

Annual Tuberculosis Surveillance Report, **2022**

Virginia Department of Health
Division of Clinical Epidemiology
Tuberculosis Program

Acknowledgments

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The Division of Clinical Epidemiology TB Program acknowledges and appreciates the public health nurses, outreach workers, and other staff who provide direct services to patients and who provide the information and data summarized in this report. Without their dedication, Virginia could not move toward the goal of TB elimination.

For more information or for specific data requests, please contact the VDH TB Program:

Email: tuberculosis@vdh.virginia.gov

Call: 804-864-7906

Visit: vdh.virginia.gov/tuberculosis/

About This Report

This report provides TB surveillance data summaries for calendar year 2022, and for prior years for variables that are not yet complete for 2022. These data reflect the most complete information available as of August 1, 2023. Due to the known and unknown impacts of the COVID-19 pandemic on TB in Virginia and the United States, comparisons are made both to pre-pandemic 2019 data and to 2021 data.

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1. All patients with confirmed TB disease
2. Anyone presumed to have TB disease
3. Anyone diagnosed with latent TB infection (LTBI)

LTBI reports may be submitted within three days of diagnosis through an [electronic confidential morbidity report](#), by submitting an [LTBI case report form](#) by encrypted email to tuberculosis@vdh.virginia.gov, or by fax to 804-416-5178. If using the confidential morbidity report, please include additional evaluation and treatment information in the comments, including the date and results of chest imaging, additional known risk factors (e.g., HIV, TNF-alpha antagonists), and treatment regimen and dates.

Additional Reporting Resources:

- [Virginia Reportable Disease List](#)
- [Conditions Reportable by Directors of Laboratories](#)
- [Local Health Department Locator](#)

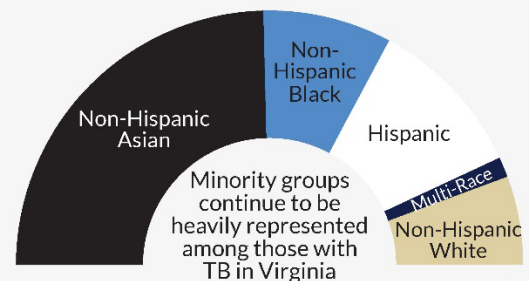
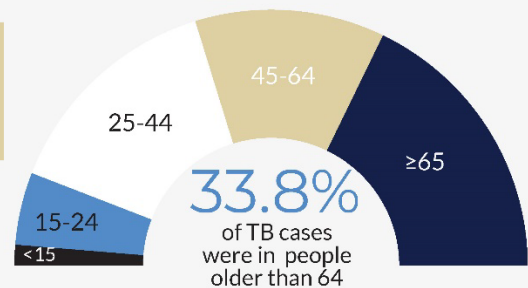
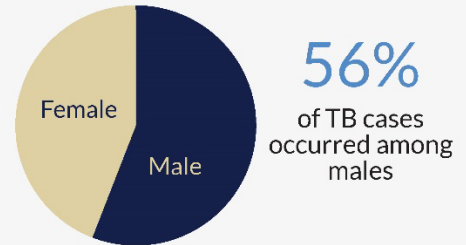


Tuberculosis in Virginia, 2022

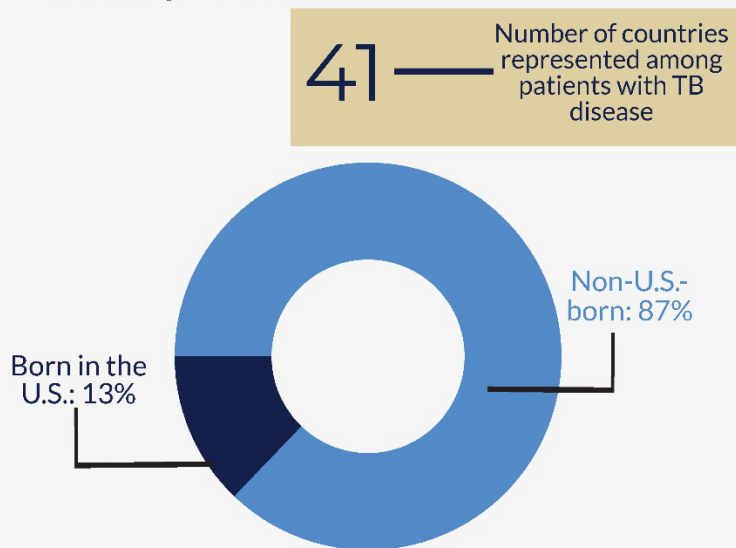
Overview



Demographics



Country of Birth



Most Common Countries of Birth Among Patients

United States: 26 Afghanistan: 22 India: 18 Vietnam: 17 Philippines: 12



Clinical Characteristics

Proportion of TB cases with:

2.1% HIV

15.9% Resistance to any first line drug

25.6% Diabetes

36.4% A positive sputum smear

75.9% A pulmonary site of disease

Time in the U.S.

8.3 — Median number of years in the U.S. at time of diagnosis among non-U.S.-born patients

Profile of Tuberculosis Cases in Virginia

In 2022, Virginia reported 195 cases of tuberculosis (TB), a 22% increase from the 160 cases reported in 2021, but only a 2.1% increase from pre-pandemic counts in 2019. This increase was expected as local and national TB numbers began to increase after declines in reported cases during the peaks of the COVID-19 pandemic. Virginia's TB case rate increased from 1.9 cases per 100,000 persons in 2021 to 2.3 cases per 100,000 persons in 2022. Virginia's 2022 rate, as it has in the past, remained below the national rate of 2.5 cases per 100,000 persons.

