

2018 GEORGIA TUBERCULOSIS REPORT



2018 Georgia Tuberculosis Data Report

Georgia Department of Public Health.....	Kathleen E. Toomey, MD, MPH <i>Commissioner</i>
Division of Health Protection.....	R. Chris Rustin, DrPH, MS, REHS <i>Deputy Director</i>
Epidemiology Branch.....	Cherie Drenzek, DVM, MS <i>State Epidemiologist</i>
	Joy Wells, MPH <i>Epidemiologist</i>
	Antoine Perrymon, MPH <i>Epidemiologist</i>
	Jasmine Ko Aqua, MPH <i>Epidemiologist</i>
Tuberculosis Program.....	Benjamin Yarn <i>TB Program Director</i>

Acknowledgments:

We thank the County Health Department staff, District Health Office TB Coordinators, and State TB surveillance staff that collected and reported the data used in this annual report.

Further information on the tuberculosis program can be obtained by contacting:

Benjamin Yarn
Georgia Department of Public Health
Division of Health Protection, Tuberculosis Program
2 Peachtree St., NW, Atlanta, GA 30303
Phone: (404) 657-0791
E-mail: Benjamin.Yarn@dph.ga.gov

Further information on this report can be obtained by contacting:

Jasmine Ko Aqua, MPH
Georgia Department of Public Health
Division of Health Protection, Epidemiology Program
2 Peachtree St., NW, Atlanta, GA 30303
Phone: (404) 463-0849
E-mail: Jasmine.Aqua@dph.ga.gov

Data sources: 1) Surveillance data were obtained from the State Electronic Notifiable Disease Surveillance System (SendSS) as of October 31st, 2019; 2) Census data were obtained from the U.S. Census Bureau via <https://oasis.state.ga.us/oasis/webquery/qryPopulation.aspx>.

Suggested citation: Georgia Department of Public Health, 2018 Georgia Tuberculosis Report, Atlanta, Georgia, November 2019.

Table of Contents

Executive Summary.....	3
Tuberculosis (TB) Surveillance in Georgia.....	4
Current Epidemiology of Tuberculosis in Georgia.....	5
High-Risk Populations.....	6
TB Diagnosis and Treatment Outcomes.....	7
TB Contact Investigations and Latent TB Infection (LTBI).....	8
Drug Resistance and Genotyping.....	9
Tables and Figures: Descriptive Epidemiology, Case Counts, and Program Performance Indicators.....	11
Graphs: Tuberculosis Morbidity Trends by Health District, 1998-2018.....	27

Executive Summary

In 2018, a total of 271 new tuberculosis (TB) cases were reported in Georgia, representing an 8% decrease from 2017. The 2018 TB incidence (new cases) of 2.6 cases per 100,000 persons represents a slight decrease from 2.8 cases per 100,000 persons in 2017.

In 2018, TB incidence by Health District ranged from 1.0 cases per 100,000 persons in District 1-2 (Dalton) and District 10-0 (Athens) to 8.4 cases per 100,000 persons in District 3-5 (DeKalb). Four Health Districts (Districts 3-2, 3-3, 3-4, and 3-5) reported a TB incidence higher than the overall state incidence. Three counties (DeKalb, Fulton, and Gwinnett) reported ≥ 30 TB cases each in 2018, accounting for 50% of reported cases statewide.

Among the 271 TB cases reported in Georgia in 2018, foreign-born persons accounted for 149 cases (55%); 122 cases (45%) occurred among U.S.-born persons (Figure 10). The top four countries of origin for foreign-born persons reported with TB disease in Georgia in 2018 were Mexico, India, Vietnam, and Guatemala (Figure 11). TB cases among persons born in these four countries accounted for 51% of all cases among foreign-born persons.

HIV status was reported for 93% of Georgia TB cases in 2018; among these patients, 6% were HIV-positive (Figure 12). Persons living in congregate settings are at high risk for TB exposure. In 2018, 13 (5%) of Georgia's total TB cases experienced homelessness in the year before diagnosis, 10 (4%) were correctional facility inmates at the time of diagnosis, and 4 (1%) were long-term care facility residents (Figure 13).

In 2018, two cases of multidrug-resistant TB (MDR-TB or TB resistant to at least isoniazid and rifampin) infections were diagnosed in Georgia. Neither of the MDR-TB cases had a previous episode of TB; one case was born in a country with a high burden of TB.

The latest year with completed TB contact investigation data was in 2017. Among 3,259 identified contacts of TB cases reported in 2017 in Georgia, 2,508 (77%) completed a medical evaluation for TB. Among the 360 contacts diagnosed with latent TB infection (LTBI), 275 (76%) started LTBI treatment and of those, 216 (79%) completed LTBI treatment.

Although TB incidence is decreasing in Georgia, epidemiologic modeling by the U.S. Centers for Disease Control and Prevention (CDC) projects that the goal of TB elimination will not be attained in this century with the current rates of decline. Current program strategies such as early identification of TB cases, completion of TB treatment by directly observed therapy, and contact investigation should be maintained; but newer strategies such as targeted TB testing among high-risk individuals, i.e. persons born in countries with a high prevalence of TB and persons who live or work in high-risk congregate settings, and treating LTBI should be implemented to accelerate progress toward TB elimination.

Tuberculosis (TB) Surveillance in Georgia

TB is a reportable disease in Georgia. All Georgia physicians, laboratories, and other health care providers are required by law to immediately report clinical and laboratory-confirmed TB cases under their care to Georgia public health authorities. TB cases may be directly reported to a County Health Department, a District Health Office, or to the State TB Program and TB Epidemiology Section of the Georgia Department of Public Health (GDPH), which 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 individuals exposed to a TB case, and control TB outbreaks.

TB cases in Georgia can be reported electronically through the State Electronic Notifiable Disease Surveillance System (SendSS), a secure web-based surveillance software developed by GDPH, or by calling, mailing, or faxing a report to public health authorities. Hospital infection control personnel, as well as public health nurses, outreach staff, epidemiologists, and communicable disease specialists involved in disease surveillance are encouraged to report TB through SendSS and register to become a SendSS user by logging into the system's Web site at: <https://sendss.state.ga.us> then selecting TB from the list of reportable diseases.

Public health authorities collect data about reported TB cases including demographic, clinical, risk factor, and contact information, which are analyzed to describe the distribution of the disease among Georgia's population, identify high risk groups and TB clusters, describe trends in morbidity, mortality, drug resistance patterns, treatment outcomes, and infection rates among contacts to TB cases. The data are used at state and local levels to guide policy and decision making, set priorities for program interventions, evaluate program performance for the prevention and control of TB in Georgia, and educate key stakeholders and the general public on TB. Georgia's TB surveillance data are transmitted electronically to the U.S. Centers for Disease Control and Prevention (CDC) and become part of the national TB surveillance database.

TB Case Definitions for Public Health Surveillance

GDPH utilizes the 2009 Council of State and Territorial Epidemiologists (CSTE) case definition for tuberculosis (Position Statement 09-ID-65) that can be accessed at: <https://wwwn.cdc.gov/nndss/conditions/tuberculosis/case-definition/2009/>.

Clinical case definition

A case that meets all of 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 imaging study or clinical evidence of current disease)
- Treatment with two or more anti-TB medications
- A completed diagnostic evaluation

Laboratory criteria for diagnosis

- Isolation of *M. tuberculosis* complex on a culture from a clinical specimen, or
- Demonstration of *M. tuberculosis* complex from a clinical specimen by nucleic acid amplification test

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

Current Epidemiology of Tuberculosis in Georgia

Georgia reported 271 new tuberculosis (TB) cases in 2018. This rate represents an 8% decrease from the 293 TB cases reported in 2017. TB case numbers in Georgia have decreased 70% since 1991, when the peak of a resurgent period of tuberculosis occurred (Figure 1). The TB case rate in Georgia decreased from 2.8 cases per 100,000 persons during 2017 to 2.6 cases per 100,000 in 2018, which is lower than the 2018 U.S. case rate of 2.8 per 100,000 (Figure 2). According to the CDC, during 2018, Georgia ranked 7th in the United States for the number of new TB cases and ranked 13th for the TB case rate (per 100,000 population) among the 50 reporting states.

Geographic Distribution

Among the 159 counties in Georgia, three counties in the metropolitan Atlanta area reported the highest number of TB cases in 2018: DeKalb (63 cases), Fulton (30 cases), and Gwinnett (40 cases) (Table 1). These three counties accounted for 50% of all TB cases reported in Georgia in 2018.

Among Georgia's 18 Health Districts, which have oversight responsibility for public health in the state's 159 counties, the DeKalb Health District 3-5 had the highest TB case rate in 2018 (8.4 per 100,000), followed by the Gwinnett District 3-4 (3.8 per 100,000) and the Clayton District 3-3 (3.2 per 100,000) (Table 2).

Sex and Age Distribution

In 2018, TB cases in Georgia occurred predominantly among males (179 cases, 66%), compared to females (92 cases, 34%). The highest proportion of TB cases by age group occurred among persons 25-44 years old (102 cases, 38%). Among the 25-44 age group, 65 cases (64%) were male and 37 cases (36%) were female (Figure 5). The 65+ age group had the highest TB case rate (4.9 per 100,000), while the lowest rate was among children 5-14 years old (0.7 per 100,000) (Figure 6). The TB case rate for children younger than 5 years of age, a group more likely to develop life-threatening forms of TB disease, decreased from 2.0 per 100,000 in 2017 to 0.9 per 100,000 in Georgia in 2018. Young children are more likely than older children and adults to have TB spread through their bloodstream and cause complications and deadlier forms of TB, such as TB meningitis or disseminated TB.

Race/Ethnicity Distribution and TB Disparities

TB disproportionately affects racial/ethnic minorities in Georgia. In 2018, non-Hispanic Blacks, Asians and Hispanics accounted for 38%, 26%, and 22% of TB cases in Georgia, respectively, but

only represented 32%, 4%, and 10% of Georgia's population, respectively (Figure 7). Non-Hispanic whites constituted 14% of TB cases in 2018. The highest TB case rate among race/ethnic groups was among non-Hispanic Asians (15.8 per 100,000), followed by Hispanics (5.8 per 100,000) and non-Hispanic Blacks (3.1 per 100,000) (Figure 8). The black non-Hispanic TB case rate in 2018 represents a 90% decrease from the TB case rate in 1993 (30.6 per 100,000) in this population. The black non-Hispanic TB case rate, however, was still more than four times higher than the white non-Hispanic TB case rate (0.7 per 100,000) in Georgia during 2018 (Figure 9).

High-Risk Populations

Foreign-Born Persons

TB infections among persons born outside of the United States accounted for 55% of TB cases in Georgia in 2018. Most foreign-born cases reported in 2018 came from Mexico (17%), India (16%), Vietnam (12%), and Guatemala (6%) - countries where TB is an endemic disease (Figures 10-11). Among 142 foreign-born cases in 2018 with known year of arrival, 66 (46%) were diagnosed in the first five years of their arrival in the U.S. This represents an increase from 63 (41%) of foreign-born cases being diagnosed within first five years in 2017.

In 2018, four Health Districts reported 65% of the total number of foreign-born TB cases in Georgia: DeKalb 3-5 (47 cases), Gwinnett 3-4 (34 cases), Cobb 3-1 (8 cases) and Gainesville 2-0 (8 cases). In all four of these Health Districts, foreign-born TB cases accounted for more than half of the TB cases (3-5, 75%; 3-4, 81%; 3-1, 67%; 2-0, 57%).

Persons with HIV Co-Infection

All TB patients need to be tested for HIV infection because TB treatment may change when antiretroviral therapy for HIV is given, and active TB often accelerates the natural progression of HIV infection. In 2018 in Georgia, among 253 TB cases with known HIV status, 6% were HIV-positive, compared to 8% in 2017 (Figure 12). Among the 16 TB cases with HIV co-infection in 2018, 63% were non-Hispanic blacks, 63% were male, and 44% were 45-64 years old.

HIV status was reported for 93% of TB cases in 2018. In the high-risk age group of adults 25-44 years of age, the percentage of TB cases for which HIV was reported was 94% in 2018, compared to 98% in 2017. Among 18 TB cases whose HIV status was not reported, HIV testing was not offered to 9 cases (50%) (three were children and five were 65+ years old), the HIV test result was unknown in four cases (22%) (two were dead at diagnosis of TB), and five (28%) refused testing. The proportion by age group among the TB cases that were not offered the HIV test was highest among adults 65 years and older (5 cases, 56%).

Persons in Congregate Settings and Persons with Substance Abuse

Persons residing in crowded congregate settings such as homeless shelters, prisons, and nursing homes are at risk for acquiring TB. In 2018, 13 (5%) TB cases in Georgia experienced homelessness in the year before TB diagnosis, 10 (4%) were residents of correctional facilities, and 4 (1%) were residents of long-term care facilities. Of the 10 TB cases incarcerated in

correctional facilities, four (40%) were inmates in county jails, one (10%) was an inmate of a state prison, and five (50%) were inmates of a U.S. Immigration and Customs Enforcement (ICE) facility.

