SOUTH DAKOTA DEPARTMENT OF HEALTH

PUBLIC HEALTH BULLETIN

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Epidemiological Profile of Tuberculosis in South Dakota, 2013

By Kristin Rounds, Tuberculosis Control Coordinator, South Dakota Department of Health

During the last 10 years, South Dakota averaged 15 cases of tuberculosis (TB) per year. During 2013, there were nine cases of TB reported to the South Dakota Department of Health, which is the lowest number of cases ever reported in the state. Figure 1 shows the 10-year trend of TB cases reported in South Dakota.

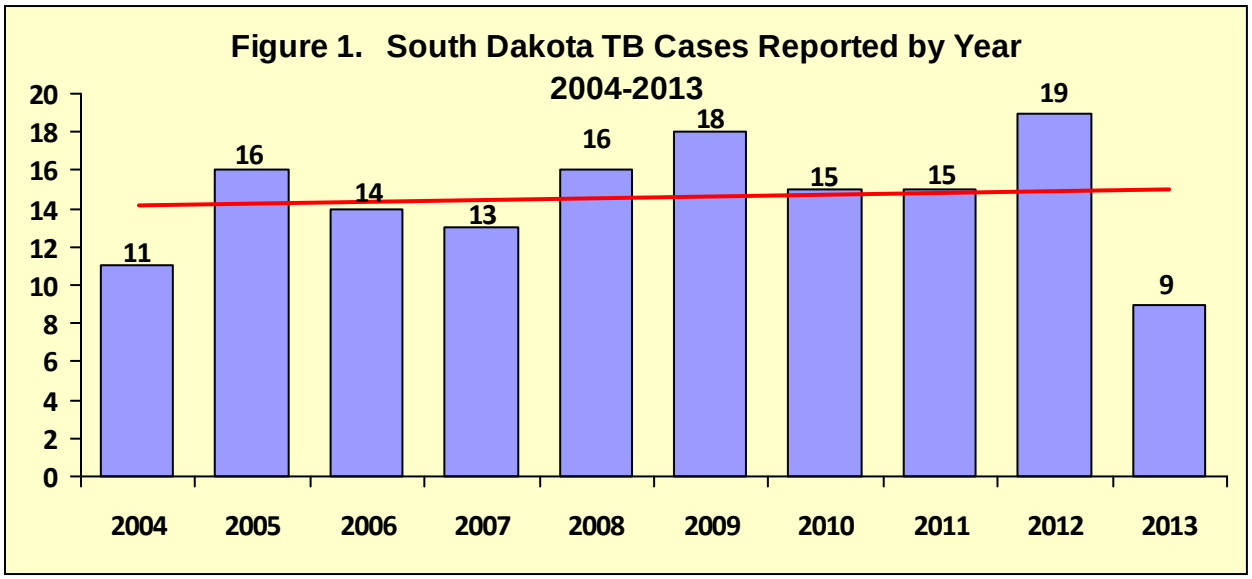
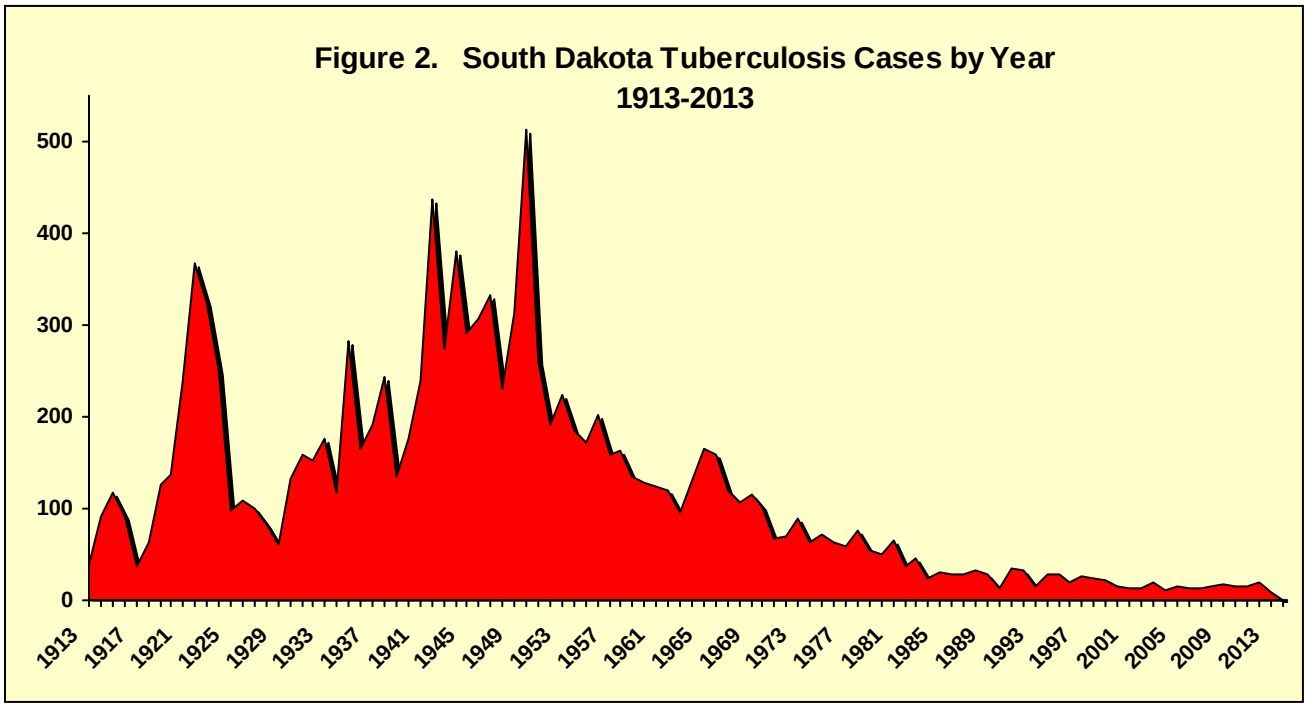


Figure 2 illustrates the 100-year history of tuberculosis cases in South Dakota. Since the 1950's there has been a dramatic decrease of cases due to the developmental of anti-tuberculosis medications. Case reductions are also a result of mandatory reporting of suspected TB cases to the Department of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



The most recent data available nationally and regionally is from calendar year 2012. 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. Please note that South Dakota has the third highest TB case rate behind Minnesota and North Dakota when comparing these seven states.

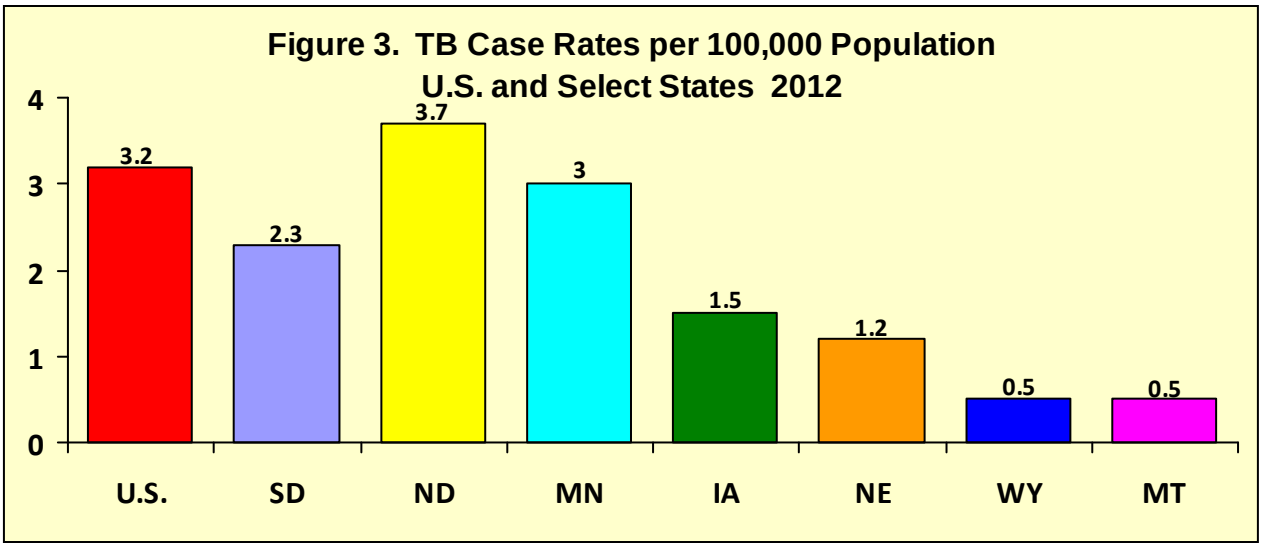
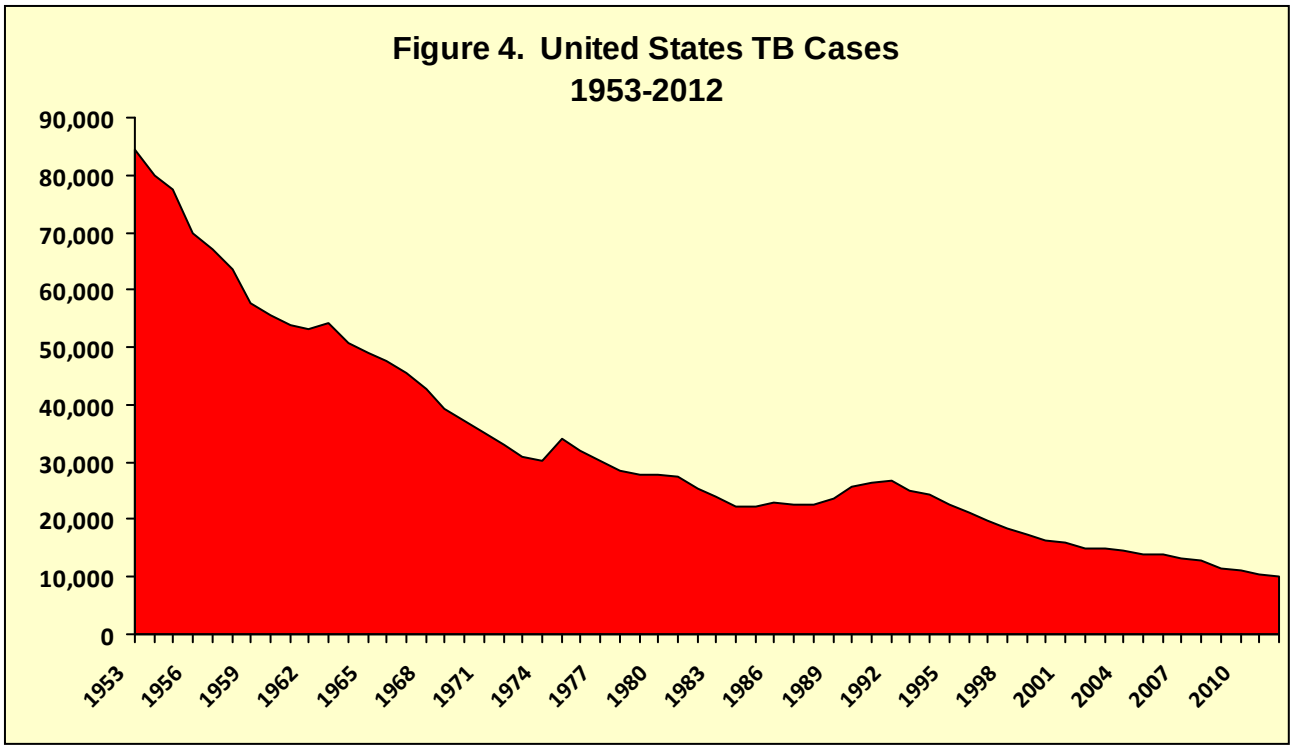


