

Cancer Health Status Report for South Dakota American Indian Communities

2011



Great Plains Tribal Chairmen's
Health Board



South Dakota
Department of Health

Preface

“*Cancer Health Status Report for South Dakota American Indian Communities*” is the first collaborative cancer report developed by the Great Plains Tribal Chairmen’s Health Board (GPTCHB) and the South Dakota Department of Health (DOH). The report describes the cancer incidence and mortality, cancer-related health behaviors and preventative screening for American Indians and whites in South Dakota.

Acknowledgements

This report represents collaborative work among individuals from multiple programs within the GPTCHB and the DOH. Specifically, the following programs led efforts to develop the report and/or to provide information:

Great Plains Tribal Chairmen’s Health Board

- Northern Plains Tribal Cancer Data Improvement Initiative
- Northern Plains Comprehensive Cancer Control Program

South Dakota Health Department

- Cancer Registry
- Data and Statistics
- Vital Records
- Comprehensive Cancer Control Program

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Executive Summary

Cancer is the second leading cause of death in the United States and affects people of all races and ethnicities. However, cancer burden is not equally distributed among different racial and ethnic groups and there are considerable regional variations in cancer incidence and mortality rates within the American Indian population. A previous study indicated that American Indians in the Northern Plains region, which includes South Dakota, experience one of the highest incidence and mortality rates within the Native American (Alaska Native/American Indian) population¹. The same study showed that Northern Plains American Indians are at a higher risk of developing certain diseases such as lung, cervical, colorectal, and liver cancers compared to whites in the same region.

The purpose of this report is to provide local cancer information by using data specific to South Dakota. The South Dakota Department of Health collects and analyzes health data including information about new cancer cases, cancer deaths, health behaviors and cancer screening use to improve public health. This report looks at the patterns of cancer incidence, mortality, risk behaviors, and screenings among American Indians compared to whites in South Dakota where data are available.

Cancer Incidence in 2008

In 2008, 3,879 South Dakotans were diagnosed with invasive, reportable cases of cancer, which excludes the less life-threatening cancers such as *in situ* cancers (except *in situ* bladders). The five most common diagnosed cancer sites (prostate, female breast, lung, colorectal, bladder) accounted for 60% of all cancer cases among South Dakota residents.

Whites accounted for 94.5% of cancer cases with 3,665 cases whereas American Indians had 4.9% with 190 cases. The American Indian age-adjusted incidence rate was 621.4 per 100,000 population compared to whites at 484.3 per 100,000 population. The South Dakota age-adjusted incidence rate for 2008 was 487.0, which is higher than the U.S. SEER 2007© age-adjusted incidence rate of 458.0 per 100,000 persons.

Cancer Mortality in 2008

In 2008, 1,561 South Dakotans died from cancer, which accounts for one in every five deaths in the state. Overall, cancer was the second leading cause of death in South Dakota. The five most common cancer sites (lung, colorectal, female breast, pancreas, prostate) caused 56.4% of all cancer deaths. Whites accounted for 94.8% of deaths with 1,479 deaths, whereas American Indians were 4.6% with 71 deaths. The American Indian age-adjusted death rate was 252.1 per 100,000 population which is 37.5% higher than the rate among whites. South Dakota's age-adjusted death rate for 2008 was 186.2 compared to the U.S. SEER 2007© rate of 178.1 per persons.

1. Wiggins CL, Espey DK, Wingo PA, et al. Cancer Among Indians and Alaska Natives in the United States, 1999-2004. Cancer 2008, 113: 1142-1152.

Cancer Related Health Behaviors

Health behaviors such as physical activity, nutritious eating, and tobacco use play an important role in prevention and control of cancer. Findings from this report show that more efforts are needed to promote a healthier lifestyle for individuals, families and the community as a whole.

For example, obesity is a major public health problem in South Dakota regardless of race. The percentage of overweight and obese adults in South Dakota increased from 53% in 1993 to 65% in 2008. In 2008, seven out of 10 American Indian adults were overweight or obese. The smoking rate among adults in South Dakota decreased between 1987 and 2008, but remained high among American Indians. In 2008, one in two American Indian adults smoked.

Cancer Screening Use

Progress has occurred in increasing cancer screening use but there is more room for improvement. In the last decade, cancer screening use increased among South Dakota residents, but some cancer screening was lower among American Indians than whites. One of the major concerns is the low rate of colorectal cancer screening use among American Indians. In 2008, only 40% of American Indian adults (50 years and older) reported having had a sigmoidoscopy or colonoscopy compared to 63% among whites.

In conclusion, the findings from this report show that continuing efforts are needed to decrease the cancer burden among American Indians in South Dakota. Priorities include obesity and smoking prevention and increasing screening tests, especially screening tests for colorectal cancers.

Data Sources

Data for this report were obtained from existing reports published by the South Dakota Department of Health. One of the important functions of a state health department is to monitor the health of state residents. The South Dakota Department of Health gathers information about reportable health conditions (e.g., cancer, selected infectious diseases), health behaviors (e.g., physical activity, nutrition), and births and deaths. Detailed and updated statistics on a variety of health topics are found on the South Dakota Health Department website: <http://doh.sd.gov/Statistics>.

Data used in this report came from the South Dakota Cancer Registry (cancer incidence), Vital Records (cancer mortality), and the Health Statistics Office (risk behaviors and cancer screening).

South Dakota Cancer Registry

The South Dakota Cancer Registry (SDCR) is a statewide population-based cancer registry. It collects data on cancer incidence and reports on cancer incidence and mortality. It began in 1992 as a limited cancer data collection system that monitored cancer incidence through pathology reports and reports from hospital tumor registries accredited by the American College of Surgeons. In 2005 a law passed that required cancer reporting by all licensed medical entities detecting, diagnosing and treating cancer cases in South Dakota. Cancer abstracts are reported from the hospital-based cancer centers and physician offices. If the medical facility does not have the expertise to abstract cancer cases, medical records are submitted to the SDCR and abstracted internally.

In 2001, the SDCR became part of the National Program of Cancer Registries (NPCR) which supports central registries in 45 states, the District of Columbia, and the territories of Puerto Rico, the Republic of Palau, and the Virgin Islands. NPCR registries collect information on cancer cases accounting for 96% of the U.S. population. NPCR is administered by the Centers for Disease Control and Prevention (CDC), which provides funding for states to implement statewide population-based registries and to enhance existing registries to meet national standards for completeness, timeliness, and data quality. The North American Association of Central Registries (NAACCR) sets standards of excellence for central registries. This is the sixth consecutive year the South Dakota Cancer Registry has been certified by NAACCR. (<http://getscreened.sd.gov/registry/>)

The quality of American Indian/Alaska Native surveillance data has been improved through a project with the Indian Health Service (IHS), Division of Epidemiology, Albuquerque, New Mexico. The SDCR participates annually with CDC and IHS to identify cancer cases and updates SDCR AI/AN data that was misclassified as non-American Indian/Alaska Native.

For more information, visit: <http://getscreened.sd.gov/registry/>

Vital Records

The Vital Records Office maintains records for all deaths occurring after 1905 in South Dakota. Records of South Dakota deaths that occurred in other states are also maintained. Cancer mortality data are utilized by the South Dakota Cancer Registry to update existing cancer records, monitor cancer-related deaths, and identify cancer cases that were not reported to the SDCR.

For more information, visit <http://doh.sd.gov/vitalrecords/>

Health Statistics Office

The Health Statistics Office coordinates the Behavioral Risk Factor Surveillance System (BRFSS). It was established in 1984 by the Centers for Disease Control and Prevention (CDC). The BRFSS is an ongoing telephone survey system, tracking health conditions and risk behaviors in the United States yearly. Data are collected monthly in all 50 states including South Dakota. The state-based system collects information on health risk behaviors, preventive health practices, and health care access primarily related to chronic disease and injury. South Dakota and other states use BRFSS data to identify emerging health problems, establish and track health objectives, and develop and evaluate public health policies and programs.

For more information, visit <http://www.cdc.gov/BRFSS/>

For the full South Dakota BRFSS report, visit <http://doh.sd.gov/Statistics/2008BRFSS/>

Introduction

Cancer is the second leading cause of death in the United States and affects people of all racial and ethnic backgrounds. Efforts to improve the cancer health status of American Indian community members in South Dakota and other Northern Plains states have prompted the Northern Plains Tribal Cancer Data Improvement Initiative (NPTCDI) and its sister program, Northern Plains Comprehensive Cancer Control Program (NPCCCCP), to partner with South Dakota's Comprehensive Cancer Control Program on a number of cancer prevention and control activities.

Development of this report was possible because of the growing partnership between NPTCDI/NPCCCCP and the South Dakota Comprehensive Cancer Control Program in the past several years.

This report was prepared to inform the American Indian communities and their partners so that information can be used for planning, implementation and evaluation of programs to prevent cancer and improve the quality of life among cancer patients, survivors and family members.

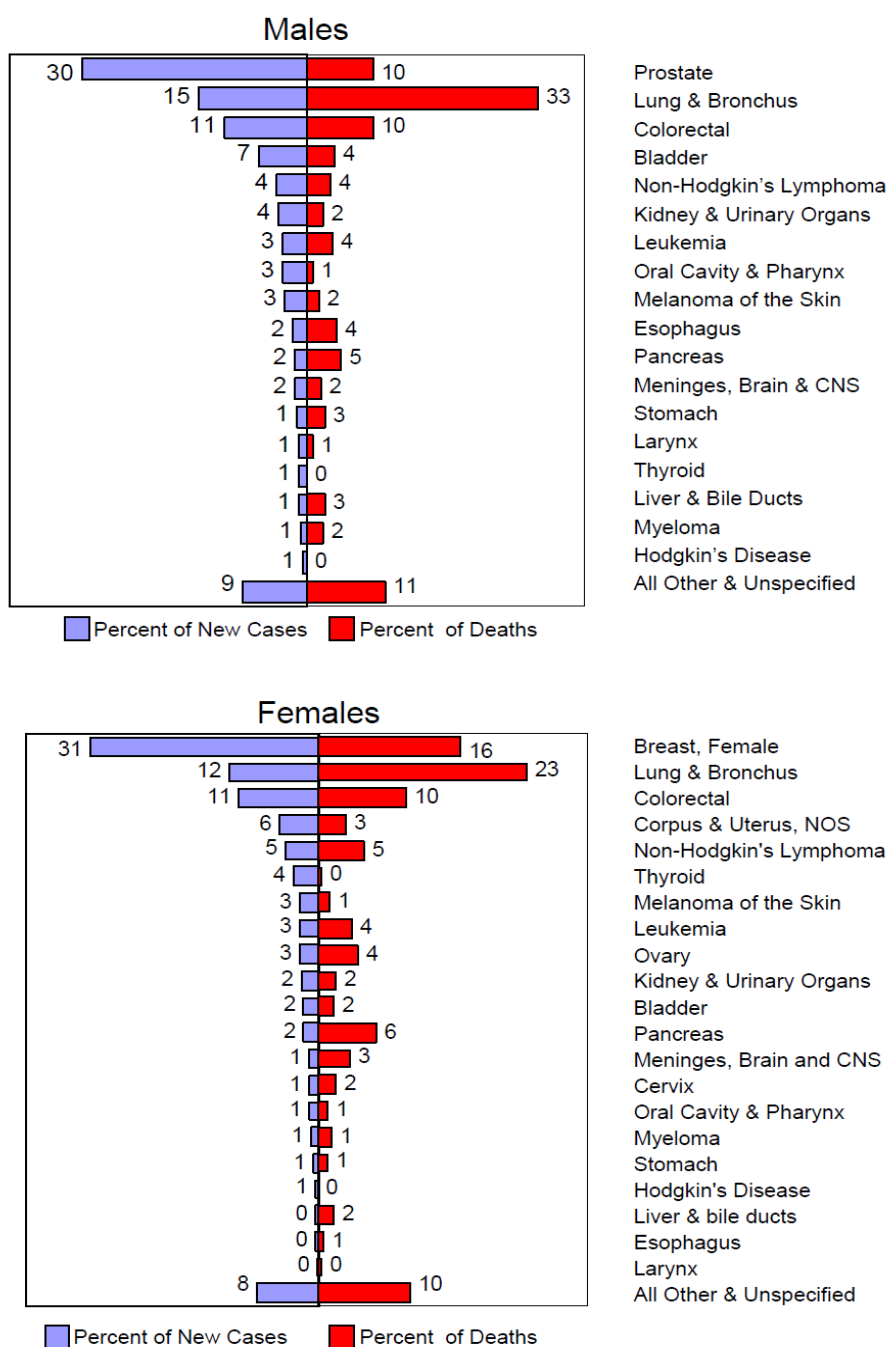
We hope that the information found in this report will promote a better understanding of cancer and will result in improvement of the cancer health status among South Dakota American Indian community members.

Cancer Incidence and Mortality

Cancer Cases and Deaths by Rank

Prostate cancer was the most common cancer diagnosed among South Dakota residents during 2008. The four most diagnosed cancers were prostate, female breast, lung and bronchus, and colorectal which accounted for 55.3% of the new cases diagnosed and 51% of cancer deaths. Figure 1 shows the percent of new cancer cases and deaths by rank and gender.

Figure 1. Percent distribution of cancer cases and deaths by rank and gender, South Dakota, 2008 (all races combined)

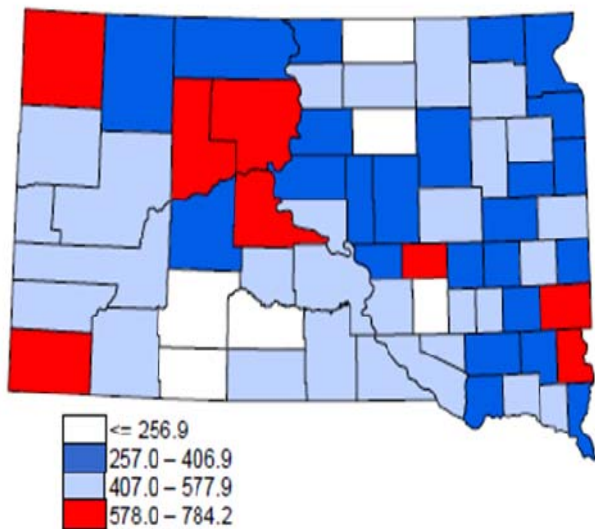


Cancer Incidence

In 2008, the South Dakota Cancer Registry collected 3,879 new reportable cancer cases (Table 1). Data at the county level ranged from a low incidence rate of 194.5 in Mellette County to a high of 768.5 in Lincoln County (Figure 2, Table 1). Table 2 shows age-adjusted incidence rates by county for selected cancer sites. For information about the counties with higher proportions of American Indians, see Appendix C which provides information about number of residents by race and ethnicity in each county.