Substance abuse is the most commonly reported behavioral risk factor among patients with TB in the United States. TB patients who abuse substances often experience treatment failure and remain infectious longer because treatment failure presumably extends periods of infectiousness. In Georgia, abuse of either illicit drugs or alcohol was reported among 36 (13%) of TB cases in 2018 (Table 3, Figure 13).

TB Infections in Children

TB in children is considered a sentinel public health event because it often indicates recent transmission from an infectious adult case. Additionally, potentially lethal forms of TB, such as TB meningitis or disseminated TB, can develop in very young children. In 2018, children younger than 15 years old comprised 6% of Georgia TB cases: 6 cases (0.9 per 100,000) were reported in children younger than 5 years old and 10 cases (0.7 per 100,000) were reported in children 5-14 years old. There were no cases of TB meningitis among children younger than 15 years old in 2018 in Georgia.

Latent tuberculosis infection (LTBI) is a state of infection by the TB bacteria without evidence of clinically manifested active TB. LTBI in children younger than five years old is also a reportable disease in Georgia. When LTBI in a child less than five years of age is reported, public health personnel will initiate contact investigations to identify the source of the infection, recommend treatment for latent TB infection, follow up with the child to ensure completion of treatment and monitor for development of active TB disease. Early identification of TB infection and treatment in children can prevent progression to active disease and identify a previously undiagnosed and untreated case of active TB.

In 2018, 29 children younger than five years old were reported to have LTBI in Georgia; 5 (17%) were identified by TB screening by a hospital or private health provider, 5 (17%) were identified by the CDC Division of Global Migration Quarantine Station, and 19 (66%) were identified by contact investigations performed by county health department staff.

TB Diagnosis and Treatment Outcomes

TB Initial Diagnosis, Treatment, and Directly Observed Therapy

In Georgia, most TB cases are initially diagnosed in a hospital or clinic and are followed up by county health departments after discharge to continue their TB treatment. In 2018, 146 (54%) of the 271 TB cases in Georgia were diagnosed and reported initially by a hospital or clinic. Seven hospitals in Georgia reported five or more TB cases in 2018.

Among TB cases with available data on type of outpatient healthcare provider, county health departments provided case management for 77% of all Georgia TB cases; 16% of cases were treated by both the health department and a private physician, 3% of cases were cared for solely

by a private physician and managed solely as in-patients, 2% were inpatient only, and 2% were treated at correctional facilities.

Treatment outcomes were analyzed for eligible 2017 cases, the most recent year with treatment completion data. Eligible cases include persons alive at diagnosis, with an initial drug regimen of one or more drugs prescribed, who did not die within one year of initiating treatment; eligible cases exclude persons with an initial rifampin-resistant isolate, patients with bone and joint disease, meningeal disease, or disease of the central nervous system, or pediatric patients (ages 0–14 years) with miliary disease or positive blood culture or a positive nucleic acid amplification test on a blood specimen, and those who moved out of the country within one year of initiating treatment.

Among the 240 eligible TB cases in Georgia who started treatment for TB in 2017, 228 (95%) completed treatment and 207 (86%) completed treatment within 12 months (Table 5).

County health department staff provide directly observed therapy (DOT) to TB patients, which entails watching a patient swallow every dose of their TB treatment medications for at least 6 months. Among the 240 eligible cases reported in 2017, 200 (83%) received TB treatment entirely by DOT and 30 (13%) were treated by a combination of DOT and self-administered therapy (Figure 16). The remaining ten cases were either totally self-administered or had missing/unknown therapy administration modes.

TB Mortality

Fourteen persons died of TB in Georgia in 2018, where the age-adjusted TB mortality rate in 2018 was 0.1 per 100,000. From 2014 to 2018, a mean of 15.5 TB deaths occurred in Georgia per year. Within these years, the highest number of deaths from TB was reported in 2016 with 18 deaths.

TB Contact Investigations and Latent TB Infection (LTBI) ---

Indicators of TB Infectiousness: Pulmonary TB

Persons with pulmonary or laryngeal TB have a greater potential to infect others with TB, and infectiousness is higher if their sputum smears are positive for acid-fast bacilli (AFB), sputum cultures are positive for *Mycobacterium tuberculosis*, or cavitory lesions are present on chest radiography. In 2018, 80% of all Georgia TB cases had pulmonary TB. Of the pulmonary TB cases, 68% had sputum cultures that were positive for *Mycobacterium tuberculosis*, 42% were sputum AFB smear-positive, and 28% showed cavitory lesions on chest radiography.

TB Contact Investigations and Latent TB Infection

Public health authorities routinely conduct contact investigations among persons exposed to a TB case to identify any secondary TB cases and contacts with latent TB infection (LTBI). Index TB cases (first case identified in an investigation) with positive acid-fast bacillus (AFB) sputum-smear results or pulmonary cavities have the highest priority for investigation. During a contact investigation, public health staff conduct in-person interviews and ask recent contacts to a TB case

whether they have TB-like symptoms, administer a TB skin test (TST) or interferon gamma release assay (IGRA), repeat the TST or IGRA 8-10 weeks after the last exposure to the index case if the initial TST or IGRA is negative, and have a chest radiology exam performed if the TST or IGRA is positive. Persons with LTBI have a positive TST or IGRA but are asymptomatic and have a normal chest radiology exam. They are not contagious but have a 10% chance of developing TB disease if they do not receive treatment for LTBI.

Among 3,259 identified contacts of Georgia TB cases reported in 2017 (the latest year with completed contact investigation data), 2,508 (77%) were completely evaluated for TB. Of the completely evaluated contacts, 360 (14%) had LTBI and 37 (1%) had TB disease. Among the 360 contacts with LTBI, 275 (76%) started LTBI treatment and of those, 216 (79%) completed LTBI treatment, 20 (7%) chose to stop LTBI treatment on their own, 24 (9%) were lost to follow-up, 2 (1%) had adverse side effects, 7 (3%) moved elsewhere, and 3 (1%) discontinued treatment due to a provider's decision.

Only LTBI in children under five is currently a reportable disease in Georgia.

Drug Resistance and Genotyping

TB Drug Resistance

Among 206 culture-positive TB cases in Georgia during 2018, 99% were tested for initial drug susceptibility to the three first-line anti-TB medications: isoniazid (INH), rifampin (RIF), and ethambutol (EMB). Of 202 tested isolates from Georgia cases with no previous history of TB, 14 (7%) had primary resistance to INH. There were two reported cases of multidrug-resistant TB (MDR-TB, i.e. TB resistant to at least INH and RIF) in 2018, compared to two in 2017. The percentage of TB cases with primary INH resistance (INH-R) in Georgia ranged from 7% to 20% in the past five years, while an average of two MDR-TB cases per year was reported in Georgia over that same period (Figure 14).

TB Genotyping

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

In the 2016-2018 three-year time period, there were 32 two-case clusters, 10 three-case clusters, 3 four-case clusters, 1 five-case cluster, 1 six-case cluster, 1 seven-case cluster, and 1 case cluster that was greater or equal to 10 in size in Georgia (Figure 17). Figure 18 displays the percentage of genotype clusters by alert level. According to the CDC, alert level is determined by the log likelihood ratio statistic (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 based on the LLR: “No alert” is indicated if LLR is between 0–<5, “medium” is for LLR of 5–<10, and “high” alert is for clusters with $LLR \geq 10$. Between 2016–2018, Georgia had 4 (8%) clusters with a high alert, 18 (35%) clusters with a medium alert, and 30 (58%) clusters with no alert (Figure 18).

Table 1. Tuberculosis Cases and Case Rates per 100,000 Population by County, Georgia, 2017 – 2018.

COUNTY	2017		2018	
	Cases	Rate	Cases	Rate
Appling	< 5	--	0	0.0
Atkinson	0	0.0	0	0.0
Bacon	0	0.0	0	0.0
Baker	0	0.0	0	0.0
Baldwin	0	0.0	< 5	--
Banks	0	0.0	0	0.0
Barrow	< 5	--	< 5	--
Bartow	< 5	--	< 5	--
Ben Hill	0	0.0	0	0.0
Berrien	0	0.0	0	0.0
Bibb	< 5	--	5	3.3
Bleckley	0	0.0	0	0.0
Brantley	0	0.0	0	0.0
Brooks	0	0.0	< 5	--
Bryan	< 5	--	0	0.0
Bulloch	< 5	--	< 5	--
Burke	0	0.0	0	0.0
Butts	0	0.0	0	0.0
Calhoun	0	0.0	0	0.0
Camden	< 5	--	< 5	--
Candler	0	0	0	0.0
Carroll	< 5	--	< 5	--
Catoosa	0	0.0	0	0.0
Charlton	0	0.0	< 5	--
Chatham	< 5	--	6	2.1
Chattahoochee	0	0.0	0	0.0
Chattooga	0	0.0	< 5	--
Cherokee	< 5	--	0	0.0
Clarke	< 5	--	0	0.0
Clay	< 5	--	< 5	--
Clayton	9	3.2	9	3.2
Clinch	0	0.0	0	0.0
Cobb	15	2.0	9	1.2
Coffee	0	0.0	0	0.0
Colquitt	0	0.0	< 5	--
Columbia*	< 5	--	< 5	--
Augusta State Medical Prison	< 5	--	0	0.0
Cook	0	0.0	< 5	--
Coweta	< 5	--	0	0.0
Crawford	0	0.0	0	0.0
Crisp	< 5	--	0	0.0

COUNTY	2017		2018	
	Cases	Rate	Cases	Rate
Dade	0	0.0	0	0.0
Dawson	0	0.0	0	0.0
Decatur	< 5	--	0	0.0
DeKalb	66	8.8	63	8.4
Dodge	0	0.0	0	0.0
Dooly	< 5	--	0	0.0
Dougherty	< 5	--	< 5	--
Douglas	< 5	--	< 5	--
Early	0	0.0	0	0.0
Echols	0	0.0	0	0.0
Effingham	< 5	--	0	0.0
Elbert	0	0.0	0	0.0
Emanuel	0	0.0	0	0.0
Evans	0	0.0	0	0.0
Fannin	0	0.0	0	0.0
Fayette	< 5	--	< 5	--
Floyd	< 5	--	< 5	--
Forsyth	6	2.6	7	3.1
Franklin	0	0.0	0	0.0
Fulton	42	4.0	30	2.9
Gilmer	0	0.0	< 5	--
Glascok	0	0.0	0	0.0
Glynn	< 5	--	0	0.0
Gordon	0	0.0	< 5	--
Grady	< 5	--	< 5	--
Greene	0	0.0	0	0.0
Gwinnett	39	4.2	40	4.3
Habersham	0	0.0	0	0.0
Hall	7	3.5	< 5	--
Hancock	0	0.0	0	0.0
Haralson	0	0.0	0	0.0
Harris	0	0.0	< 5	--
Hart	< 5	--	0	0.0
Heard	0	0.0	0	0.0
Henry	< 5	--	< 5	--
Houston	< 5	--	< 5	--
Irwin*	0	0.0	0	0.0
Irwin County Detention Center	< 5	--	0	0.0
Jackson	0	0.0	0	0.0
Jasper	0	0.0	0	0.0
Jeff Davis	< 5	--	0	0.0
Jefferson	< 5	--	0	0.0
Jenkins	0	0.0	0	0.0
Johnson	0	0.0	0	0.0

COUNTY	2017		2018	
	Cases	Rate	Cases	Rate
Jones	0	0.0	0	0.0
Lamar	< 5	--	< 5	--
Lanier	0	0.0	0	0.0
Laurens	< 5	--	0	0.0
Lee	0	0.0	0	0.0
Liberty	< 5	--	< 5	--
Lincoln	0	0.0	0	0.0
Long	0	0.0	0	0.0
Lowndes	< 5	--	< 5	--
Lumpkin	0	0.0	0	0.0
Macon	< 5	--	0	0.0
Madison	0	0.0	< 5	--
Marion	< 5	--	0	0.0
McDuffie	0	0.0	< 5	--
McIntosh	0	0.0	0	0.0
Meriwether	0	0.0	0	0.0
Miller	< 5	--	0	0.0
Mitchell	6	26.9	< 5	--
Monroe	0	0.0	< 5	--
Montgomery	0	0.0	0	0.0
Morgan	0	0.0	0	0.0
Murray	0	0.0	< 5	--
Muscogee	6	3.1	6	3.1
Newton	< 5	--	< 5	--
Oconee	< 5	--	< 5	--
Oglethorpe	0	0.0	0	0.0
Paulding	< 5	--	0	0.0
Peach	< 5	--	0	0.0
Pickens	0	0.0	0	0.0
Pierce	< 5	--	0	0.0
Pike	0	0.0	0	0.0
Polk	0	0.0	5	11.9
Pulaski	0	0.0	0	0.0
Putnam	0	0.0	0	0.0
Quitman	< 5	--	0	0.0
Rabun	0	0.0	0	0.0
Randolph	0	0.0	0	0.0
Richmond	7	3.5	< 5	--
Rockdale	< 5	--	< 5	--
Schley	0	0.0	0	0.0
Screven	0	0.0	0	0.0
Seminole	< 5	--	0	0.0
Spalding	< 5	--	< 5	--