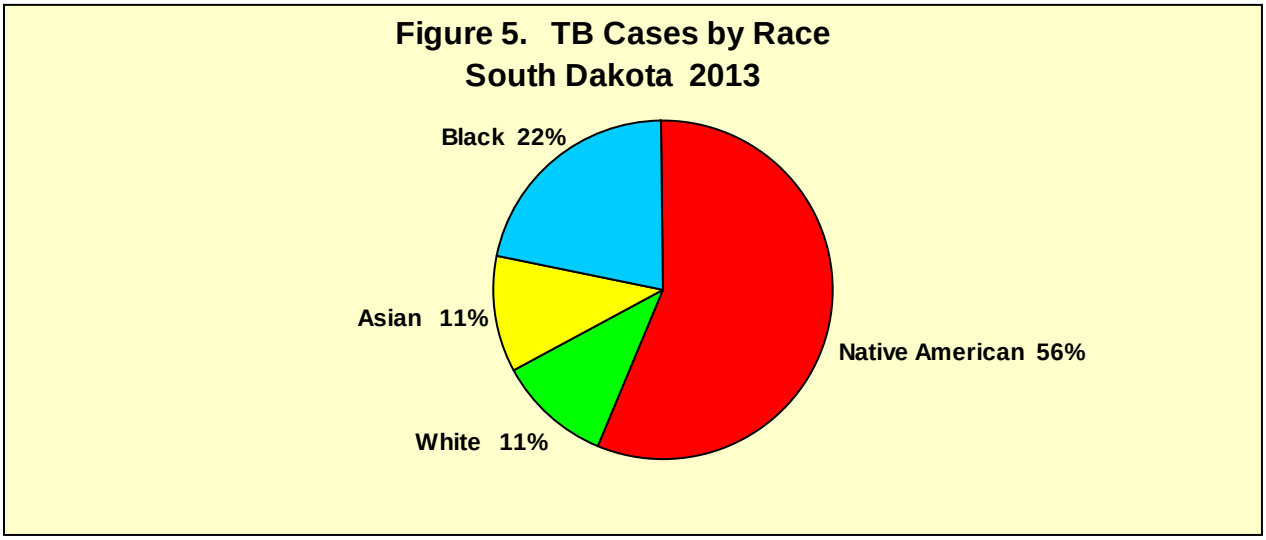
Figure 4 illustrates the historical trend of decreasing TB cases reported in the United States. In 2012 there were 9,945 TB cases reported in the US which was the lowest year on record, representing a 5.4% decrease from 2011. During 2012, 17 states reported increased case counts from 2011. The four states of California, Texas, New York and Florida accounted for 50% of the national case total. During 2012, 1.1% of the reported cases had primary multi-drug resistance which is defined as resistance to the TB medications of at least isoniazid and rifampin. During 2012, 63% of TB cases nationally were in foreign-born persons, the highest percentage ever reported.



Native Americans have historically had the highest percentage of TB cases by race in South Dakota and in 2013 they contributed 56% of the total TB cases reported. Table 1 and Figure 5 provide information on TB cases by race in 2013.

Table 1. TUBERCULOSIS CASES REPORTED BY SEX AND RACE SOUTH DAKOTA 2013

Race	Male	Female	Total	% of Cases
Native American	1	4	**5**	56%
White	1	0	**1**	11%
Black	1	1	**2**	22%
Asian	0	1	**1**	11%
Total	**3**	**6**	**9**	**100%**



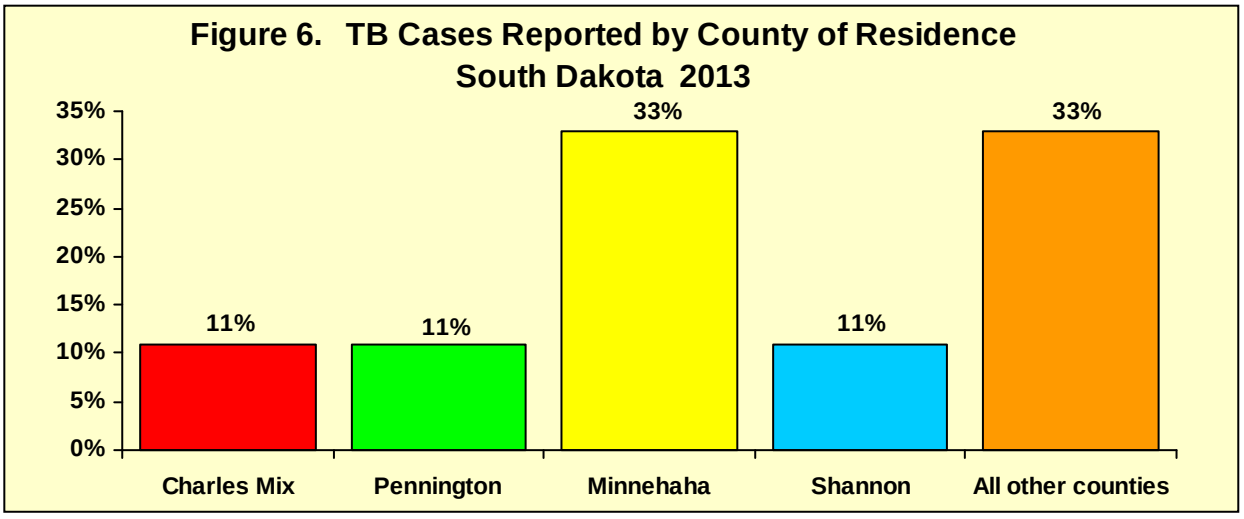
The TB incidence rate, which measures the number of TB cases per 100,000 population, is the best measure for determining the progress towards the elimination of TB in South Dakota. Historically, Native American TB case rates have dropped considerably while white cases have consistently remained low. The black, Asian and other races mainly represent TB cases born outside of the United States who were diagnosed in South Dakota. Table 2 provides additional information on TB case rates for the last 6 years.

Table 2. TUBERCULOSIS MORBIDITY INCIDENCE RATES PER 100,000 BY RACE & YEAR SOUTH DAKOTA 2008-2013

Race	2008	2009	2010	2011	2012	2013
US Case Rate (All Races)	4.2	3.8	3.6	3.4	3.2	Not available*
SD All Races	2.1	2.2	1.8	1.8	2.3	1.1
SD Native American	5.9	10.3	15.0	6.1	9.7	6.1
SD White	0.1	0.9	0.3	0.7	0.9	0.1
SD Black	161.3	64.5	24.6	13.6	20.4	13.6
SD Asian	17.4	17.4	0.0	39.4	26.3	13.1
All Other SD Races	0.0	0.0	0.0	0.0	0.0	0.0

**2013 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 3.5 cases per 100,000 by the year 2015. In addition there is a special population target goal of reducing Native American tuberculosis cases to less than 15 cases per 100,000 by 2015. As referenced in Table 2, both of these objectives have been met in 2013.

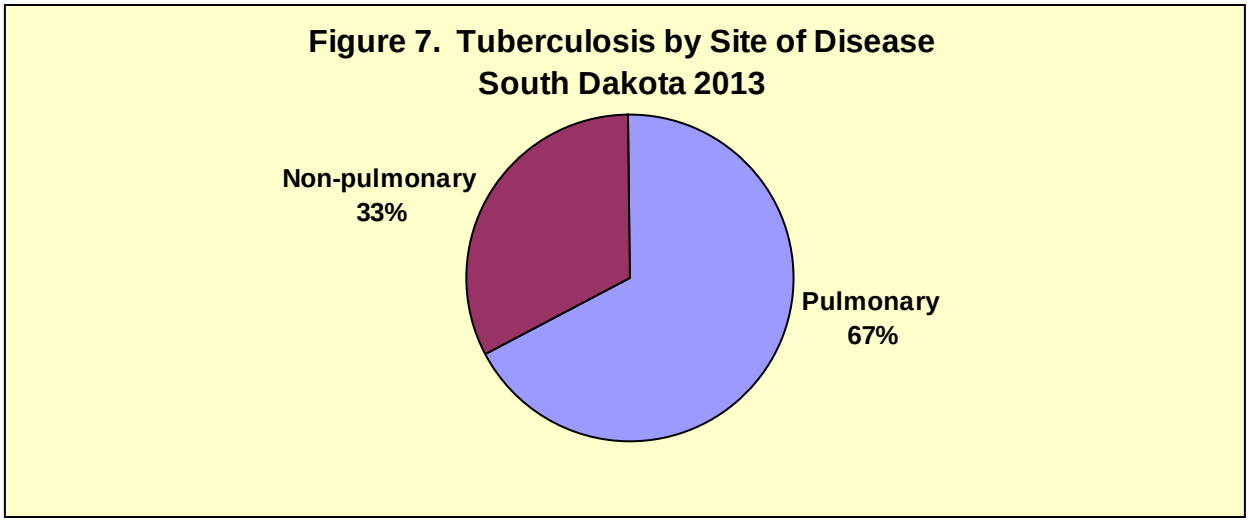


Tuberculosis cases in South Dakota have historically been located in a few geographic locations that consistently report the majority of TB cases. These include Minnehaha County, which reports the highest number of foreign-born TB cases, and Shannon, Todd and Pennington counties, which report the highest number of Native American TB cases. Figure 6 and Table 3 provide additional information on the counties of residence of the TB cases in 2013.