The 2007 incidence rate for South Dakota incidence rate at 478.3 was significantly higher than the rate for United States.

Figure 2. Cancer Incidence Rates by County, South Dakota, 2008



Note: Rates are per 100,000 age-adjusted to US 2000 Standard Population. Source: South Dakota Department of Health

South Dakota has an area of 77,121 square miles with a 2000 Census population of 754,844 persons resulting in a population density of 10.2 persons per square mile. Population densities range from a low of 1.3 in Ziebach County to a high of 183.1 persons per square mile in Minnehaha County. (Preliminary results of the 2010 census report that South Dakota's population is at 814,180 persons resulting in a population density of 9.5 persons per square mile.)

Table 1 : Cancer Cases and Incidence Rates by County South Dakota, 2008 and 2004-2008 Average

County	2008		2004-2008*	
	Cases	Rate	Cases	Rate
South Dakota	3,879	487.0	3,878	485.1
Aurora	12	252.8 ▼	16	370.8 ▼
Beadle	93	424.7	98	436.9 ▼
Bennett	8	235.2 ▼	13	396.7 ▼
Bon Homme	28	276.5 ▼	41	416.0 ▼
Brookings	106	448.5	115	492.8
Brown	183	447.6	191	462.3
Brule	28	443.0	26	420.0
Buffalo	5	372.6	6	452.7
Butte	53	513.5	52	507.6
Campbell	9	377.9	6	212.1 ▼
Charles Mix	53	499.9	56	512.3
Clark	27	466.5	25	395.8 ▼
Clay	32	313.3 ▼	43	411.6 ▼
Codington	122	454.9	128	476.6
Corson	10	291.3	9	257.0 ▼
Custer	50	544.7	42	469.0
Davison	111	499.8	106	489.2
Day	46	493.2	40	432.8
Deuel	21	329.9 ▼	27	428.1
Dewey	23	602.7	22	549.9
Douglas	21	452.0	23	470.9
Edmunds	30	458.8	21	323.3 ▼
Fall River	70	655.9	66	579.9 ▲
Faulk	11	250.7 ▼	14	358.5 ▼
Grant	45	421.9	42	398.6 ▼
Gregory	42	530.7	32	400.8 ▼
Haakon	10	369.6	14	494.3
Hamlin	30	397.5	31	426.5
Hand	15	277.4 ▼	19	335.8 ▼
Hanson	17	485.7	15	419.3
Harding	9	644.8	6	428.1
Hughes	92	535.8	77	448.2
Hutchinson	38	316.5 ▼	49	393.7 ▼
Hyde	10	344.2	10	409.1
Jackson	7	254.8 ▼	11	388.6
Jerauld	21	639.7	15	429.7
Jones	8	545.8	8	524.0
Kingsbury	35	350.4 ▼	39	453.7
Lake	61	480.4	65	493.3
Lawrence	108	455.5	118	500.4
Lincoln	159	768.5 ▲	131	640.1 ▲
Lyman	18	433.9	21	531.2
McCook	24	344.0	35	464.3
McPherson	12	214.9 ▼	15	285.9 ▼
Marshall	21	315.4 ▼	25	381.1 ▼
Meade	111	528.1	103	492.9
Mellette	4	194.5 ▼	10	496.6
Miner	14	345.2	20	413.3
Minnehaha	823	625.7 ▲	778	590.3 ▲
Moody	25	356.6	27	376.9 ▼
Pennington	479	570.3 ▲	463	552.8 ▲
Perkins	15	282.9 ▼	19	364.8 ▼
Potter	13	270.1 ▼	20	405.9
Roberts	44	361.3 ▼	47	393.5 ▼
Sanborn	11	312.0	13	392.2
Shannon	30	502.8	30	523.5
Spink	27	287.1 ▼	40	404.0 ▼
Stanley	20	766.5	16	606.3
Sully	8	398.6	7	363.2
Todd	24	469.5	23	467.8
Tripp	37	436.0	38	453.5
Turner	42	365.4	48	401.9 ▼
Union	64	484.7	59	444.8
Walworth	40	436.8	38	412.1 ▼
Yankton	104	445.9	102	435.4 ▼
Ziebach	7	690.1	4	306.1 ▼

Incidence rates with counts less than 20 are generally considered unstable. *Number of the cases and rates are averaged over the 5-year period.

▲ Rate significantly higher; ▼ Rate significantly lower

Rates are per 100,000 age-adjusted to US 2000 Standard Population.

Source: South Dakota Department of Health.

Figure 3 below shows that incidence rates for American Indians in South Dakota were higher than those for whites in 2008. Of the 3,879 newly diagnosed cases in 2008, 190 or 4.9% were American Indians, 88 males and 102 females.

Figure 3. All Sites Cancer Incidence Rates by Race in South Dakota, 2008

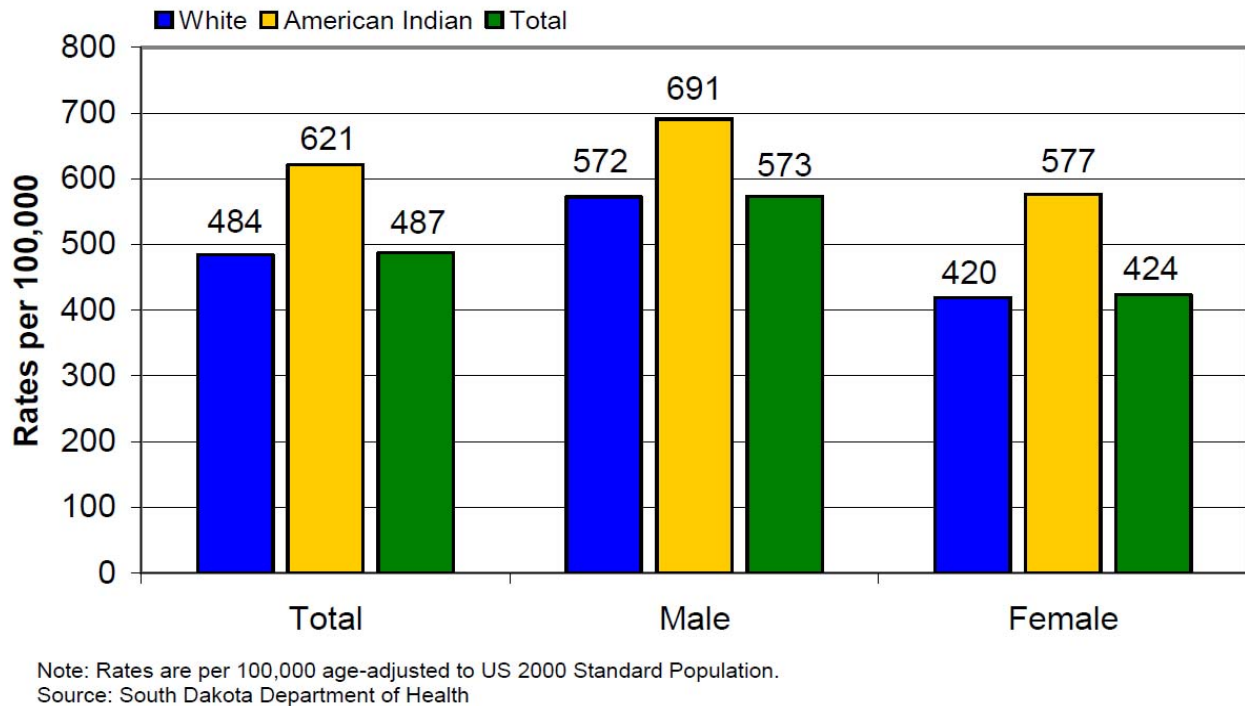


Table 3 shows the number of new cancer cases and age-adjusted rates by gender and race. Because of the small population size of American Indians, it should be noted that the rates are unstable for specific category or site of cancer.

Table 2: Age-adjusted Incidence Rates by County for Selected Sites, 2008

	Colorectal		Lung & Bronchus		Female Breast		Prostate		Bladder		NHL	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
South Dakota	424	51.8	527	64.5	570	137.4	625	173.3	178	21.3	169	21.1
Aurora	3	44.7	*	42.1	3	129.3	*	37.0	0	0.0	0	0.0
Beadle	17	72.3	8	33.6	9	70.1	19	200.1	8	35.5	3	13.3
Bennett	*	27.7	*	53.9	0	0.0	4	272.1	0	0.0	0	0.0
Bon Homme	3	29.6	*	20.2	*	27.7	9	195.2	*	23.4	*	6.2
Brookings	13	54.7	6	24.5	19	165.4	15	149.6	5	21.2	5	20.8
Brown	21	50.8	29	66.6	33	153.9	14	79.7	14	33.2	10	24.3
Brule	6	94.7	3	45.3	*	19.0	6	245.2	*	16.1	3	42.3
Buffalo	0	0.0	0	0.0	0	0.0	*	270.5	*	78.4	0	0.0
Butte	4	37.2	6	55.1	5	94.0	11	226.7	3	30.5	*	9.2
Campbell	0	0.0	*	35.3	3	266.2	3	281.0	0	0.0	0	0.0
Charles Mix	6	49.9	4	31.7	8	140.9	11	220.6	*	18.4	*	8.3
Clark	*	13.9	4	52.9	3	132.8	4	161.4	6	77.0	0	0.0
Clay	5	42.1	6	56.7	3	59.0	6	131.3	0	0.0	*	10.3
Codington	10	35.3	28	99.8	20	140.6	18	154.7	7	24.2	4	15.0
Corson	*	30.2	*	56.6	0	0.0	*	105.1	*	23.3	*	31.0
Custer	5	54.1	5	52.9	5	114.9	9	166.5	*	23.6	3	35.4
Davison	13	54.6	16	68.3	12	91.0	24	269.7	6	24.9	6	27.8
Day	4	39.4	9	98.2	10	189.9	6	134.8	*	8.0	3	29.0
Deuel	*	13.9	6	85.2	3	120.0	4	139.8	*	27.2	0	0.0
Dewey	3	93.3	6	153.2	*	53.5	5	250.4	*	30.8	*	34.5
Douglas	5	99.4	*	43.6	*	58.3	6	293.7	0	0.0	0	0.0
Edmunds	8	122.3	4	51.0	6	208.6	4	127.1	*	11.2	*	17.8
Fall River	*	18.1	13	104.5	10	190.3	7	97.9	*	15.8	3	26.6
Faulk	*	26.2	*	41.4	0	0.0	*	105.1	*	26.2	*	19.6
Grant	12	107.4	3	26.3	6	99.2	5	109.6	*	18.2	*	12.3
Gregory	7	93.4	4	41.6	3	80.3	5	130.4	4	48.5	*	19.5
Haakon	*	31.0	*	36.5	0	0.0	3	281.5	0	0.0	3	105.3
Hamlin	4	40.3	4	55.1	*	59.1	5	158.8	*	29.3	*	10.3
Hand	*	28.3	*	27.2	3	124.3	*	57.5	3	43.1	0	0.0
Hanson	0	0.0	0	0.0	3	163.2	5	299.1	*	39.2	*	52.3
Harding	*	73.9	0	0.0	0	0.0	3	437.6	0	0.0	*	130.4
Hughes	10	56.5	13	78.4	9	92.6	20	260.0	3	17.1	3	19.0
Hutchinson	3	17.7	3	20.2	5	109.1	4	81.6	3	12.6	*	13.0
Hyde	*	79.4	*	23.1	*	136.5	3	236.9	0	0.0	0	0.0
Jackson	*	39.8	*	39.8	*	73.2	*	111.5	*	33.7	0	0.0
Jerauld	*	42.2	*	59.7	*	98.2	3	154.7	*	23.0	0	0.0
Jones	*	58.7	*	92.2	*	317.0	*	128.6	0	0.0	*	58.7
Kingsbury	4	28.6	3	28.2	7	178.8	3	64.4	3	20.3	*	18.9
Lake	12	83.5	5	38.8	10	170.0	7	125.7	4	32.7	4	32.5
Lawrence	8	32.6	12	48.8	17	146.4	16	146.5	5	20.4	8	32.7
Lincoln	17	81.4	17	85.0	27	244.8	29	302.2	4	20.4	9	44.0
Lyman	3	79.0	0	0.0	*	38.5	5	252.2	*	23.9	0	0.0
McCook	*	23.5	*	14.3	*	37.0	6	168.1	*	17.1	*	34.5
McPherson	*	27.2	4	59.0	*	63.8	*	72.1	0	0.0	0	0.0
Marshall	6	80.7	6	86.4	*	58.1	4	133.9	0	0.0	0	0.0
Meade	4	19.3	18	89.0	15	138.2	17	171.9	3	15.3	5	23.8
Mellette	0	0.0	*	46.9	0	0.0	*	92.6	0	0.0	0	0.0
Miner	*	18.2	*	37.3	*	47.6	*	81.3	0	0.0	*	19.0
Minnehaha	83	63.6	109	84.3	138	189.3	137	244.3	24	18.7	34	25.7
Moody	3	43.6	4	52.5	*	68.3	3	96.7	*	26.7	0	0.0
Pennington	42	49.9	67	80.9	75	166.4	77	199.7	22	26.6	19	22.7
Perkins	0	0.0	*	47.9	*	51.6	*	36.4	3	46.3	*	44.9
Potter	*	30.1	0	0.0	*	74.5	*	72.4	*	12.9	0	0.0
Roberts	9	59.1	6	50.5	7	93.3	4	67.9	2	16.2	0	0.0
Sanborn	3	88.3	*	54.9	0	0.0	*	52.9	*	24.1	*	55.3
Shannon	6	91.7	3	69.0	4	99.4	4	312.5	*	27.9	*	14.6
Spink	*	24.7	3	33.2	3	53.0	4	87.2	3	25.9	*	11.0
Stanley	4	134.9	5	206.8	*	75.9	*	132.7	*	101.8	*	64.3
Sully	0	0.0	*	47.4	3	325.1	3	303.7	0	0.0	0	0.0
Todd	*	40.4	4	72.0	*	66.8	*	55.1	0	0.0	*	18.3
Tripp	3	47.4	3	24.5	5	100.0	7	179.5	0	0.0	*	10.3
Turner	6	40.9	6	49.0	8	169.8	10	189.9	0	0.0	*	5.6
Union	3	22.9	10	74.9	13	200.9	3	47.4	*	16.3	*	7.1
Walworth	4	43.2	11	107.1	6	119.9	7	158.6	*	18.0	*	19.0
Yankton	16	66.1	20	85.8	19	149.3	16	161.1	5	22.1	6	24.0
Ziebach	0	0.0	*	73.0	*	608.4	0	0.0	*	193.9	0	0.0

Note: Counts less than 3 are suppressed. Incidence rates with counts less than 20 are generally considered unstable.