COUNTY	2017		2018	
	Cases	Rate	Cases	Rate
Stephens	< 5	--	< 5	--
Stewart*	0	0.0	0	0.0
Stewart Detention Center	< 5	--	< 5	--
Sumter	< 5	--	0	0.0
Talbot	0	0.0	0	0.0
Taliaferro	0	0.0	0	0.0
Tattnall	0	0.0	0	0.0
Taylor	0	0.0	0	0.0
Telfair	0	0.0	< 5	--
Terrell	< 5	--	0	0.0
Thomas	< 5	--	< 5	--
Tift	0	0.0	< 5	--
Toombs	0	0.0	< 5	--
Towns	0	0.0	0	0.0
Treutlen	0	0.0	0	0.0
Troup	< 5	--	< 5	--
Turner	< 5	--	< 5	--
Twiggs	0	0.0	0	0.0
Union	0	0.0	< 5	--
Upson	< 5	--	0	0.0
Walker	0	0.0	< 5	--
Walton	0	0.0	< 5	--
Ware	0	0.0	< 5	--
Warren	0	0.0	0	0.0
Washington	0	0.0	0	0.0
Wayne	0	0.0	0	0.0
Webster	0	0.0	0	0.0
Wheeler	0	0.0	0	0.0
White	0	0.0	< 5	--
Whitfield	< 5	--	< 5	--
Wilcox	0	0.0	0	0.0
Wilkes	0	0.0	0	0.0
Wilkinson	0	0.0	0	0.0
Worth	0	0.0	0	0.0
GEORGIA	293	2.8	271	2.6

*Reported cases and calculated case rates in these counties exclude cases from corresponding prisons and detentions centers

Note: In counties where one to four cases were reported, “< 5” is used to represent the number of reported cases, and the case rate is not calculated.

Data Sources: 1) Case counts from State Electronic Notifiable Disease Surveillance System (SendSS) data as of September 24th, 2019; 2) Rates calculated using population estimates obtained from the U.S. Census Bureau via <https://oasis.state.ga.us/oasis/webquery/qryPopulation.aspx>.

Table 2. Number of TB Cases and TB Case Rates per 100,000 population by Health District, Georgia, 2017 – 2018.

Health District	2017		2018	
	Cases	Rate	Cases	Rate
1.1 Rome	5	0.7	14	2.1
1.2 Dalton	5	1.0	5	1.0
2.0 Gainesville	16	2.3	14	2.0
3.1 Cobb	18	2.0	12	1.3
3.2 Fulton	42	4.0	30	2.9
3.3 Clayton	9	3.2	9	3.2
3.4 Lawrenceville	42	3.8	43	3.8
3.5 DeKalb	66	8.8	63	8.4
4.0 LaGrange	11	1.3	14	1.6
5.1 Dublin	< 5	--	< 5	--
5.2 Macon	5	0.9	13	2.5
6.0 Augusta*	11	2.3	8	1.6
Augusta State Medical Prison	< 5	--	0	0.0
7.0 Columbus*	16	4.4	8	2.2
Stewart Detention Center	< 5	--	< 5	--
8.1 Valdosta*	< 5	--	6	2.3
Irwin County Detention Center	< 5	--	0	0.0
8.2 Albany	17	4.9	8	2.3
9.1 Coastal	11	1.8	10	1.6
9.2 Waycross	5	1.4	7	1.9
10.0 Athens	< 5	--	5	1.0
Total	293	2.8	271	2.6

*Reported cases and calculated case rates in these health districts exclude cases from corresponding prisons and detentions centers

Note: In districts where one to four cases were reported, “< 5” is used to represent the number of reported cases, and the case rate is not calculated.

Data Sources: 1) Case counts from State Electronic Notifiable Disease Surveillance System (SendSS) data as of September 24th, 2019; 2) Rates calculated using population estimates obtained from the U.S. Census Bureau via <https://oasis.state.ga.us/oasis/webquery/qryPopulation.aspx>.

Table 3. Percentage of TB Cases with Known Risk Factors for TB, by Health District, Georgia, 2018.

Health District	Foreign-born %	Homelessness in past year %	Correctional Facility %	Long-term Care Facility %	Substance Abuse %
1.1 Rome	43	0	0	0	0
1.2 Dalton	60	0	0	0	20
2.0 Gainesville	57	7	0	0	14
3.1 Cobb	67	0	0	0	8
3.2 Fulton	23	13	0	3	7
3.3 Clayton	67	0	0	0	22
3.4 Lawrenceville	81	2	2	2	7
3.5 DeKalb	75	8	5	0	11
4.0 LaGrange	43	0	0	0	29
5.1 Dublin	100	0	50	0	0
5.2 Macon	23	0	0	15	31
6.0 Augusta	38	13	0	0	38
7.0 Columbus	25	0	0	0	25
8.1 Valdosta	50	17	0	0	0
8.2 Albany	25	0	0	0	0
9.1 Coastal	10	0	0	0	30
9.2 Waycross	71	0	57	0	14
10 Athens	40	0	0	0	20
Georgia	55	5	4	1	13

Table 4. Primary Resistance to First-line Anti-TB Medications, Georgia, 2018.

TB Drug	Isoniazid		Rifampin		Ethambutol	
	Cases	Percent*	Cases	Percent*	Cases	Percent*
Georgia Total	14	7	4	2	2	1

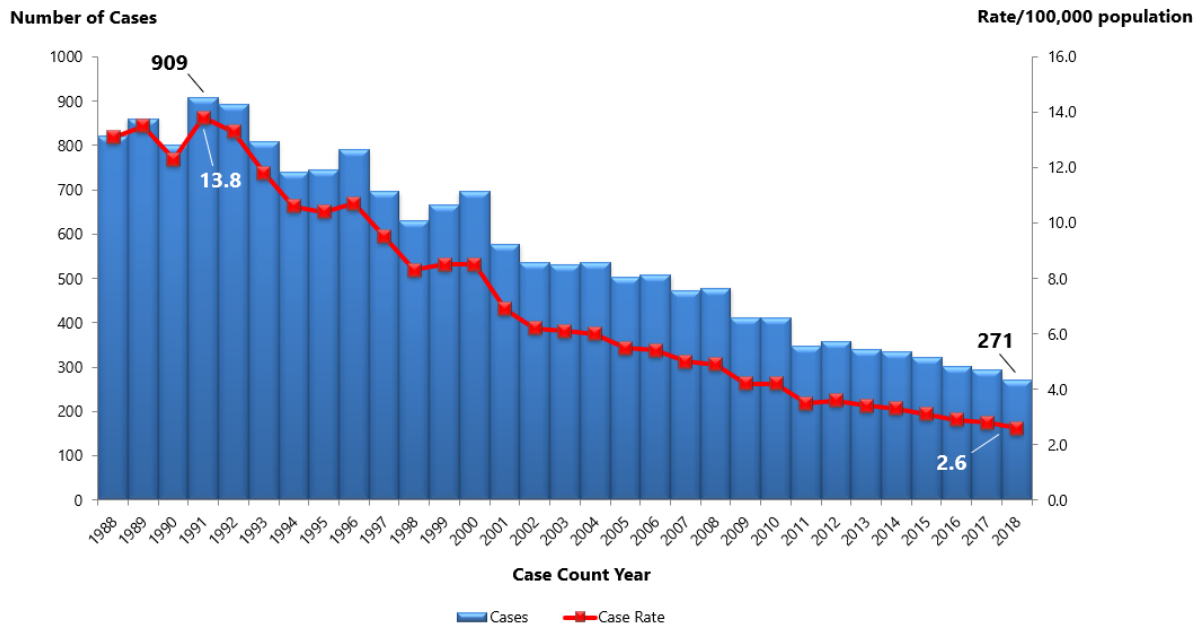
*Denominator equals the cases with completed drug susceptibility testing

Table 5. Completion of TB Treatment and Completion of TB Treatment within 12 months by Health District, Georgia, 2017.

Health District	Completion of TB Treatment* (%)	Completion of TB Treatment within 12 months* (%)
1.1 Rome	100	100
1.2 Dalton	100	100
2.0 Gainesville	100	92
3.1 Cobb	100	91
3.2 Fulton	97	88
3.3 Clayton	100	100
3.4 Lawrenceville	97	79
3.5 DeKalb	98	91
4.0 LaGrange	67	44
5.1 Dublin	100	100
5.2 Macon	100	80
6.0 Augusta	100	100
7.0 Columbus	65	57
8.1 Valdosta	67	67
8.2 Albany	100	100
9.1 Coastal	100	88
9.2 Waycross	100	100
10 Athens	100	75
Georgia Total	95	86

*Includes persons alive at diagnosis, with initial drug regimen of one or more drugs prescribed, who did not die within one year of initiating treatment; excludes persons with initial rifampin-resistant isolate, patients with bone and joint disease, meningeal disease, or disease of the central nervous system, or pediatric patients (ages 0–14 years) with miliary disease or positive blood culture or a positive nucleic acid amplification test on a blood specimen, and those who moved out of the country within one year of initiating treatment.

Figure 1. TB Cases and Case Rates, Georgia, 1988-2018



Note: The most current year and the highest case and case rate in the graphed time frame are labeled.

Figure 2. TB Case Rates, Georgia and United States, 1988-2018

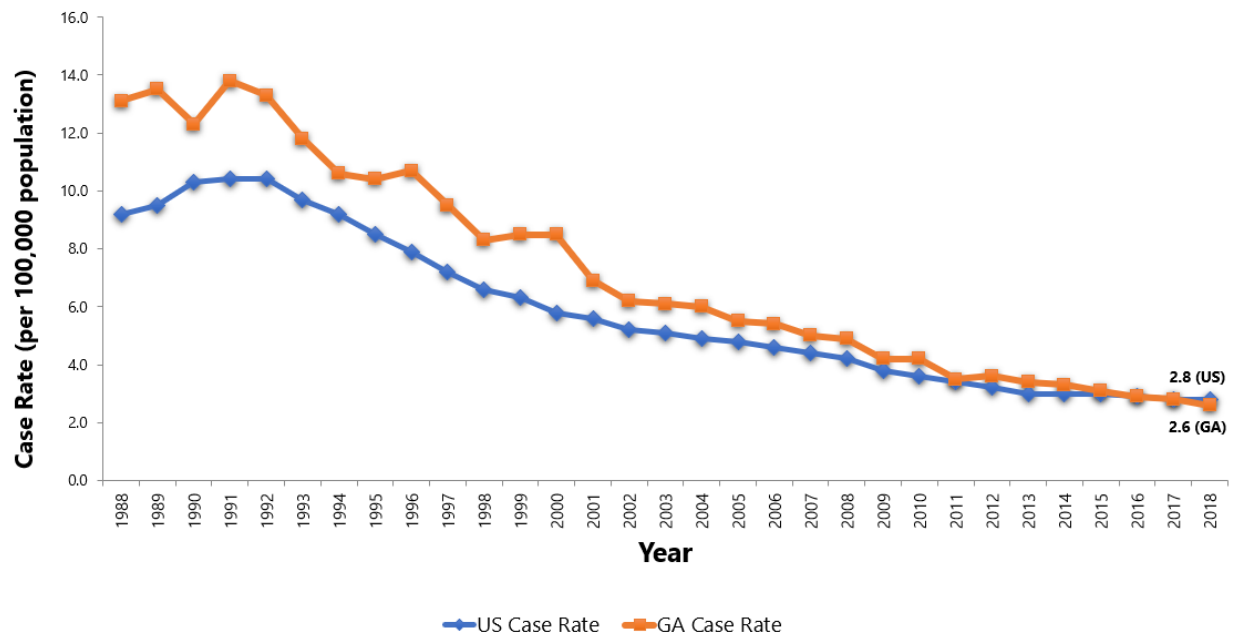


Figure 3. Number of TB Cases by Health District Map, Georgia, 2018 (N=271)