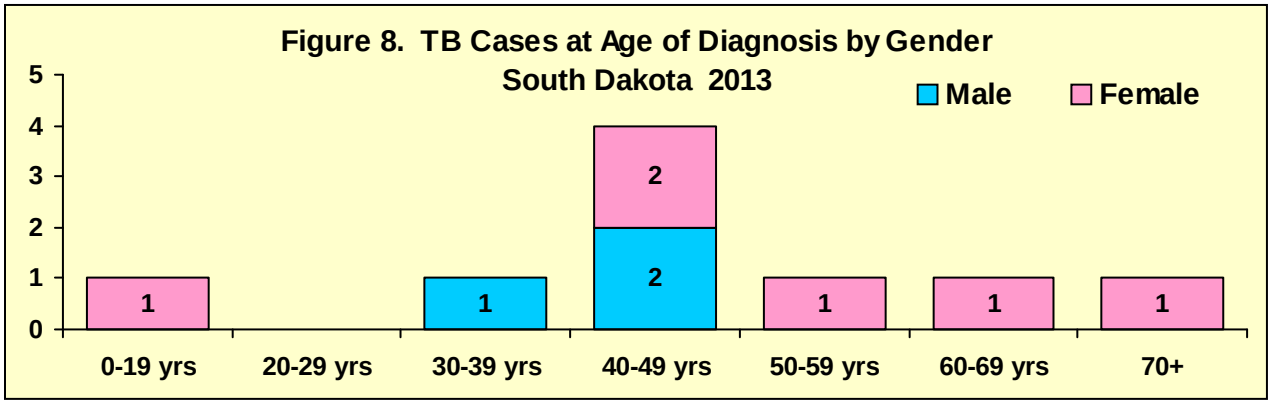
Table 3. TB CASES REPORTED BY COUNTY OF RESIDENCE SOUTH DAKOTA 2013

County	# of TB Cases	County	# of TB Cases
Butte	1	Pennington	1
Charles Mix	1	Shannon	1
Davison	1	Ziebach	1
Minnehaha	3	**TOTAL**	**9**

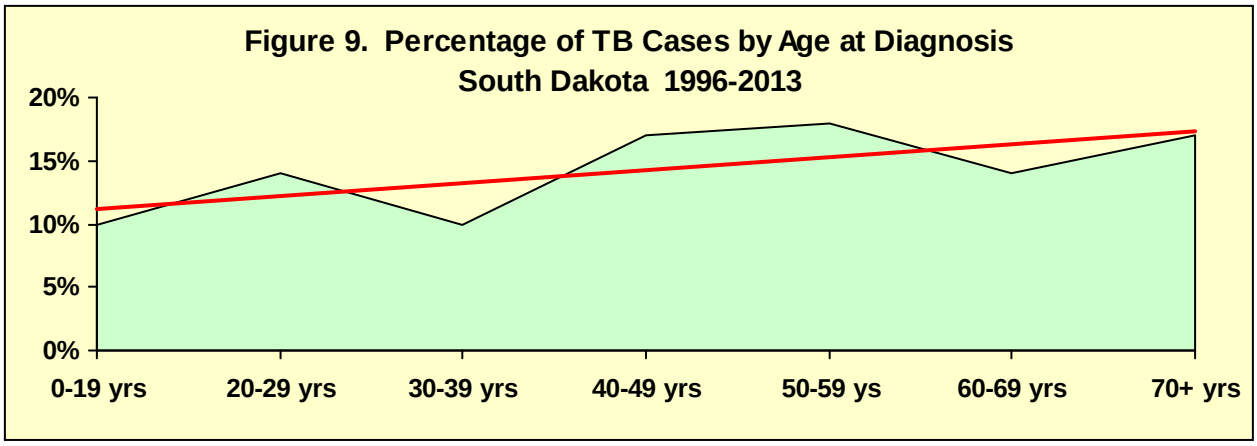
Tuberculosis remains primarily a pulmonary disease with approximately 85% of cases nationally reported as pulmonary disease and 15% as non-pulmonary disease. South Dakota has historically reported a higher percentage of non-pulmonary TB disease. In 2013 this trend continued with three cases (33%) reported as non-pulmonary sites of disease as described in Figure 7. The non-pulmonary sites of disease in 2013 included TB reported in the bone or joint, liver and meningeal TB.



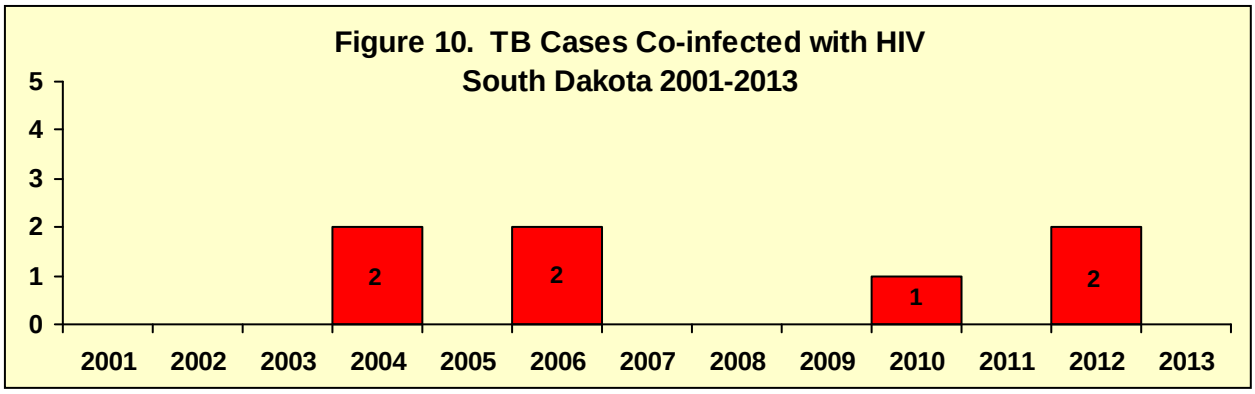
The average age of a TB case in 2013 was 48 years of age. This is a slight increase in age as compared to 2011 when the average age was 45 years of age. There were no children less than 10 years of age reported during this time period. Figure 8 illustrates the age at diagnosis by gender for tuberculosis cases reported in 2013.



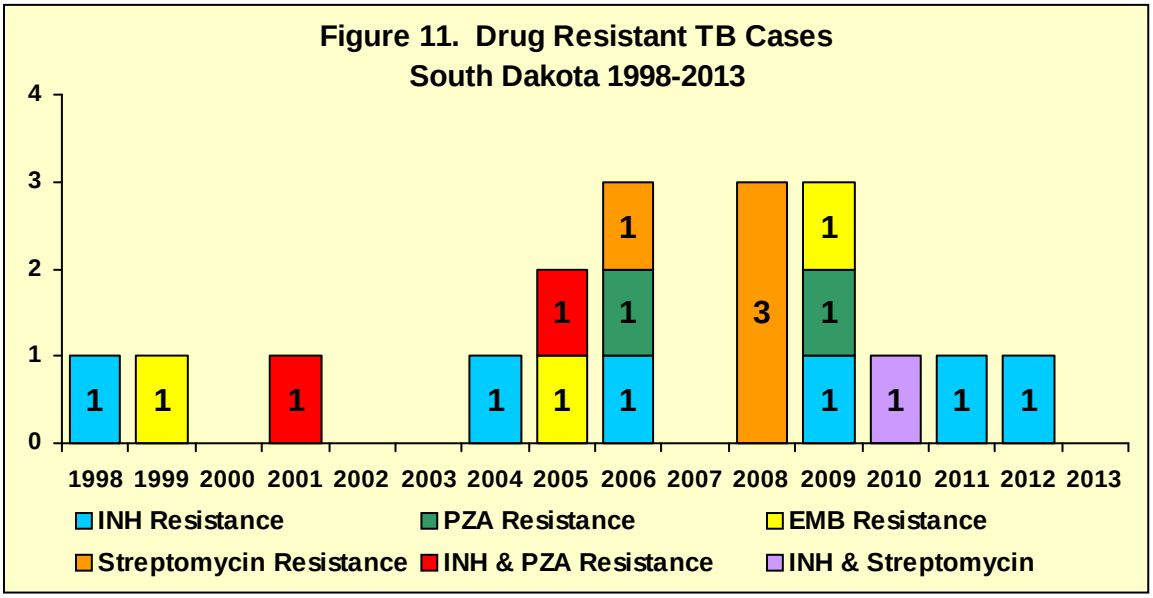
Historically most tuberculosis cases are diagnosed as adults in South Dakota. Figure 9 shows the majority of TB cases diagnosed in South Dakota were 40 years of age or older at the time of diagnosis from 1996 through 2013.