Figure 1. Tuberculosis Cases, Virginia, 1942-2022

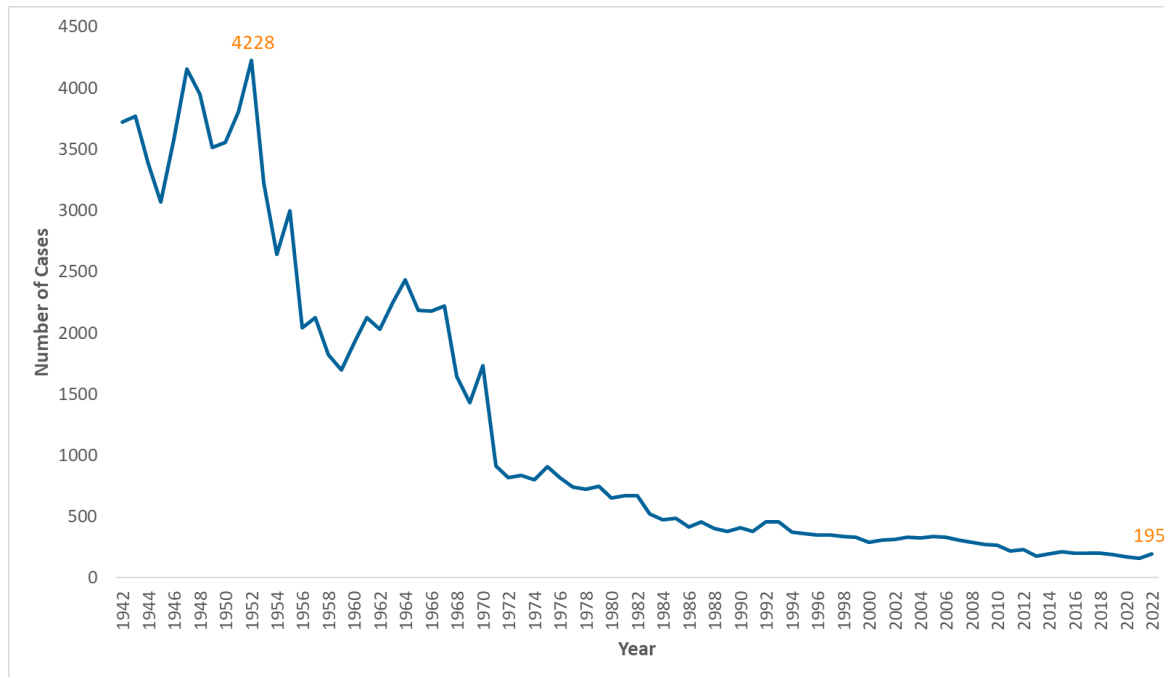
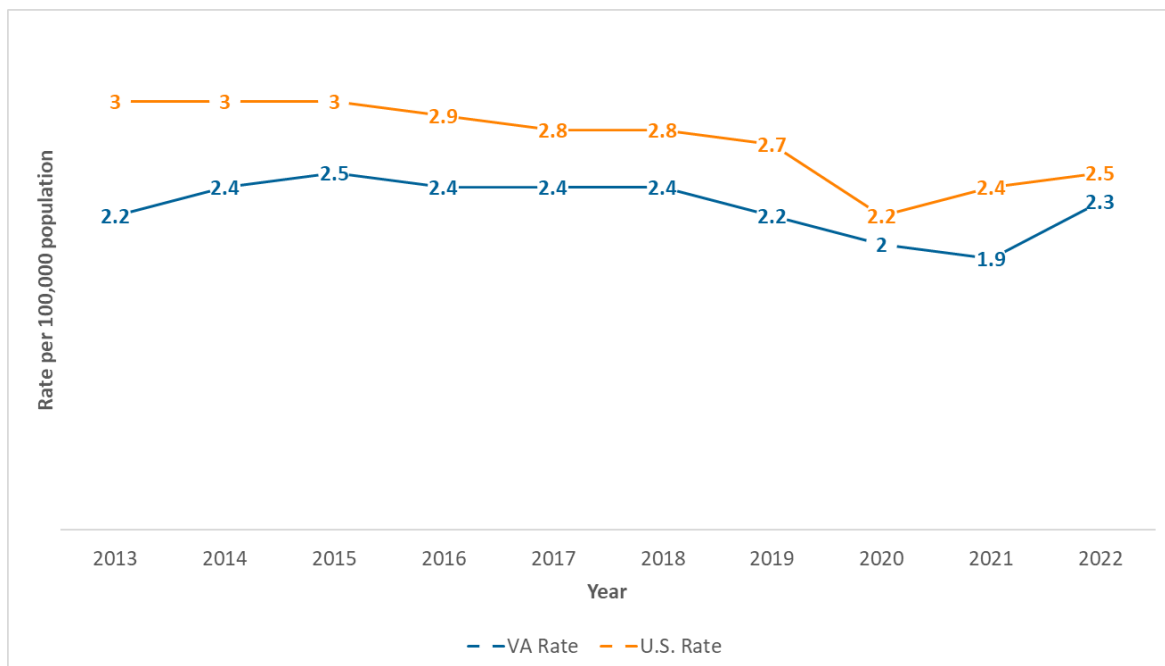
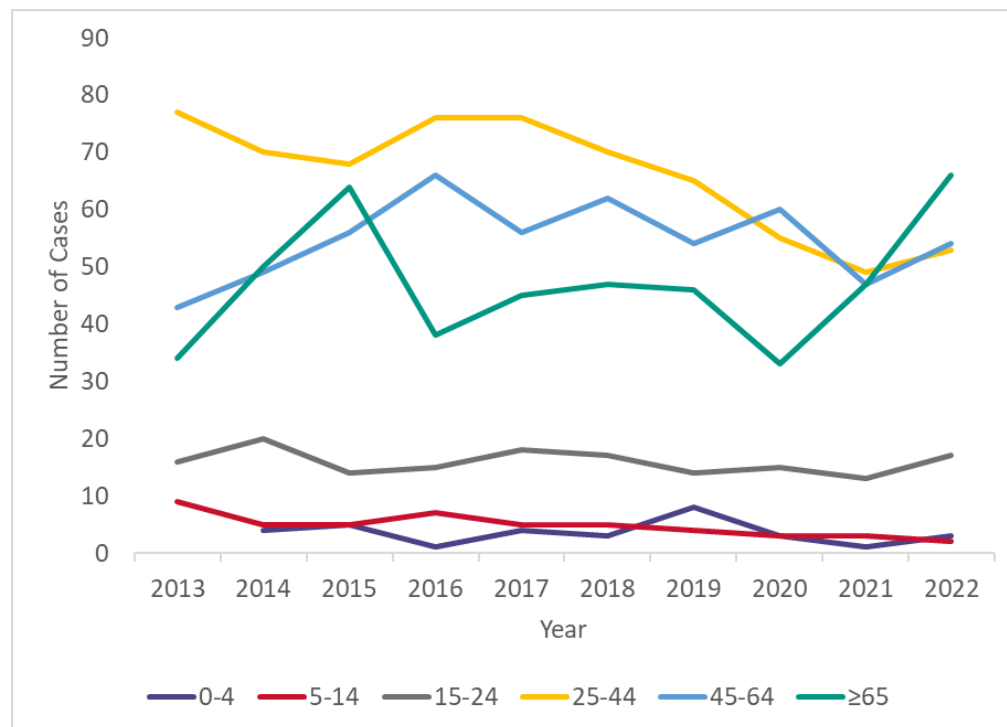


Figure 2. Tuberculosis Rates, Virginia and the United States, 2013-2022



Demographics

Figure 3. Tuberculosis Cases by Age Group in Years, Virginia, 2013-2022



In 2022, Virginia's TB cases ranged in age from two to 98 years old. In 2022, the number of older individuals with TB increased with clients aged 65 and older accounting for 34% of cases, compared to 29% in 2021 and only 24% in 2019. This was different than a trend seen in the national data where cases dropped in people aged 65 and older. In 2022, three children under the age of five were treated for active TB disease and an additional two children between the ages of five and 14. Diagnosing and treating young children with active TB can be challenging but is critical, as serious negative outcomes are possible. Fortunately, Virginia continues to see fewer children diagnosed with TB than were seen in 2019 when pediatric TB became a focus for the state. Fifty-six percent of Virginia's 2022 TB cases were male and 44% were female.

Figure 4. Tuberculosis Cases by Sex, Virginia, 2013-2022

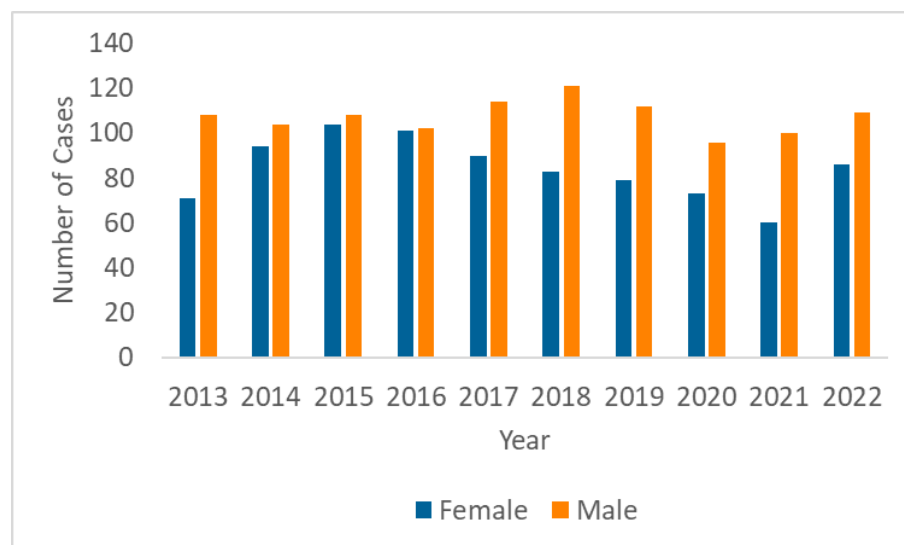


Figure 5. Race and Ethnicity of U.S.-Born Tuberculosis Cases, Virginia, 2013-2022