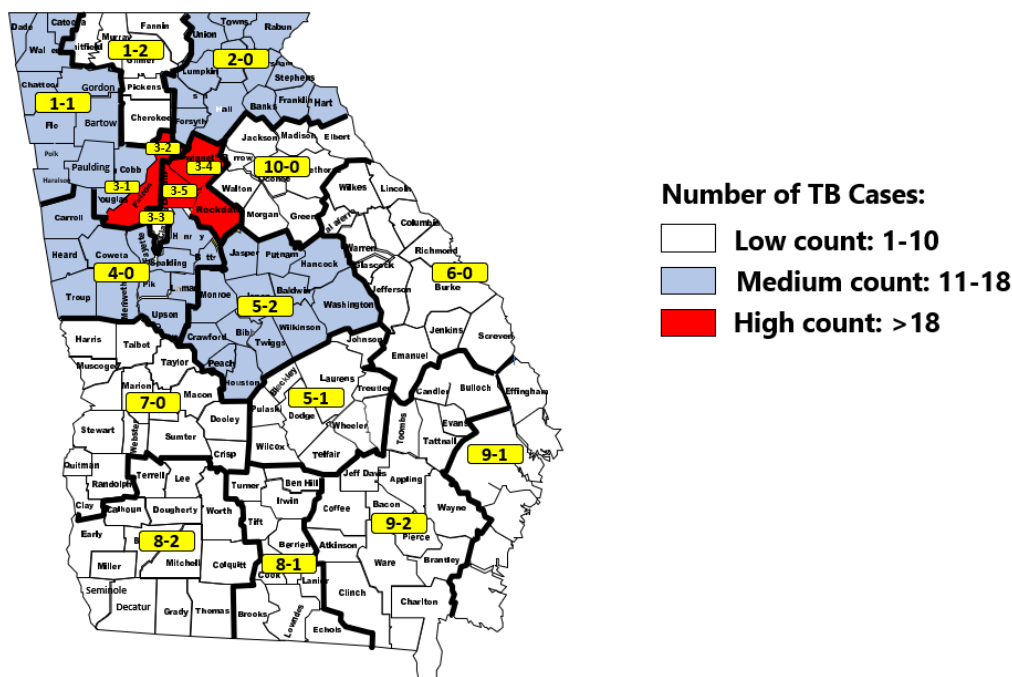


Figure 4. TB Case Rate by Health District Map, Georgia, 2018 (N=271)

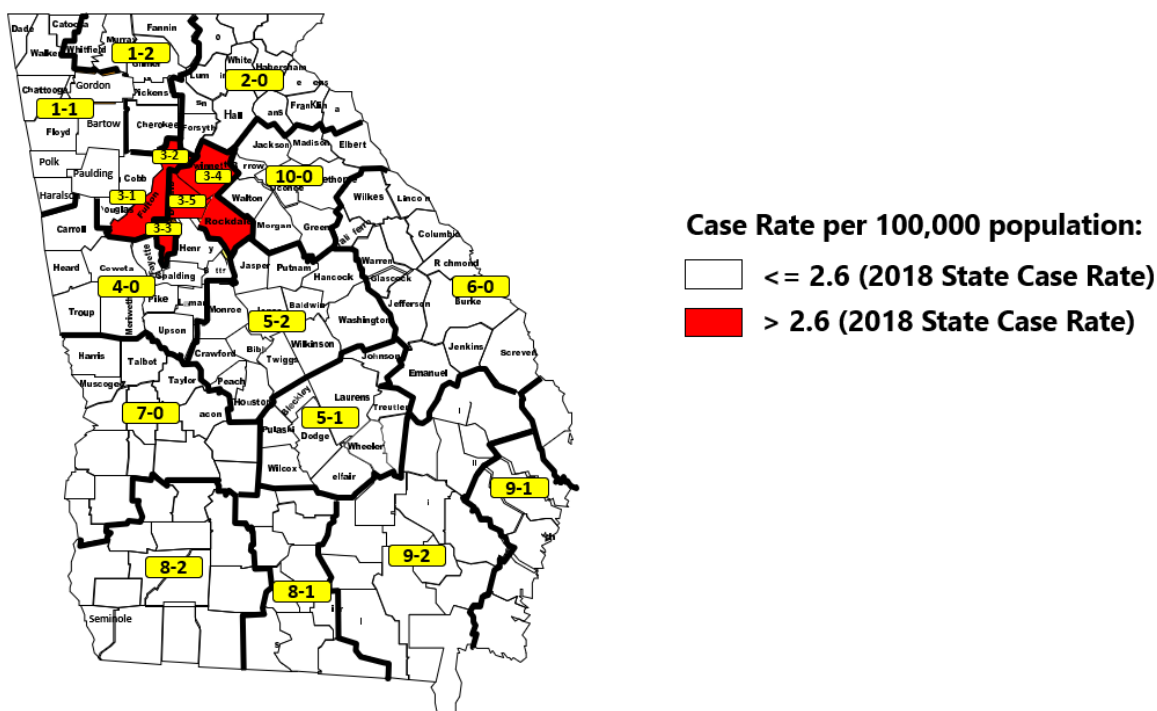


Figure 5. TB Cases by Age and Sex, Georgia, 2018

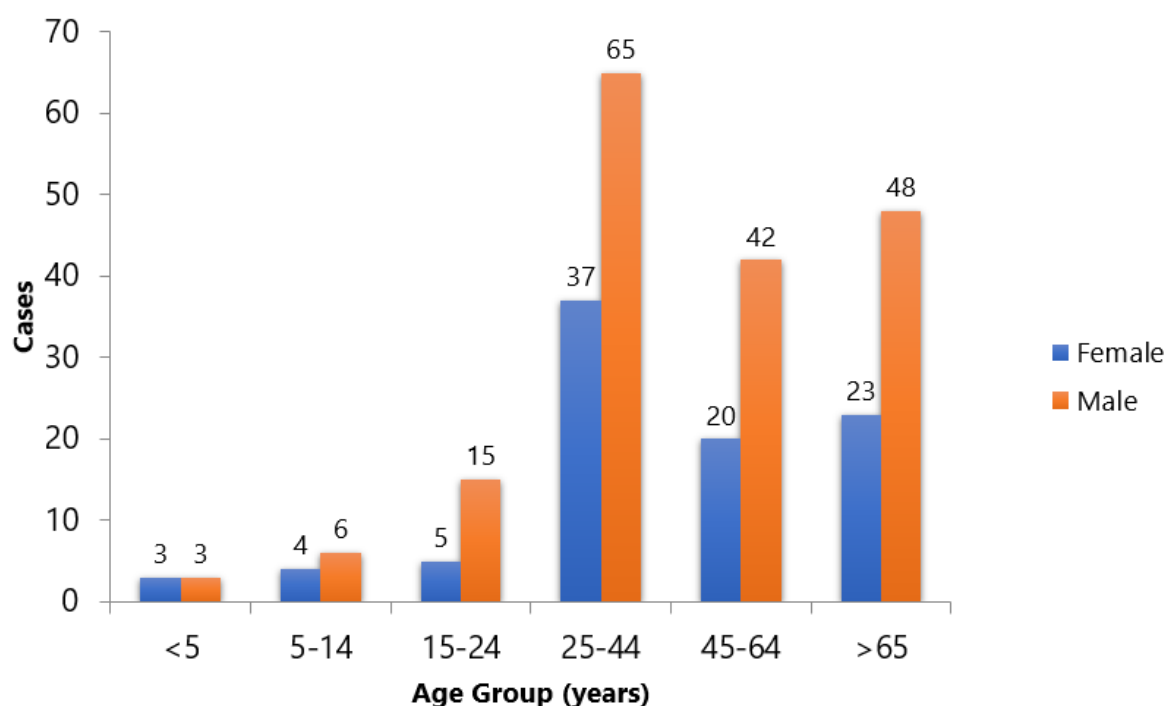


Figure 6. TB Case Rates* by Age Group, Georgia, 2014-2018

Age Group	2014 (N=335)	2015 (N=321)	2016 (N=301)	2017 (N=293)	2018 (N=271)
< 5 years	2.3	2.1	1.4	2.0	0.9
5-14 years	0.8	0.2	0.7	0.6	0.7
15-24 years	1.5	1.7	1.7	1.8	1.4
25-44 years	4.4	4.0	3.2	3.6	3.6
45-64 years	4.3	4.7	4.2	3.5	2.3
65+ years	4.5	3.6	4.1	3.6	4.9

*Rates per 100,000 population

Figure 7. Percentage of TB Cases by Race/Ethnicity, Georgia, 2018 (N=271)

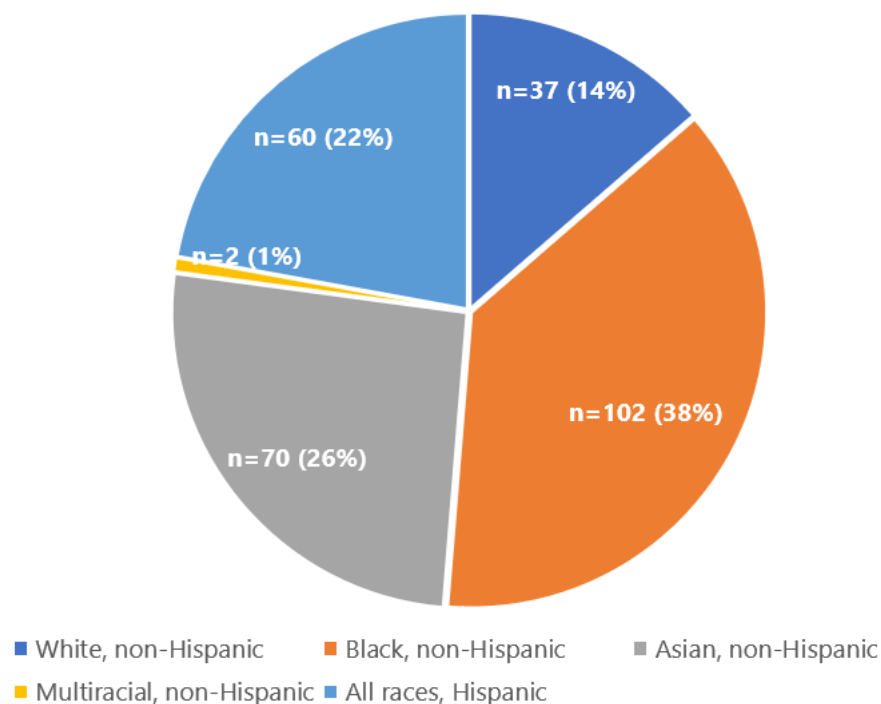


Figure 8. TB Case Rates* by Race/Ethnicity, Georgia, 2014-2018

Race/ Ethnicity	2014 (N=335)	2015 (N=321)	2016 (N=301)	2017 (N=293)	2018 (N=271)
Asian, non-Hispanic	19.3	20.2	17.0	16.7	15.8
All races, Hispanic	6.2	4.1	4.5	4.1	5.8
Black, non-Hispanic	5.1	5.0	4.6	4.7	3.1
White, non-Hispanic	0.8	0.8	0.7	0.5	0.7

*Rates per 100,000 population

Figure 9. TB Case Rates Among Non-Hispanic Black (N=102) and White Persons (N=37), Georgia, 1998-2018

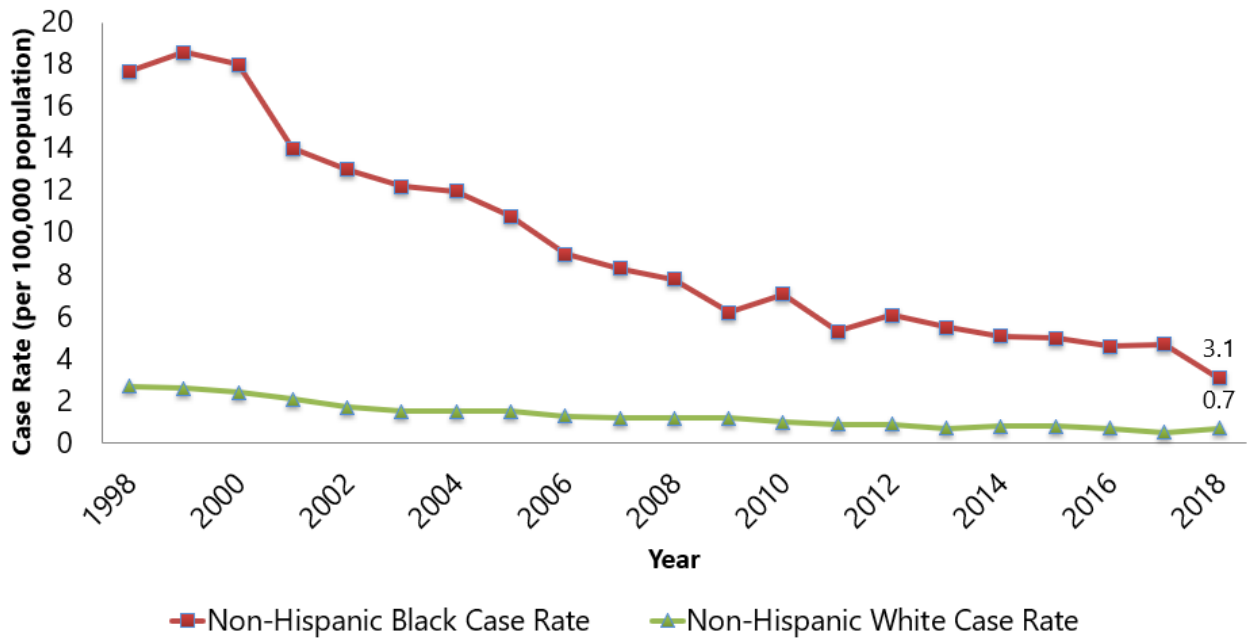


Figure 10. US-born and Foreign-born TB Cases, Georgia, 1998-2018 (N=271)