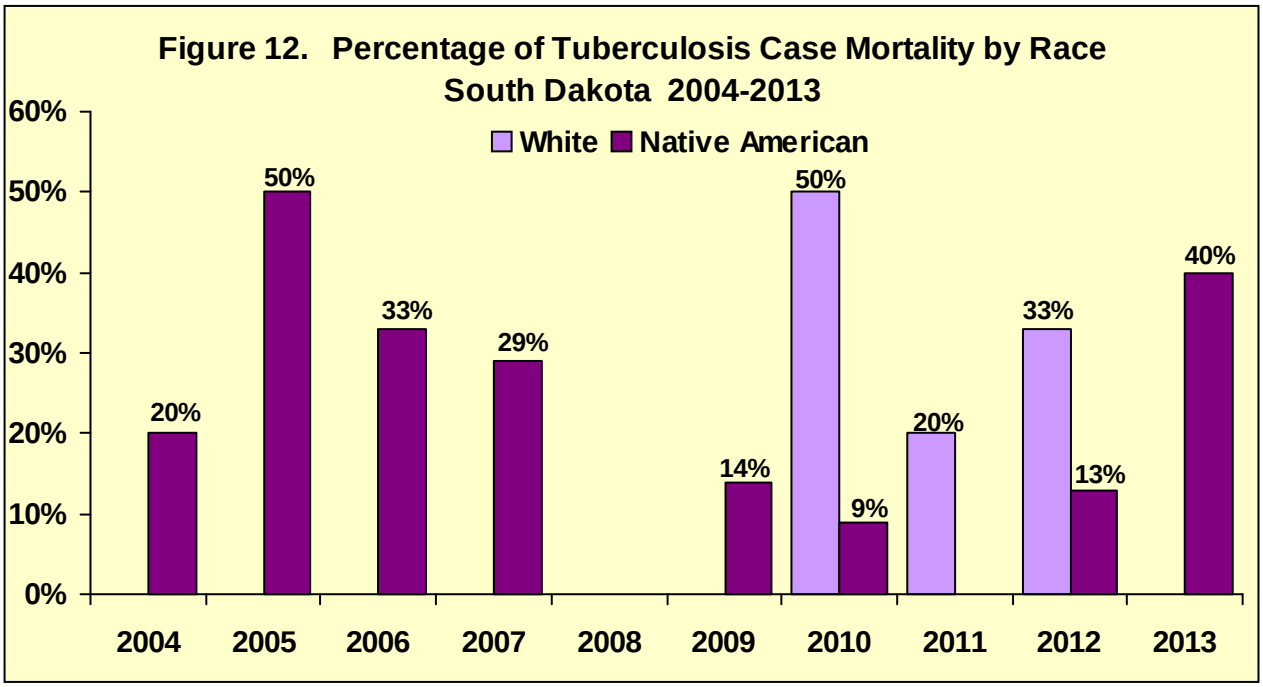
Co-infection with HIV is an important risk factor for the development of active TB. Because of this, all TB cases diagnosed in South Dakota are offered HIV testing. Co-infected TB cases require more monitoring for toxicity and are frequently treated with second line TB medications. Figure 10 describes the number of TB cases co-infected with HIV since 2001, 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), ethambutol (EMB) and streptomycin (SM). 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 1998 illustrating that South Dakota most often has single drug resistant cases. No multi-drug resistant TB cases have been reported in South Dakota although the Department of Health has managed several MDR-TB cases reported in other states that then moved to South Dakota.



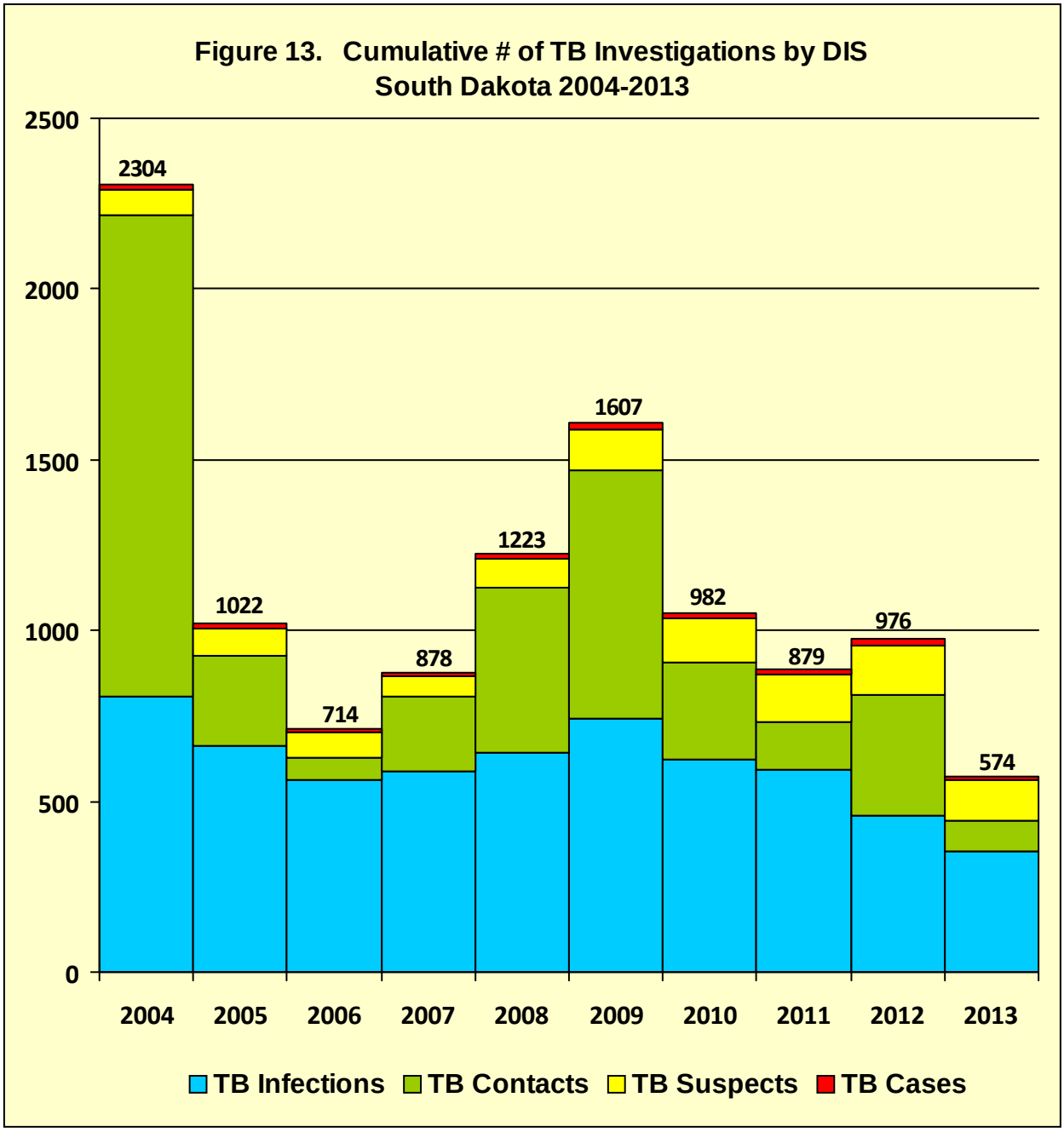
South Dakota has reported a higher than expected mortality rate during certain years, especially among Native American patients. Figure 12 shows the mortality rates by race since 2004 showing the higher trend among Native American cases. Mortality rates are calculated by the percentage of TB cases by race that die during the year of their diagnosis.



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

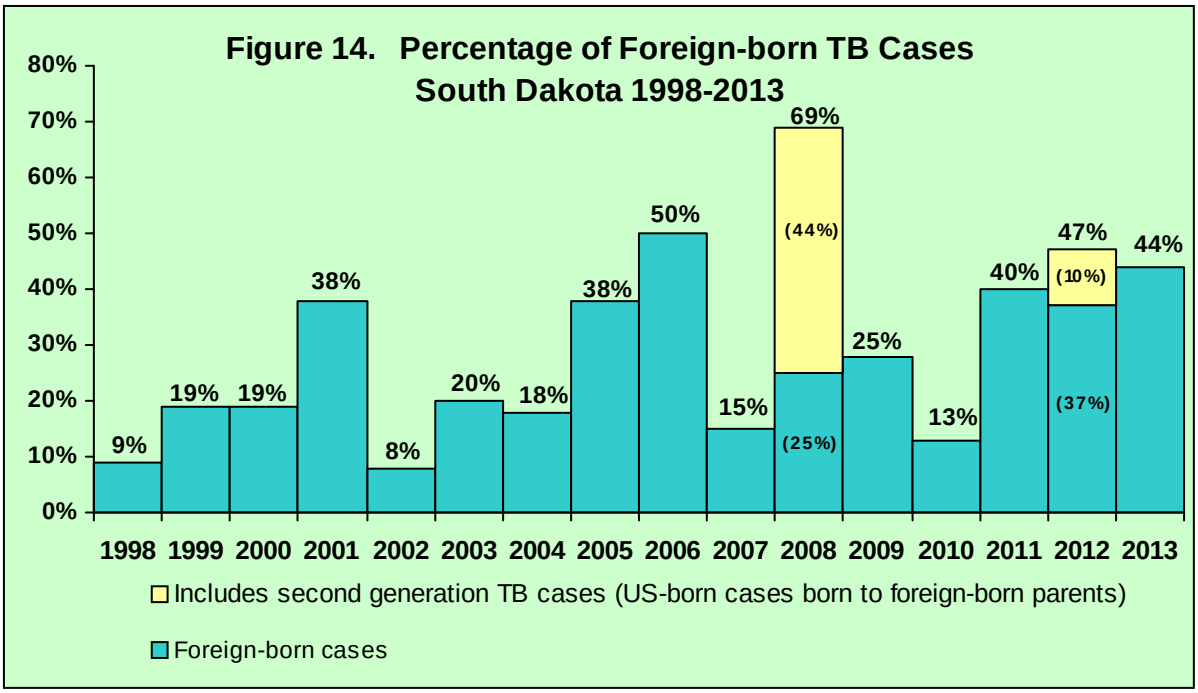
1) **TB cases** (persons diagnosed with active TB)
2) **TB suspects** (persons suspected of active TB with a pending diagnosis)
3) **TB contacts** (persons exposed to an infectious TB case)
4) **Latent TB infection** (persons reported with a positive TB skin test or positive IGRA test [interferon gamma 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 which is divided among 19 DIS staff illustrating that the 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 within the TB Control Program.