Rates are per 100,000 age-adjusted to US 2000 Standard Population.

Source: South Dakota Department of Health.

Table 3: Age-adjusted Incidence Rates by Site, Gender and Race, South Dakota, 2008

	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total	3,879	487.0	2,056	573.3	1,823	423.9	3,665	484.3	190	621.4
Oral Cavity	88	11.4	65	18.1	23	5.6	85	11.7	2	3.9
Lip	12	1.5	11	3.0	1	0.1	12	1.6	0	0.0
Tongue	22	2.9	17	4.8	5	1.3	22	3.0	0	0.0
Salivary Gland	10	1.3	7	1.9	3	0.8	9	1.2	1	1.4
Floor of Mouth	4	0.5	3	0.8	1	0.2	3	0.4	1	2.5
Gum and Other Mouth	10	1.2	4	1.1	6	1.3	9	1.2	0	0.0
Nasopharynx	4	0.5	2	0.5	2	0.5	4	0.6	0	0.0
Tonsil	17	2.3	14	3.9	3	0.8	17	2.4	0	0.0
Oropharynx	2	0.3	1	0.3	1	0.2	2	0.3	0	0.0
Hypopharynx	3	0.4	2	0.5	1	0.2	3	0.4	0	0.0
Other Oral Cavity & Pharynx	4	0.5	4	1.1	0	0.0	4	0.6	0	0.0
Digestive System	696	85.3	376	105.3	320	68.9	639	81.5	47	156.4
Esophagus	46	5.7	38	10.6	8	1.8	41	5.3	5	19.0
Stomach	40	5.0	27	7.7	13	3.2	34	4.4	5	14.9
Small Intestine	16	2.0	11	3.1	5	1.1	15	1.9	1	3.1
Colorectal	425	51.9	226	63.4	199	42.4	396	50.4	24	80.1
Colon Excluding Rectum	307	36.9	162	45.4	145	29.9	289	36.1	14	49.3
Rectum and Rectosigmoid	118	15.0	64	17.9	54	12.6	107	14.2	10	30.8
Anus, Anal Canal and Anorectum	13	1.7	2	0.6	11	2.7	13	1.8	0	0.0
Liver & Intrahepatic Bile Duct	31	3.9	22	6.1	9	1.9	24	3.1	4	15.2
Gallbladder	19	2.2	2	0.6	17	3.2	18	2.1	1	5.0
Other Biliary	12	1.5	6	1.7	6	1.4	11	1.5	1	4.0
Pancreas	77	9.3	36	10.1	41	8.6	73	9.1	3	8.8
Retroperitoneum	4	0.5	4	1.1	0	0.0	3	0.4	1	0.8
Peritoneum, Omentum and Mesentery	13	1.6	2	0.6	11	2.6	11	1.4	2	5.6
Respiratory	562	68.9	328	91.2	234	51.7	530	67.9	32	127.9
Nose, Nasal Cavity and Middle Ear	4	0.5	1	0.3	3	0.5	4	0.5	0	0.0
Larynx	30	3.8	24	6.6	6	1.6	27	3.7	3	11.2
Lung and Bronchus	527	64.5	302	84.1	225	49.6	498	63.7	29	116.8
Pleura	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mediastinum and Other Resp Organs	1	0.1	1	0.3	0	0.0	1	0.1	0	0.0
Bones and Joints	9	1.1	4	1.1	5	1.2	8	1.1	1	0.8
Soft Tissue (Including Heart)	20	2.6	12	3.4	8	2.0	18	2.5	2	2.6
Skin	128	16.6	71	20.1	57	14.0	127	17.7	1	4.0
Melanomas of the Skin	115	15.0	63	17.7	52	12.7	114	15.9	1	4.0
Other Skin	13	1.7	8	2.4	5	1.3	13	1.8	0	0.0
Breast	573	73.2	3	0.9	570	137.4	548	74.0	24	79.4
Breast, Female	570	137.4			570	137.4	545	139.3	24	139.7
Breast, Male	3	0.9	3	0.9			3	0.9	0	0.0
Female	193	47.0			193	47.0	178	43.0	14	64.4
Vulva	16	3.4			16	3.4	16	3.4	0	0.0
Vagina	0	0.0			0	0.0	0	0.0	0	0.0
Cervix Uteri	25	6.7			25	6.7	20	5.3	5	20.9
Corpus and Uterus, NOS	101	24.7			101	24.7	93	23.9	8	36.5
Corpus Uteri	99	24.3			99	24.3	91	22.2	8	36.5
Uterus, NOS	2	0.4			2	0.4	2	0.4	0	0.0
Ovary	50	12.0			50	12.0	48	11.5	1	7.1
Other Female Genital Organs	1	0.2			1	0.2	1	0.2	0	0.0

Source: South Dakota Department of Health

Table 3: Age-adjusted Incidence Rates by Site, Gender and Race, South Dakota, 2008 (continued)

	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Male	658	182.3	658	182.3			625	182.0	25	193.5
Penis	4	1.2	4	1.2			2	0.6	2	11.7
Prostate	625	173.3	625	173.3			595	172.7	22	180.0
Testis	28	7.6	28	7.6			27	8.3	1	1.8
Other Male Genital Organs	1	0.3	1	0.3			1	0.3	0	0.0
Urinary	308	37.9	219	61.6	89	19.9	291	37.4	16	49.7
Bladder	178	21.3	136	38.8	42	9.0	173	21.5	5	18.8
Kidney and Renal Pelvis	125	16.0	80	22.0	45	10.5	114	15.3	10	25.5
Ureter	3	0.3	1	0.3	2	0.4	2	0.2	1	5.3
Other Urinary Organs	2	0.3	2	0.6	0	0.0	2	0.3	0	0.0
Eye and Orbit	1	0.1	0	0.0	1	0.1	1	0.1	0	0.0
Brian & CNS	58	7.6	32	8.8	26	6.6	54	7.6	4	7.9
Brain	58	7.6	32	8.8	26	6.6	54	7.6	4	7.9
Meninges & CNS	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Endocrine	94	12.8	26	7.2	68	18.5	89	13.2	4	9.4
Thyroid	89	12.1	23	6.4	66	17.9	84	12.4	4	9.4
Other Endocrine	5	0.7	3	0.8	2	0.6	5	0.8	0	0.0
Lymphomas	192	24.1	96	26.8	96	22.3	185	24.6	7	26.8
Hodgkin's Lymphoma	23	3.0	12	3.1	11	2.9	23	3.3	0	0.0
Non-Hodgkin's Lymphoma	169	21.1	84	23.7	85	19.4	162	21.3	7	26.8
Myeloma	40	4.9	18	5.0	22	4.8	37	4.7	2	8.4
Leukemia	116	14.2	65	18.1	51	11.4	113	14.6	3	6.6
Acute Lymphocytic	8	1.1	3	0.8	5	1.3	7	1.1	1	0.8
Chronic Lymphocytic	52	6.3	30	8.4	22	4.6	52	6.6	0	0.0
Other Lymphocytic	3	0.4	3	0.9	0	0.0	3	0.4	0	0.0
Acute Myeloid	28	3.5	13	3.6	15	3.4	27	3.6	1	4.0
Acute Monocytic	2	0.2	1	0.3	1	0.2	2	0.2	0	0.0
Chronic Myeloid	13	1.5	7	2.1	6	1.2	12	1.4	1	1.8
Other Acute Leukemia	2	0.3	1	0.3	1	0.3	2	0.3	0	0.0
Other Leukemia	8	1.0	7	1.9	1	0.2	8	1.0	0	0.0
Myeloproliferative & Myelodysplastic	45	5.3	24	6.9	21	4.3	44	5.4	1	5.3
Mesothelioma	7	0.9	6	1.6	1	0.2	7	0.9	0	0.0
Other Sites	91	11.0	53	15.0	38	7.9	86	10.8	5	14.8

Rates are per 100,000 age-adjusted to US 2000 Standard Population.
Source: South Dakota Department of Health

Stage at Diagnosis

Seer Summary Staging:

- ***In Situ*** – Malignant cells are within the cell groups from which they arose, without penetration of the basement membrane of the tissue and stromal invasion
- **Localized** – The malignant cells are limited to the organ of origin and have spread no farther than the organ where they began
- **Regional** – The tumor is beyond the limits of the organ of origin by direct extension to adjacent areas such as the regional lymph nodes, adjacent organs, or tissues.
- **Distant** – The tumor cells have broken away from the primary tumor and traveled to other parts of the body.
- **Unknown** – If extension of disease is unknown, there is not sufficient evidence available to assign a stage.

Table 4 below shows stage at diagnosis for selected cancer sites for whites and American Indians. The number of cases are shown followed by the percentage of each. For whites, there is a total of 1,784 localized cases, 658 regional cases, and 856 distant cases. For American Indians, there is a total of 85 localized cases, 42 regional cases, and 47 distant cases.

Table 4. Stage at diagnosis for selected sites by Race, South Dakota, 2008

	White						American Indian					
	Localized		Regional		Distant		Localized		Regional		Distant	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Bronchus & Lungs	97	5.4%	82	12.5%	277	32.4%	2	2.4%	10	23.8%	13	27.7%
Colorectal	195	10.9%	115	17.5%	62	7.2%	6	7.1%	9	21.4%	8	17.0%
Melanoma of the Skin	97	5.4%	5	0.8%	7	0.8%	1	1.2%	0	0.0%	0	0.0%
Female Breast	325	18.2%	182	27.7%	31	3.6%	21	24.7%	3	7.1%	0	0.0%
Kidney & Urinary Organs	77	4.3%	10	1.5%	18	2.1%	7	8.2%	0	0.0%	2	4.3%
Uterus	64	3.6%	17	2.6%	9	1.1%	5	5.9%	1	2.4%	2	4.3%
Pancreas	6	0.3%	21	3.2%	37	4.3%	0	0.0%	1	2.4%	2	4.3%
Prostate	530	29.7%	38	5.8%	11	1.3%	18	21.2%	0	0.0%	3	6.4%
Bladder	71	4.0%	7	1.1%	8	0.9%	3	3.5%	0	0.0%	1	2.1%
Non-Hodgkin's Lymphoma	51	2.9%	24	3.6%	76	8.9%	3	3.5%	2	4.8%	2	4.3%
Leukemia	0	0.0%	0	0.0%	113	13.2%	0	0.0%	0	0.0%	3	6.4%

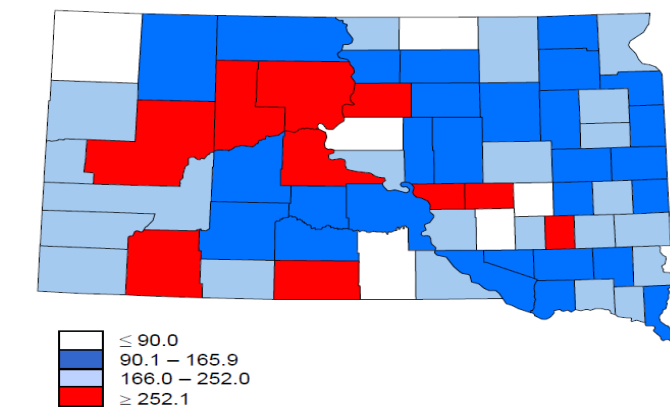
Source: South Dakota Department of Health

Cancer Mortality

Cancer age-adjusted death rates for 2008 ranged from a low of 35.1 per 100,000 population in Stanley County to a high of 358.0 in Shannon County (Figure 4 and Table 5). Table 6 shows age-adjusted mortality rates by county for selected cancer sites. For information about the counties with higher proportions of American Indians, see Appendix C which provides information about number of residents by race and ethnicity in each county.

The United States mortality rate was 178.1 and South Dakota mortality rate was 191.6 per 100,000 persons in 2007.

Figure 4. Cancer Mortality Rates by County, South Dakota, 2008



Note: Rates are per 100,000 age-adjusted to US 2000 Standard Population.
Source: South Dakota Department of Health

Table 7 shows the number of cancer deaths and death rates by gender and race. Because of the small population size of American Indians, it should be noted that the rates are unstable for specific category or site of cancer.