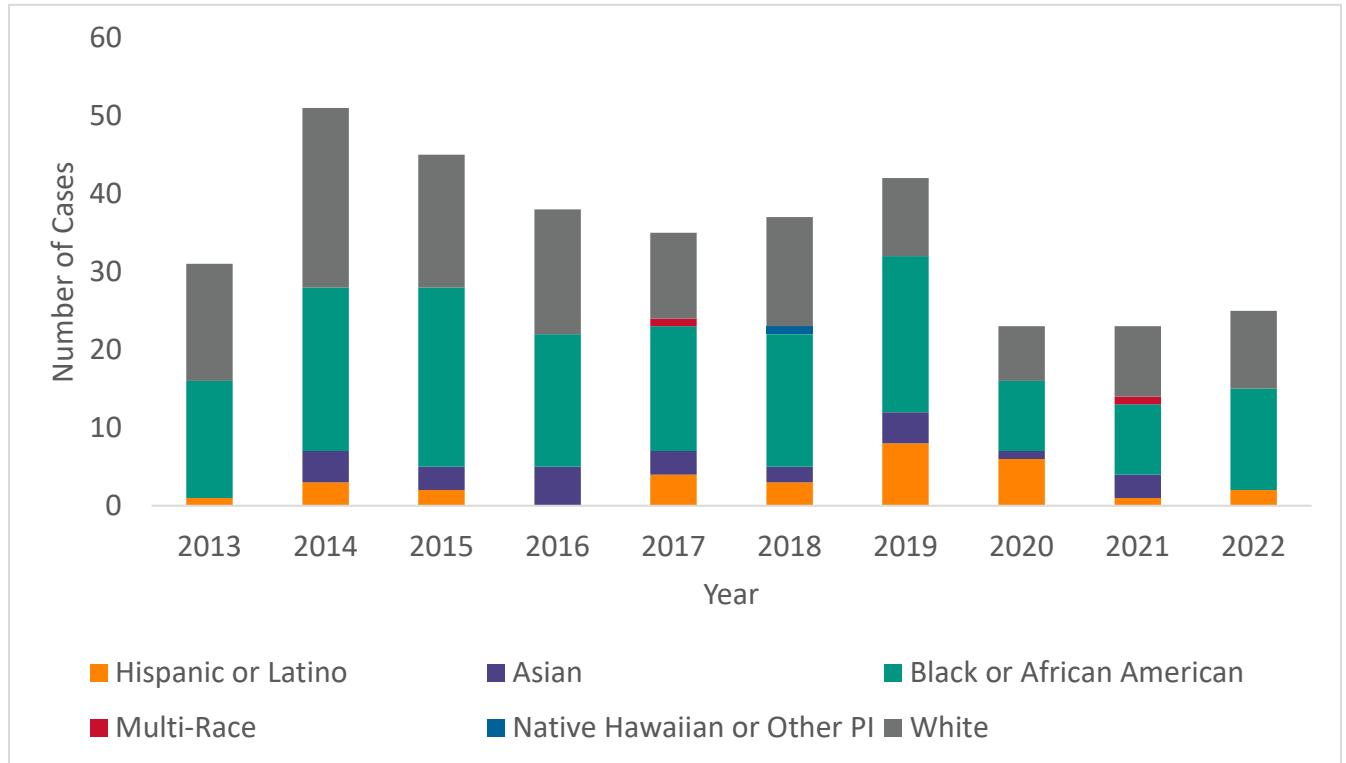
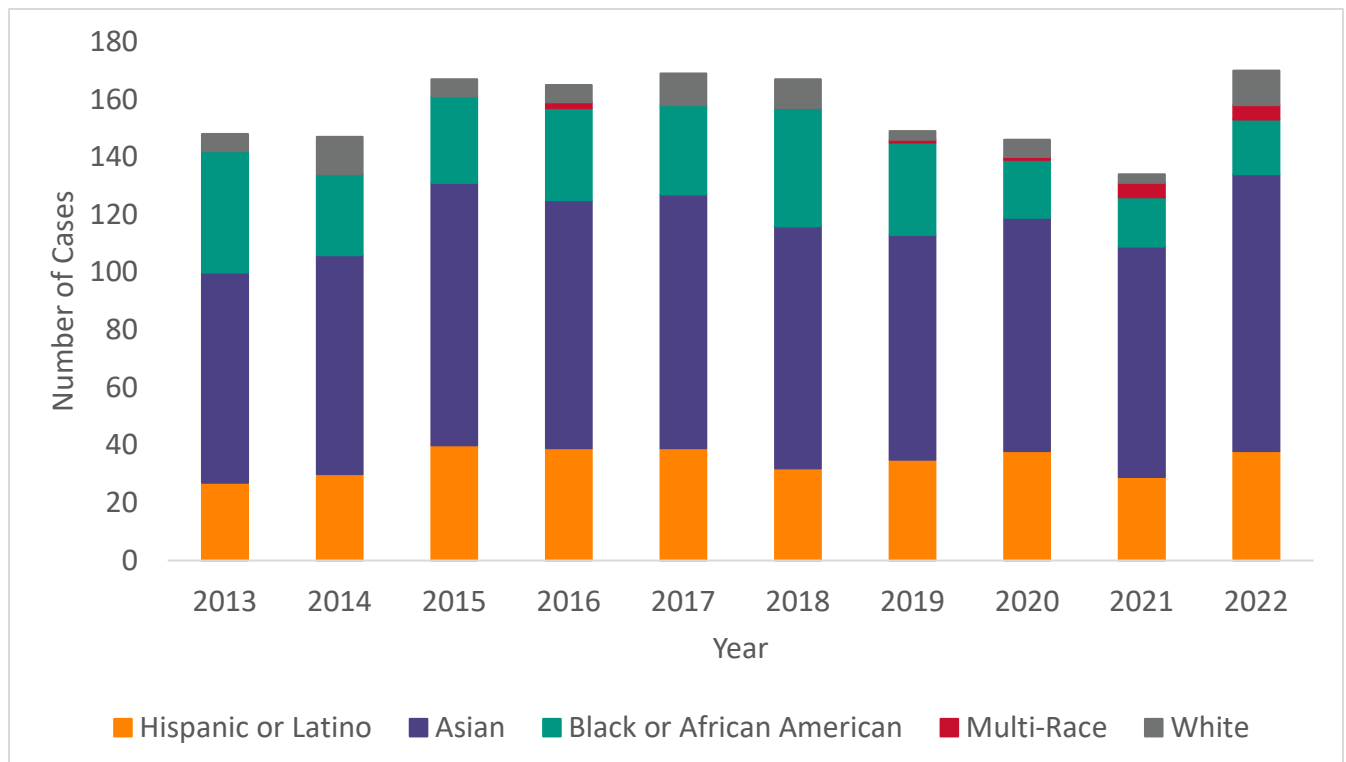


Figure 6. Race and Ethnicity of Non-U.S.-Born Tuberculosis Cases, Virginia, 2013-2022



Virginia typically sees a high percentage of TB clients in individuals who were born outside of the United States, and sees higher numbers of individuals identifying as Asian or Hispanic/Latino in this group, compared to higher numbers of individuals identifying as Black or African American among U.S.-born people with TB. In 2022, 87% of Virginia's TB clients were non-U.S. born. In 2019, 78% of TB clients were non-U.S.-born and in 2021 86% were non-U.S.-born. Humanitarian crises across the world and associated global movement continue to impact local, state, and national TB burden, and emphasize the need for a global TB elimination strategy. In 2022, Virginia provided care for TB clients born in 40 countries other than the United States. Rates of TB in the non-U.S.-born population are significantly higher than rates seen in the U.S.-born population in Virginia.