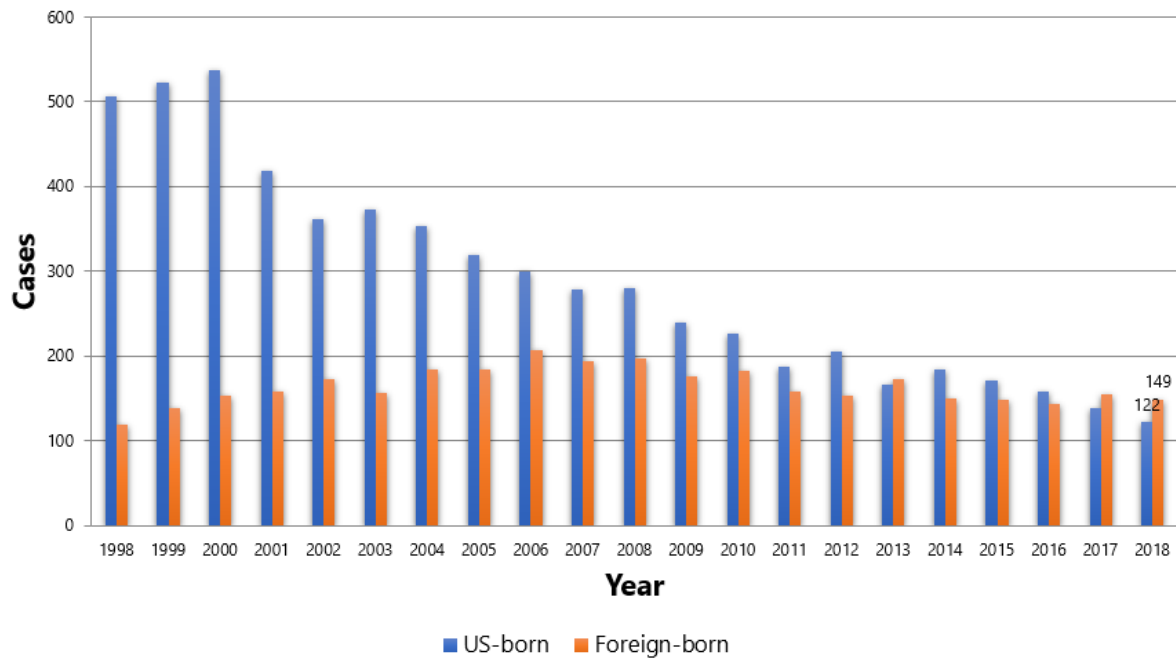


Figure 11. Country of Origin for Foreign-born TB Cases, Georgia, 2018 (N=149)

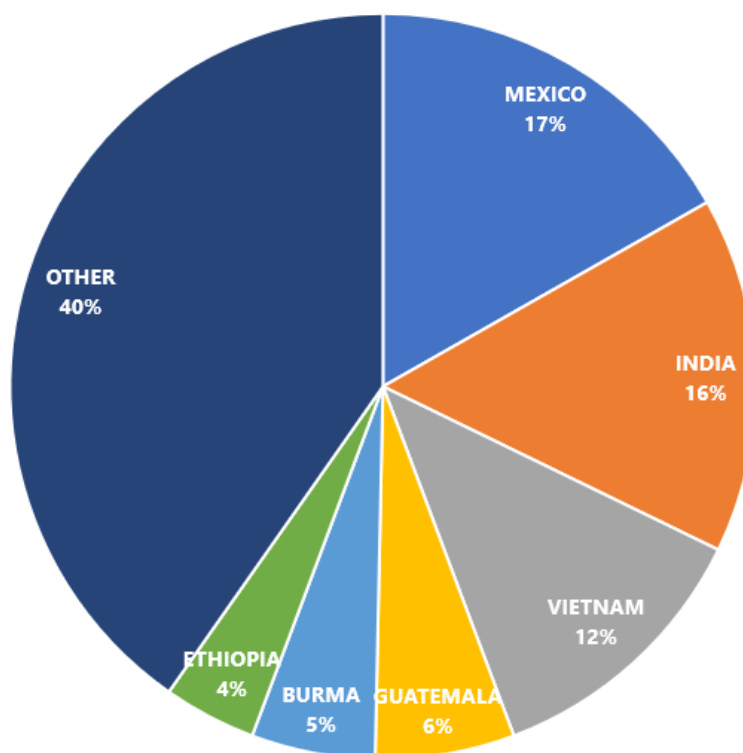


Figure 12. HIV Status of TB Cases, Georgia, 1998-2018 (N=271)

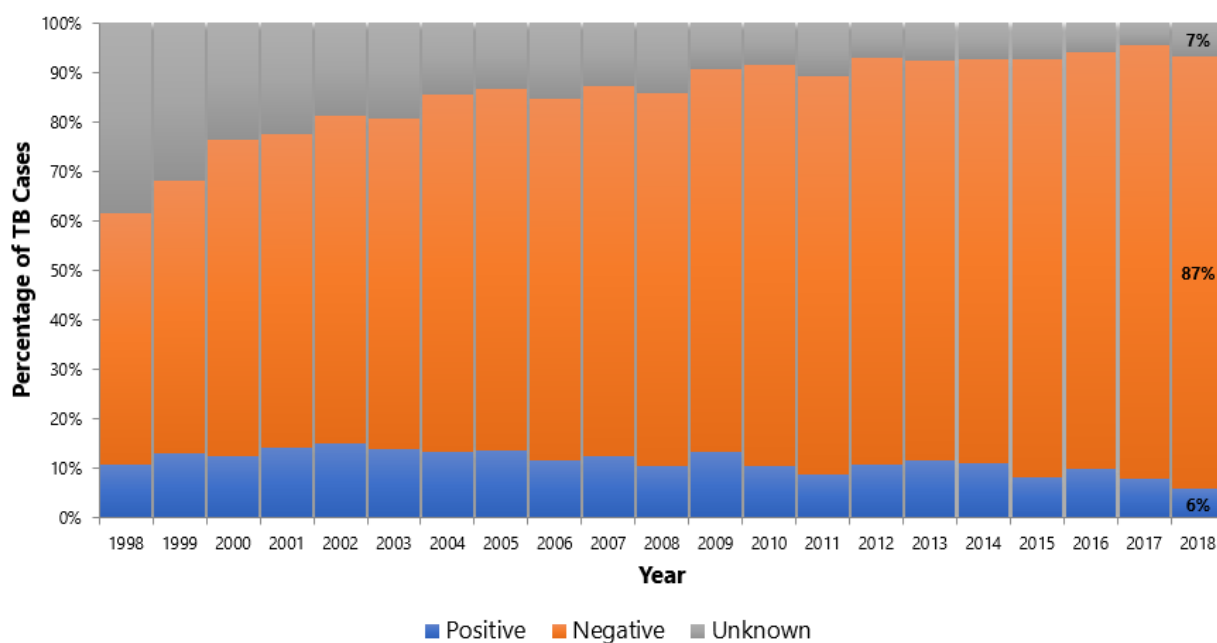


Figure 13. Risk Factors Among TB Patients, Georgia, 2014-2018

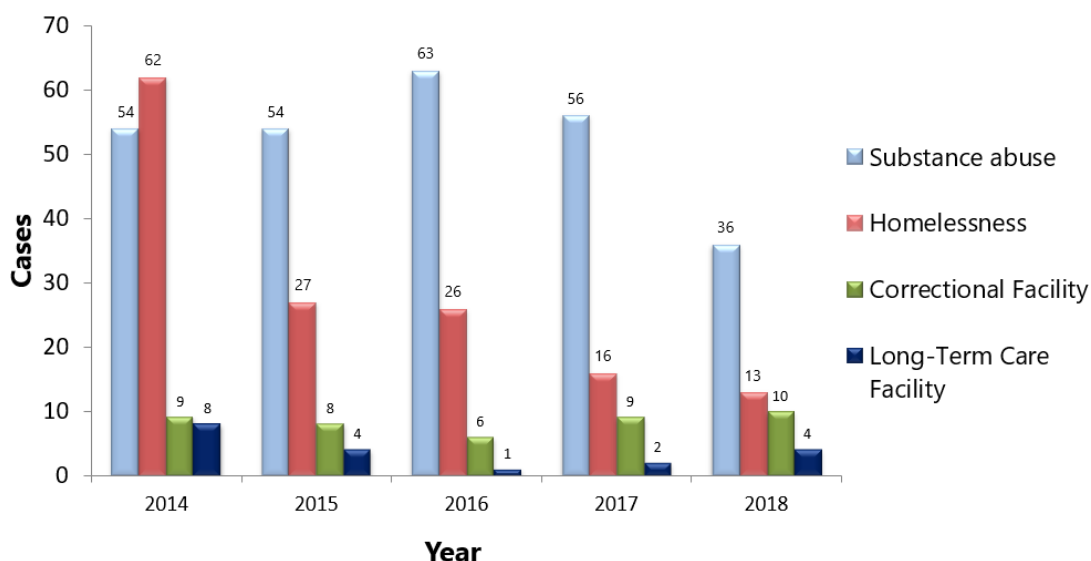
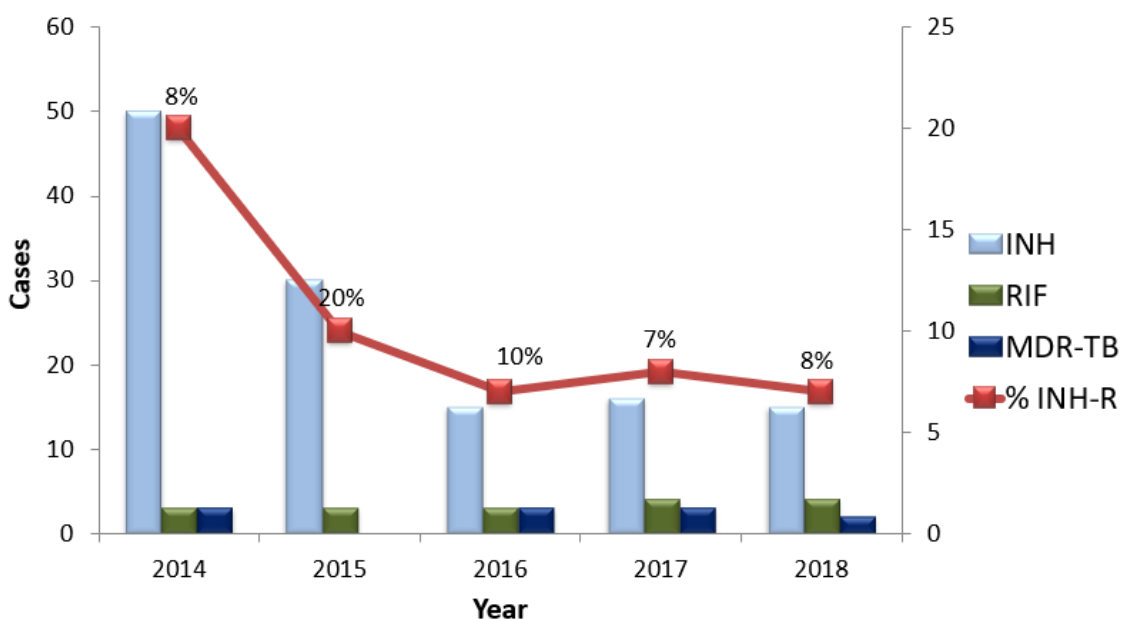