Table 5. Cancer Mortality Rates by County, South Dakota, 2008 and 2004-2008 Average

County	2008		2004-2008 [^]	
	Cases	Rate	Cases	Rate
South Dakota	1,561	186.2	1,579	188.7
Aurora	3	63.2	5	105.8
Beadle	49	204.4	47	188.1
Bennett	5	167.7	5	166.6
Bon Homme	13	120.1	19	170.8
Brookings	38	147.6	42	173.4
Brown	87	196.6	80	180.8
Brule	14	204.2	11	173.5
Buffalo	3	298.8	3	251.7
Butte	25	232.2	25	232.3
Campbell	5	202.9	4	130.5
Charles Mix	14	116.2	17	147.9
Clark	7	97.8	12	171.6
Clay	16	141.1	20	183.6
Codington	64	232.6	57	203.0
Corson	5	150.1	5	148.5
Custer	18	199.9	19	209.7
Davison	51	221.4	46	198.9
Day	11	116.8	13	130.5
Deuel	9	119.9	13	178.0
Dewey	12	302.3	12	310.6
Douglas	8	159.2	9	170.2
Edmunds	8	114.5	8	112.4
Fall River	29	224.4	26	214.0
Faulk	5	123.5	6	142.4
Grant	16	138.9	16	143.9
Gregory	17	187.6	15	178.0
Haakon	4	108.9	7	196.0
Hamlin	14	174.2	16	203.5
Hand	9	140.9	10	144.8
Hanson	9	253.6	6	176.2
Harding	0	0.0	*	110.5
Hughes	34	190.4	25	139.0
Hutchinson	26	159.7	22	129.8
Hyde	3	101.1	5	165.8
Jackson	4	155.8	6	238.4
Jerauld	10	261.0	8	190.7
Jones	*	119.3	3	191.9
Kingsbury	14	143.4	17	172.8
Lake	25	182.3	20	147.4
Lawrence	51	204.7	52	205.7
Lincoln	43	204.2	51	247.4
Lyman	6	150.8	5	130.2
McCook	20	216.1	17	186.4
McPherson	4	53.8	7	115.6
Marshall	9	126.9	11	143.1
Meade	54	263.8	51	250.3
Mellette	3	135.7	5	241.7
Miner	9	156.1	9	166.9
Minnehaha	273	206.8	280	212.0
Moody	9	130.5	10	143.3
Pennington	168	204.1	169	205.1
Perkins	5	99.9	9	154.0
Potter	13	269.7	10	184.2
Roberts	32	243.3	27	211.4
Sanborn	*	57.4	6	159.9
Shannon	16	355.8	16	309.3
Spink	14	132.7	15	142.5
Stanley	9	339.3	7	265.8
Sully	*	47.4	*	123.6
Todd	11	312.4	10	206.7
Tripp	8	76.3	16	167.2
Turner	20	125.6	21	142.9
Union	33	241.9	32	234.9
Walworth	13	135.3	17	175.0
Yankton	45	183.7	41	171.2
Ziebach	4	403.3	*	207.1

* Counts less than 3 are suppressed. Incidence rates with counts less than 20 are generally considered unstable.

[^] Number of the cases and rates are averaged over the 5-year period.

▲ Rate significantly higher; ▼ Rate significantly lower

Rates are per 100,000 age-adjusted to US 2000 Standard Population.

Source: South Dakota Department of Health.

Table 6. Age-adjusted Mortality Rates by County for Selected Sites, South Dakota, 2008

	Colorectal		Lung & Bronchus		Female Breast		Prostate		Bladder		NHL	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
South Dakota	153	18.3	445	53.6	118	26.5	78	22.7	47	5.3	68	7.7
Aurora	0	0.0	*	19.4	*	51.7	*	37.0	0	0.0	0	0.0
Beadle	9	42.9	14	60.5	4	24.5	5	49.3	*	3.8	3	12.2
Bennett	*	36.0	3	97.4	0	0.0	0	0.0	0	0.0	0	0.0
Bon Homme	*	19.8	5	54.5	0	0.0	0	0.0	0	0.0	*	6.2
Brookings	5	16.5	8	30.3	5	41.0	*	9.1	*	3.0	4	13.7
Brown	11	25.9	23	51.7	7	27.4	*	6.1	3	6.8	7	14.8
Brule	*	28.7	*	12.2	*	82.7	*	34.3	0	0.0	*	14.0
Buffalo	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Butte	*	10.1	11	104.1	*	12.6	*	38.1	*	8.6	0	0.0
Campbell	0	0.0	0	0.0	*	197.5	0	0.0	0	0.0	0	0.0
Charles Mix	0	0.0	4	33.4	*	18.2	0	0.0	*	5.2	0	0.0
Clark	0	0.0	*	30.4	*	26.7	0	0.0	0	0.0	0	0.0
Clay	3	25.4	6	55.7	0	0.0	*	43.2	0	0.0	*	7.0
Codington	3	10.0	27	99.1	5	38.9	*	8.3	3	10.2	*	6.5
Corson	0	0.0	*	51.8	*	41.8	0	0.0	0	0.0	0	0.0
Custer	0	0.0	4	37.9	*	38.5	0	0.0	*	14.3	3	34.2
Davison	6	23.9	17	77.0	5	34.4	*	12.2	*	6.7	*	8.5
Day	0	0.0	5	55.4	0	0.0	0	0.0	*	8.0	0	0.0
Deuel	*	24.5	5	71.3	0	0.0	0	0.0	0	0.0	*	13.6
Dewey	*	22.5	6	134.8	0	0.0	0	0.0	0	0.0	*	34.5
Douglas	0	0.0	0	0.0	*	35.0	0	0.0	0	0.0	0	0.0
Edmunds	0	0.0	*	22.4	*	56.8	*	27.0	0	0.0	0	0.0
Fall River	*	15.3	11	84.0	0	0.0	*	12.9	*	7.8	*	7.3
Faulk	*	26.2	*	26.2	0	0.0	0	0.0	0	0.0	*	18.7
Grant	5	44.5	*	16.4	*	42.1	3	56.0	0	0.0	0	0.0
Gregory	*	21.8	3	22.7	*	38.5	*	52.0	0	0.0	0	0.0
Haakon	*	31.0	*	57.2	0	0.0	*	64.6	0	0.0	0	0.0
Hamlin	*	21.8	6	82.2	0	0.0	3	91.7	0	0.0	0	0.0
Hand	0	0.0	4	65.4	*	19.1	0	0.0	*	13.6	0	0.0
Hanson	0	0.0	*	57.7	0	0.0	0	0.0	0	0.0	0	0.0
Harding	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hughes	3	16.6	12	69.0	0	0.0	*	15.4	0	0.0	0	0.0
Hutchinson	2	14.3	7	40.6	*	5.1	3	44.8	*	7.6	0	0.0
Hyde	0	0.0	0	0.0	*	70.6	0	0.0	0	0.0	0	0.0
Jackson	*	42.4	*	39.8	*	51.7	*	81.6	0	0.0	0	0.0
Jerauld	*	16.5	3	91.3	0	0.0	0	0.0	*	16.5	0	0.0
Jones	0	0.0	0	0.0	*	119.3	*	119.3	0	0.0	0	0.0
Kingsbury	3	34.9	6	60.2	0	0.0	0	0.0	0	0.0	0	0.0
Lake	*	5.5	2	15.7	3	48.0	*	16.9	0	0.0	*	5.7
Lawrence	6	25.3	17	69.3	4	30.5	3	31.3	3	11.1	0	0.0
Lincoln	3	14.0	13	66.6	*	20.6	3	36.0	*	10.9	*	3.8
Lyman	0	0.0	4	96.4	0	0.0	0	0.0	0	0.0	0	0.0
McCook	0	0.0	5	56.9	*	27.4	3	77.4	0	0.0	0	0.0
McPherson	0	0.0	*	28.9	0	0.0	0	0.0	*	11.3	0	0.0
Marshall	*	31.5	*	8.8	*	39.4	0	0.0	0	0.0	0	0.0
Meade	*	4.8	16	78.3	6	57.6	3	37.2	3	15.1	5	24.9
Mellette	0	0.0	0	0.0	*	95.2	0	0.0	0	0.0	0	0.0
Miner	*	12.2	0	0.0	*	32.5	*	67.6	*	12.2	0	0.0
Minnehaha	24	18.0	75	58.2	15	19.4	10	21.0	11	8.2	15	11.2
Moody	*	32.5	*	15.5	*	48.4	*	62.9	*	17.8	0	0.0
Pennington	13	15.8	40	48.5	18	39.1	7	20.9	6	7.3	8	10.0
Perkins	0	0.0	*	57.4	*	28.4	0	0.0	0	0.0	0	0.0
Potter	*	19.7	*	41.5	3	125.4	*	71.1	0	0.0	*	40.7
Roberts	8	55.1	8	59.7	3	36.2	0	0.0	0	0.0	*	16.7
Sanborn	*	32.6	*	24.8	0	0.0	0	0.0	0	0.0	0	0.0
Shannon	5	109.0	4	111.9	*	23.9	0	0.0	0	0.0	*	26.5
Spink	*	17.7	*	11.0	0	0.0	*	44.0	0	0.0	0	0.0
Stanley	0	0.0	3	106.1	*	69.9	0	0.0	0	0.0	*	101.8
Sully	0	0.0	*	47.4	0	0.0	0	0.0	0	0.0	0	0.0
Todd	*	18.3	4	110.9	0	0.0	0	0.0	0	0.0	0	0.0
Tripp	*	10.3	*	16.5	*	18.3	0	0.0	0	0.0	0	0.0
Turner	4	29.6	4	26.3	0	0.0	0	0.0	*	5.6	*	5.2
Union	*	15.3	10	73.7	3	41.9	*	29.5	0	0.0	3	21.9
Walworth	*	29.8	4	36.6	0	0.0	*	24.8	0	0.0	0	0.0
Yankton	4	15.8	16	63.5	4	27.1	5	49.7	0	0.0	0	0.0
Ziebach	0	0.0	*	193.9	0	0.0	0	0.0	0	0.0	0	0.0

Note: * Counts less than 3 are suppressed. Mortality rates with counts less than 20 are generally considered unstable.
Rates are per 100,000 age-adjusted to US 2000 Standard Population. Source: South Dakota Department of Health.

Table 7. Age-adjusted Mortality Rates by Site, Gender, and Race, South Dakota, 2008

	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total	1,561	186.2	815	230.9	746	156.4	1,479	183.4	71	252.1
Oral Cavity	16	1.9	8	2.2	8	1.6	15	1.9	0	0.0
Lip	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tongue	2	0.2	2	0.5	0	0.0	2	0.3	0	0.0
Salivary Gland	1	0.1	1	0.3	0	0.0	1	0.1	0	0.0
Floor of Mouth	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Gum and Other Mouth	3	0.3	0	0.0	3	0.4	3	0.3	0	0.0
Nasopharynx	3	0.4	1	0.3	2	0.5	2	0.3	0	0.0
Tonsil	1	0.1	0	0.0	1	0.2	1	0.1	0	0.0
Oropharynx	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Hypopharynx	3	0.4	2	0.6	1	0.2	3	0.4	0	0.0
Other Oral Cavity & Pharynx	3	0.4	2	0.5	1	0.2	3	0.4	0	0.0
Digestive System	370	44.0	209	59.1	161	32.2	322	39.5	21	67.9
Esophagus	40	4.8	35	9.8	5	1.0	38	4.8	2	9.4
Stomach	30	3.5	22	6.3	8	1.7	26	3.1	3	8.0
Small Intestine	4	0.5	3	0.9	1	0.3	4	0.5	0	0.0
Colorectal	153	18.3	79	22.1	74	14.6	138	17.0	13	41.0
Colon Excluding Rectum	124	14.7	63	17.6	61	11.7	113	13.8	9	28.9
Rectum and Rectosigmoid	29	3.5	16	4.5	13	2.9	25	3.2	4	12.1
Anus, Anal Canal and Anorectum	1	0.1	1	0.3	0	0.0	1	0.2	0	0.0
Liver & Intrahepatic Bile Duct	35	4.2	21	5.8	14	2.7	21	2.7	1	5.0
Gallbladder	7	0.8	2	0.5	5	0.9	7	0.8	0	0.0
Other Biliary	4	0.4	2	0.6	2	0.3	4	0.4	0	0.0
Pancreas	87	10.3	39	11.4	48	10.0	83	10.2	2	4.6
Retroperitoneum	1	0.1	0	0.0	1	0.1	1	0.1	0	0.0
Peritoneum, Omentum and Mesentery	8	0.9	5	1.4	3	0.6	8	1.0	0	0.0
Respiratory	463	55.7	281	78.9	182	39.3	439	55.1	21	89.6
Nose, Nasal Cavity and Middle Ear	4	0.5	0	0.0	4	0.9	4	0.5	0	0.0
Larynx	9	1.1	6	1.7	3	0.9	6	0.8	1	5.3
Lung and Bronchus	445	53.6	272	76.4	173	37.2	424	53.2	20	84.2
Pleura	2	0.2	1	0.3	1	0.2	2	0.2	0	0.0
Mediastinum and Other Resp Organs	3	0.3	2	0.5	1	0.1	3	0.3	0	0.0
Bones and Joints	5	0.6	3	0.8	2	0.4	5	0.7	0	0.0
Soft Tissue (Including Heart)	12	1.4	4	1.2	8	1.8	11	1.4	1	5.3
Skin	34	4.2	21	6.1	13	2.9	33	4.3	1	3.1
Melanomas of the Skin	23	2.9	13	3.7	10	2.2	23	3.0	0	0.0
Other Skin	11	1.3	8	2.3	3	0.7	10	1.3	1	3.1
Breast	119	14.6	1	0.3	118	26.5	112	14.4	7	22.3
Breast, Female	118	26.5			118	26.5	111	26.1	7	39.8
Breast, Male	1	0.3	1	0.3			1	0.3	0	0.0
Female	73	15.6			73	15.6	68	15.0	5	24.5
Vulva	0	0.0			0	0.0	0	0.0	0	0.0
Vagina	0	0.0			0	0.0	0	0.0	0	0.0
Cervix Uteri	15	3.3			15	3.3	12	2.6	3	13.1
Corpus and Uterus, NOS	23	4.9			23	4.9	22	4.9	1	7.1
Corpus Uteri	17	3.6			17	3.6	16	3.5	1	7.1
Uterus, NOS	6	1.3			6	1.3	6	1.3	0	0.0
Ovary	33	7.1			33	7.1	32	7.2	1	4.3
Other Female Genital Organs	2	0.3			2	0.3	2	0.3	0	0.0

Source: South Dakota Department of Health

Table 7. Age-adjusted Mortality Rates by Site, Gender, and Race, South Dakota, 2008 (cont'd)

