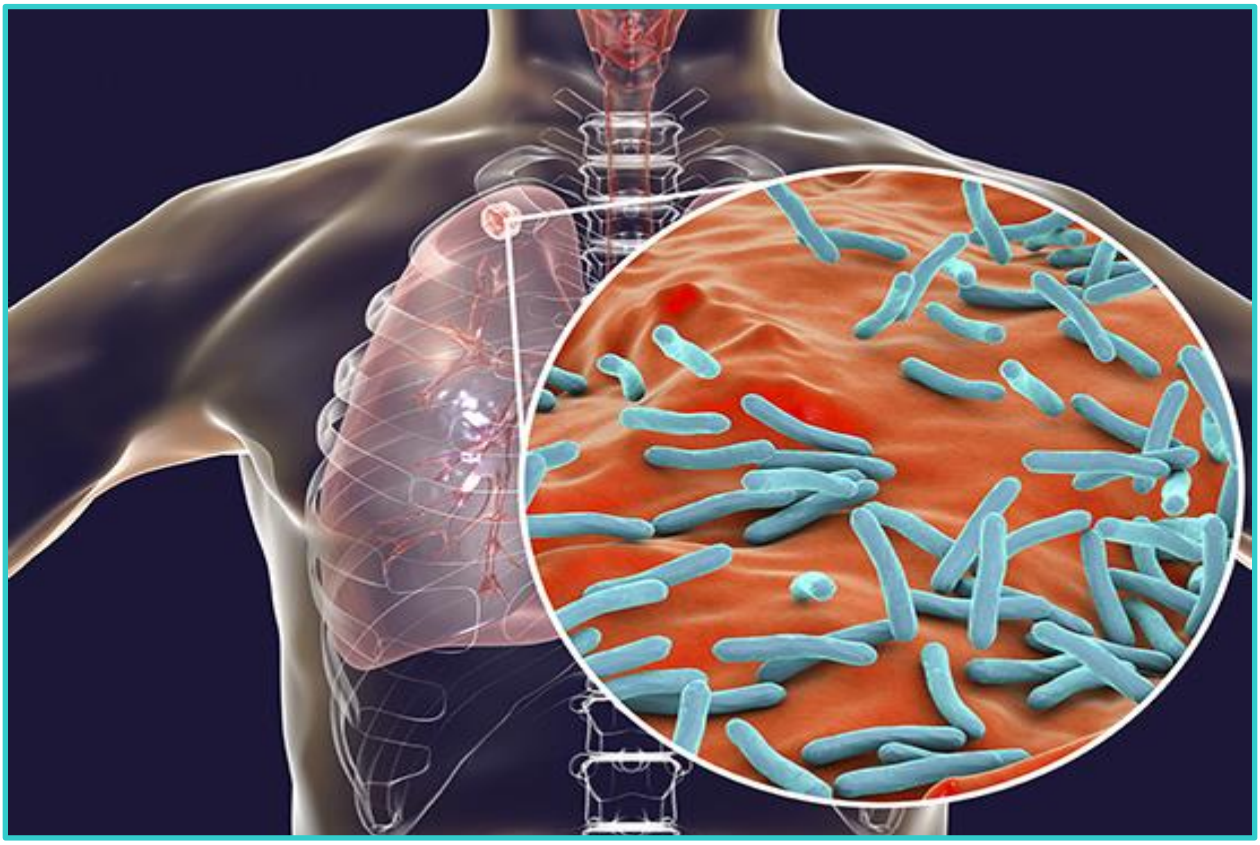
South Dakota Department of Health

Tuberculosis Control Program Annual Report 2021



For additional information visit the South Dakota Tuberculosis Control Program website: http://doh.sd.gov/diseases/infectious/TB/ or contact the following staff:

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Last revised January 2022

EIDEMIOLOGICAL PROFILE OF TUBERCULOSIS IN SOUTH DAKOTA

During the last ten years, South Dakota averaged 14 cases of tuberculosis (TB) per year. During 2021, there were 12 cases of TB reported to the South Dakota Department of Health. Figure 1 shows the 10-year trend of TB cases reported in South Dakota.

Figure 1. South Dakota TB Cases Reported by Year, 2012-2021

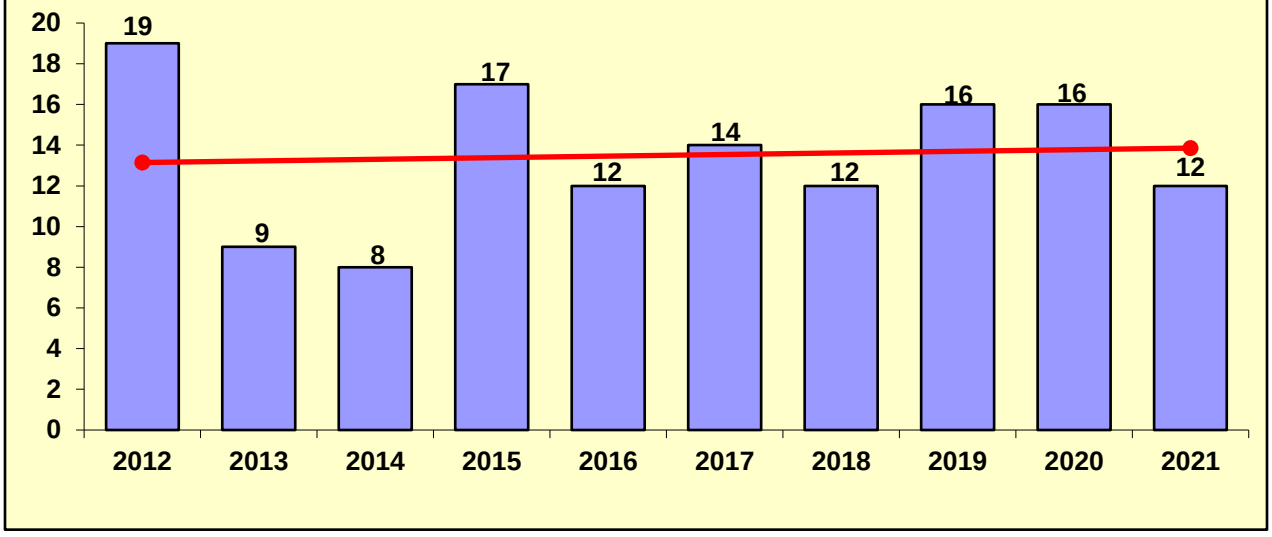
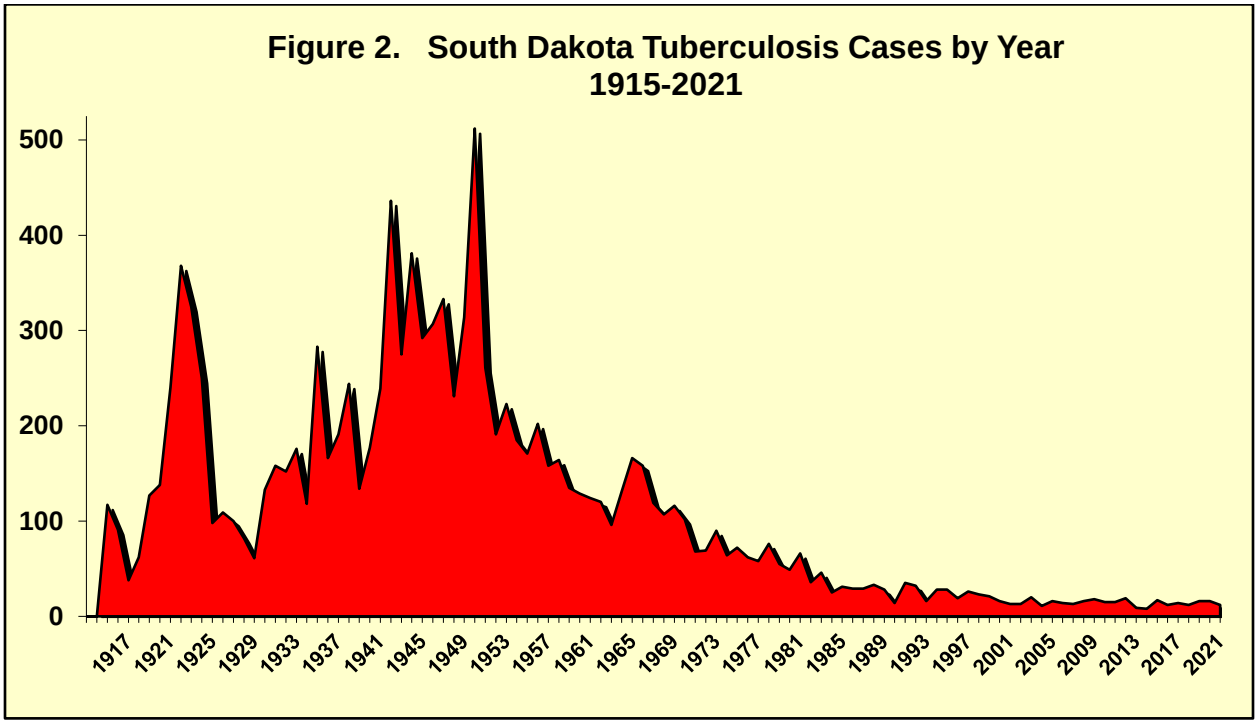


Figure 2 illustrates the 100-year history of tuberculosis cases in South Dakota. Since the 1950's there has been a dramatic decrease of cases due to the developmental of anti-tuberculosis medications. Case reductions are also a result of mandatory reporting of suspected TB cases to the Department of Health, case management, new treatment regimens and comprehensive contact investigations to ensure those exposed receive prompt intervention efforts.