Figure 7. Percent of Total Tuberculosis Cases by Nativity, Virginia, 2013-2022

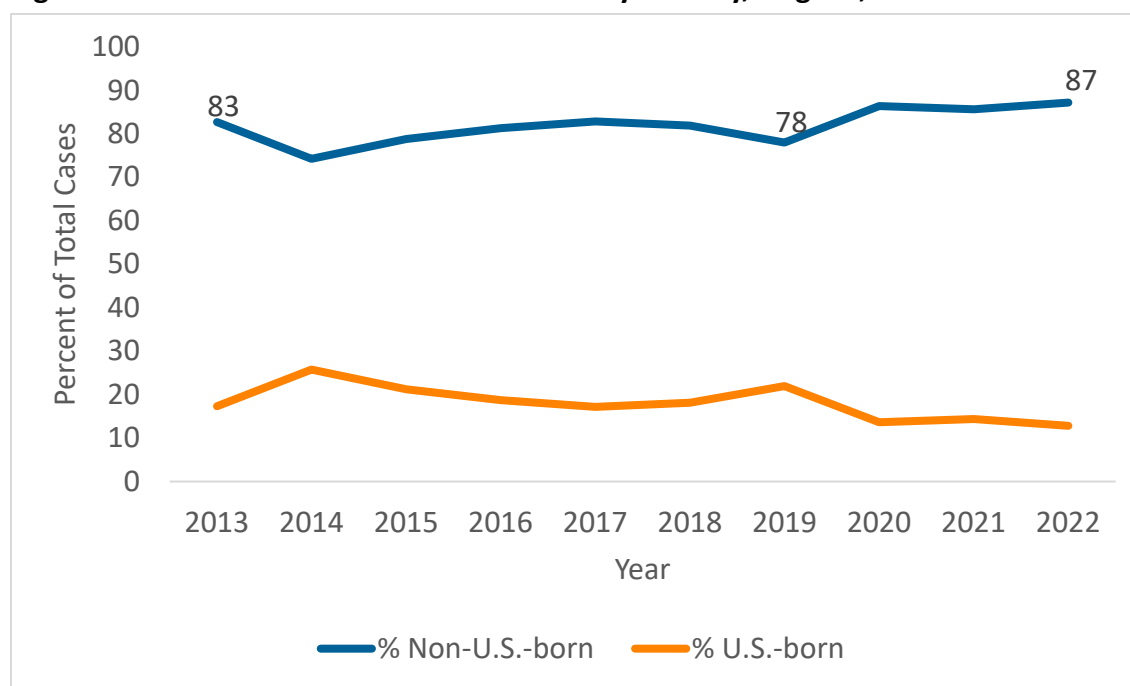


Figure 8. Tuberculosis Rate by Nativity and Overall State Rate, Virginia, 2013-2022

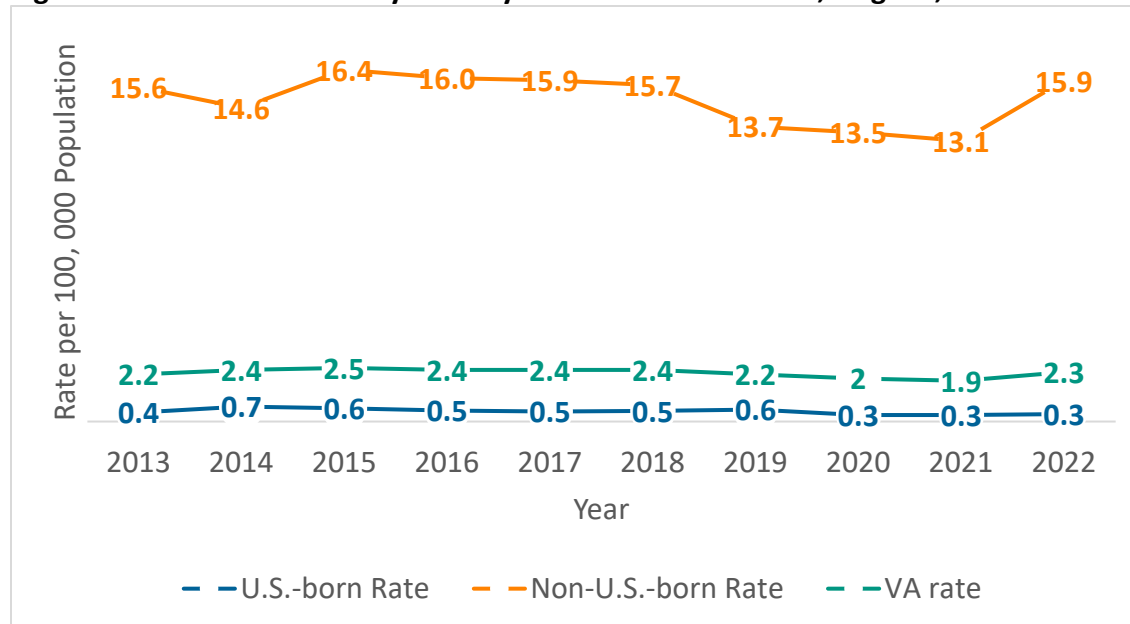
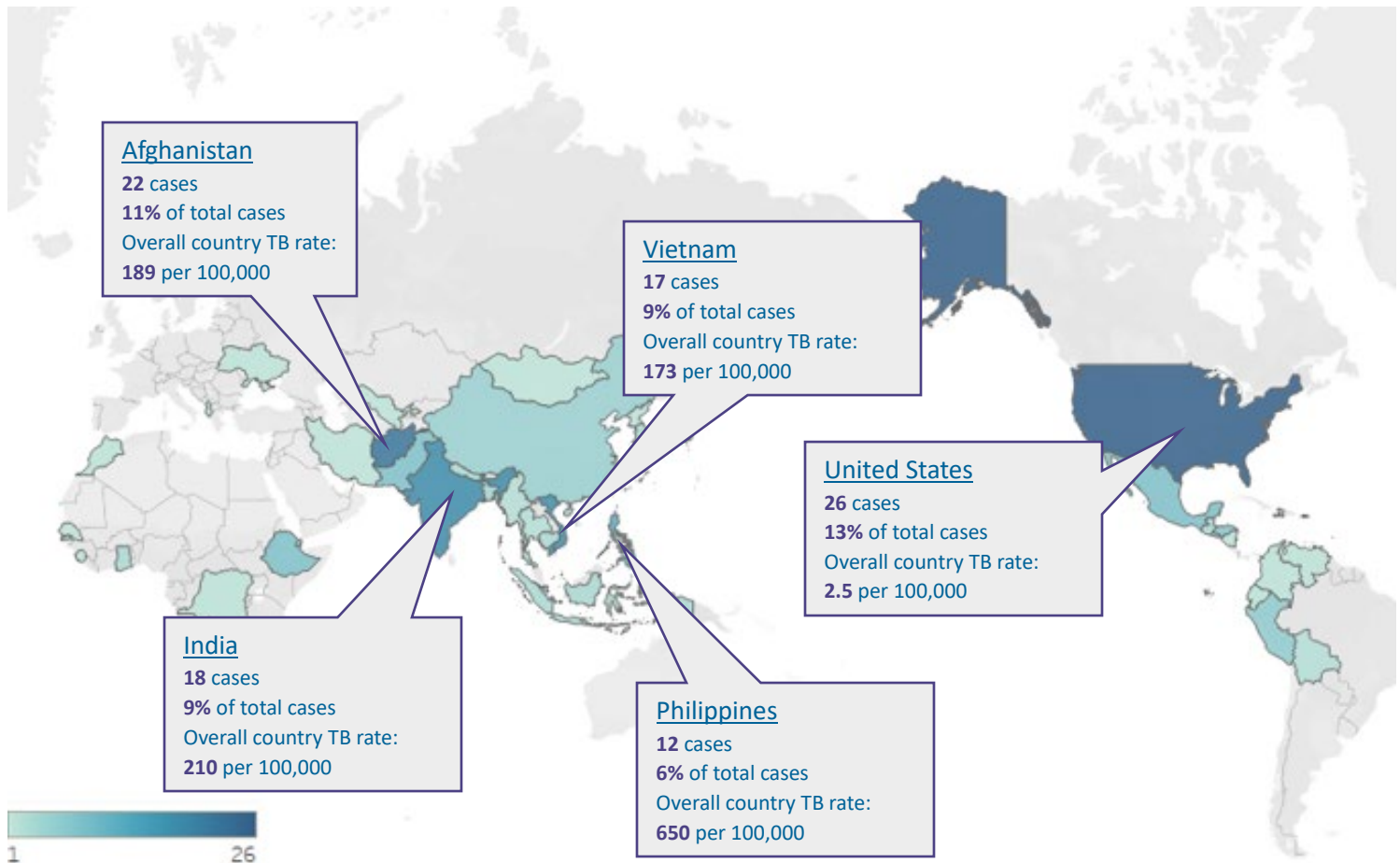
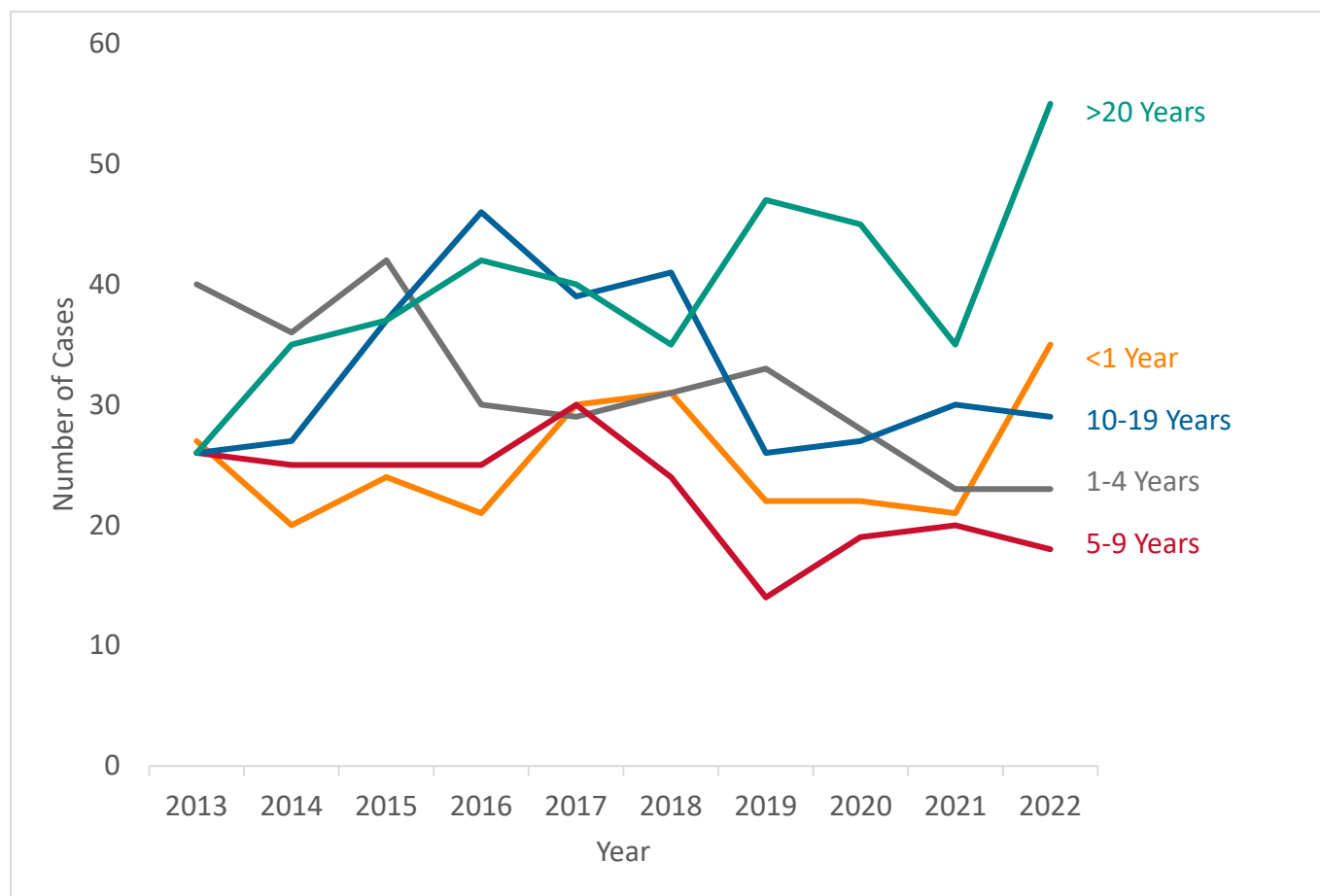