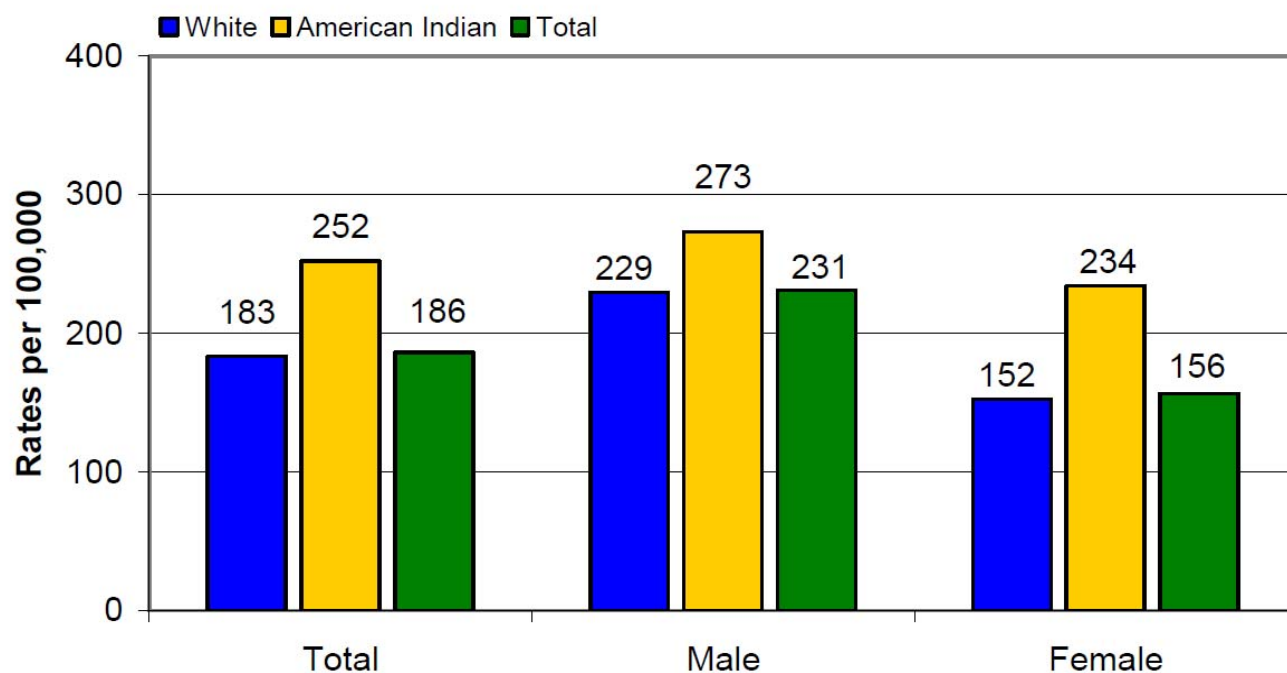
	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Male	80	23.3	80	23.3			78	23.4	0	0.0
Penis	0	0.0	0	0.0			0	0.0	2	10.5
Prostate	78	22.7	78	22.7			76	22.8	2	13.8
Testis	2	0.6	2	0.6			2	0.6	0	0.0
Other Male Genital Organs	0	0.0	0	0.0			0	0.0	0	0.0
Urinary	83	9.7	54	15.3	29	5.5	80	9.6	3	10.5
Bladder	47	5.3	34	9.8	13	2.2	46	5.3	1	5.7
Kidney and Renal Pelvis	33	4.0	18	5.0	15	3.1	31	3.9	2	4.8
Ureter	3	0.4	2	0.6	1	0.2	3	0.4	0	0.0
Other Urinary Organs	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Eye and Orbit	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Brian & CNS	42	5.3	16	4.5	26	6.2	40	5.3	2	3.5
Brain	41	5.2	16	4.5	25	5.9	40	5.3	1	1.8
Meninges& CNS	1	0.1	0	0.0	1	0.3	0	0.0	1	1.8
Endocrine	8	1.0	4	1.1	4	0.9	7	0.9	1	3.1
Thyroid	6	0.7	3	0.8	3	0.7	5	0.6	1	3.1
Other Endocrine	2	0.3	1	0.3	1	0.3	2	0.3	0	0.0
Lymphomas	70	7.9	29	8.2	41	7.7	69	8.1	1	5.0
Hodgkin's Lymphoma	2	0.2	0	0.0	2	0.5	2	0.3	0	0.0
Non-Hodgkin's Lymphoma	68	7.7	29	8.2	39	7.2	67	7.8	1	5.0
Myeloma	29	3.4	19	5.5	10	2.0	29	3.6	0	0.0
Leukemia	61	7.0	31	8.8	30	5.6	59	7.1	2	6.3
Acute Lymphocytic Leukemia	7	0.9	4	1.1	3	0.6	7	0.9	0	0.0
Chronic Lymphocytic Leukemia	16	1.7	9	2.6	7	1.0	16	1.8	0	0.0
Other Lymphocytic Leukemia	1	0.1	1	0.3	0	0.0	1	0.1	0	0.0
Acute Myeloid Leukemia	20	2.4	10	2.7	10	1.9	19	2.3	1	2.3
Acute Monocytic Leukemia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chronic Myeloid Leukemia	4	0.4	2	0.7	2	0.4	4	0.4	0	0.0
Other Acute Leukemia	8	0.9	4	1.1	4	0.7	8	1.0	0	0.0
Other Leukemia	5	0.6	1	0.3	4	0.8	4	0.5	1	4.0
Immunoproliferative Diseases	3	0.3	2	0.6	1	0.2	3	0.4	0	0.0
Mesothelioma	2	0.2	2	0.6	0	0.0	2	0.2	0	0.0
Ill-Defined and Unspecified Sites	91	10.8	51	14.3	40	8.2	86	10.7	4	16.4

Rates are per 100,000 age-adjusted to US 2000 Standard Population.

Source: South Dakota Department of Health

Figure 5 illustrates that males had higher death rates than females for all races, whites, and American Indians. American Indians had higher death rates than whites.

Figure 5. All Sites Cancer Mortality Rates by Race, South Dakota, 2008



Note: Rates are per 100,000 age-adjusted to US 2000 Standard Population.
Source: South Dakota Department of Health

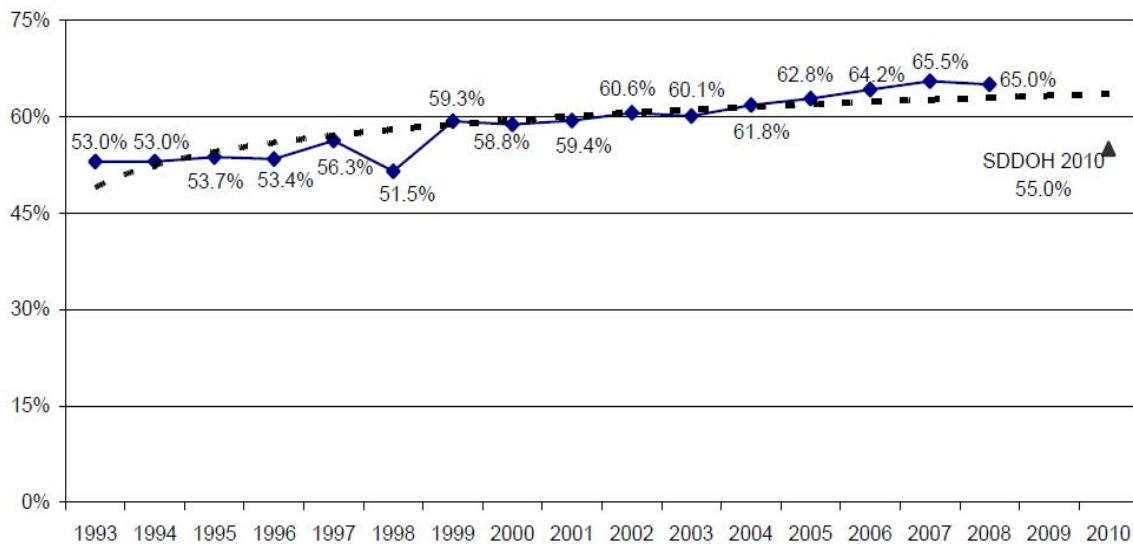
Cancer Related Health Behaviors and Screening Use

Overweight and Obesity

Definition: Overweight or obese is defined as having a Body Mass Index (BMI) of 25.0 or above. Body Mass Index (BMI) is calculated by taking a person's body weight in pounds, divided by their height in inches, divided by height in inches (again) times 703. The mathematical equation for BMI is: $\text{weight (lb)}/\text{height (in)}^2 \times 703$.

Overall, the percent of South Dakota residents who are overweight or obese has been increasing since 1993. Males have a significantly higher prevalence of overweight or obesity than females. A comparison between American Indians and whites show that American Indian females have a significantly higher prevalence of overweight or obesity than white females.

Figure 6. Percent of Respondents Who Are Overweight or Obese Based on Body Mass Index, South Dakota 1993-2008



Source: The Behavioral Risk Factor Surveillance System, South Dakota Department of Health, 1993-2008

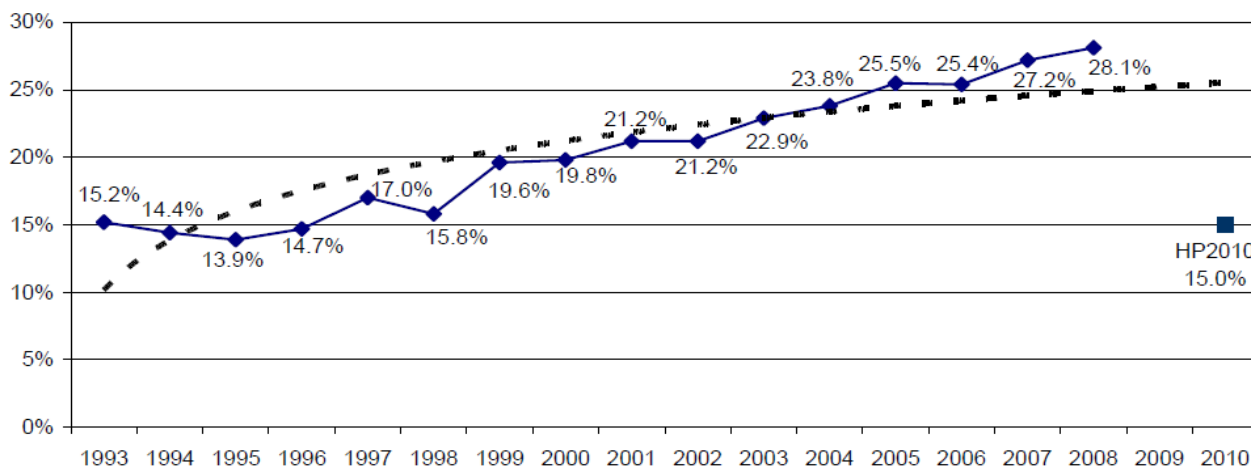
Table 8. Respondents Who Are Overweight or Obese, South Dakota 2008

	Total			Male			Female		
	# Resp.	%	95% CI	# Resp.	%	95% CI	# Resp.	%	95% CI
Total	6,694	65.0%	(63.1-66.7)	2,813	73.4	(70.6-76.0)	3,881	56.2	(53.8-58.6)
Age									
18-24	217	48.9	(40.7-57.2)	*	*	*	*	*	*
25-34	636	63.8	(59.1-68.2)	262	74.9	(68.1-80.7)	374	51.1	(45.1-57.0)
35-44	883	65.6	(61.7-69.3)	376	73.8	(68.1-78.9)	507	56.5	(51.4-61.5)
45-54	1,301	71.0	(68.0-73.9)	598	79.9	(75.7-83.5)	703	61.5	(57.0-65.7)
55-64	1,374	72.8	(69.9-75.5)	605	79.5	(75.3-83.2)	769	65.4	(61.2-69.3)
65-74	1,097	72.2	(68.9-75.3)	487	81.6	(77.4-85.2)	610	63.3	(58.5-67.9)
75+	1,156	59.6	(56.2-63.0)	380	66.4	(60.5-71.9)	776	55.2	(51.0-59.3)
Race									
White	5,877	64.8	(62.9-66.6)	2,474	73.7	(70.8-76.3)	3,403	55.6	(53.1-58.1)
American Indian	620	71.5	(64.6-77.5)	246	72.3	(61.3-81.1)	374	70.7	(61.8-78.3)
Region									
Southeast	1,428	63.1	(59.6-66.5)	590	73.8	(68.5-78.5)	838	52.7	(48.0-57.3)
Northeast	1,426	66.8	(63.4-70.1)	610	73.2	(67.9-78.0)	816	59.6	(55.2-63.8)
Central	1,434	70.5	(67.2-73.7)	626	79.6	(74.8-83.6)	808	60.9	(56.3-65.4)
West	1,489	62.7	(59.1-66.1)	603	69.8	(63.9-75.0)	886	55.2	(51.0-59.4)
American Indian Counties	917	68.7	(62.9-73.9)	384	73.6	(64.9-80.7)	533	64.0	(56.2-71.2)

Definition: Obesity is defined as having a Body Mass Index (BMI) of 30.0 or above. Body Mass Index (BMI) is calculated by taking a person's body weight in pounds divided by height in inches, divided by height in inches (again) times 703. The mathematical equation for BMI is: $\text{weight (lb)}/\text{height (in)}^2 \times 703$.

The percent of South Dakota adults who are obese increased from 15.8% in 1998 to 28.1% in 2008. The obesity rate is higher among males than in females. American Indians have a significantly higher prevalence of obesity than do whites. This difference is much more evident in females.