Figure 2. South Dakota Tuberculosis Cases by Year 1915-2021



The most recent data available nationally and regionally is from calendar year 2020. Figure 3 provides a comparison of the TB case rate per 100,000 population for the United States as well as a regional comparison of South Dakota and our border states of North Dakota, Minnesota, Iowa, Nebraska, Wyoming and Montana.

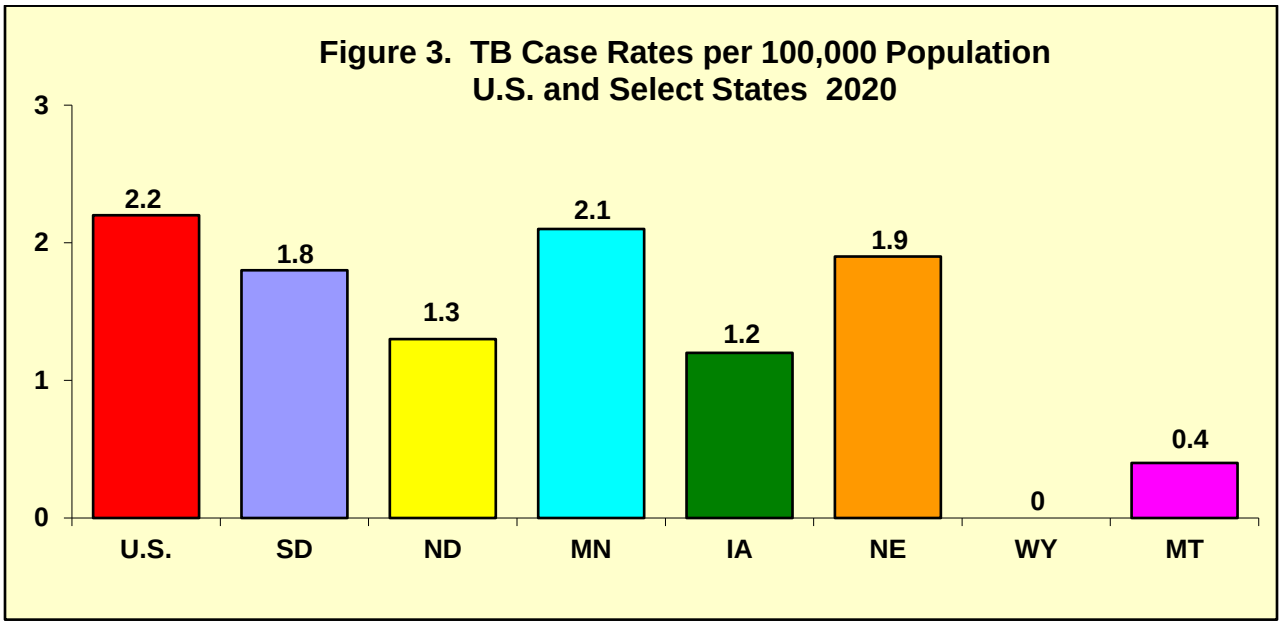
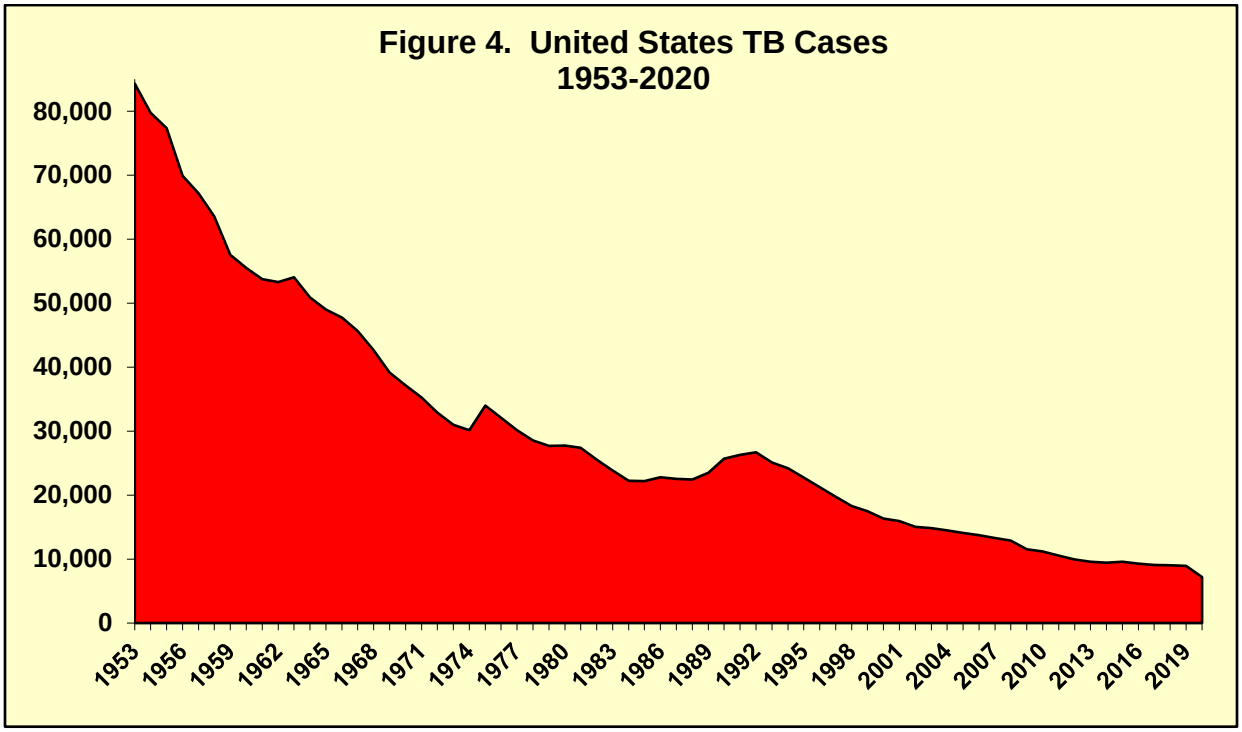


Figure 4 illustrates the historical trend of decreasing TB cases reported in the United States. In 2020 there were 7,174 TB cases reported in the US which is a 2.2% decrease from 2019. The four states of California, Texas, New York and Florida accounted for 50% of the national case total. During 2020, <1% of the reported cases had multi-drug resistance (MDR) which is defined as resistance to at least TB medications isoniazid and rifampin. During 2020, 71.5% of TB cases nationally were in foreign-born persons.

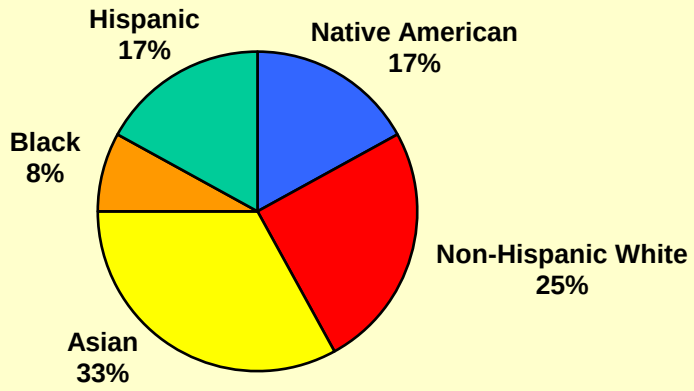


Native Americans have historically had the highest percentage of TB cases by race however in 2021 they only contributed to 17% of the cases. Table 1 and Figure 5 provide information on TB cases by race in 2021.