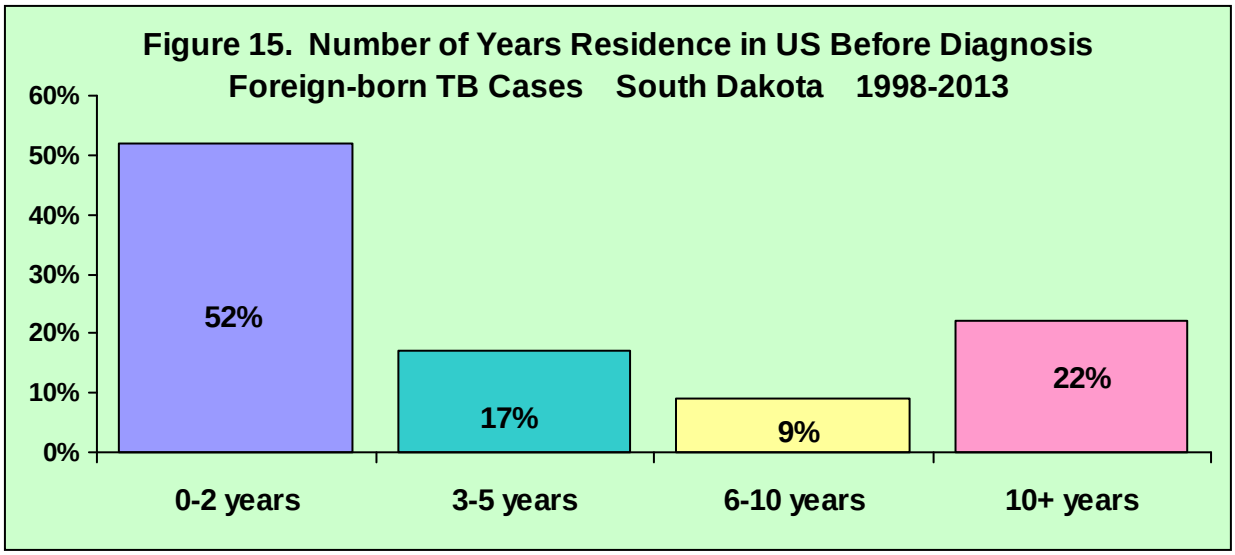


Analysis of Foreign-born TB Cases in South Dakota

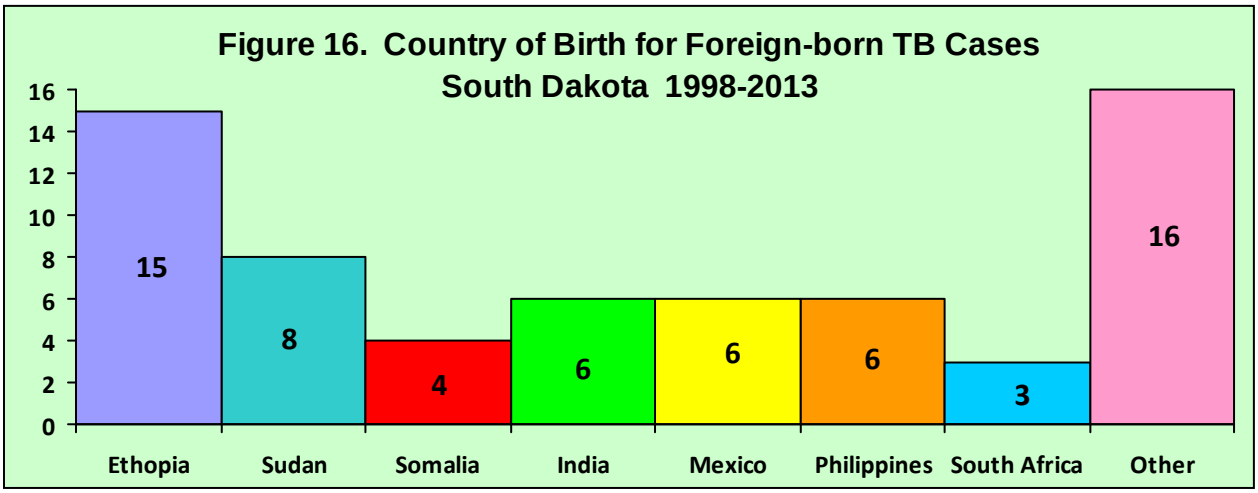
Tuberculosis cases who were born outside the United States continue to represent an important risk group in the United States as well as in South Dakota. Figure 14 describes the percentage of foreign-born TB cases in South Dakota. Second generation TB cases (US-born TB cases born to foreign-born parents) are a relatively new risk group that has been identified nationally. TB cases were first reported in this group in South Dakota in 2008 and then again in 2012.



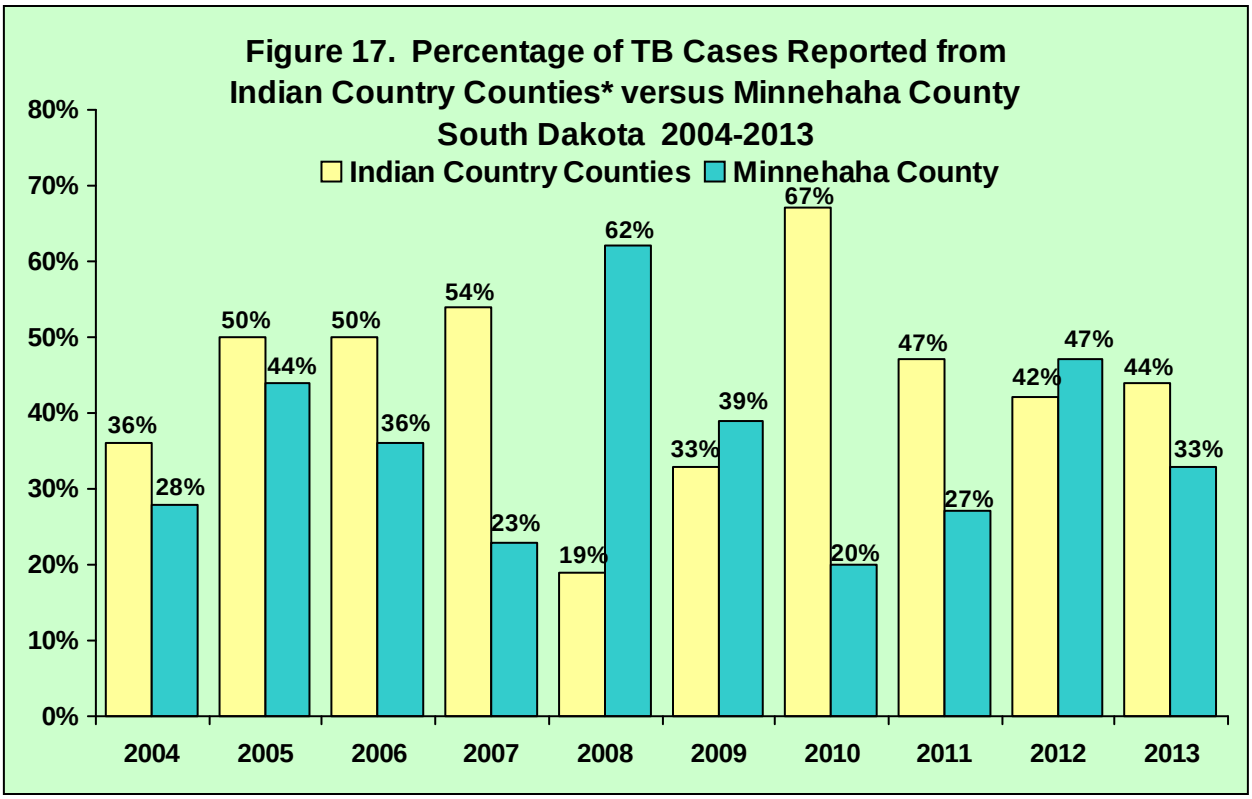
Most foreign-born persons who develop active TB usually do so within the first 2 years after arrival in the United States. Figure 15 describes that 69% of foreign-born TB cases since 1998 developed active TB within the first five years of their arrival. Because of this increased risk these individuals are targeted for preventive TB program activities including targeted TB skin testing and preventive treatment programs.



Foreign-born TB cases continue to come from many areas of the world however the majority of the TB cases reported in South Dakota are of African descent. Figure 16 describes the country of birth for the foreign-born TB cases reported in South Dakota since 1998. Countries of birth for the "other" category include Afghanistan, China, El Salvador, Indonesia, Romania, Russia, Nepal, Mauritania, Vietnam, South Korea, Bhutan, Kenya and Palau.

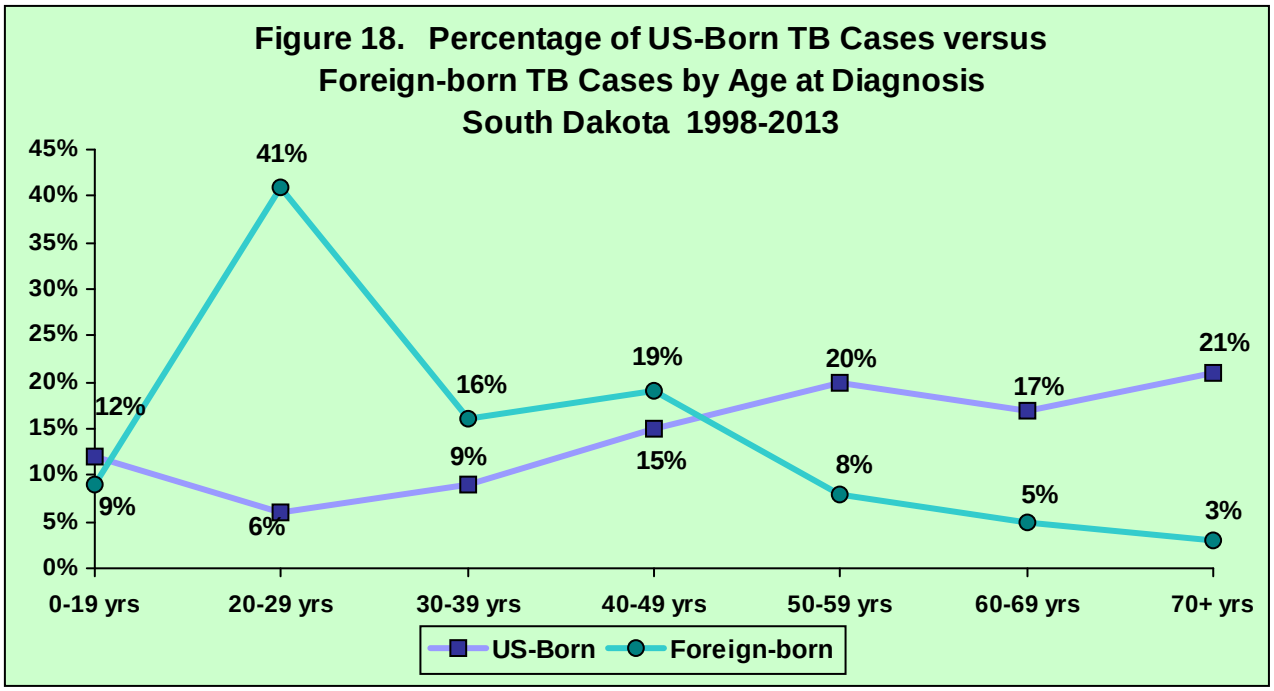


Another factor in the increase of foreign-born TB cases in South Dakota is the change geographically where TB cases are reported. Historically, the highest percentage of TB cases have been reported from counties that included and bordered American Indian reservations. As Native American TB cases decreased and foreign-born TB cases increased, there has been a geographic shift of TB cases from Indian Country counties to Minnehaha County as illustrated in Figure 17. This is due to the fact that most foreign-born persons who resettle in South Dakota do so in Minnehaha County.