Figure 7. Percent of Respondents Who Are Obese Based on Body Mass Index, South Dakota 1993-2008



Source: The Behavioral Risk Factor Surveillance System, South Dakota Department of Health, 1993-2008

Table 9. Respondents Who Are Obese, South Dakota 2008

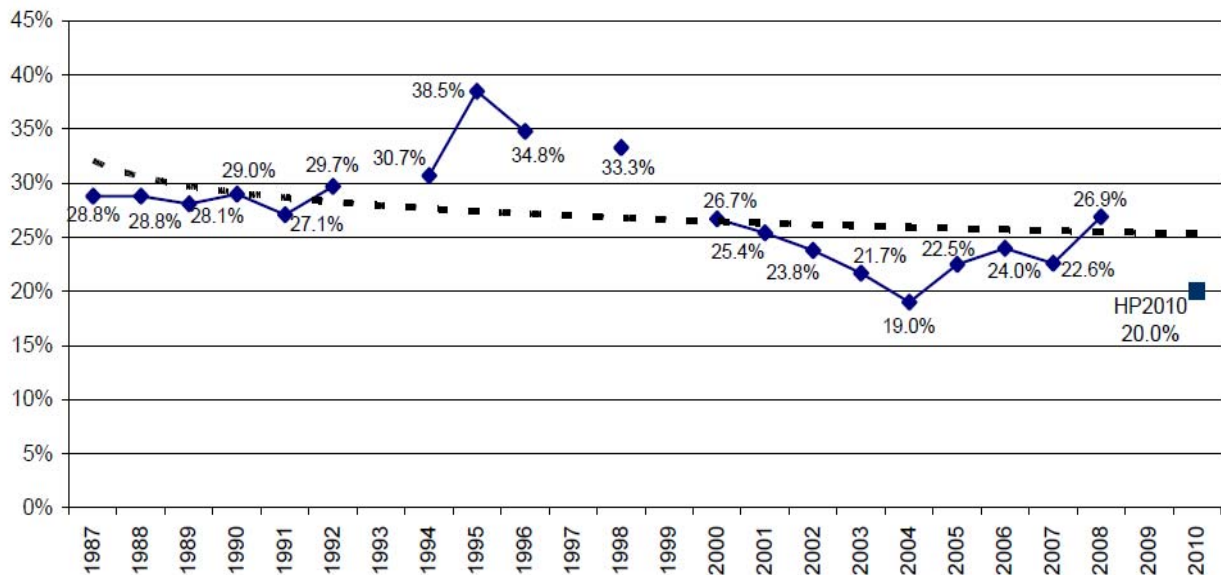
	Total			Male			Female		
	# Resp.	%	95% CI	# Resp.	%	95% CI	# Resp.	%	95% CI
Total	6,694	28.1	(26.5-29.8)	2,813	30.4	(28.0-32.9)	3,881	25.8	(23.7-27.9)
Age									
18-24	217	19.9	(13.8-27.8)	*	*	*	*	*	*
25-34	636	28.8	(24.6-33.4)	262	32.8	(26.3-40.0)	374	24.3	(19.6-29.6)
35-44	883	27.7	(24.3-31.4)	376	27.8	(22.8-33.5)	507	27.5	(23.2-32.4)
45-54	1,301	34.2	(31.1-37.4)	598	38.4	(33.8-43.3)	703	29.5	(25.7-33.7)
55-64	1,374	32.5	(29.6-35.5)	605	34.5	(30.2-39.2)	769	30.3	(26.6-34.2)
65-74	1,097	31.6	(28.5-35.0)	487	36.9	(32.0-42.0)	610	26.7	(22.8-31.0)
75+	1,156	18.8	(16.1-21.7)	380	20.0	(15.7-25.1)	776	18.0	(14.8-21.6)
Race									
White	5,877	27.7	(26.1-29.5)	2,474	30.2	(27.7-32.8)	3,403	25.2	(23.0-27.4)
American Indian	620	38.4	(32.7-44.5)	246	39.3	(30.6-48.6)	374	37.6	(30.4-45.5)
Region									
Southeast	1,428	28.1	(25.1-31.3)	590	31.6	(27.2-36.4)	838	24.6	(20.7-29.0)
Northeast	1,426	29.3	(26.2-32.5)	610	30.6	(26.0-35.7)	816	27.7	(24.1-31.7)
Central	1,434	30.2	(27.3-33.3)	626	30.9	(26.7-35.4)	808	29.5	(25.6-33.7)
West	1,489	24.4	(21.5-27.5)	603	26.1	(21.7-31.2)	886	22.5	(19.2-26.3)
American Indian Counties	917	35.7	(31.1-40.5)	384	38.9	(31.8-46.5)	533	32.5	(26.9-38.7)

Physical Activity

Definition: Respondents who report no leisure time physical activity or exercise during the past 30 days other than the respondent's regular job.

Since 2000, the percent of South Dakota adults who do not engage in a leisure time physical activity has been decreasing. There is no significant difference between males and females overall. Also, there is no significant difference between American Indians and whites.

Figure 8. Percent of Respondents Who Reported No Leisure Time Physical Activity, South Dakota 1987-1992, 1994-1996, 1998, and 2000-2008



Source: The Behavioral Risk Factor Surveillance System, South Dakota Department of Health, 1987-1992, 1994-1996, 1998, 2000-2006, and 2008

Table 10. Respondents Who Reported No Leisure Time Physical Activity, South Dakota 2008

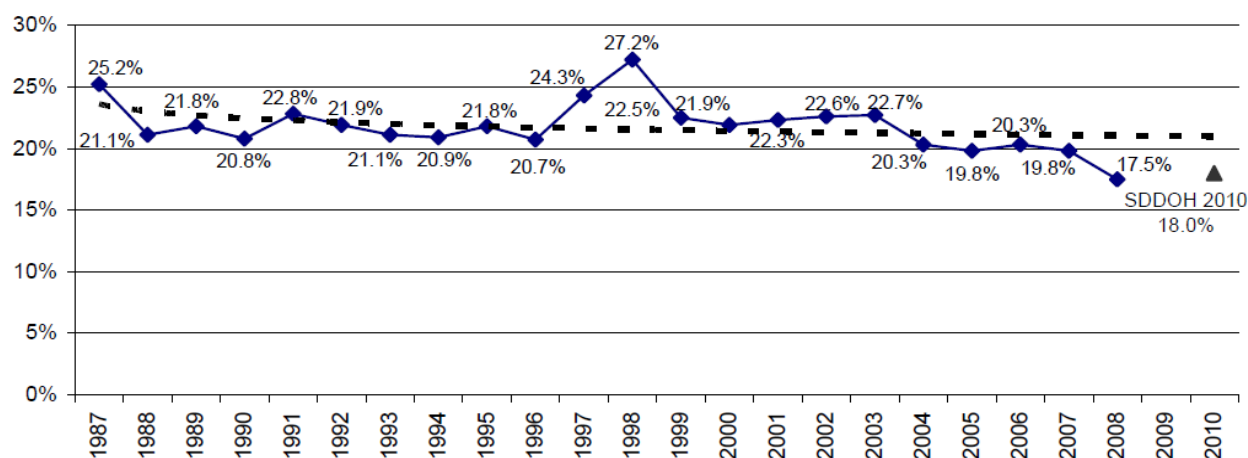
	Total			Male			Female		
	# Resp.	%	95% CI	# Resp.	%	95% CI	# Resp.	%	95% CI
Total	6,974	26.9	(25.3-28.4)	2,849	27.4	(25.1-29.9)	4,125	26.3	(24.4-28.3)
Age									
18-24	222	23.4	(17.1-31.2)	*	*	*	*	*	*
25-34	664	19.8	(16.3-23.9)	268	20.0	(14.6-26.8)	396	19.6	(15.5-24.4)
35-44	916	25.8	(22.6-29.3)	379	28.1	(23.1-33.6)	537	23.5	(19.6-27.9)
45-54	1,355	27.0	(24.2-29.9)	602	30.6	(26.2-35.3)	753	23.3	(19.9-27.0)
55-64	1,439	26.4	(23.8-29.2)	612	28.4	(24.4-32.8)	827	24.3	(21.0-27.9)
65-74	1,134	32.3	(29.1-35.7)	491	31.8	(27.1-36.8)	643	32.8	(28.4-37.5)
75+	1,191	40.4	(37.1-43.8)	387	37.0	(31.5-42.8)	804	42.6	(38.6-46.8)
Race									
White	6,130	26.8	(25.2-28.5)	2,503	27.9	(25.5-30.5)	3,627	25.8	(23.8-27.9)
American Indian	633	27.0	(21.9-32.7)	250	18.6	(12.6-26.6)	383	35.0	(27.7-43.1)
Region									
Southeast	1,498	26.3	(23.5-29.4)	596	26.2	(22.0-31.0)	902	26.4	(22.7-30.5)
Northeast	1,493	30.2	(27.3-33.3)	620	30.3	(25.8-35.2)	873	30.0	(26.5-33.8)
Central	1,493	30.7	(27.7-34.0)	634	35.7	(31.0-40.7)	859	25.8	(22.0-30.0)
West	1,541	21.5	(18.9-24.4)	609	22.7	(18.4-27.6)	932	20.3	(17.5-23.3)
American Indian Counties	949	30.6	(26.1-35.6)	390	24.7	(19.4-31.0)	559	36.2	(29.4-43.6)

Tobacco Use

Definition: Respondents who report having smoked at least 100 cigarettes in their lifetime and now smoke every day or smoke some days.

In 2008, the percent of South Dakota adults who were current smokers reached an all time low of 17.5%. There is no significant difference between males and females. However, there is a large difference between American Indians and whites. In 2008, 44.0% of American Indians were estimated to be current smokers compared to just 15.9% of whites.

Figure 9. Percent of Respondents Who Currently Smoke Cigarettes, South Dakota 1987-2008



Source: The Behavioral Risk Factor Surveillance System, South Dakota Department of Health, 1987-2008

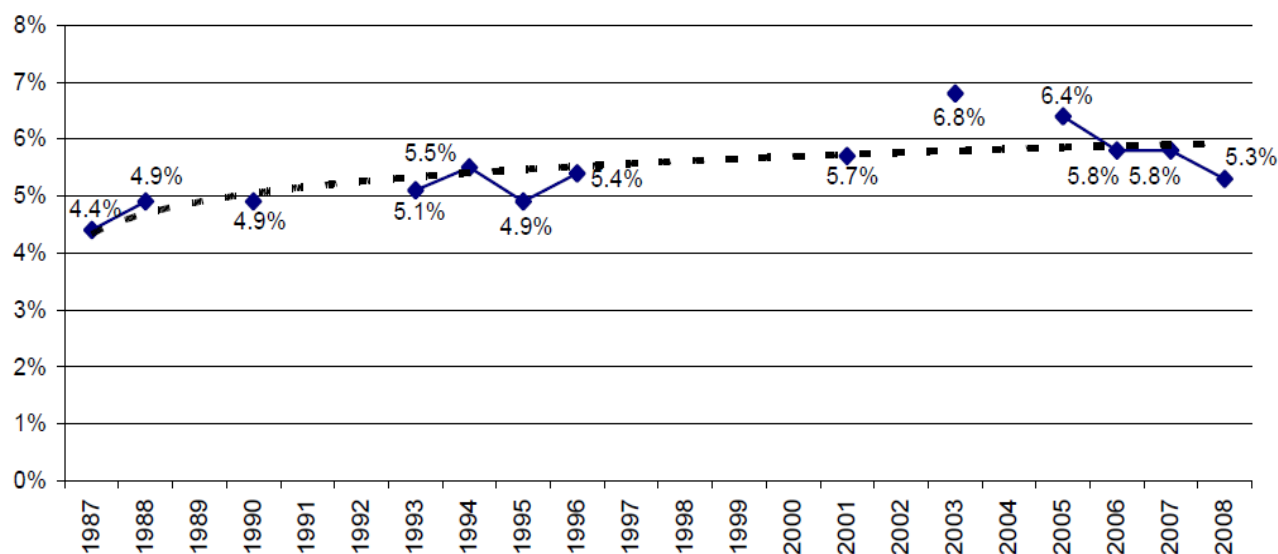
Table 11. Respondents Who Currently Smoke, South Dakota 2008

	Total			Male			Female		
	# Resp.	%	95% CI	# Resp.	%	95% CI	# Resp.	%	95% CI
Total	6,956	17.5	(16.2-19.0)	2,839	18.9	(16.8-21.3)	4,117	16.2	(14.6-17.8)
Age									
18-24	221	22.2	(16.3-29.6)	*	*	*	*	*	*
25-34	665	23.6	(19.9-27.7)	269	27.6	(21.7-34.3)	396	19.2	(15.3-23.9)
35-44	916	19.3	(16.4-22.5)	379	15.8	(12.0-20.6)	537	22.9	(18.9-27.4)
45-54	1,353	18.0	(15.7-20.6)	601	17.7	(14.4-21.5)	752	18.3	(15.2-21.9)
55-64	1,432	17.8	(15.5-20.4)	609	19.8	(16.2-23.9)	823	15.8	(13.1-19.0)
65-74	1,133	9.5	(7.8-11.6)	490	10.3	(7.7-13.5)	643	8.9	(6.6-11.8)
75+	1,186	4.3	(3.1-5.9)	384	4.9	(3.0-8.1)	802	3.9	(2.6-5.8)
Race									
White	6,117	15.9	(14.5-17.4)	2,496	17.5	(15.2-20.0)	3,621	14.3	(12.7-16.0)
American Indian	632	44.0	(38.0-50.2)	249	42.9	(33.8-52.5)	383	45.1	(37.3-53.1)
Region									
Southeast	1,492	14.2	(12.0-16.8)	593	16.6	(13.0-20.9)	899	12.1	(9.6-15.1)
Northeast	1,491	17.5	(14.7-20.7)	617	18.8	(14.5-24.1)	874	16.1	(13.1-19.8)
Central	1,489	14.4	(12.3-16.8)	634	15.0	(12.0-18.7)	855	13.8	(11.0-17.1)
West	1,539	20.7	(17.8-23.9)	607	21.3	(16.6-26.7)	932	20.1	(17.0-23.7)
American Indian Counties	945	37.6	(32.5-42.9)	388	36.5	(29.2-44.6)	557	38.5	(31.9-45.7)

Definition: Respondents who report that they use chewing tobacco or snuff every day or some days.

Overall, the percent of South Dakota adults who use smokeless tobacco has been increasing with a high of 6.8% in 2003 compared to a low of 4.4% in 1987. However, there was a decrease from 5.8% in 2007 to 5.3% in 2008. Males have a significantly higher prevalence of smokeless tobacco use than females. American Indian females have a significantly higher prevalence of smokeless tobacco use than white females.