Table 1. TUBERCULOSIS CASES REPORTED BY SEX AND RACE SOUTH DAKOTA 2021

Race	Male	Female	Total	% of Cases
Native American	1	1	**2**	17%
Non-Hispanic White	1	2	**3**	25%
Black	0	1	**1**	8%
Asian	2	2	**4**	33%
Hispanic	1	1	**2**	17%
Total	**5**	**7**	**12**	**100%**

Figure 5. TB Cases by Race South Dakota 2021



The TB incidence rate, which measures the number of TB cases per 100,000 population, is the best measure for determining the progress towards the elimination of TB in South Dakota. Native American TB case rates have decreased in recent years while Non-Hispanic White cases have consistently remained low. Black, Asian and Hispanic cases primarily represent TB cases born outside the United States. Table 2 provides additional information on TB case rates.

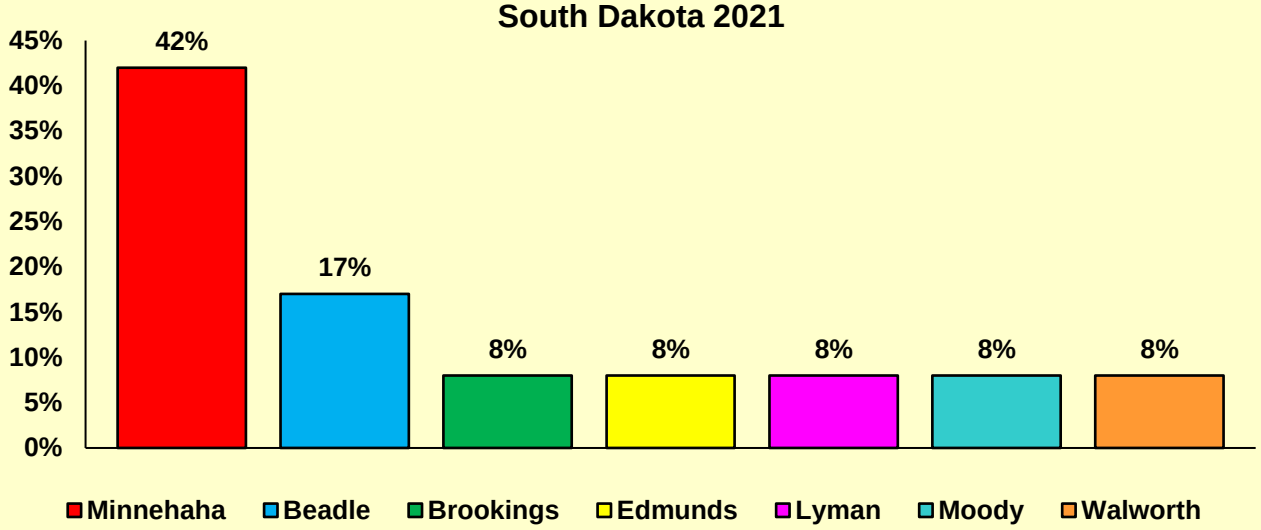
Table 2. TUBERCULOSIS MORBIDITY INCIDENCE RATES PER 100,000 BY RACE & YEAR SOUTH DAKOTA 2016-2021

Race	2016	2017	2018	2019	2020	2021
US Case Rate (All Races)	**2.7**	**2.8**	**2.8**	**2.7**	**2.2**	**Not available***
SD All Races	1.5	1.7	1.5	2.0	1.8	1.3
SD Native American	4.9	8.5	4.9	1.2	8.7	2.7
SD Non-Hispanic White	0.1	0.1	0.6	0.4	0.2	0.4
SD Black	34	20.4	27.2	54.4	14.7	4.9
SD Asian	26.3	39.4	0	52.6	30.1	27.3
SD Hispanic	0	0	0	0	0	5.0
All Other SD Races	0	9	0	0	0	0

**2021 US case rate data is not yet available.*

The South Dakota TB elimination goal is to reduce tuberculosis cases to an incidence of no more than 1.5 cases per 100,000 by the year 2025. There two special population goals which are reducing Native American tuberculosis cases to less than 8 cases per 100,000 by 2025 and reducing foreign-born TB cases to less than 15 cases per 100,000 by 2025.

Figure 6. TB Cases Reported by County of Residence
South Dakota 2021



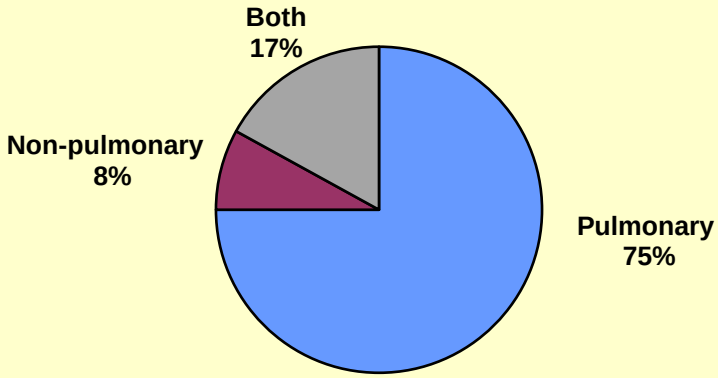
Tuberculosis cases in South Dakota are historically located in select geographic locations that consistently report the majority of TB cases. These include Minnehaha County which reports the highest number of foreign-born TB cases and Oglala Lakota, Todd, Pennington, Dewey and Ziebach counties which report the highest number of Native American TB cases. Figure 6 and Table 3 provide additional information on the counties of residence of the TB cases in 2021.

Table 3. TB CASES REPORTED BY COUNTY OF RESIDENCE
SOUTH DAKOTA 2021

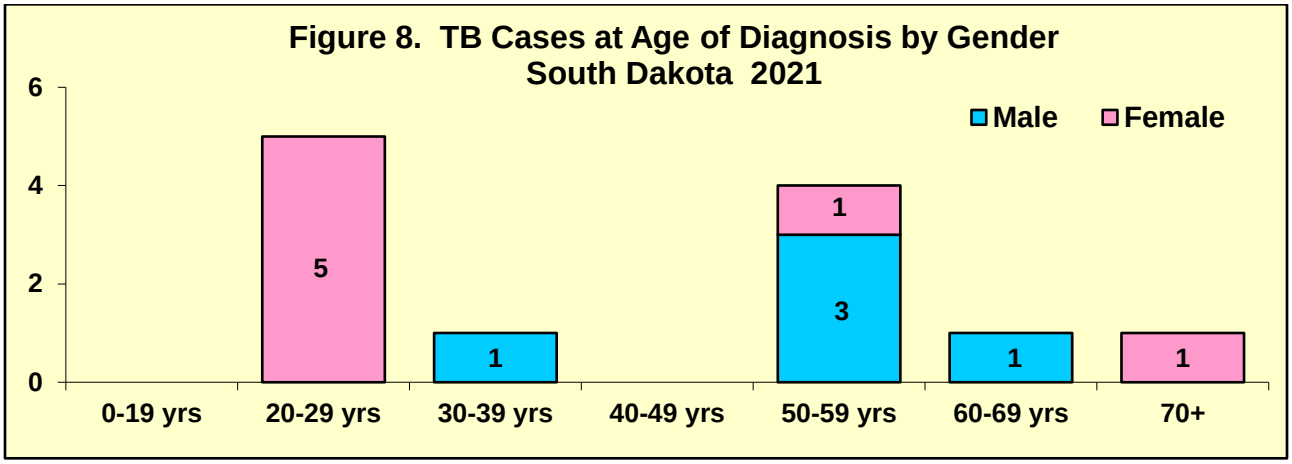
County	# of TB Cases	County	# of TB Cases
Beadle	2	Brookings	1
Edmunds	1	Lyman	1
Minnehaha	5	Moody	1
Walworth	1		

Figure 7 describes the percentage of TB cases by site of disease. The non-pulmonary TB sites of disease in 2021 included pleural, soft tissue and bone.