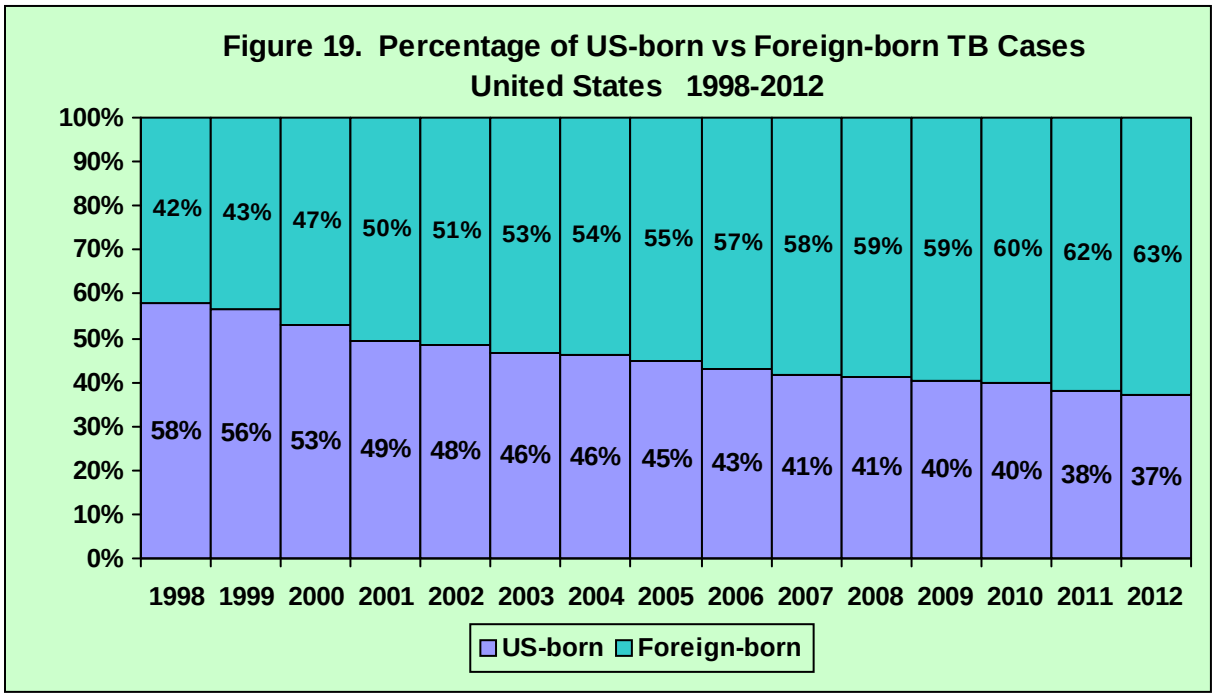


*Indian Country counties include Bennett, Brule, Buffalo, Charles Mix, Corson, Dewey, Jackson, Mellette, Moody, Pennington, Roberts, Shannon, Todd, Tripp, Walworth and Ziebach.

Foreign-born TB cases are consistently reported in younger persons as compared to US born patients in South Dakota. This presents additional TB program management issues as 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 18 illustrates that the majority of foreign-born TB cases are diagnosed while young adults.



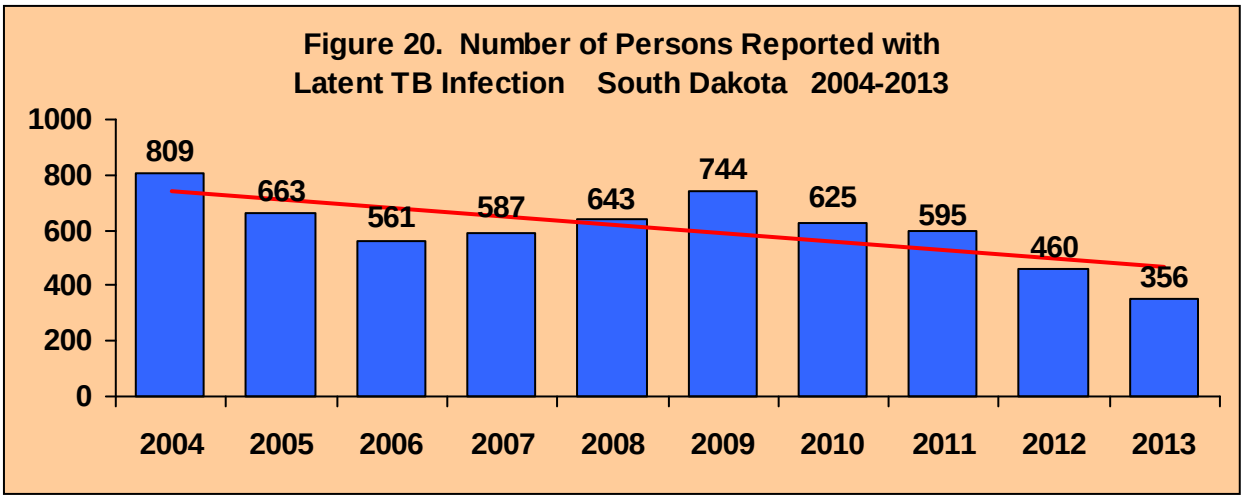
Foreign-born TB cases represent a unique challenge to the South Dakota TB Control Program because of cultural issues, language barriers and a greater likelihood of drug resistance. As these cases continue to increase in South Dakota, additional time and resources will need to be dedicated to address these unique issues. Figure 19 describes the ever increasing trend of the percentage of foreign-born TB in the United States since 1998.



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, an emphasis must be made on preventing future cases of TB. 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.

Figure 20 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 individuals have the potential to develop active TB disease and potentially be infectious to others.



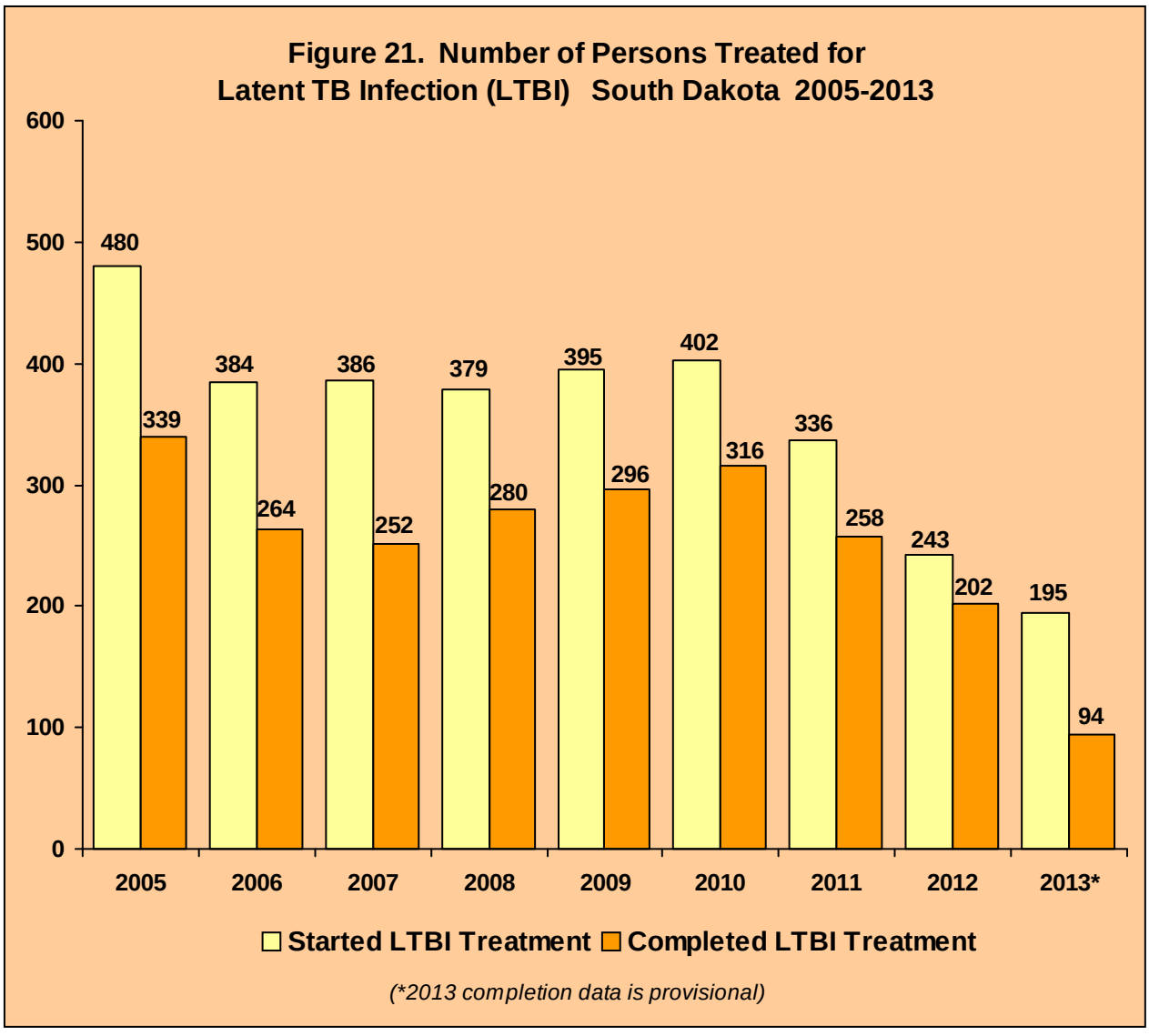
On August 2, 2011, the South Dakota Department of Health implemented an administrative rule change which changed the reporting requirement for latent TB infection. Prior to that, all persons diagnosed with latent TB infection were reportable to the South Dakota Department of Health. As of August 2, 2011,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