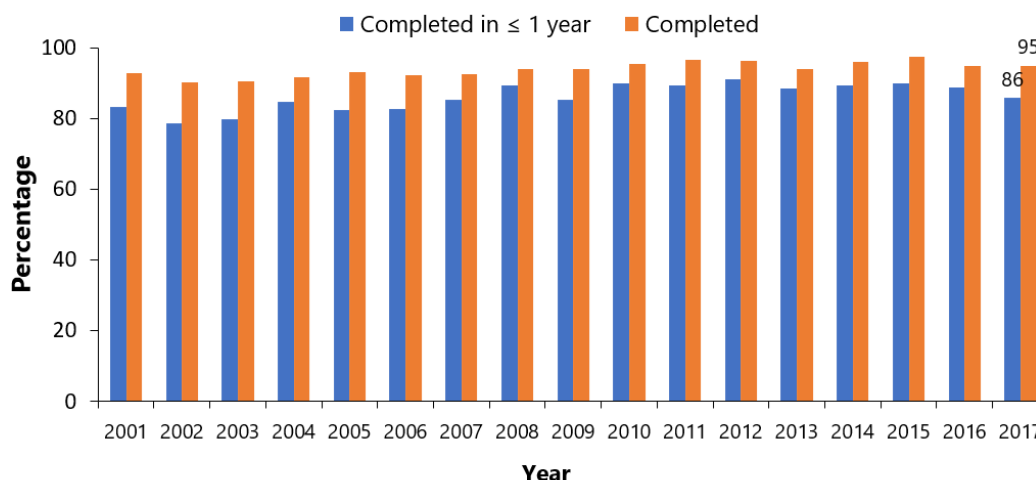
Figure 14. Primary Drug Resistance (INH-R)* and Multi-drug Resistant TB (MDR-TB), Georgia, 2014-2018 (N=202)**



*Defined as having no previous diagnosis of TB and having the first occurrence of TB INH-resistant

**Defined as having resistance to at least INH and RIF

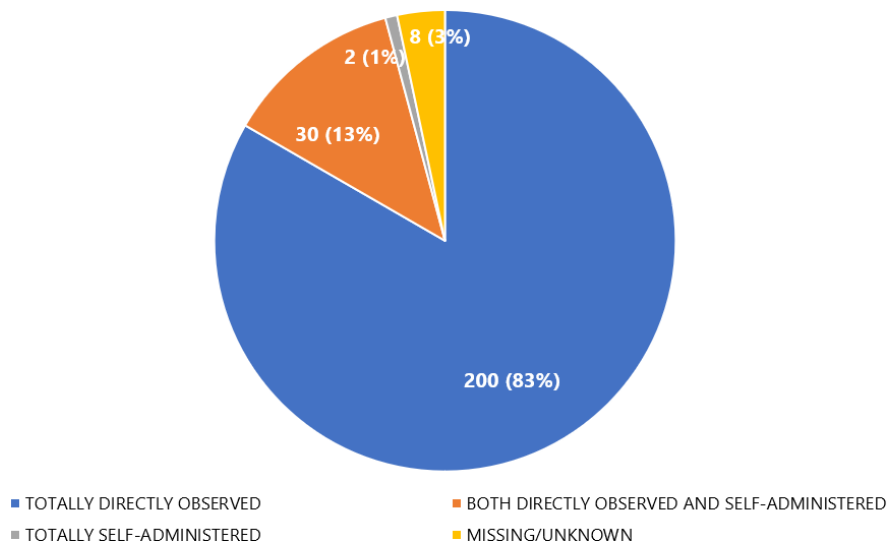
Figure 15. Completion of TB Treatment Therapy, Georgia, 2001-2017* (N=240)



*As of November 12, 2019; data available through 2017 only.

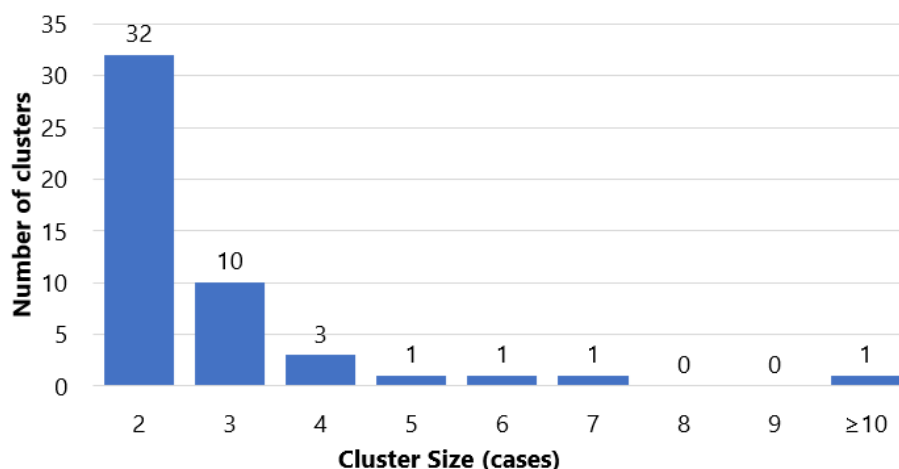
Note: Includes persons alive at diagnosis, with initial drug regimen of one or more drugs prescribed, who did not die within one year of initiating treatment; excludes persons with initial rifampin-resistant isolate, patients with bone and joint disease, meningial disease, or disease of the central nervous system, or pediatric patients (ages 0–14 years) with miliary disease or positive blood culture or a positive nucleic acid amplification test on a blood specimen, and those who moved out of the country within one year of initiating treatment.

Figure 16. Mode of Treatment Administration Among Persons Reported with TB, Georgia, 2017 (N=240)



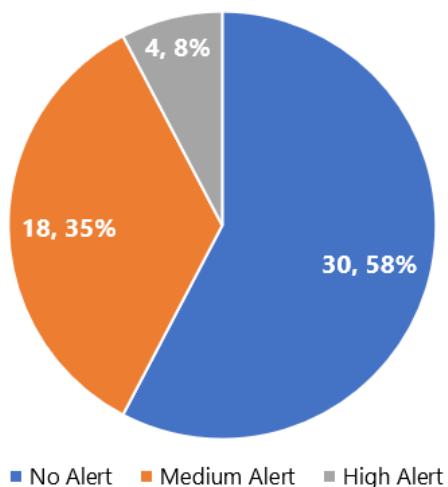
Note: Includes persons alive at diagnosis, with initial drug regimen of one or more drugs prescribed, who did not die within one year of initiating treatment; excludes persons with initial rifampin-resistant isolate, patients with bone and joint disease, meningial disease, or disease of the central nervous system, or pediatric patients (ages 0–14 years) with miliary disease or positive blood culture or a positive nucleic acid amplification test on a blood specimen, and those who moved out of the country within one year of initiating treatment.

Figure 17. Number of County-based Tuberculosis Genotype Clusters* by Cluster Size, Georgia, 2016–2018



*Genotype cluster is defined as two or more cases with matching spoligotype and 24-locus MIRU-VNTR (GENType) within a county during the specified 3-year time period.

Figure 18. Tuberculosis Genotype Clusters by TB GIMS* Alert Levels†, Georgia, 2016–2018



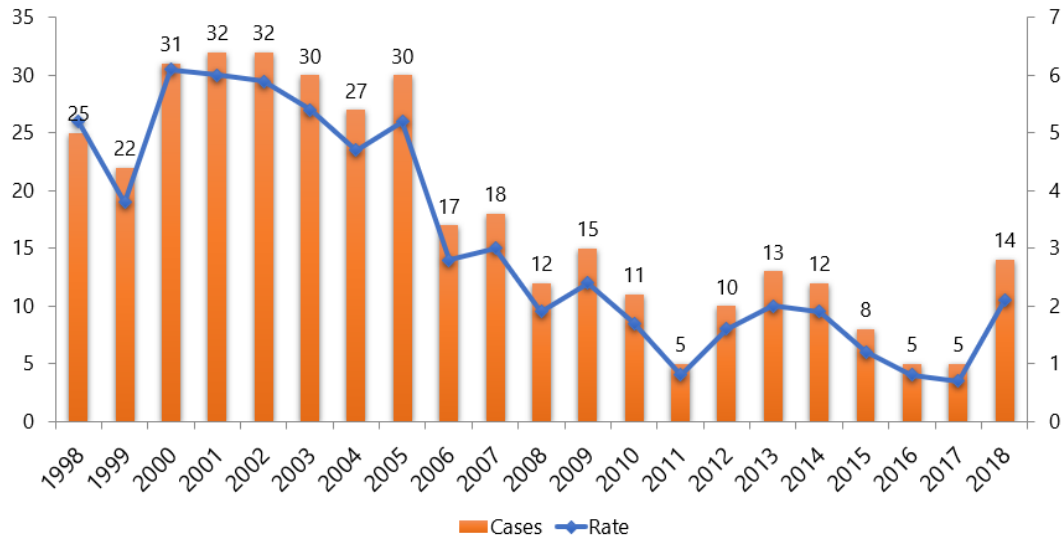
*Tuberculosis Genotyping Information Management System

†Alert level is determined by the log likelihood ratio statistic (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; TB GIMS generates alert level notifications based on this statistic: “No alert” is indicated if LLR is between 0 – <5, “medium” is for LLR of 5 – <10 and “high” alert is for clusters with LLR ≥ 10.

Tuberculosis Morbidity Trends by Health District, Georgia, 1998-2018



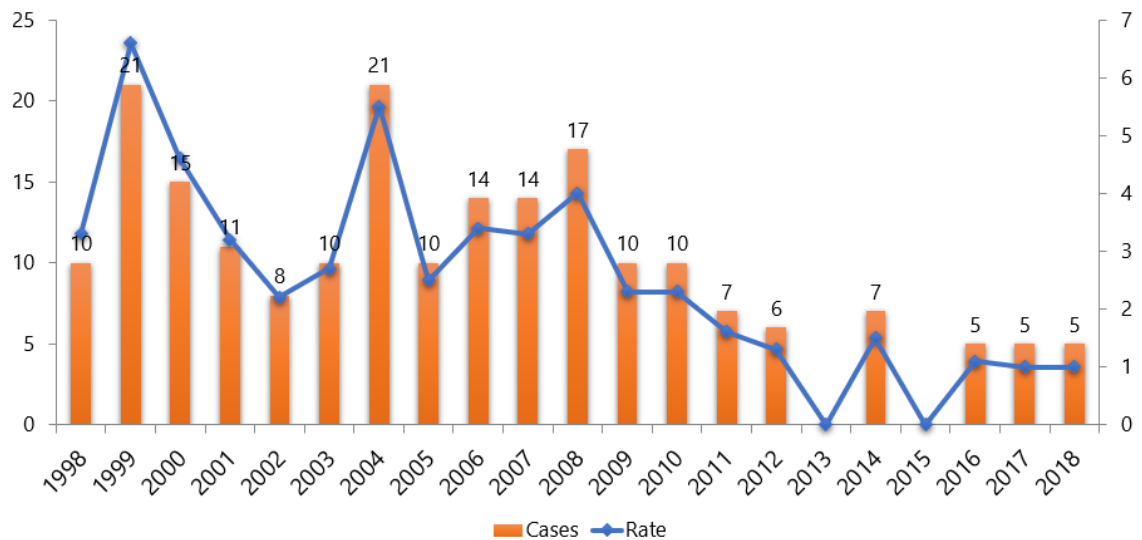
TB Cases and Rates, District 1-1 (Rome), 1998-2018



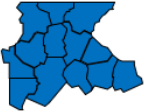
Note: Rates are per 100,000 population
Case counts less than five are masked.



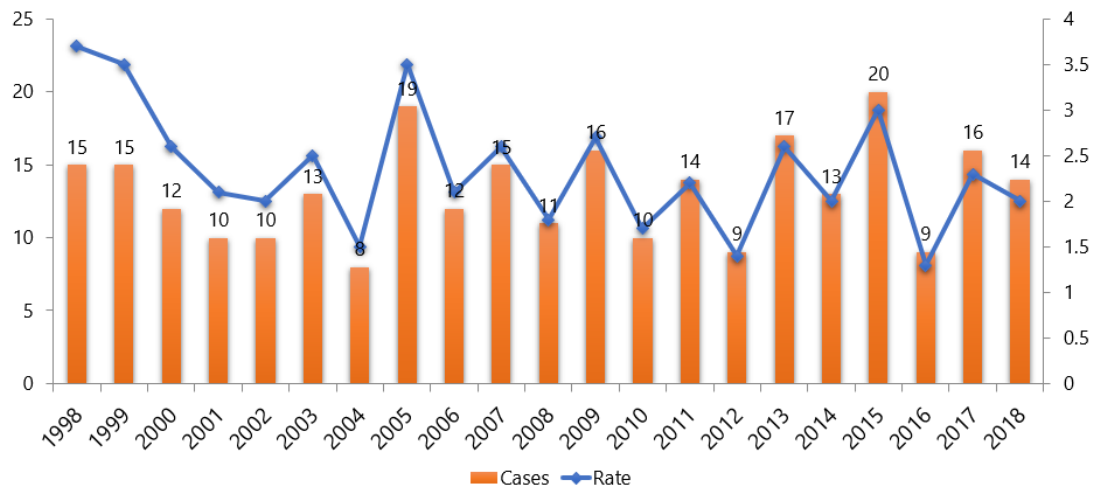
TB Cases and Rates, District 1-2 (Dalton), 1998-2018



Note: Rates are per 100,000 population
Case counts less than five are masked.