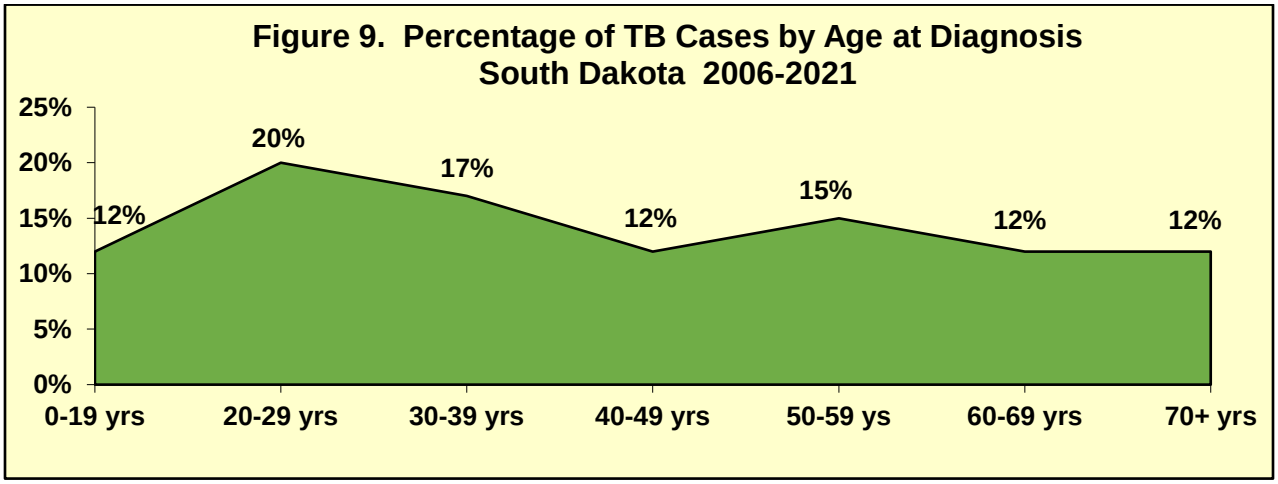
Figure 7. Tuberculosis by Site of Disease
South Dakota 2021



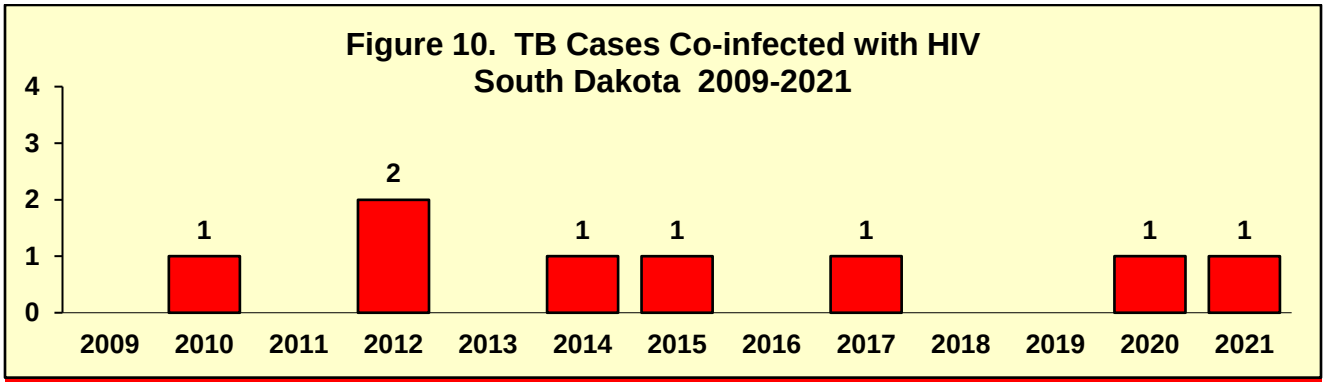
The average age of a TB case in 2021 was 42 years of age. This is a decrease in age when compared to 2020 when the average age was 44 years of age. There were no children less than 10 years of age reported during this time period. Figure 8 illustrates the age at diagnosis by gender for tuberculosis cases reported in 2021.



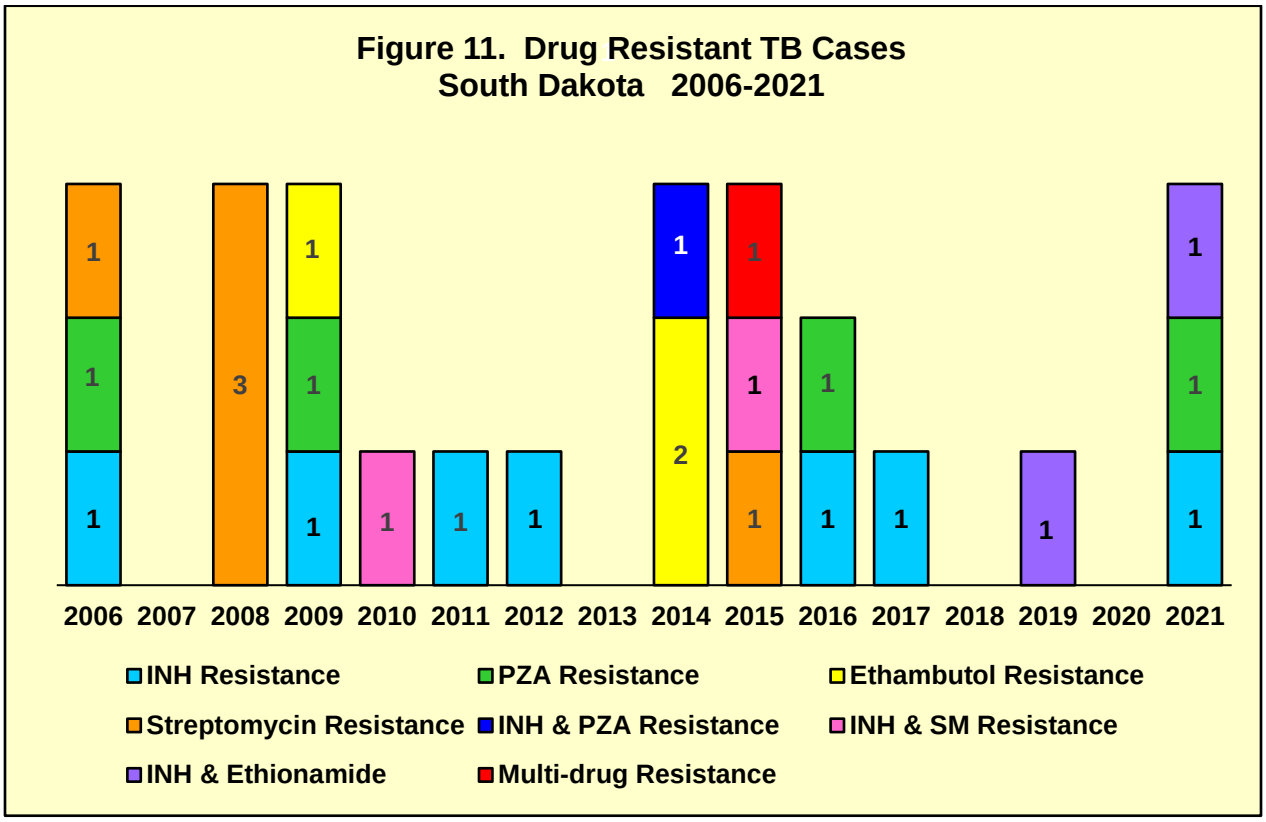
Historically most tuberculosis cases are diagnosed as adults in South Dakota. Figure 9 shows most TB cases diagnosed in South Dakota were 30 years of age or older at the time of diagnosis from 2006 through 2021.



Co-infection with HIV is an important risk factor for the development of active TB. Because of this, all TB cases diagnosed in South Dakota are offered HIV testing. Co-infected TB cases require more monitoring for toxicity and are frequently treated with second line TB medications. Figure 10 describes the number of TB cases co-infected with HIV since 2009 documenting that HIV co-infected TB cases remain uncommon.

