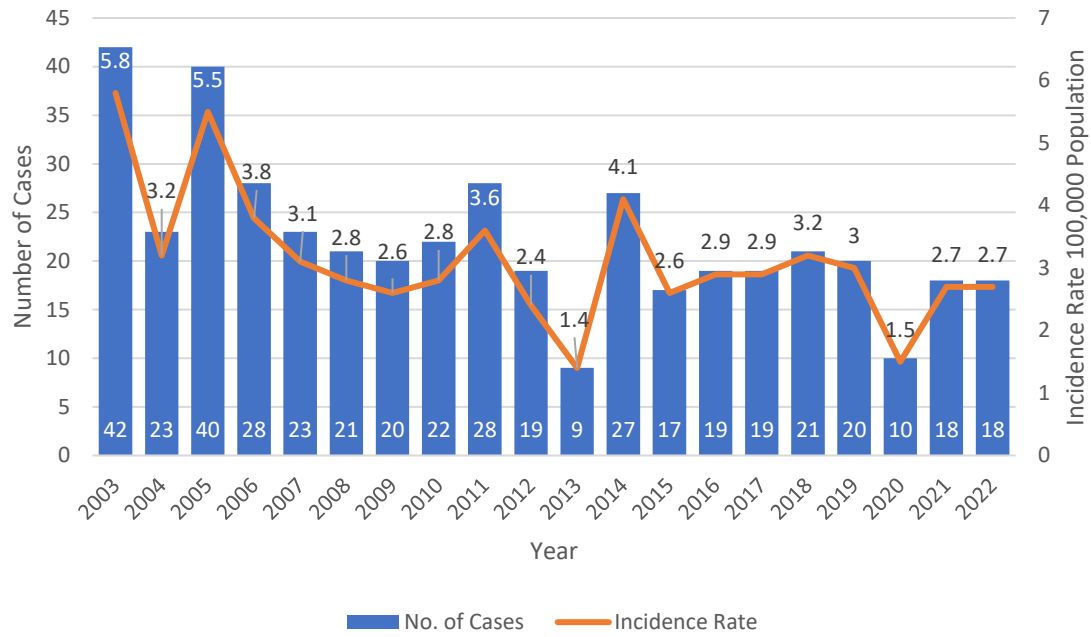
Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

WEST CENTRAL PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2013 - 2022

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

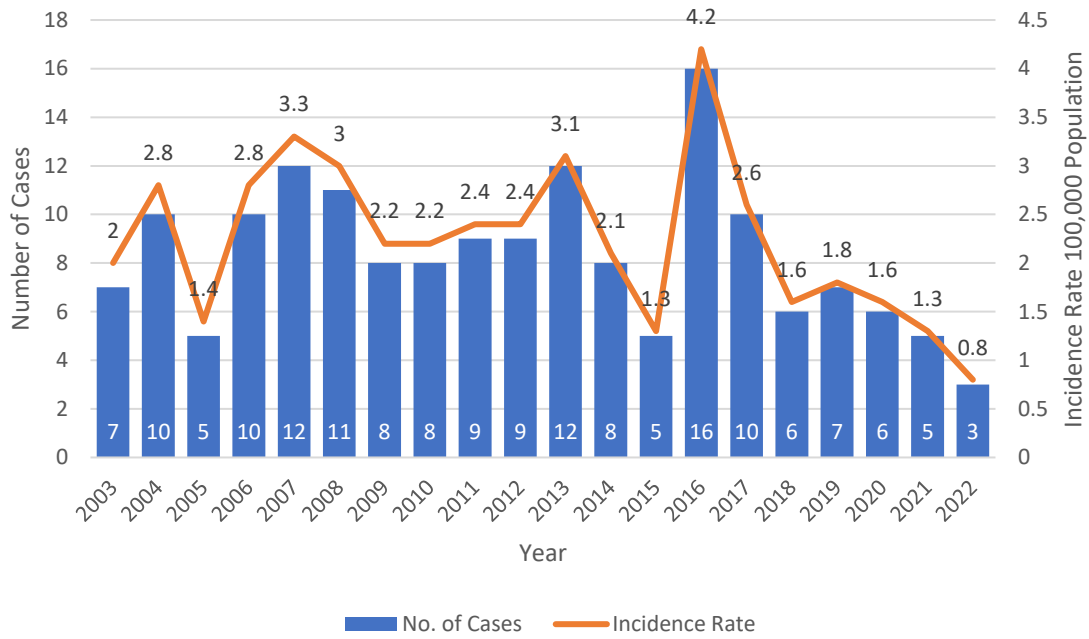# EAST CENTRAL PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2013 - 2022