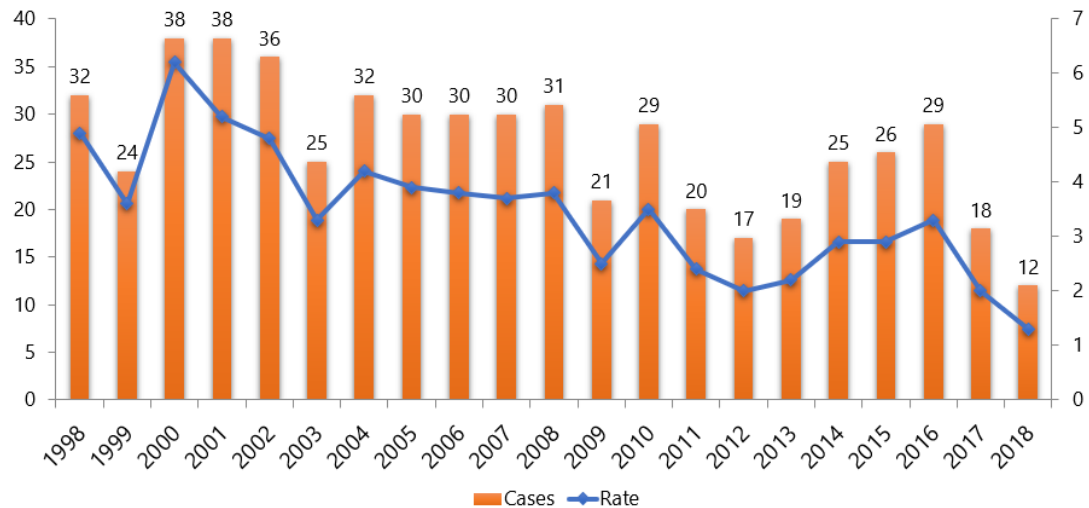
TB Cases and Rates, District 2 (Gainesville), 1998-2018



Note: Rates are per 100,000 population
Case counts less than five are masked.



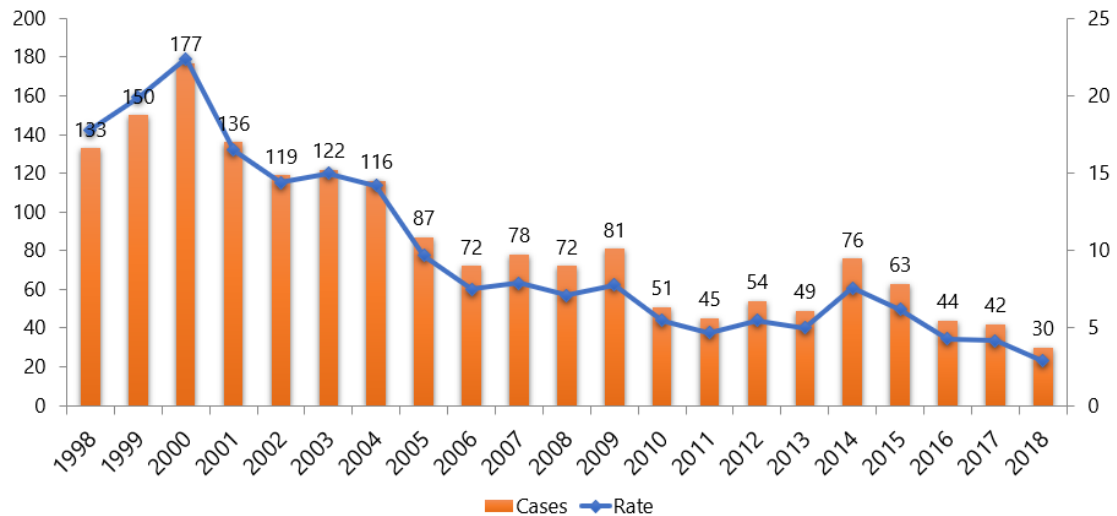
TB Cases and Rates, District 3-1 (Cobb), 1998-2018



Note: Rates are per 100,000 population
Case counts less than five are masked.



TB Cases and Rates, District 3-2 (Fulton), 1998-2018



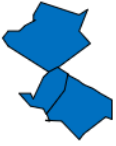
Note: Rates are per 100,000 population
Case counts less than five are masked.



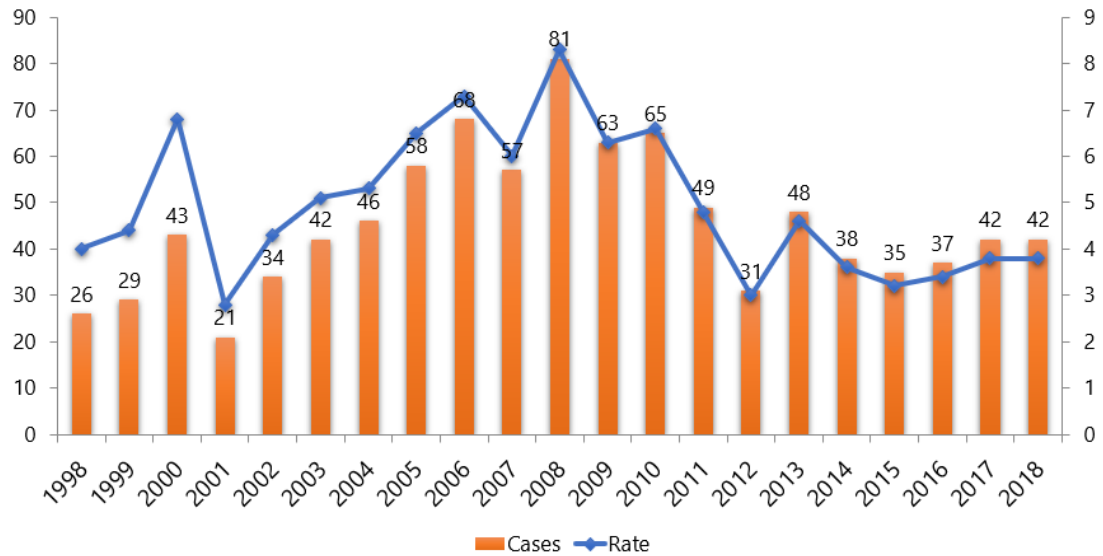
TB Cases and Rates, District 3-3 (Clayton), 1998-2018



Note: Rates are per 100,000 population
Case counts less than five are masked.



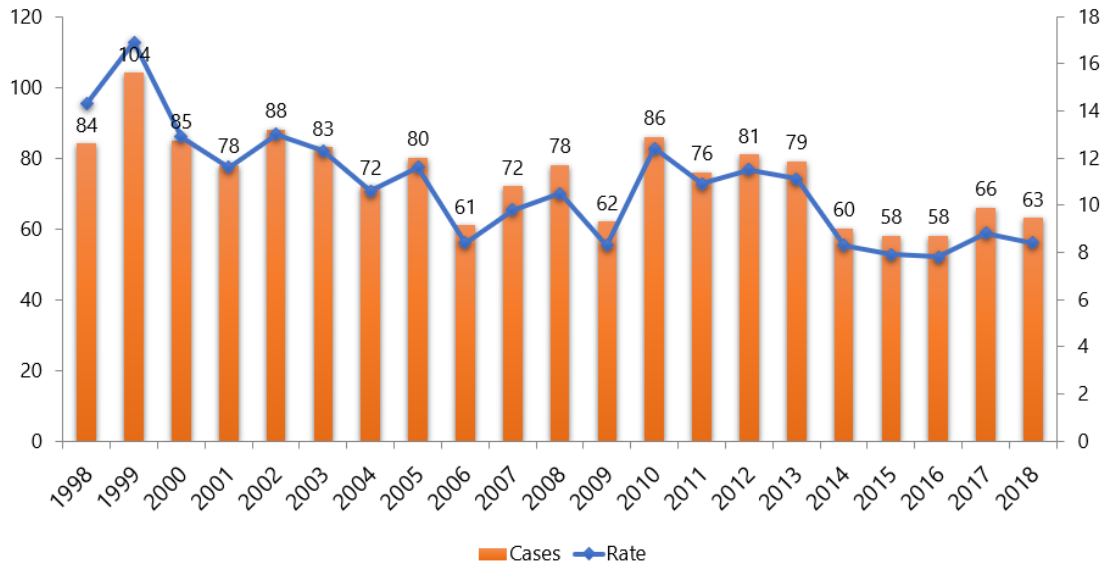
TB Cases and Rates, District 3-4 (Lawrenceville), 1998-2018



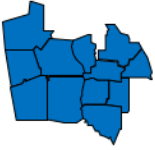
Note: Rates are per 100,000 population
Case counts less than five are masked.



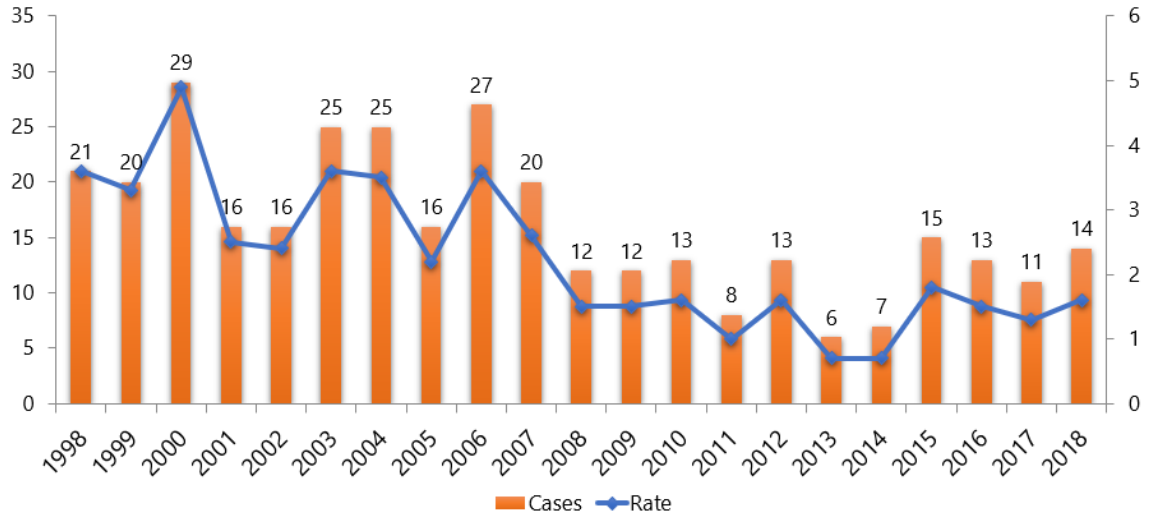
TB Cases and Rates, District 3-5 (DeKalb), 1998-2018



Note: Rates are per 100,000 population
Case counts less than five are masked.



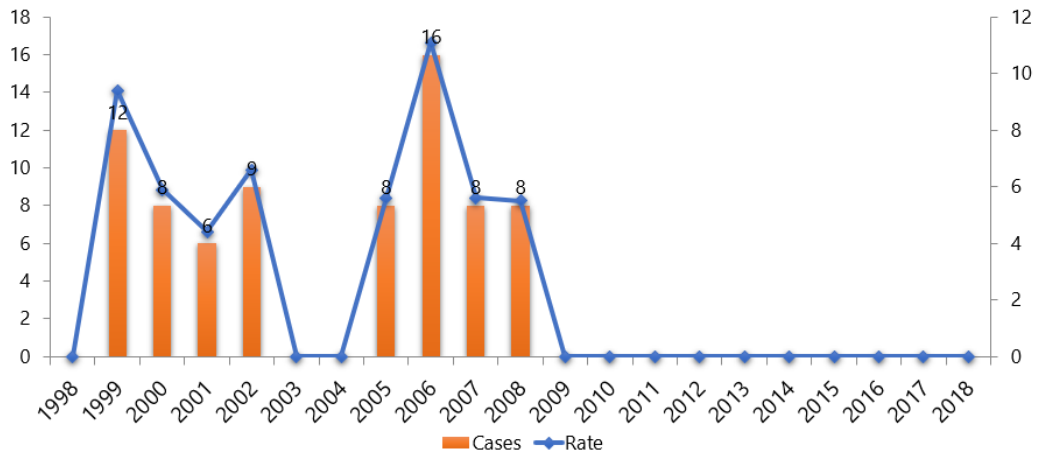
TB Cases and Rates, District 4 (LaGrange), 1998-2018



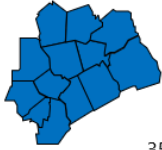
Note: Rates are per 100,000 population
Case counts less than five are masked.