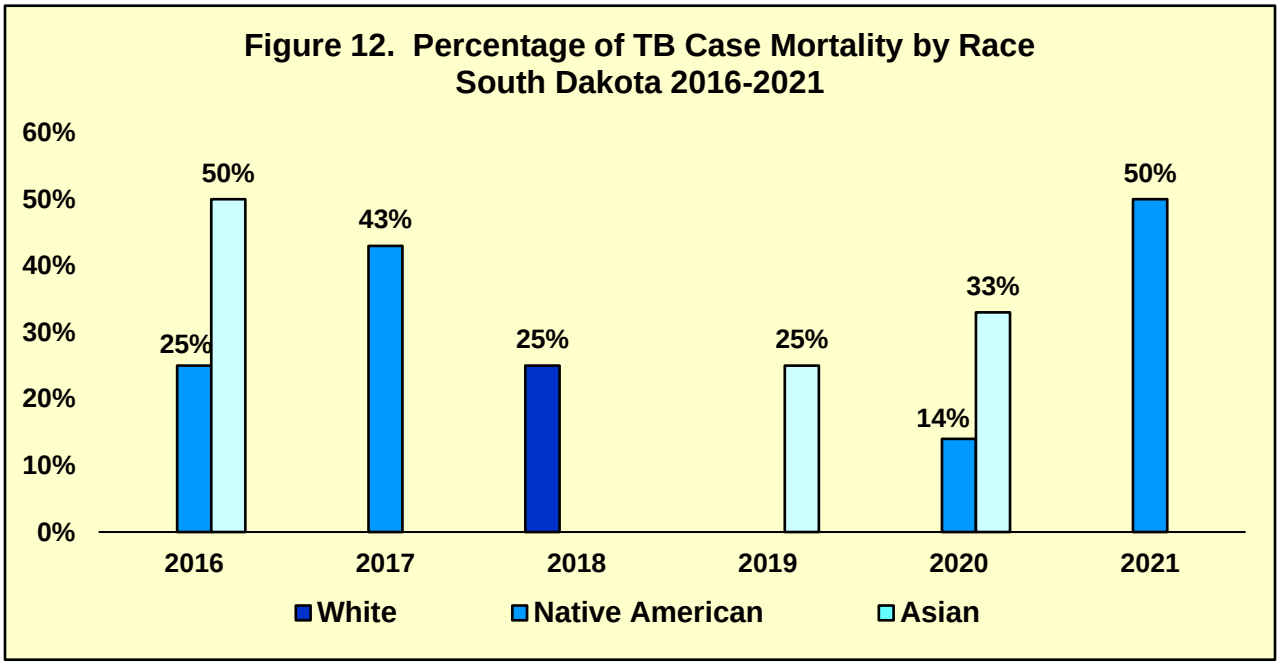


All culture positive TB isolates are tested for drug resistance to first-line TB medications including isoniazid (INH), rifampin (RIF), pyrazinamide (PZA) and ethambutol (EMB). Multi-drug resistant TB is defined by CDC as resistance to at least INH and RIF and is a significant public health problem because of the difficulty in achieving a successful treatment outcome. Figure 11 shows drug resistant TB cases since 2006 illustrating that South Dakota most often has single drug resistant cases. South Dakota reported the first multi-drug resistant TB case in 2015.



The 2015 MDR-TB case was resistant to INH, RIF, PZA, EMB, SM, Rifabutin and Ethionamide.

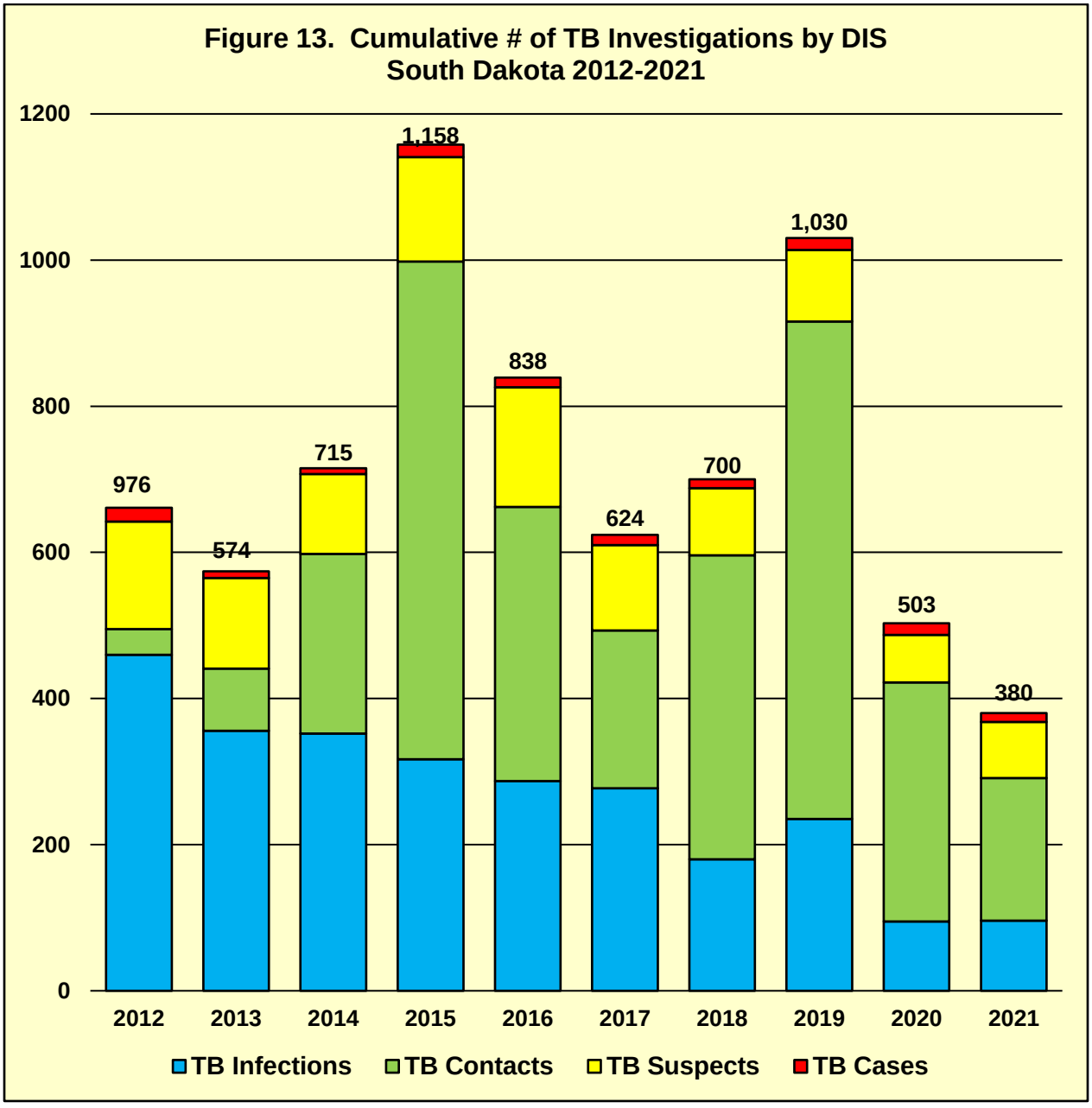
South Dakota has reported a high mortality rate during certain years, especially among Native American patients. Figure 12 shows the mortality rates by race since 2016 by race.



The workload in the TB Control Program consists of four categories of patients:

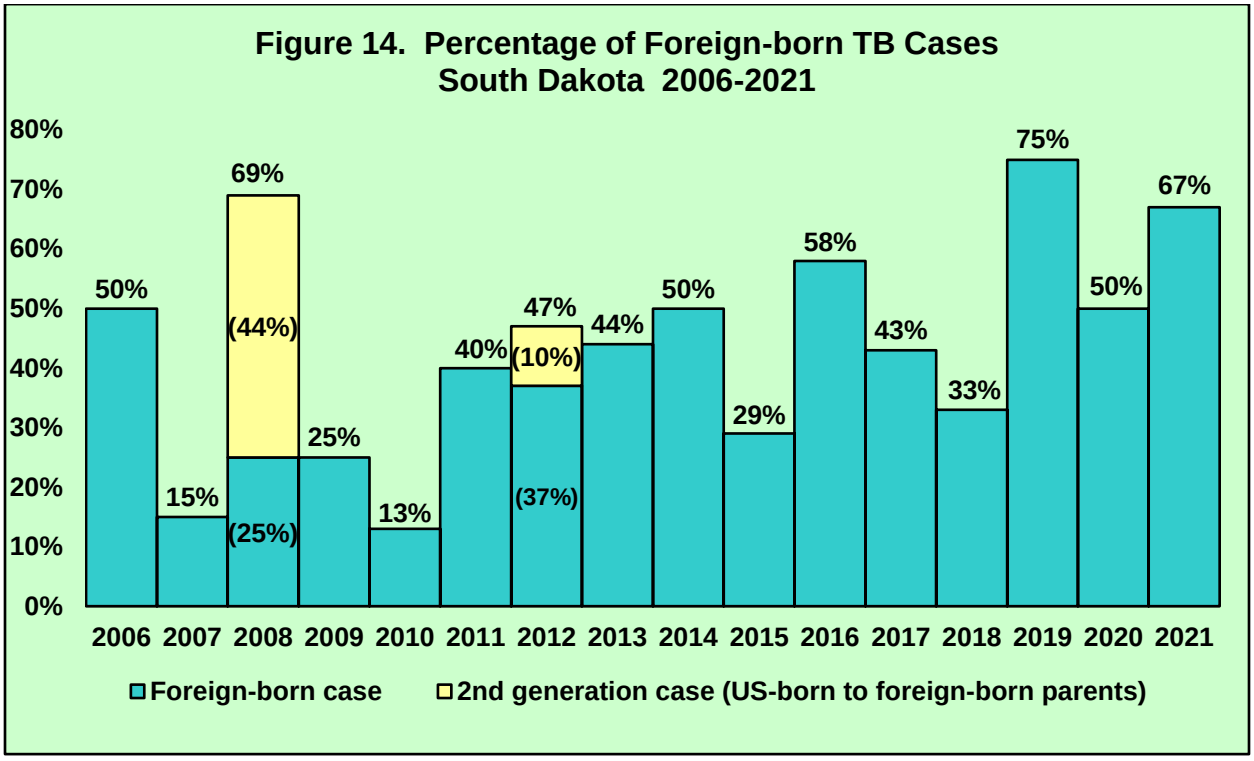
1) **TB cases** (persons diagnosed with active TB)
2) **TB suspects** (persons suspected of active TB with a pending diagnosis)
3) **TB contacts** (persons exposed to an infectious TB case)
4) **Latent TB infection** (persons reported with a positive TB skin test or positive IGRA test [interferon gamma release assay])

Disease Intervention Specialist (DIS) staff are responsible for ensuring appropriate investigation, treatment and follow-up of these individuals statewide. Figure 13 describes this cumulative caseload documenting that active TB cases and suspect TB cases represent the smallest number of patients reported. TB contacts and patients with latent TB infection make up the greatest percentage of assigned workload for DIS staff.