Figure 9. Top Countries of Birth, Tuberculosis Cases, Virginia, 2022*

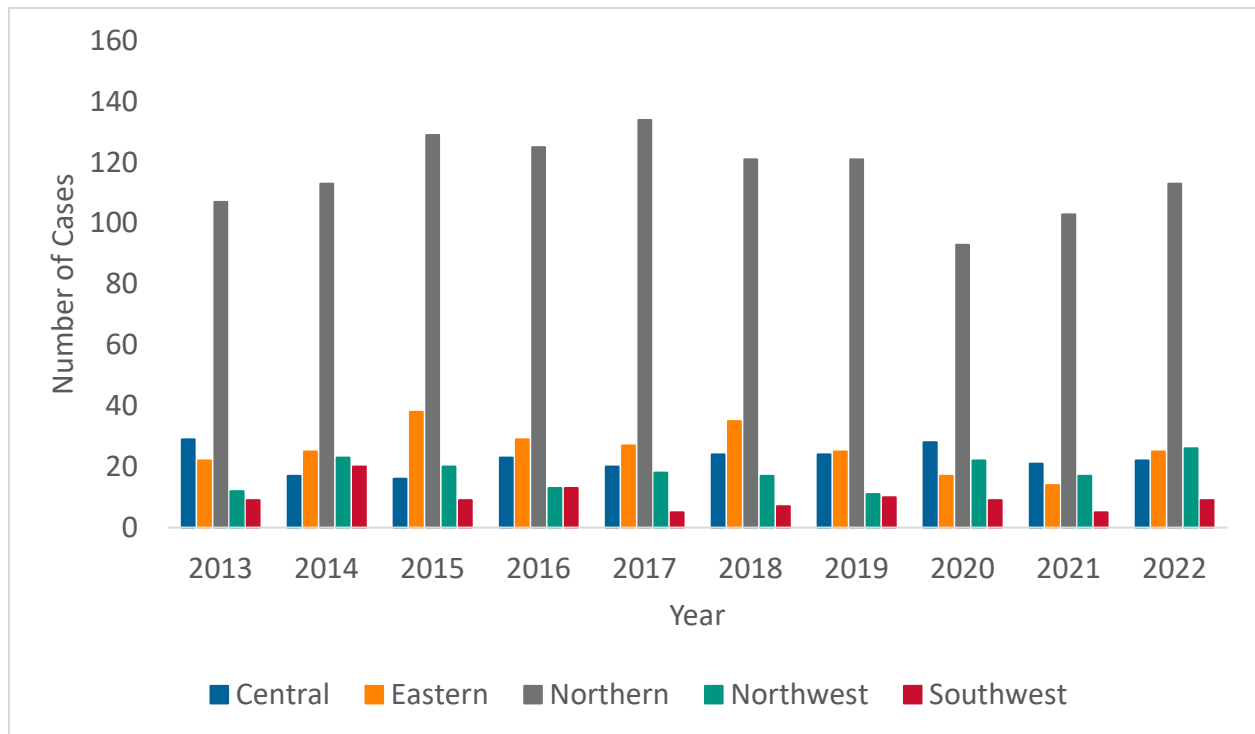


*Country-specific TB rates for countries other than the United States are based on 2021 data published as part of the [2022 WHO Global Tuberculosis Report](#).

Figure 10. Time in the United States at Tuberculosis Diagnosis, Virginia, 2013-2022