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

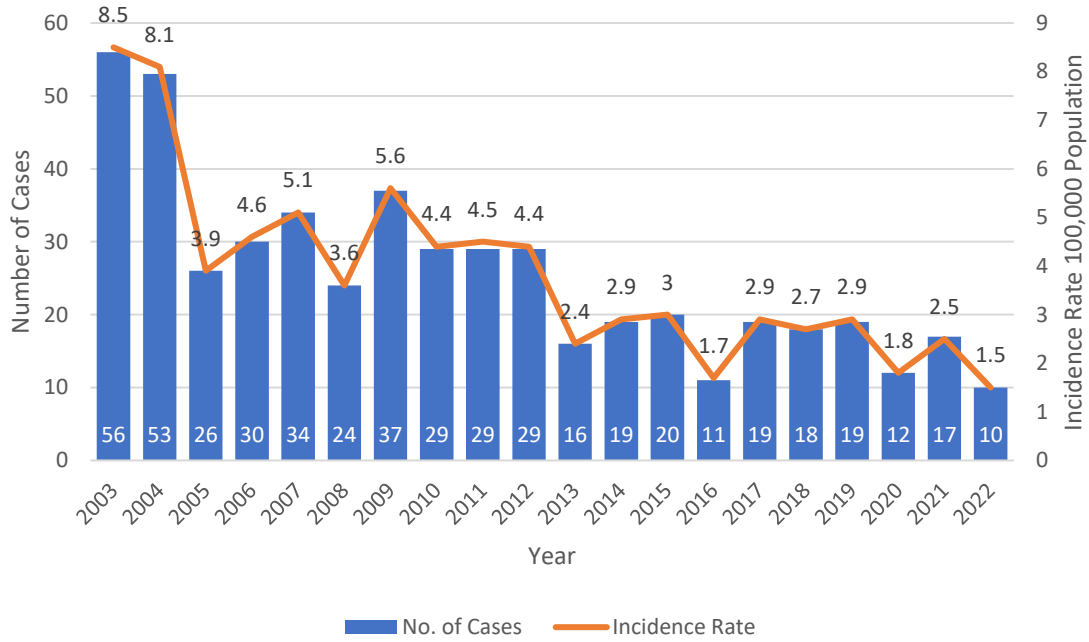# SOUTHWESTERN PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2013 - 2022

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

SOUTHEASTERN PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2013 - 2022
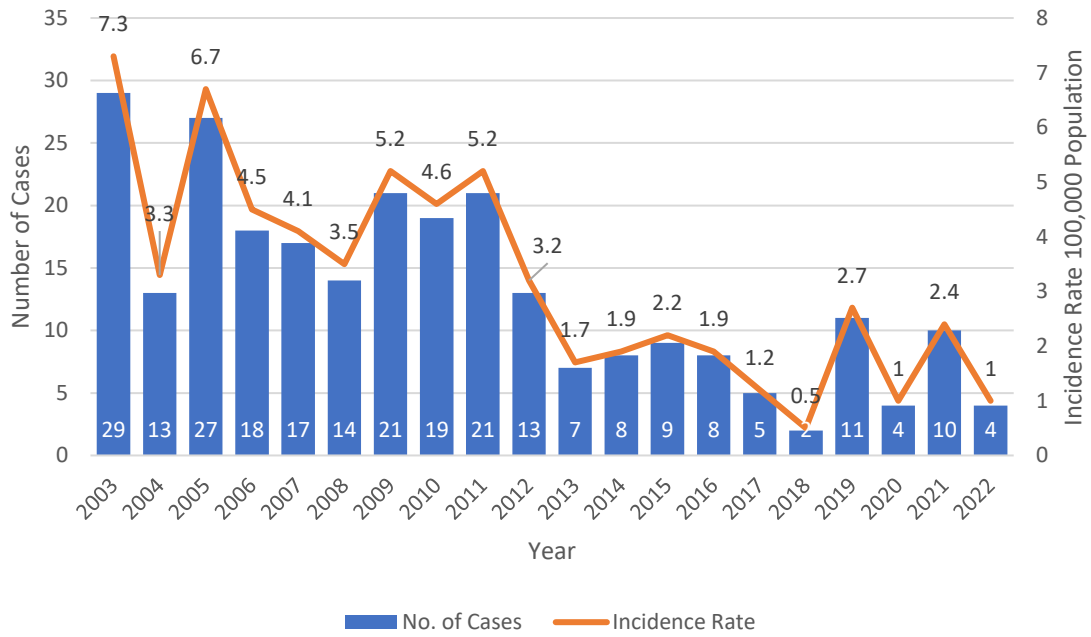

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

JEFFERSON PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2013 - 2022

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.

MOBILE PUBLIC HEALTH DISTRICT: TB CASES AND RATES 2013 - 2022

Data Source: Case counts was obtained from the National Tuberculosis Surveillance System data as of September 14, 2023.