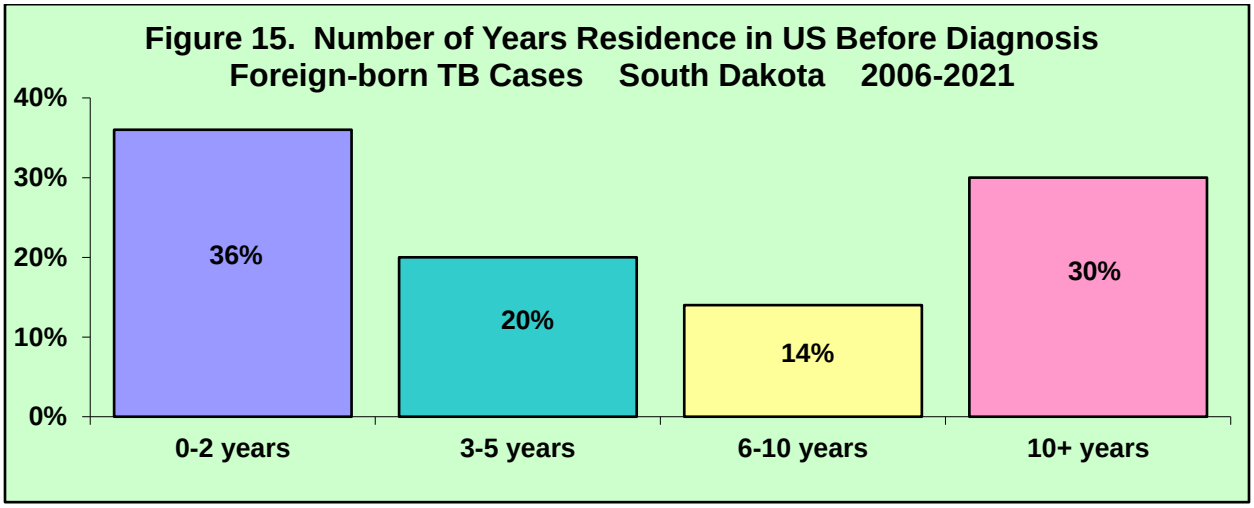


ANALYSIS OF FOREIGN-BORN TB CASES IN SOUTH DAKOTA

Tuberculosis cases born outside the United States continue to represent an important risk group in the United States as well as in South Dakota. Figure 14 describes the percentage of foreign-born TB cases in South Dakota. Second generation TB cases (US-born TB cases born to foreign-born parents) are a relatively new risk group first reported in South Dakota in 2008.



Most foreign-born persons who develop active TB usually do so within the first 5 years after arrival in the United States. Figure 15 describes that 56% of foreign-born TB cases since 2006 developed active TB within the first 5 years of their arrival. Because of this increased risk, these individuals are targeted for preventive TB program activities including targeted TB testing and preventive treatment programs.



Foreign-born TB cases continue to arrive from all parts of the world however the majority of the TB cases reported in South Dakota are from African or Asian descent as described in Figure 16.

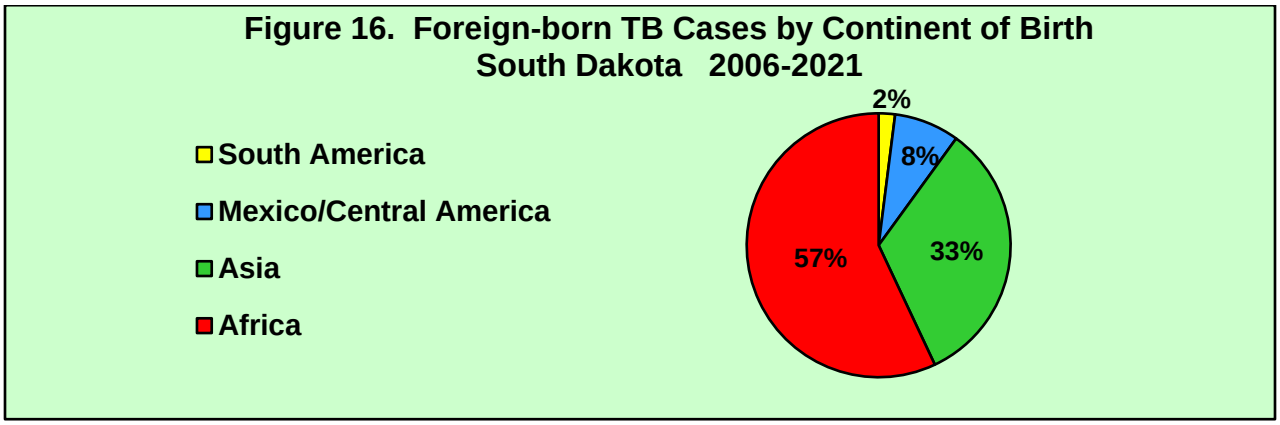
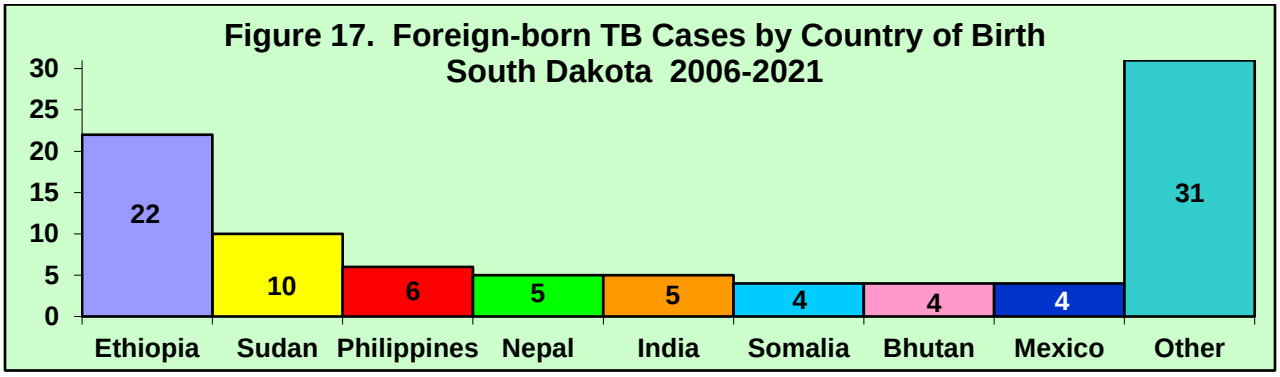
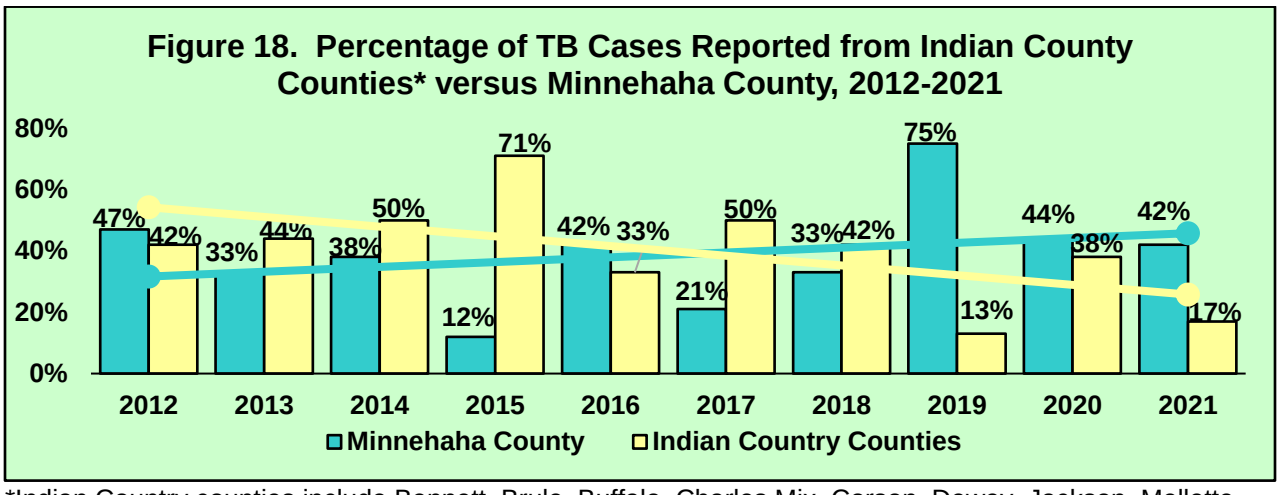


Figure 17 describes the country of birth for the foreign-born TB cases reported in South Dakota since 2006. Countries of birth for the "other" category include Bangladesh, Brazil, China, Congo, El Salvador, Guatemala, Honduras, Kenya, Laos, Liberia, Mauritania, Myanmar, Palau, Peru, Russia, South Africa, South Korea, South Sudan, Tanzania, Thailand, Uganda and Vietnam.