REPORTABLE TB RISK FACTORS

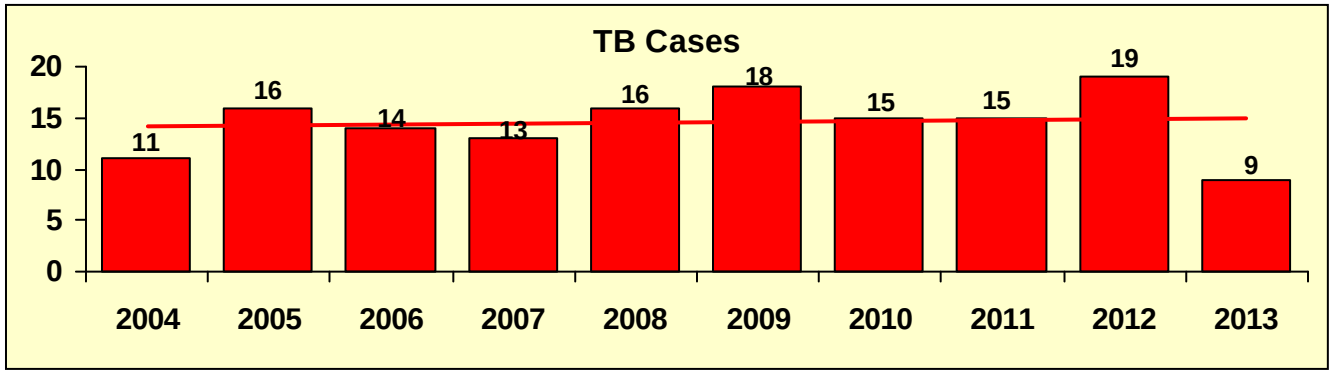
- Foreign-born persons who entered the US within the last 5 years
- Persons evaluated for tumor necrosis factor-alpha therapy
- Immunosuppressive therapies (i.e. high dose steroids)
- Radiographic evidence of prior TB
- Children less than 5 years of age
- Close contact to infectious TB
- HIV infection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

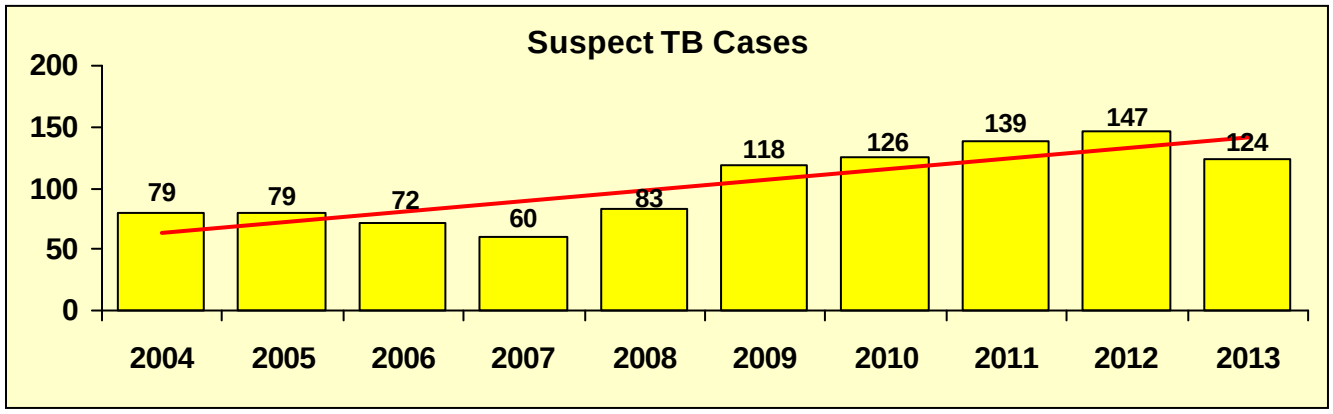
This reporting change allows the Department of Health to focus staff time, medication and resources towards those patients who have the highest risk of developing active tuberculosis. Due to this change, only the above patients are eligible for Department of Health nurse case management and medication. Health care providers and facilities are asked to report only patients with LTBI who meet this new reporting requirement by mailing or faxing the "*Latent Tuberculosis infection Report Form*" to the TB Control Program (reporting instructions are on the form). The form is available on the South Dakota Department of Health website: http://doh.sd.gov/diseases/infectious/tuberculosis. Patients who do not meet this reporting criteria should be referred to their private health care provider for evaluation and treatment at their own expense. All patients currently being managed by Department of health staff will be allowed to finish their prescribed course of treatment regardless of their risk factor status.

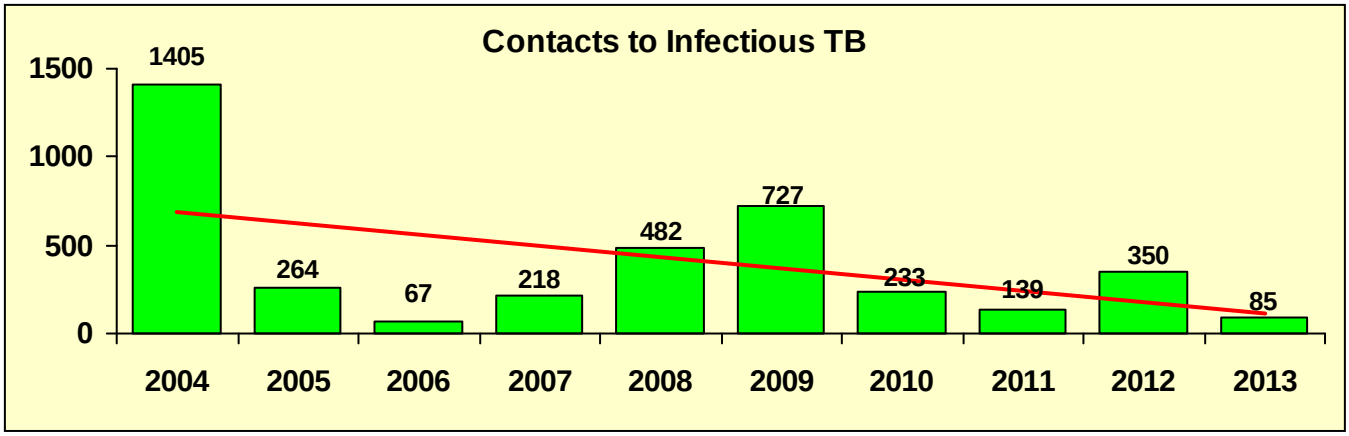
Figure 21 presents the number of patients with latent TB infection that started a course of preventive treatment as well as the number who completed this treatment. The treatment is usually done with Isoniazid (INH) which is provided free of charge to patients by the TB Control Program.

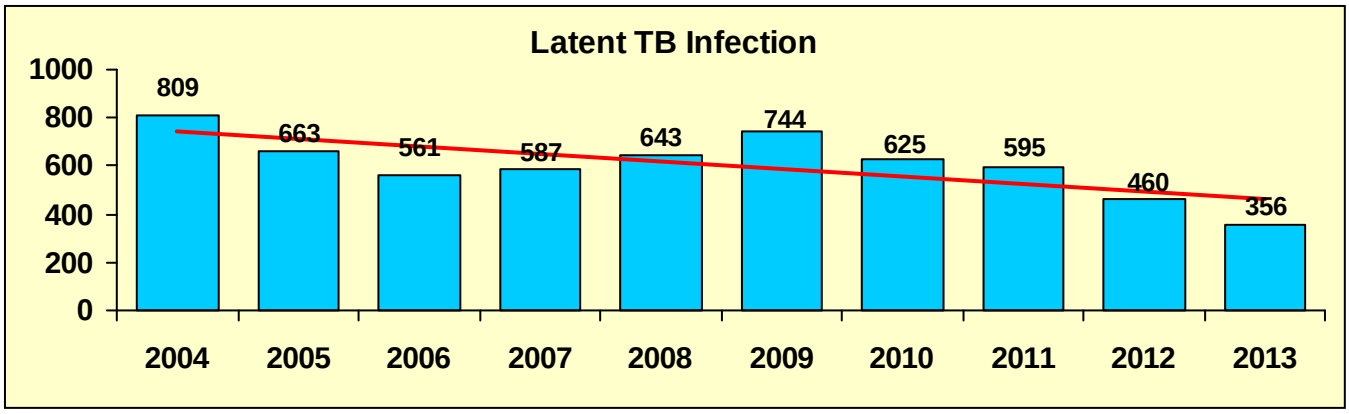


Summary of TB Control Program Caseload, South Dakota 2004-2013









SOUTH DAKOTA HIV/AIDS SURVEILLANCE REPORT

JANUARY 2014

36 New HIV/AIDS cases were reported in 2013.

24 Males
12 Females

515 People are estimated to be living with HIV/AIDS in South Dakota.

Disproportionately impacted by HIV/AIDS:

Blacks: 24% of living cases, 1% of the population

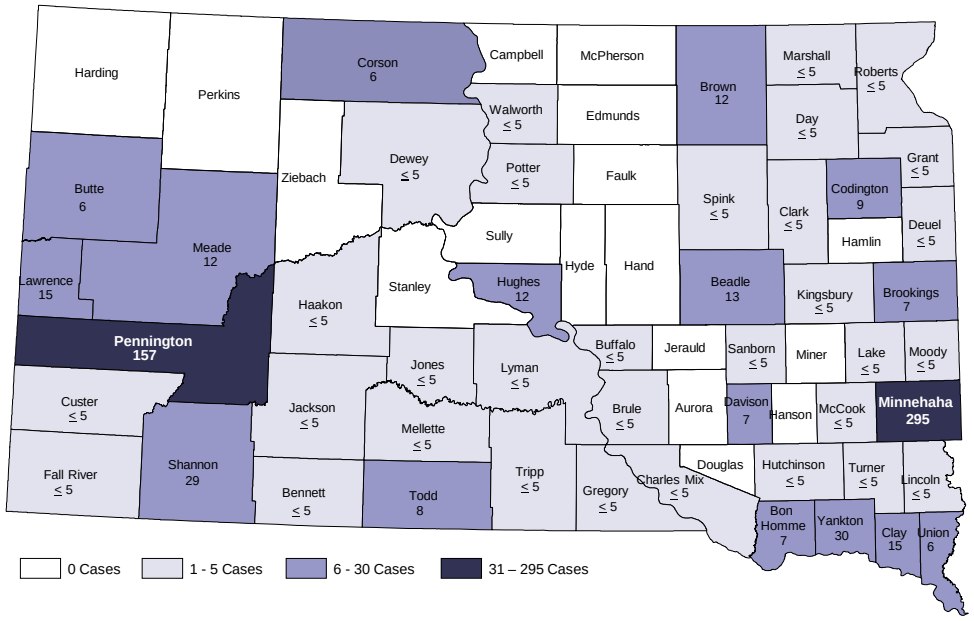
Native Americans: 15% of living cases, 9% of population