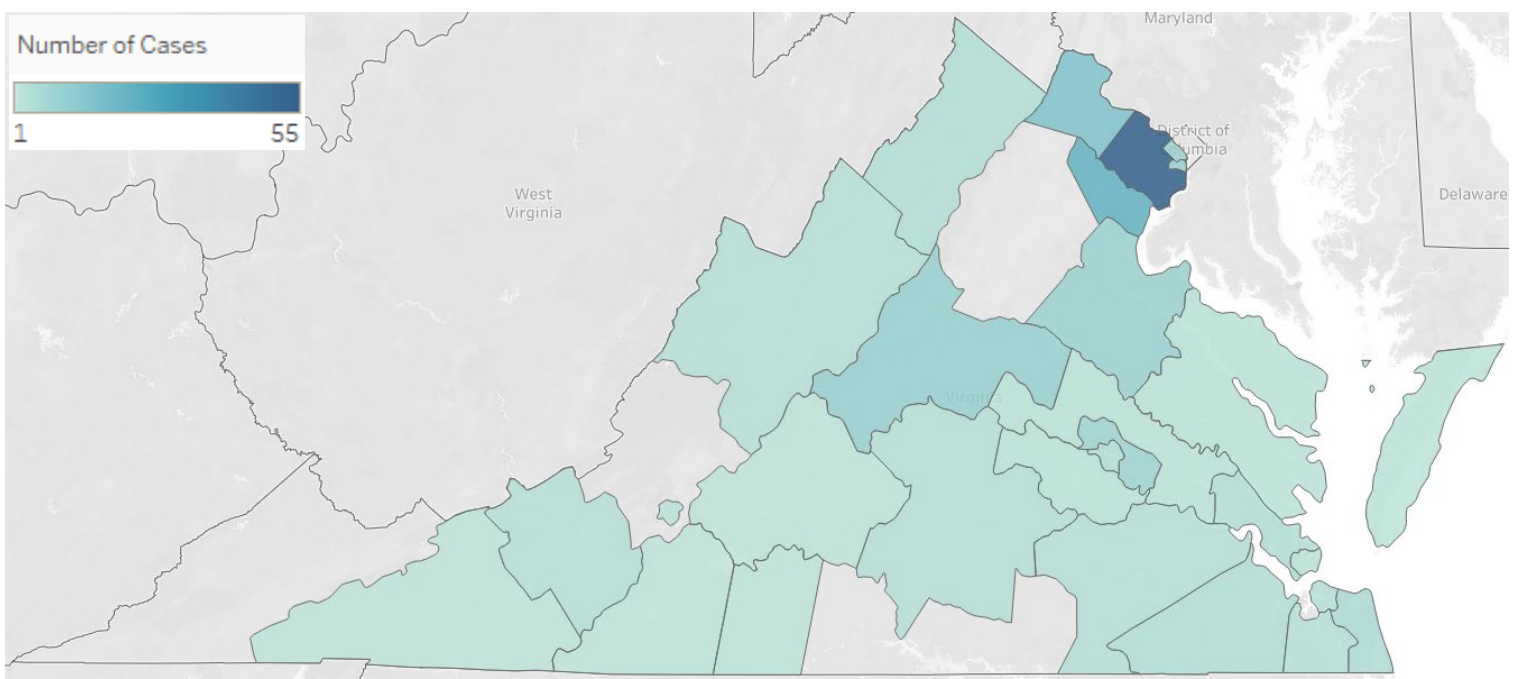
Among non-U.S.-born persons with TB in Virginia in 2022 for whom year of arrival data was available, there was an increase in diagnosis of TB in people who had recently arrived to the United States with 21% arriving less than a year from their diagnosis, compared to 15% in 2019 and 16% in 2021. This increase was consistent with national trends. Nationally, there was a slight decrease in people who had lived in the United States for a more than 10 years, but Virginia saw an increase in the number of people diagnosed with TB who had lived in the United States for longer, specifically more than 20 years. This group accounted for 34% of Virginia's 2022 non-U.S.-born cases. This aligns with the increase in those aged 65 years and older.

Figure 11. Tuberculosis Case Distribution by Region, Virginia, 2013-2022



In 2022, 58% of persons with TB were living in the Northern Region of Virginia. However, every region in Virginia has provided care for a person with TB over the past decade. In 2022, 29 of Virginia's 35 Health Districts provided care for active TB clients, ranging from one to 55 clients per Health District. TB rates across districts ranged in 2022 from 0 to 6.3 cases per 100,000 population.

Figure 12. Tuberculosis Case Distribution by District, Virginia, 2022



Clinical Characteristics

In 2022, 76% of Virginia's TB cases had a pulmonary site of disease, with 43% of all TB cases having evidence of advanced pulmonary disease including positive sputum smears and/or cavitation on diagnostic chest imaging. These factors typically increase infectiousness of the patient and imply a significant burden of disease which may lead to delayed culture conversion. Over the past decade, at least 75% of Virginia's TB cases have pulmonary involvement each year.

Figure 13. Site of Disease of Tuberculosis Cases, Virginia, 2013-2022

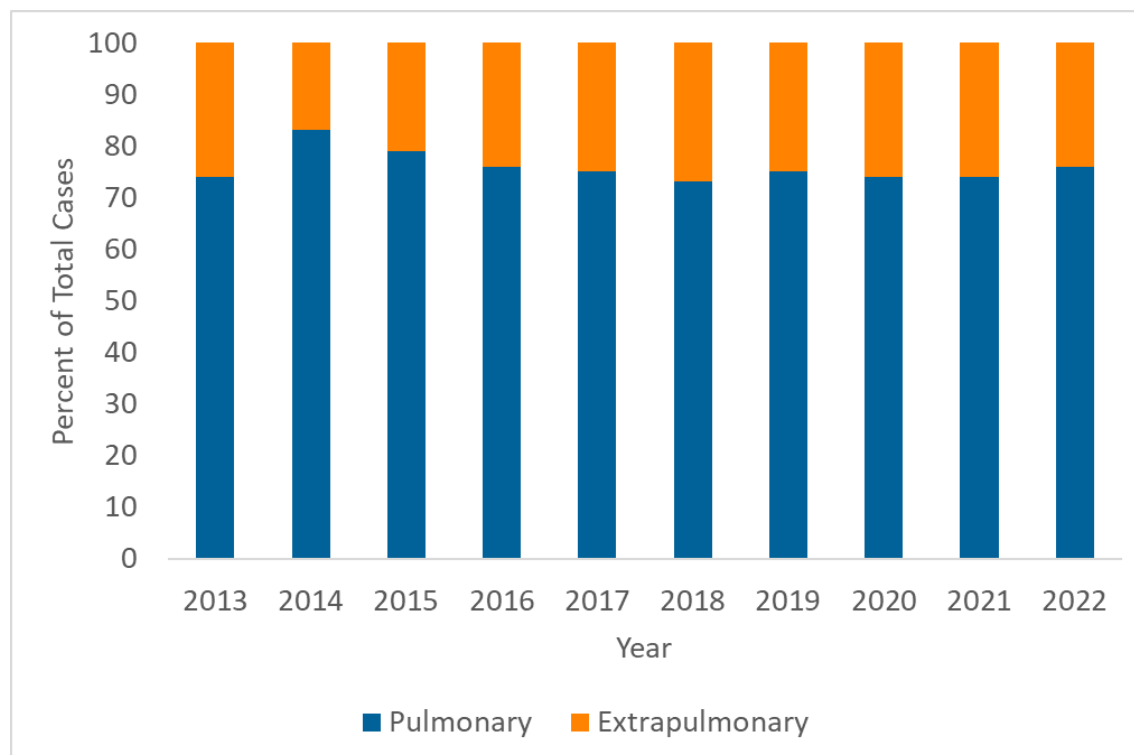


Table 1. Site of Disease of Extrapulmonary Tuberculosis Cases*, Virginia, 2013-2022

| Disease site | Number of Cases |
|-------------------------|-----------------|
| Any extrapulmonary site | 60 |
| Pleural | 12 |
| Other | 9 |
| Lymphatic cervical | 8 |
| Bone and/or Joint | 7 |
| Eye and ear appendages | 6 |
| Peritoneal | 6 |
| Brain | 4 |
| Genitourinary | 4 |
| Lymphatic other | 3 |
| Meningeal | 3 |
| Lymphatic intrathroacic | 2 |

*Categories are not mutually exclusive

Hemoglobin A1c testing and HIV testing are both standards of care for TB clients in Virginia. Diabetes is a leading comorbidity for TB clients in Virginia. In 2022, 26% of TB clients also had diabetes and this percentage has been at least 15% over the past decade. Virginia sees a relatively low percentage of HIV co-infection among TB clients. In 2022, 2% of TB cases were also living with HIV. This percentage has trended down over the past decade. Serum drug level testing is provided to monitor medication absorption for clients with diabetes, HIV, and in certain other circumstances.