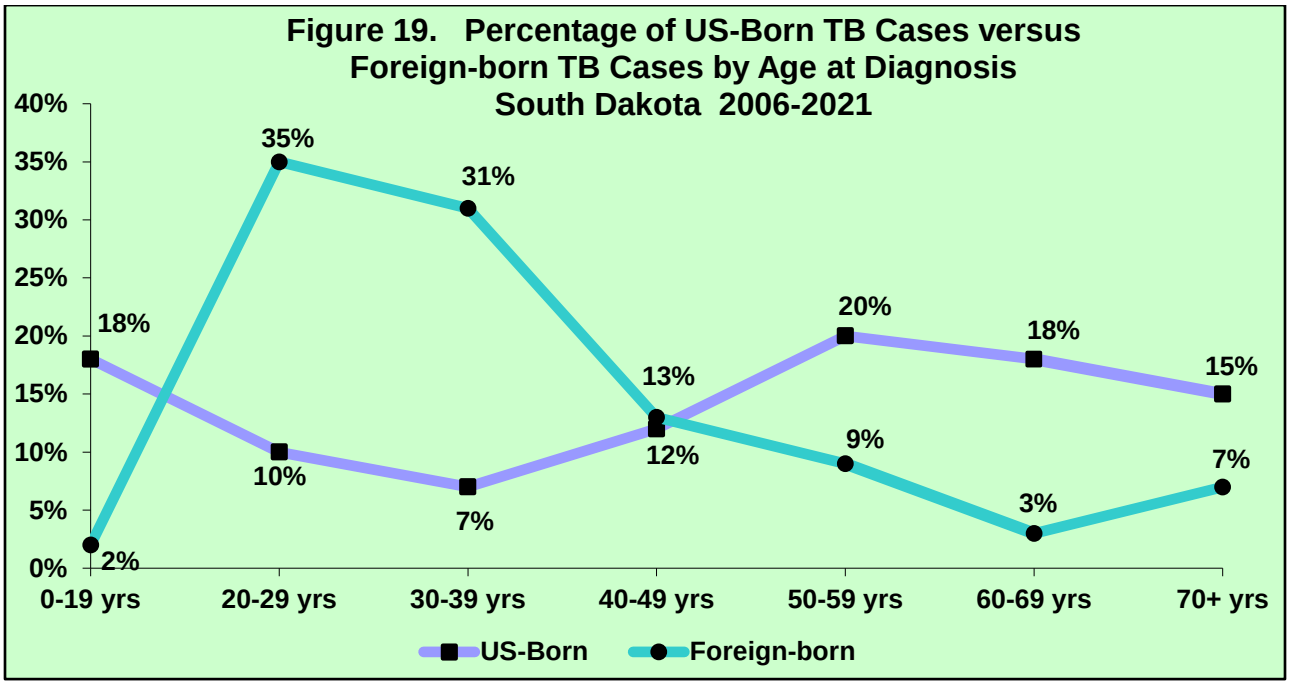


Another factor in the increase of foreign-born TB cases in South Dakota is the change geographically where TB cases are reported. Historically, the highest percentage of TB cases was reported from counties that included and bordered American Indian Reservations. More recently there has been a shift to more cases reported from Minnehaha County as illustrated in Figure 18. This is because most foreign-born persons resettle in Minnehaha County.

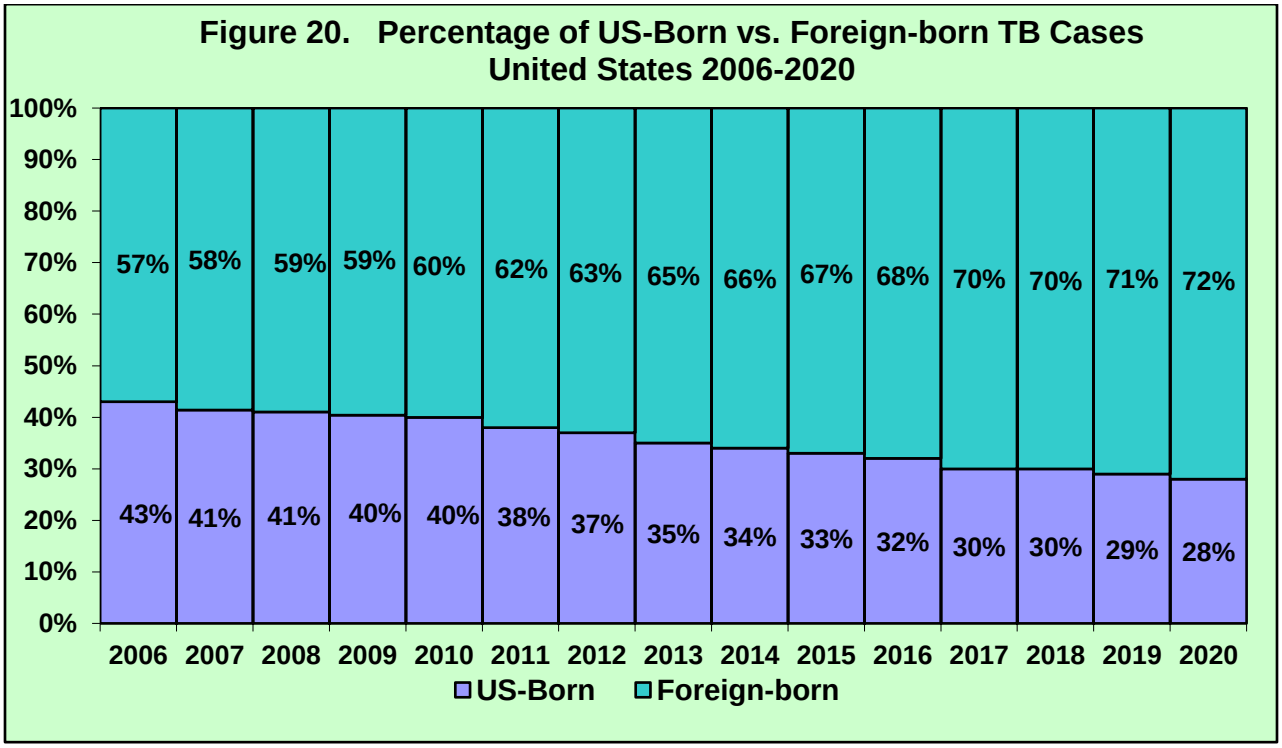


*Indian Country counties include Bennett, Brule, Buffalo, Charles Mix, Corson, Dewey, Jackson, Mellette, Moody, Pennington, Roberts, Oglala Lakota, Todd, Tripp, Walworth and Ziebach.

Foreign-born TB cases are consistently reported in younger persons as compared to US born patients in South Dakota. This presents additional TB program challenges because these TB cases more commonly have young children who have been exposed at home and are typically employed requiring an investigation at their worksite which increases the number of contacts that must be screened and treated. Figure 19 illustrates the majority of foreign-born TB cases are diagnosed while young adults.