Figure 10. Percent of Respondents Who Use Smokeless Tobacco, South Dakota 1987-1988, 1990, 1993-1996, 2001, 2003, 2005-2008



Source: The Behavioral Risk Factor Surveillance System, South Dakota Department of Health, 1987-1988, 1990, 1993-1996, 2001, 2003, and 2005-2008

Table 12. Respondents Who Use Smokeless Tobacco, South Dakota 2008

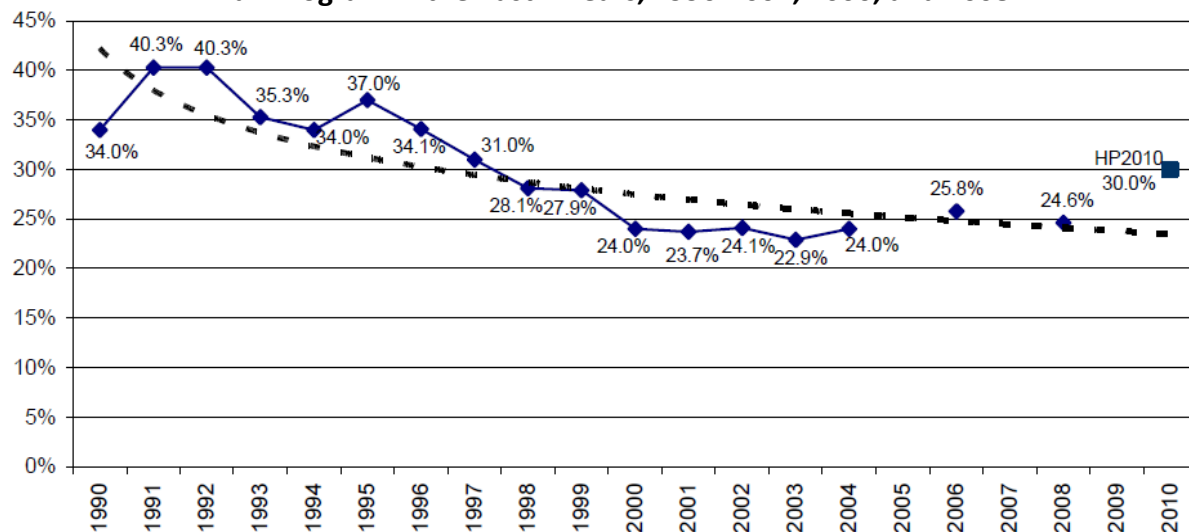
	Total			Male			Female		
	# Resp.	%	95% CI	# Resp.	%	95% CI	# Resp.	%	95% CI
Total	6,854	5.3	(4.5-6.3)	2,787	10.5	(8.9-12.3)	4,067	0.3	(0.2-0.6)
Age									
18-24	217	6.5	(3.4-11.9)	*	*	*	*	*	*
25-34	653	10.2	(7.7-13.4)	262	19.1	(14.3-25.0)	391	0.7	(0.2-1.7)
35-44	890	7.8	(5.9-10.3)	363	15.1	(11.4-19.9)	527	0.5	(0.2-1.2)
45-54	1,333	4.2	(3.1-5.7)	590	8.0	(5.8-10.9)	743	0.4	(0.1-1.2)
55-64	1,417	2.5	(1.7-3.7)	603	4.9	(3.3-7.2)	814	0.0	-
65-74	1,119	2.1	(1.3-3.4)	483	4.3	(2.7-7.0)	636	0.1	(0.0-0.7)
75+	1,176	1.4	(0.8-2.4)	379	3.3	(1.8-5.9)	797	0.1	(0.0-0.9)
Race									
White	6,034	5.3	(4.4-6.3)	2,450	10.5	(8.8-12.5)	3,584	0.2	(0.1-0.4)
American Indian	611	7.2	(4.8-10.7)	241	11.4	(7.0-17.9)	370	3.3	(1.7-6.5)
Region									
Southeast	1,474	4.1	(2.8-5.9)	584	8.6	(5.9-12.4)	890	0.0	-
Northeast	1,461	4.4	(3.1-6.4)	605	8.6	(6.0-12.2)	856	0.0	-
Central	1,478	6.5	(4.9-8.6)	624	12.7	(9.6-16.6)	854	0.3	(0.1-1.0)
West	1,519	6.9	(5.1-9.3)	597	13.1	(9.6-17.6)	922	0.7	(0.3-1.6)
American Indian Counties	922	10.6	(7.7-14.4)	377	18.2	(12.8-25.1)	545	3.5	(1.7-7.0)

Breast and Cervical Cancer Screening

Definition: Female respondents, ages 40 and older, who have not had a mammogram in the past two years.

Overall, the percent of South Dakota females who have not had a mammogram in the past two years has been decreasing since 1990. There is no significant difference between American Indians and whites.

Figure 11. Percent of Female Respondents, Ages 40 and Older, Who Have Not Had a Mammogram in the Past 2 Years, 1990-2004, 2006, and 2008



Source: The Behavioral Risk Factor Surveillance System, South Dakota Department of Health, 2008

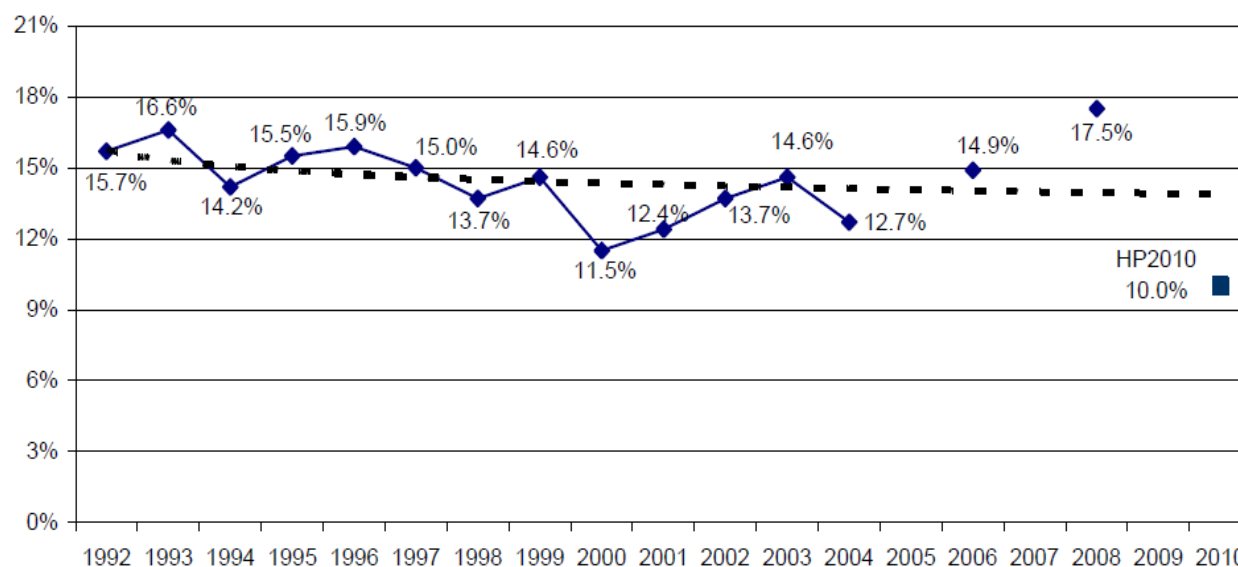
Table 13. Female Respondents, Ages 40 and Older Who Have Not Had a Mammogram In the Past 2 years, South Dakota 2008

	Total			Male			Female		
	# Resp.	%	95% CI	# Resp.	%	95% CI	# Resp.	%	95% CI
Total	3,251	24.6	(22.8-26.5)	-	-	-	3,251	24.6	(22.8-26.5)
Age									
18-24	-	-	-	-	-	-	-	-	-
25-34	-	-	-	-	-	-	-	-	-
35-44	286	40.8	(34.2-47.7)	-	-	-	286	40.8	(34.2-47.7)
45-54	745	26.3	(22.7-30.3)	-	-	-	745	26.3	(22.7-30.3)
55-64	809	17.7	(14.8-21.0)	-	-	-	809	17.7	(14.8-21.0)
65-74	633	17.5	(14.1-21.5)	-	-	-	633	17.5	(14.1-21.5)
75+	778	24.0	(20.8-27.6)	-	-	-	778	24.0	(20.8-27.6)
Race									
White	2,946	24.6	(22.7-26.5)	-	-	-	2,946	24.6	(22.7-26.5)
American Indian	235	29.3	(22.0-37.9)	-	-	-	235	29.3	(22.0-37.9)
Region									
Southeast	691	21.6	(18.3-25.4)	-	-	-	691	21.6	(18.3-25.4)
Northeast	695	22.3	(19.0-26.0)	-	-	-	695	22.3	(19.0-26.0)
Central	706	24.9	(21.6-28.5)	-	-	-	706	24.9	(21.6-28.5)
West	758	30.9	(27.4-34.7)	-	-	-	758	30.9	(27.4-34.7)
American Indian Counties	401	29.9	(24.8-35.5)	-	-	-	401	29.9	(24.8-35.5)

Definition: Female respondents, ages 18 and older, who have not received a Pap test within the past three years.

Overall, the percent of females who had insufficient cervical cancer screening has been decreasing since 1992. There is no difference between American Indian and whites.

Figure 12. Percent of Female Respondents, Who Had Insufficient Cervical Cancer Screening, South Dakota 1992-2004, 2006, 2008



Source: The Behavioral Risk Factor Surveillance System, South Dakota Department of Health, 1992-2004, 2006, and 2008

Table 14. Female Respondents, Who Had Insufficient Cervical Cancer Screening, South Dakota 2008

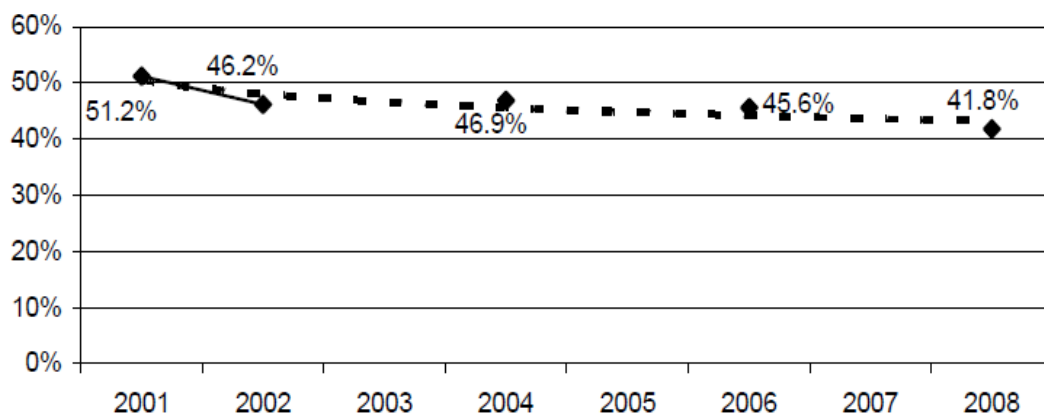
	Total			Male			Female		
	# Resp.	%	95% CI	# Resp.	%	95% CI	# Resp.	%	95% CI
Total	2,815	17.5	(15.4-19.8)	-	-	-	2,815	17.5	(15.4-19.8)
Age									
18-24	124	23.5	(15.3-34.5)	-	-	-	124	23.5	(15.3-34.5)
25-34	384	8.1	(5.4-12.1)	-	-	-	384	8.1	(5.4-12.1)
35-44	463	11.0	(7.9-15.1)	-	-	-	463	11.0	(7.9-15.1)
45-54	547	16.5	(13.0-20.6)	-	-	-	547	16.5	(13.0-20.6)
55-64	523	13.5	(10.6-17.1)	-	-	-	523	13.5	(10.6-17.1)
65-74	349	20.3	(15.8-25.7)	-	-	-	349	20.3	(15.8-25.7)
75+	425	45.6	(40.0-51.3)	-	-	-	425	45.6	(40.0-51.3)
Race									
White	2,432	16.8	(14.7-19.2)	-	-	-	2,432	16.8	(14.7-19.2)
American Indian	296	20.5	(14.1-28.8)	-	-	-	296	20.5	(14.1-28.8)
Region									
Southeast	623	15.8	(12.2-20.2)	-	-	-	623	15.8	(12.2-20.2)
Northeast	589	14.9	(11.4-19.3)	-	-	-	589	14.9	(11.4-19.3)
Central	557	21.4	(17.0-26.7)	-	-	-	557	21.4	(17.0-26.7)
West	639	20.3	(16.2-25.2)	-	-	-	639	20.3	(16.2-25.2)
American Indian Counties	407	21.8	(15.7-29.5)	-	-	-	407	21.8	(15.7-29.5)

Prostate Cancer Screening

Definition: Males, age 40 and older, who have had a PSA test within the past two years.

Overall, the percent of South Dakota males who have not had a PSA test within the past two years has been decreasing. There is no difference between American Indians and Whites.