Figure 14. Tuberculosis Cases with Diabetes, Virginia, 2013-2022

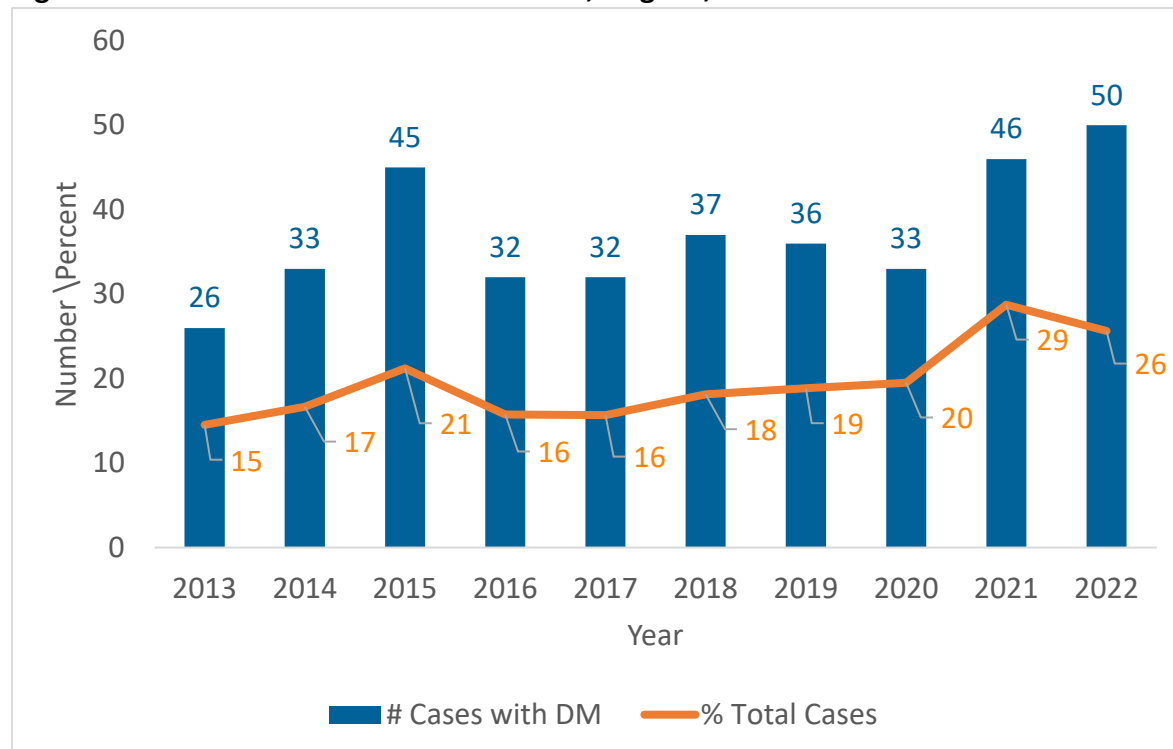
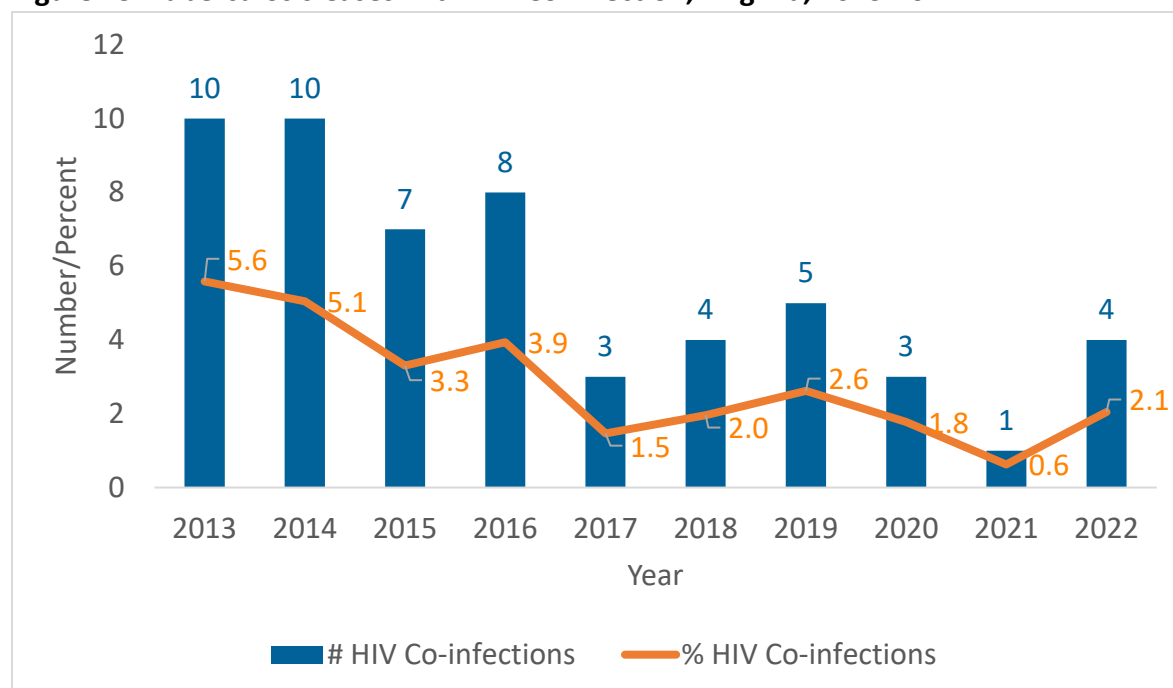


Figure 15. Tuberculosis Cases with HIV Co-infection, Virginia, 2013-2022



In 2021, the most recent year for which outcome data is complete, 85% of TB clients completed treatment, but 12.5% died either prior to diagnosis (6) or after starting treatment (14). Although 2022 outcome data is not yet complete, five clients were deceased at diagnosis and an additional 18 have died during treatment.

Figure 16. Treatment Outcomes for Tuberculosis Cases Counted in 2021, Virginia

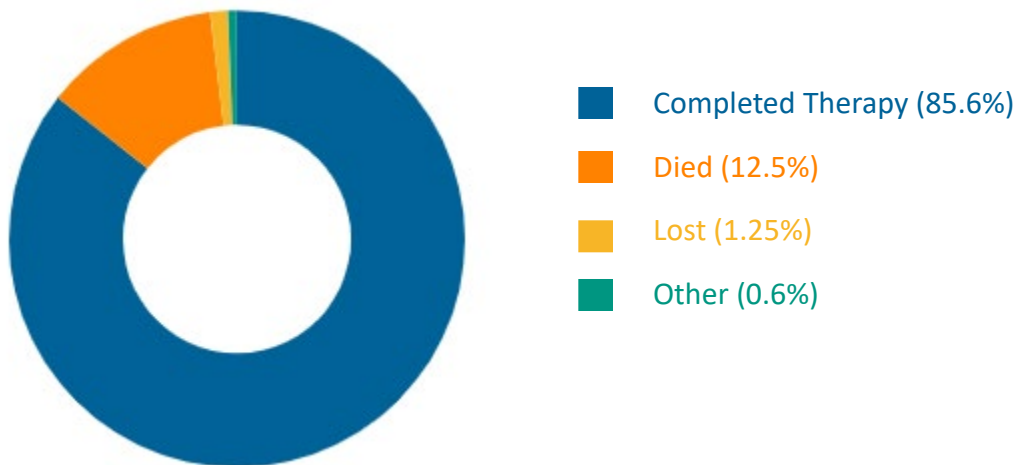
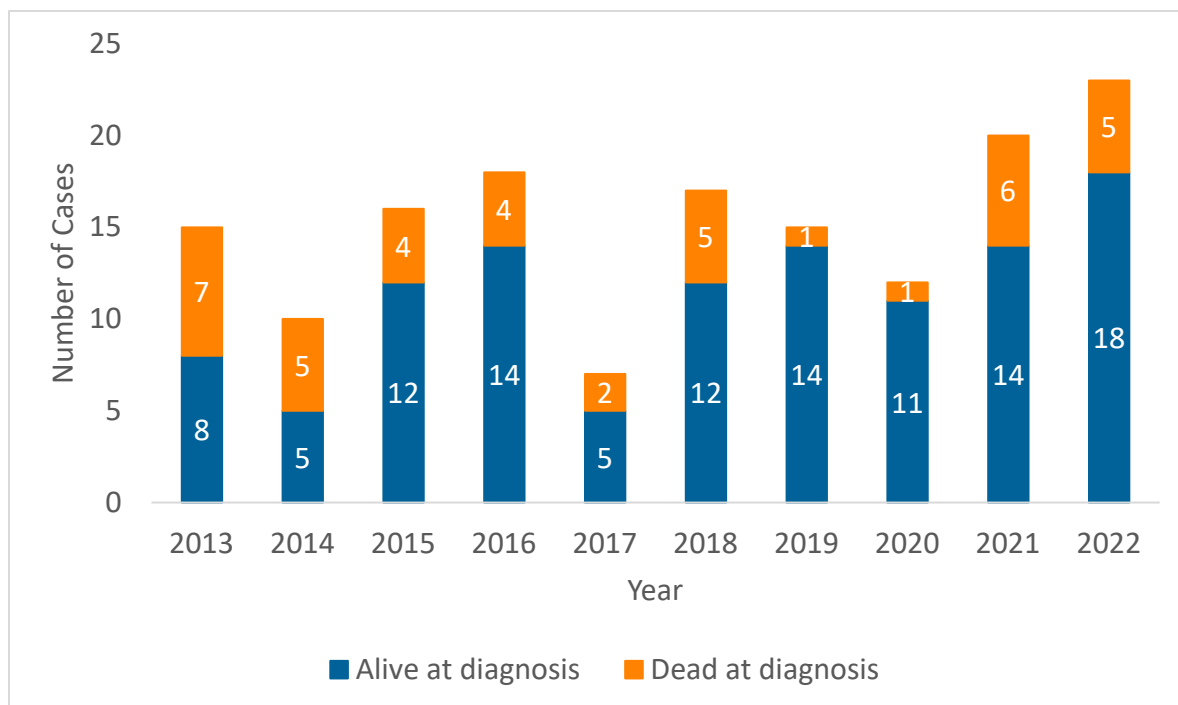