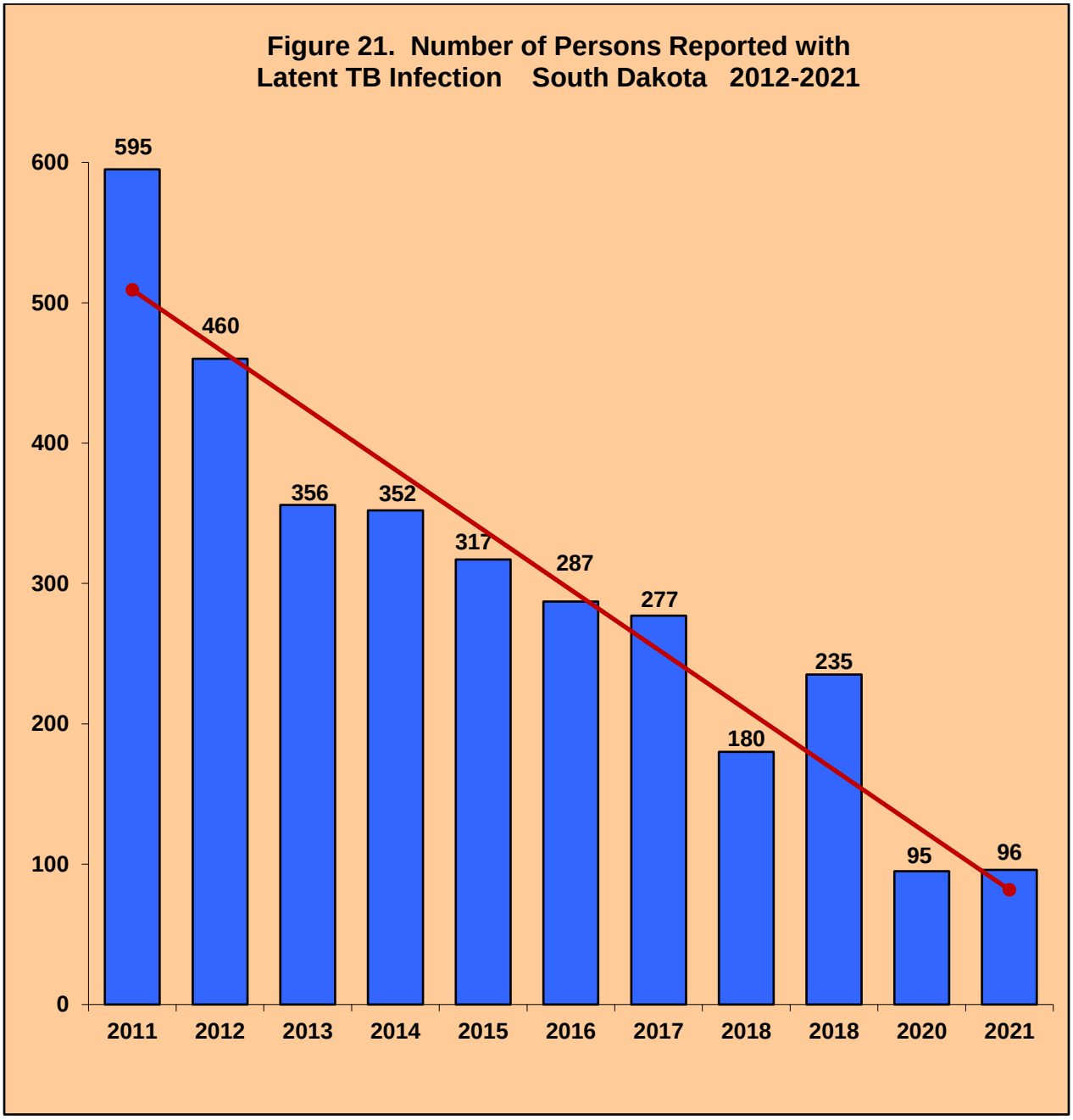
Foreign-born TB cases represent a unique challenge to the South Dakota TB Control Program because of cultural issues, language barriers and a greater likelihood of drug resistance. As these cases continue to increase in South Dakota, additional time and resources will need to be dedicated to address these unique issues. Figure 20 describes the increasing trend of the percentage of foreign-born TB in the United States since 2006.



LATENT TB INFECTION AND PREVENTION ACTIVITIES

Ensuring for appropriate treatment and follow-up of active TB cases and suspects is the highest priority of the Tuberculosis Control Program however in order to achieve TB elimination in South Dakota emphasis on preventing future cases of TB is necessary. This is accomplished by follow-up of persons infected with latent TB infection. These individuals are infected with the TB bacteria (*Mycobacterium tuberculosis*) but have not yet developed an active form of the disease. By finding and treating these individuals, future TB cases can be prevented and therefore the TB Control Program dedicates time and resources to this preventive strategy. Figures 21 presents the number of patients reported with latent TB infection (positive TB skin tests or positive IGRA testing) over the last 10 years. All of these persons have the potential to develop active TB disease and possibly be infectious to others.

Figure 21. Number of Persons Reported with Latent TB Infection South Dakota 2012-2021

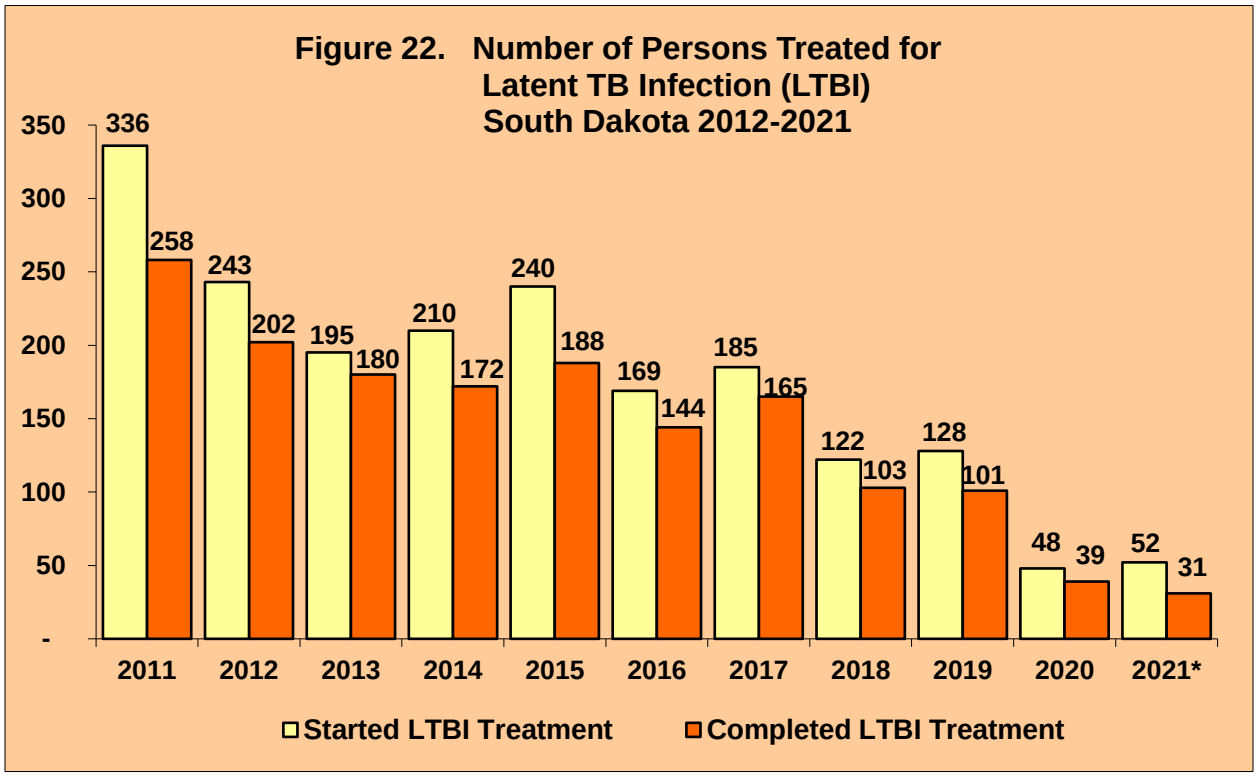


On August 2, 2011, the South Dakota Department of Health implemented an administrative rule change which changed the reporting requirement for latent TB infection. Prior to that, all persons diagnosed with latent TB infection were reportable to the South Dakota Department of Health. As of August 2, 2011, only patients with latent TB infection who have at least one of the following TB risk factors are now reportable:

REPORTABLE TB RISK FACTORS

- Foreign-born persons who entered the US within the last 5 years
- Persons evaluated for tumor necrosis factor-alpha therapy
- Immunosuppressive therapies
- Radiographic evidence of prior TB
- Children less than 5 years of age
- Close contact to infectious TB
- HIV infection
- Diabetes
- Renal dialysis
- Silicosis
- Organ transplant
- Head and neck cancers
- Leukemia
- Hodgkin's disease

This reporting change allows the TB Control Program to focus staff time, medication and resources towards patients who have the highest risk of developing active tuberculosis. Due to this change, only the above patients will be eligible for Department of Health nurse case management and free medication. Health care providers and facilities are asked to report only patients who meet this reporting requirement by mailing or faxing the *"Latent Tuberculosis infection Report Form*" which is available on the South Dakota Department of Health website: https://doh.sd.gov/diseases/infectious/TB/. Figure 22 presents the number of patients with latent TB infection that started a course of preventive treatment as well as the number who completed.



*2021 completion data is provisional.

Summary of TB Control Program Caseload
South Dakota 2012-2021