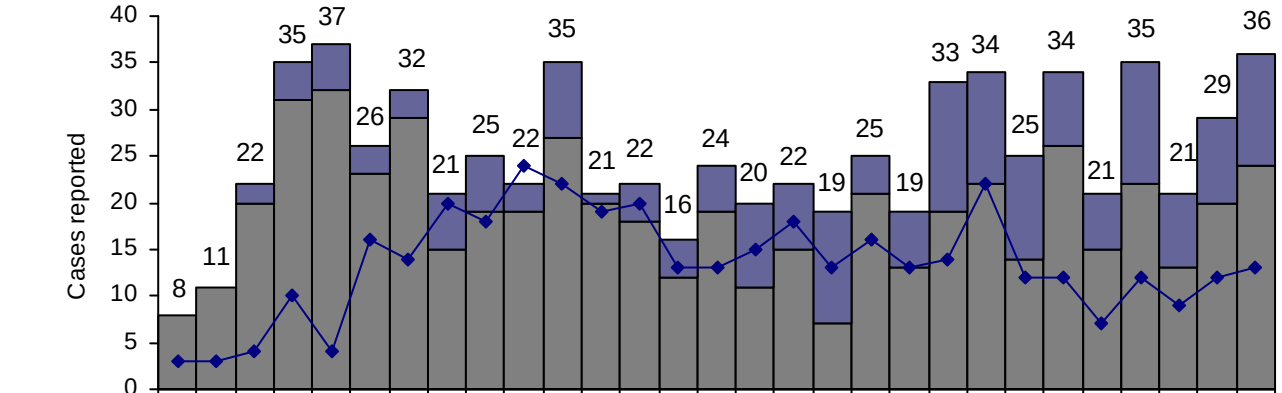
730 Cumulative cases of HIV/AIDS were reported in South Dakota from 1985-2013.

7 HIV cases were Co-infected with Syphilis in 2013.

South Dakota HIV/AIDS Web site:
http://doh.sd.gov/Disease/statistics.aspx

South Dakota Residents Reported Infected with HIV/AIDS: Cumulative Cases by County, 1985 - 2013





	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
HIV(female)	0	0	2	4	5	3	3	6	6	3	8	1	4	4	5	9	7	12	4	6	14	12	11	8	6	13	8	9	12
HIV(male)	8	11	20	31	32	23	29	15	19	19	27	20	18	12	19	11	15	7	21	13	19	22	14	26	15	22	13	20	24
AIDS	3	3	4	10	4	16	14	20	18	24	22	19	20	13	13	15	18	13	16	13	14	22	12	12	7	12	9	12	13
Total	8	11	22	35	37	26	32	21	25	22	35	21	22	16	24	20	22	19	25	19	33	34	25	34	21	35	21	29	36

South Dakota Residents Infected with HIV and AIDS, by Gender , 1985-2013

At the end of 2013, 730 SD residents had been reported as infected with HIV (545 male, 185 female) and 391 of those had also been diagnosed with AIDS. Some cases may have been reported as an HIV case in a different year than they were diagnosed with AIDS.

Routine Interstate Duplicate Review (RIDR) *Interstate duplicate review initiated by the CDC in 2004, compares patient records throughout the nation to identify duplicate cases. Because of this process, the cumulative number of cases within South Dakota may change .*

Characteristics of South Dakota HIV/AIDS Infected Persons as of December 31, 2013

	Total HIV/AIDS Diagnoses *Total number of persons diagnosed with HIV or AIDS (1985-2013)*		Persons Living with HIV/AIDS *Minimum estimate of persons living with HIV or AIDS*	
	Cases	**Percent**	**Cases**	**Percent**
TOTAL	730	100%	515	100%
Sex				
Female	185	25%	150	29%
Male	545	75%	365	71%
Race and Ethnicity				
American Indian	137	19%	78	15%
Black	119	16%	119	24%
Hispanic and Other *	34	5%	33	6%
White	440	60%	285	55%
Country of Origin				
United States	636	87%	412	80%
Other	94	13%	103	20%
Age Group	**(Age at HIV Diagnosis)**		**(Age December 31, 2013)**	
< 2 years	9	1%	0	0%
2-12 years	10	1%	7	2%
13-24 years	93	13%	7	2%
25-44 years	462	63%	214	41%
45-65 years	152	21%	268	52%
>65 years	4	1%	19	4%
Exposure Category				
Heterosexual	172	23%	150	29%
IDU (Injection Drug User)	109	15%	74	14%
MSM (Men who have Sex with Men)	302	42%	195	38%
MSM & IDU	25	3%	23	5%
Perinatal/Pediatric	13	2%	8	2%
Transfusion/Hemophilia	20	3%	10	2%
Unspecified	89	12%	55	11%
HIV Prevention Region				
Central	38	5%	18	4%
Northeast	69	10%	48	9%
Southeast	383	52%	310	60%
West	231	32%	139	27%
Unknown/Other**	9	1%	0	0

Department of Health Confidential HIV Testing Centers
or call Toll Free

Aberdeen
402 S. Main St.
Aberdeen, SD 57401
605-626-2373
1-866-805-1007

Rapid City
909 E. St. Patrick
Rapid City, SD 57701
605-394-2289
1-866-474-8221

Watertown
2001 9th Avenue SW., Ste. 500
Watertown, SD 57201
605-882-5096
1-866-817-4090

Webster
711 West 1st St.., Ste. 109
Webster, SD 57274
605-345-2340

Sioux Falls
1200 N. West Ave.
Sioux Falls, SD 57104
605-367-5365
1-866-315-9214

Pierre
740 E. Dakota
Pierre, SD 57501
605-773-5348
1-866-229-4927

Dupree
Ziebach County Court House
Dupree, SD 57623
605-365-5164
1-866-778-5157

CDC HOTLINE
1-800-232-4636

The South Dakota Department of Health is authorized by SDCL 34-22-12 and ARSD 44:20 to collect and process mandatory reports of communicable diseases.

How to report:
Secure Website:
http://doh.sd.gov/HIV/
Telephone: 1-800-592-1804 (Confidential answering device) or 1-800-592-1861 or 605-773-3737

Photo Chad Coppess:
www.*dakotagraph.com*

* Hispanic and Other denotes cases that are Asian, Hispanic, or Multi-race.
** Unknown/Other denotes cases in which the HIV/AIDS county is unknown or in a state other than South Dakota.
*** *Due to rounding totals may not equal 100.*
Questions regarding the surveillance report may be directed to Christine Olson 605-773-3737 or Christine.Olson@state.sd.us.

South Dakota Department of Health – Infectious Disease Surveillance

Selected Morbidity Report, 1 January – 31 December 2013

(provisional numbers) see http://doh.sd.gov/statistics/disease-surveillance/

	Disease	2013 year-to-date	5-year median	Percent change
Vaccine-Preventable Diseases	Diphtheria	0	0	n/a
	Tetanus	0	0	n/a
	Pertussis	64	58	+10%
	Poliomyelitis	0	0	n/a
	Measles	0	2	n/a
	Mumps	0	2	n/a
	Rubella	0	0	n/a
	Haemophilus influenza type b	3	0	n/a
Sexually Transmitted Infections and Blood-borne Diseases	HIV infection	36	29	+24%
	Hepatitis B, acute	1	1	n/a
	Chlamydia	3,931	3,191	+23%
	Gonorrhea	779	468	+66%
	Syphilis, early	48	4	+1100%
Tuberculosis	Tuberculosis	9	16	-44%
Invasive Bacterial Diseases	Meningococcal, invasive	4	3	+33%
	Invasive Group A *Streptococcus*	0	0	n/a
Enteric Diseases	*E. coli*, Shiga toxin-producing	41	48	-15%
	Campylobacteriosis	293	296	-1%
	Salmonellosis	180	170	+6%
	Shigellosis	180	7	+2471%
	Giardiasis	108	112	-4%
	Cryptosporidiosis	172	113	+52%
	Hepatitis A	4	3	+100%
Vector-borne Diseases	Animal Rabies	28	40	-30%
	Tularemia	7	8	-13%
	Rocky Mountain Spotted Fever	6	1	+500%
	Malaria (imported)	7	2	+250%
	Hantavirus Pulmonary Syndrome	1	0	n/a
	Lyme disease	4	3	+33%
	West Nile Virus disease	149	21	+610%
Other Diseases	Legionellosis	8	3	+166%
	Streptococcus pneumoniae, invasive	68	-	n/a
	Additionally, the following were reported: Babesiosis (1); Brucellosis (1); CRE (14); Chickenpox (42); Cyclosporiasis (1); Dengue Fever (2); Ehrlichiosis (1); Hepatitis B Acute (5); Hepatitis B Chronic (65); MRSA, invasive (97); Typhoid (3); Q Fever (2).			

Communicable diseases are obligatorily reportable by physicians, hospitals, laboratories, and institutions. The **Reportable Diseases List** is found at http://doh.sd.gov/diseases/infectious/reporting-communicable-diseases.aspx or upon request. Diseases are reportable by telephone, fax, mail, website, or courier.
Secure website: www.state.sd.us/doh/diseasereport
Telephones: 24 hour answering device 1-800-592-1804; for a live person at any time call 1-800-592-1861; after hours emergency 605-280-4810.
Fax 605-773-5509.
Mail in a sealed envelope addressed to the DOH, Office of Disease Prevention, 615 E. 4th Street, Pierre, SD 57501, marked "Confidential Medical Report".

3,200 copies of this Bulletin were printed by the Department of Health at a cost of $0.__ per copy.