Figure 17. Number of Patients with Tuberculosis Who Died Before or During Treatment, Virginia, 2013-2022*

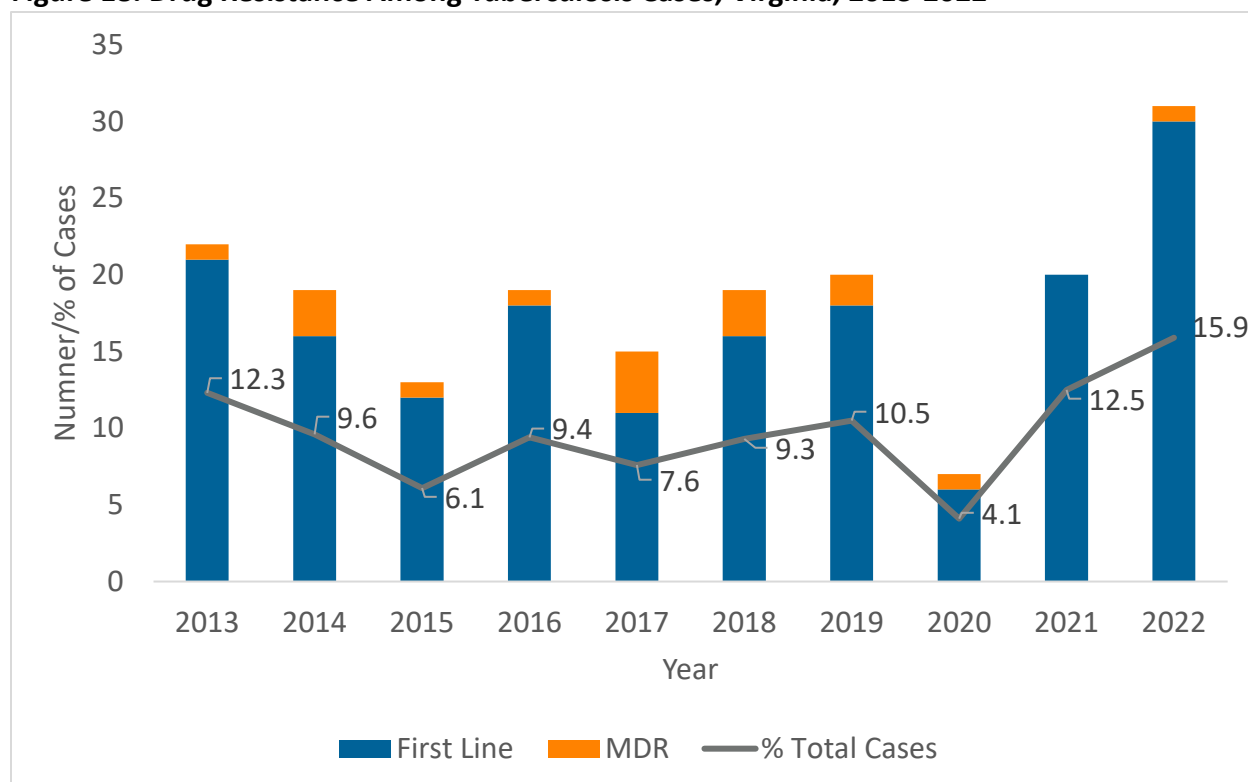


*2022 outcome data is not final

Drug Resistance

Virginia saw an increase in resistance to at least one of the first line TB drugs (rifampin, isoniazid, pyrazinamide, and ethambutol) among 16% of TB clients in 2022 compared to 12.5% in 2021 and 10.5% in 2019. The majority of first line resistance identified is to isoniazid and pyrazinamide. In 2022, Virginia had one case with multi-drug resistant TB, compared to zero in 2021 and two in 2019. Phenotypic drug susceptibility testing is performed for all culture positive TB cases.

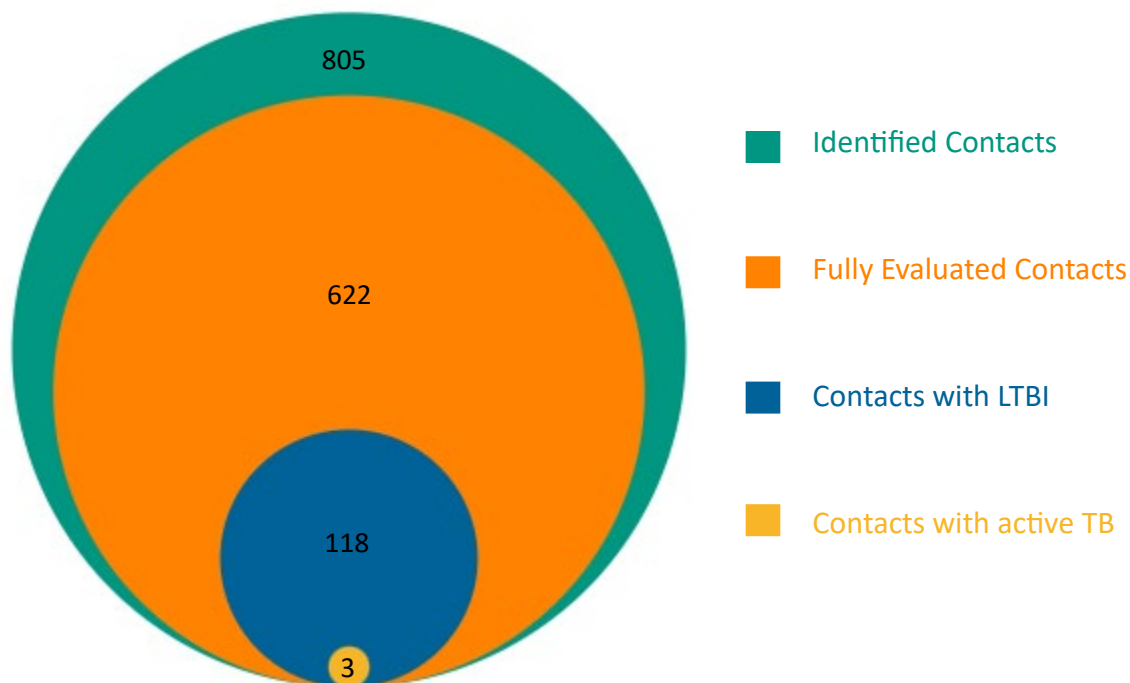
Figure 18. Drug Resistance Among Tuberculosis Cases, Virginia, 2013-2022



Contact Investigations

In 2021, the most recent year for which complete contact investigation data is available, 805 contacts to TB cases were identified who warranted evaluation based on their exposure. Of these contacts, 622 (77%) were completely evaluated, meaning at least one test for TB infection eight to ten weeks after their last possible exposure, and a chest x-ray if indicated, was completed. These evaluations identified three people with active TB disease and 118 people with new or previously undiagnosed LTBI. Of those identified with LTBI, 103 (87%) started treatment and 92 of those who started (89%) completed treatment. Contact investigations were conducted in many different locations including household settings, businesses, places of worship, schools, and healthcare facilities.

Figure 19. Contact Investigation Outcomes, Virginia, 2021



Genotyping

Genotyping can assist with contact investigations, providing supporting evidence for hypothesized links between cases. Genotyping also provides additional information when laboratory contamination is suspected or when a person is experiencing a second episode of TB, which may be recurrence or a new infection. The Virginia Department of Health was able to submit isolates for 149 of 150 patients with culture positive TB in 2022.