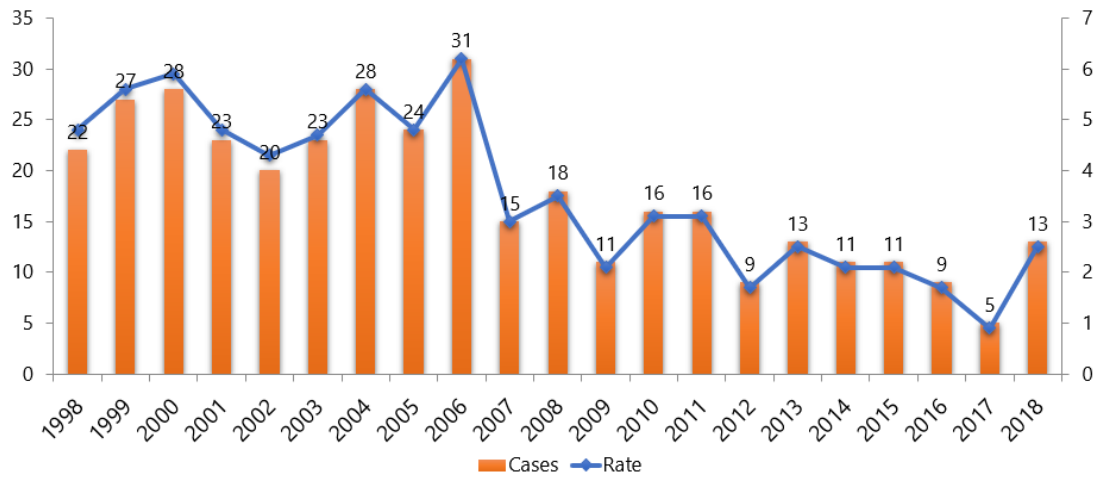
TB Cases and Rates, District 5-1 (Dublin), 1998-2018



Note: Rates are per 100,000 population
Case counts less than five are masked.



TB Cases and Rates, District 5-2 (Macon), 1998-2018



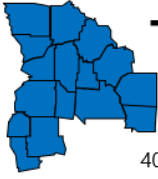
Note: Rates are per 100,000 population
Case counts less than five are masked.



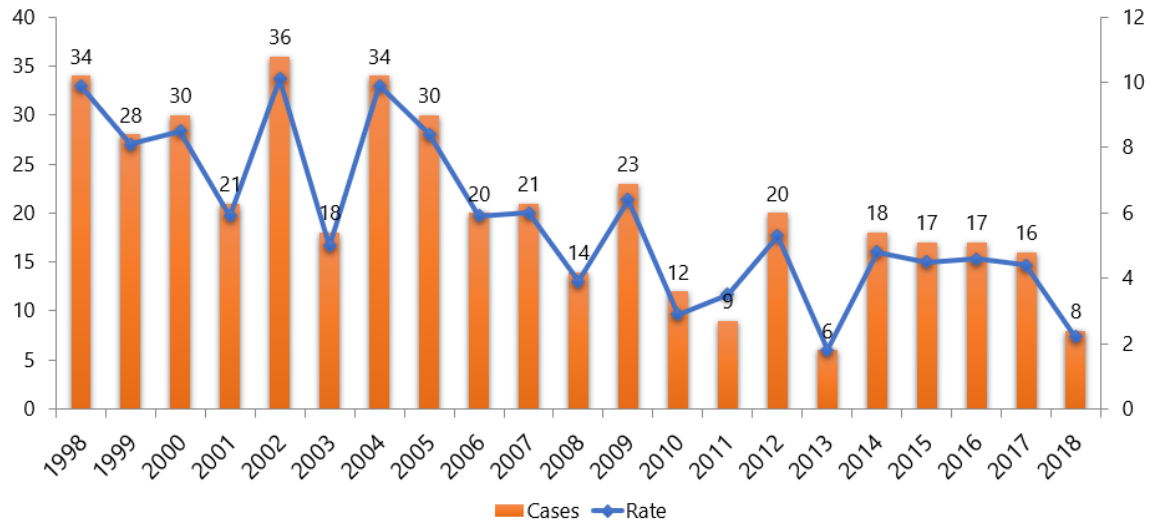
TB Cases and Rates, District 6 (Augusta)*, 1998-2018



Note: Rates are per 100,000 population
Case counts less than five are masked.
 *Augusta State Medical Prison cases not included



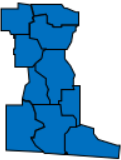
TB Cases and Rates, District 7 (Columbus)*, 1998-2018



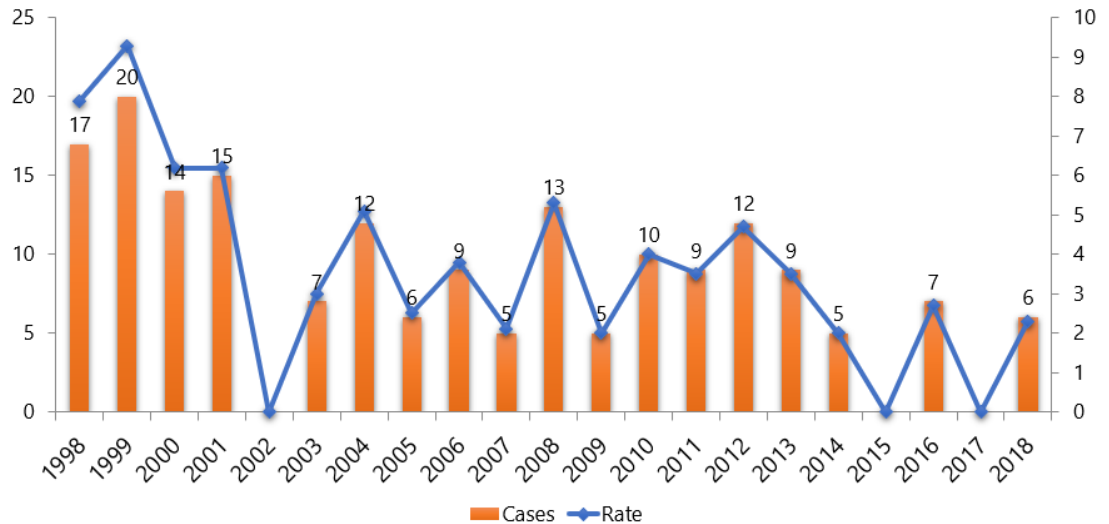
Note: Rates are per 100,000 population

Case counts less than five are masked.

*Stewart Detention Center cases not included



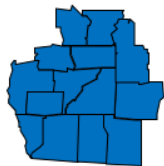
TB Cases and Rates, District 8-1 (Valdosta)*, 1998-2018



Note: Rates are per 100,000 population

Case counts less than five are masked.

*Irwin County Detention Center cases not included



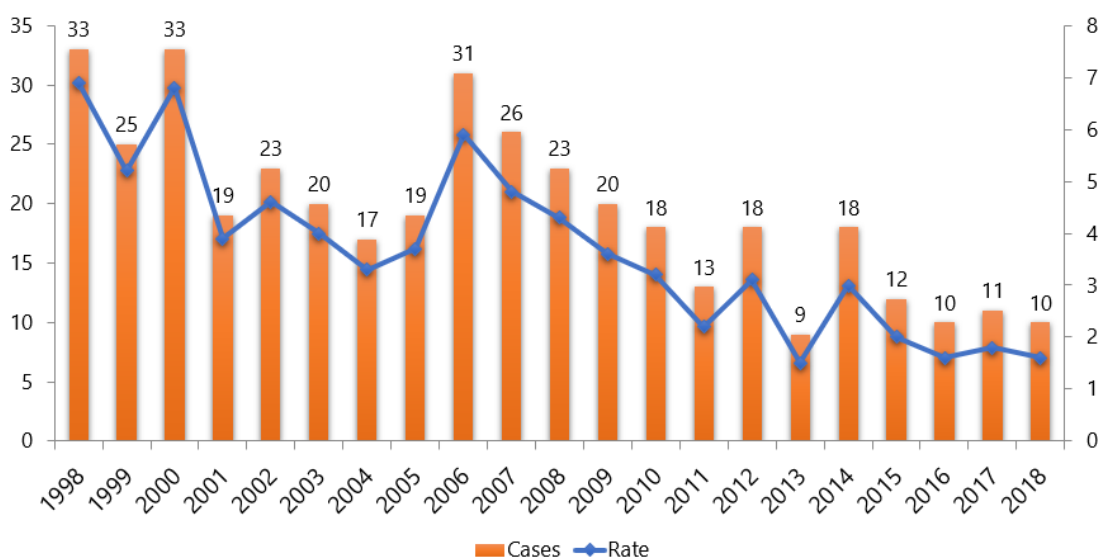
TB Cases and Rates, District 8-2 (Albany), 1998-2018



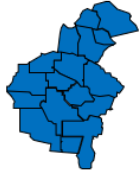
Note: Rates are per 100,000 population
Case counts less than five are masked.



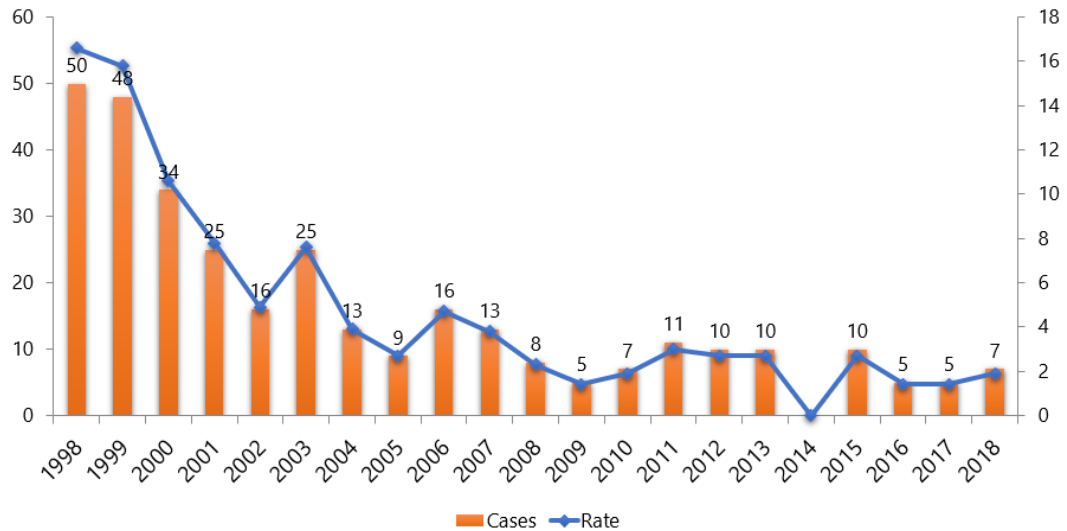
TB Cases and Rates, District 9-1 (Coastal), 1998-2018



Note: Rates are per 100,000 population
Case counts less than five are masked.



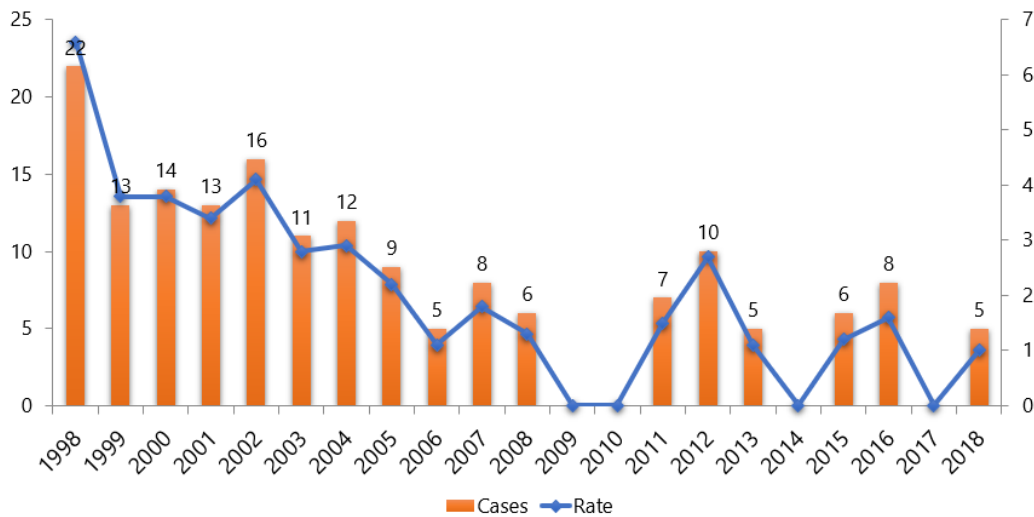
TB Cases and Rates, District 9-2 (Waycross), 1998-2018



Note: Rates are per 100,000 population
Case counts less than five are masked.



TB Cases and Rates, District 10 (Athens), 1998-2018



Note: Rates are per 100,000 population
Case counts less than five are masked.