Figure 13. Percent of Male Respondents, Ages 40 and Older, Who Have Not Had a PSA Test Within the Past 2 years, South Dakota 2001-2002, 2004, 2006, and 2008



Source: The Behavioral Risk Factor Surveillance System, South Dakota Department of Health, 2001-2002, 2004, 2006, and 2008

Table 15. Male Respondents, Ages 40 and Older, Who Have Not Had a PSA Test Within the Past 2 years, 2008

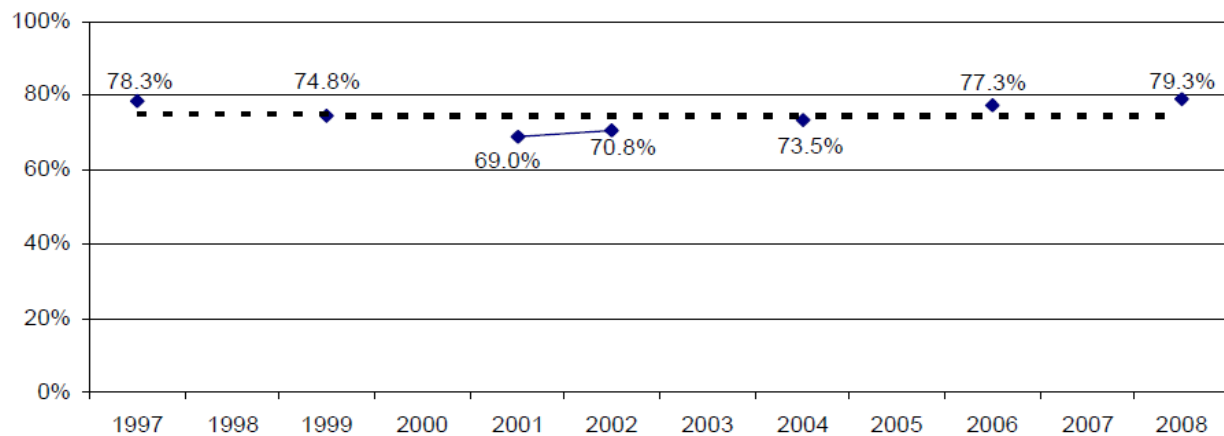
	Total			Male			Female		
	# Resp.	%	95% CI	# Resp.	%	95% CI	# Resp.	%	95% CI
Total	2,165	41.8	(39.2-44.5)	2,165	41.8	(39.2-44.5)	-	-	-
Age									
18-24	-	-	-	-	-	-	-	-	-
25-34	-	-	-	-	-	-	-	-	-
35-44	187	82.7	(75.4-88.2)	187	82.7	(75.4-88.2)	-	-	-
45-54	562	55.3	(50.3-60.2)	562	55.3	(50.3-60.2)	-	-	-
55-64	591	27.8	(23.6-32.3)	591	27.8	(23.6-32.3)	-	-	-
65-74	472	14.9	(11.7-18.8)	472	14.9	(11.7-18.8)	-	-	-
75+	353	19.1	(15.0-23.9)	353	19.1	(15.0-23.9)	-	-	-
Race									
White	1,958	41.0	(38.3-43.8)	1,958	41.0	(38.3-43.8)	-	-	-
American Indian	149	54.0	(42.9-64.7)	149	54.0	(42.9-64.7)	-	-	-
Region									
Southeast	467	40.6	(35.6-45.7)	467	40.6	(35.6-45.7)	-	-	-
Northeast	489	39.6	(34.7-44.6)	489	39.6	(34.7-44.6)	-	-	-
Central	495	44.5	(39.7-49.4)	495	44.5	(39.7-49.4)	-	-	-
West	455	43.8	(38.7-48.9)	455	43.8	(38.7-48.9)	-	-	-
American Indian Counties	259	52.4	(45.2-59.5)	259	52.4	(45.2-59.5)	-	-	-

Colorectal Cancer Screening

Definition: Respondents aged 50 and older that have not had a blood stool test using a home kit within the past two years.

The percent of South Dakota adults who have not had a blood stool test within the past two years hit an all time high in 2008 with 79.3%. Overall, the percent has remained steady since 1997. There are no significant gender differences. Also, there are no differences between American Indians and whites.

Figure 14. Percent of Respondents, Ages 50 and Older, Who Have Not Had a Blood Stool Test Using Home Kit Within the Past 2 years, South Dakota 1997, 1999, 2001-2002, 2004, 2006 and 2008



Source: The Behavioral Risk Factor Surveillance System, South Dakota Department of Health, 1997, 1999, 2001-2002, 2004, 2006, and 2008

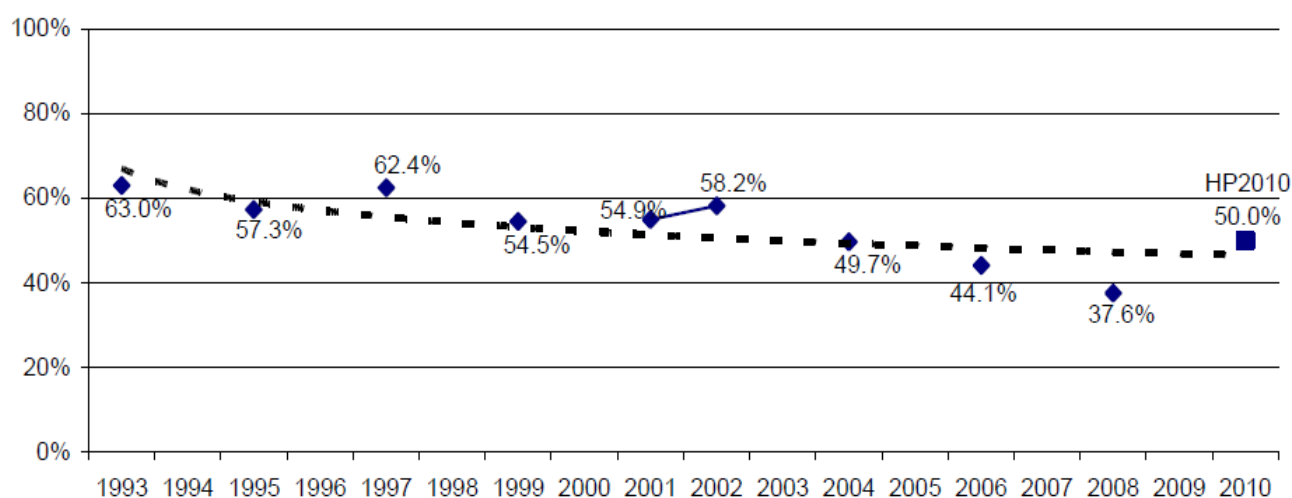
Table 16. Respondents, Ages 50 and Older, Who Have Not Had a Blood Stool Test Using Home Kit Within the Past 2 years, South Dakota 2008

	Total			Male			Female		
	# Resp.	%	95% CI	# Resp.	%	95% CI	# Resp.	%	95% CI
Total	4,351	79.3	(77.8-80.6)	1,751	79.1	(76.8-81.2)	2,600	79.4	(77.5-81.2)
Age									
18-24	-	-	-	-	-	-	-	-	-
25-34	-	-	-	-	-	-	-	-	-
35-44	-	-	-	-	-	-	-	-	-
45-54	708	83.2	(79.8-86.2)	302	82.0	(76.5-86.5)	406	84.4	(80.1-88.0)
55-64	1,405	81.0	(78.5-83.3)	601	80.9	(77.1-84.2)	804	81.1	(77.8-84.1)
65-74	1,100	75.2	(72.1-78.0)	476	75.8	(71.2-79.9)	624	74.7	(70.5-78.5)
75+	1,138	76.4	(73.3-79.2)	372	75.8	(70.4-80.5)	766	76.8	(72.9-80.3)
Race									
White	4,014	79.2	(77.7-80.6)	1,610	79.5	(77.1-81.6)	2,404	79.0	(77.0-80.8)
American Indian	246	78.3	(68.9-85.4)	*	*	*	*	*	*
Region									
Southeast	906	84.8	(82.1-87.1)	362	86.7	(82.6-90.0)	544	83.0	(79.3-86.1)
Northeast	963	79.0	(76.1-81.6)	392	79.9	(75.4-83.7)	571	78.2	(74.4-81.6)
Central	983	74.0	(71.0-76.9)	407	74.5	(69.7-78.8)	576	73.6	(69.5-77.3)
West	992	73.1	(70.0-76.1)	388	68.7	(63.4-73.5)	604	77.1	(73.3-80.5)
American Indian Counties	507	80.6	(76.4-84.3)	202	76.5	(69.5-82.3)	305	84.1	(78.7-88.4)

Definition: Respondents aged 50 and older that have never had a sigmoidoscopy or colonoscopy.

Overall, the percent of South Dakota adults who have never had a sigmoidoscopy or colonoscopy has been decreasing since 1993. There is no gender difference. However, the percentage of American Indians who have never had a sigmoidoscopy or colonoscopy is much higher than whites (60.1% vs. 36.9% in 2008).

Figure 15. Percent of Respondents, Ages 50 and Older, Who Have Never Had a Sigmoidoscopy or Colonoscopy in South Dakota 1993, 1995, 1997, 1999, 2001-2002, 2004, 2006 and 2008



Source: The Behavioral Risk Factor Surveillance System, South Dakota Department of Health, 1993, 1995, 1997, 1999, 2001-2002, 2004, 2006, and 2008

Table 17. Percent of Respondents, Ages 50 and Older, Who Have Never Had a Sigmoidoscopy or Colonoscopy in South Dakota 2008

	Total			Male			Female		
	# Resp.	%	95% CI	# Resp.	%	95% CI	# Resp.	%	95% CI
Total	4,415	37.6	(35.8-39.4)	1,765	38.1	(35.4-40.9)	2,650	37.1	(34.9-39.4)
Age									
18-24	-	-	-	-	-	-	-	-	-
25-34	-	-	-	-	-	-	-	-	-
35-44	-	-	-	-	-	-	-	-	-
45-54	711	55.0	(50.6-59.4)	304	54.7	(48.0-61.3)	407	55.3	(49.5-61.0)
55-64	1,424	40.6	(37.5-43.7)	606	41.0	(36.5-45.7)	818	40.1	(36.2-44.1)
65-74	1,117	25.5	(22.5-28.6)	481	25.0	(20.9-29.7)	636	25.8	(21.9-30.2)
75+	1,163	27.0	(24.1-30.1)	374	26.4	(21.6-31.9)	789	27.4	(23.9-31.2)
Race									
White	4,075	36.9	(35.1-38.7)	1,622	37.5	(34.7-40.4)	2,453	36.4	(34.1-38.7)
American Indian	246	60.1	(51.3-68.4)	*	*	*	*	*	*
Region									
Southeast	931	34.6	(31.3-38.1)	368	36.1	(31.0-41.6)	563	33.3	(29.1-37.8)
Northeast	974	37.3	(34.0-40.6)	393	36.7	(31.7-42.0)	581	37.8	(33.6-42.1)
Central	995	41.0	(37.7-44.4)	410	42.3	(37.3-47.5)	585	39.8	(35.5-44.2)
West	1,007	38.8	(35.5-42.2)	391	38.6	(33.5-44.1)	616	39.0	(34.8-43.3)
American Indian Counties	508	54.8	(49.7-59.7)	203	55.0	(47.1-62.7)	305	54.5	(48.0-60.9)

Appendices

Appendix A. Technical Notes about Cancer Registry Data Analysis

Age-adjusted death rates: Death rates are calculated for total cases and separately for males and females. The death rates are age-adjusted to the 2000 U.S. Standard Population using five-year groups, and are per 100,000 persons. Rates are presented for 2008 and for the five-year period, 2004-2008.

Age-adjusted incidence rate: Age-adjusted incidence rates were calculated using the direct method and standardized to the age distribution of the 2000 U.S. Standard Population (Appendix A). Age adjustment allows rates for one geographic area to be compared with rates from other geographic areas that may have differences in age distributions. Any observed differences in age-adjusted incidence rates between populations are not due to different age structures. Reports prior to 1999 used the 1970 U.S. Standard Population. In conformity with the National Cancer Institute's (NCI) Surveillance, Epidemiology, and End Results (SEER) Program guidelines, the incidence rates for cancer sites exclude the following:

- *In situ* cases, except bladder
- Basal and squamous cell skin cancers
- Cases with unknown age
- Cases with unknown gender

Age-specific incidence rates: Age specific rates are calculated by dividing the number of cases for a given age group by the total population of that age group and are expressed as an average annual rate per 100,000 persons by age group. Age specific rates exclude the same types of cases that are excluded from age-adjusted incidence rates. These rates, however, are crude rates, i.e. not age-adjusted.

Annual percent change (APC): The annual percent change is the average rate of change in a cancer rate per year in a given time frame indicating how fast or how slowly a cancer rate has increased or decreased each year over a period of years. A negative APC describes a decreasing trend, and a positive APC describes an increasing trend.

Average years of life lost (AYLL): This is the extent to which life is cut short due to premature death. This is obtained by dividing the YPLL by the number of deaths. On average each person who dies from cancer loses 15 years of their life.

Cancer case definitions: A "cancer case" is defined as the primary cancer site, i.e., the site where the cancer started. Since an individual can have more than one primary cancer site, the number of incident cancer cases could be greater than the number of persons who are diagnosed with cancer. A *metastasis* is not a primary site.

Changes in diagnostic criteria: Early detection resulting from either screening or early response to symptoms may result in increasing diagnosis in small tumors that are not yet life-threatening. This may raise incidence and survival rates but without changes in mortality rates. Cancers likely to be affected are breast, colon, cervix uteri, prostate, and melanoma. Prostate cancer is particularly prone to changing diagnostic criteria.

Confidence intervals (CI): A confidence interval tells how confident we are of the accuracy of the calculated rates. The SDCR uses a computed interval with a given probability of 95%, i.e., the true value of the calculated rate is contained within the interval. Thus, given a calculated rate of 191.4 and a confidence interval of 182.1 to 200.8, it is better to say that the true rate will fall between 182.1 and 200.8. The larger the sample size, the shorter the interval size, giving us more certainty that the rate is correct. When CI for percentages contains zero, the rate is considered to be stable. Above zero, the statistical significance is higher and below zero it is lower.

Data source: All data, tables, and figures come from the South Dakota Department of Health, *American Cancer Society Facts and Figures 2008* or *SEER Cancer Statistics Review 1975-2007* and should be cited as such if taken out of this report in part. SEER data represents approximately 10% of the U.S population.

Disparity: Health disparities are differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States.¹ Health disparities can be defined as a specific group bearing a disproportionate share of negative health outcomes compared to the general population, i.e., disease, disability, and death.² Disparity can occur as a result of factors such as poverty, living in geographically underserved areas and belonging to specific minority groups.

Early detection/screening: Improved early detection/screening may produce increases in both incidence and survival rates. Increases may occur as a result of the introduction of new procedures. The interval between the time a cancer is diagnosed by a screening procedure and the time when it would have been diagnosed in the absence of screening procedures is called the lead-time. Changes in lead-time, for example, in breast cancer diagnosis, have led to an increased survival and reduction of mortality.

Limitations to data interpretation and comparison: A number of factors need to be considered when reviewing cancer statistics and interpreting them. A cancer registry database is a fluid and dynamic database, therefore, the reported number of new cases in a particular race, gender, and age cancer category may change for the calendar year for which the data have already been reported in a previous publication. Additional cancer cases which have been previously overlooked for a given diagnosis year may be found and reported to the central registry. There may also be elimination of duplicate records for the same patient, often due to name changes or spelling corrections.

Mortality/incidence ratio (M/I): This ratio is calculated by dividing the number of deaths in a given year by the number of new cancers diagnosed in the same year. The death to case ratio provides a crude indication of the prognosis for patients. A ratio approaching 1.0, when the number of deaths equals the number of cases for a particular type of cancer, indicates a poor prognosis. A lower ratio indicates fewer deaths relative to the number of cases and suggests a better prognosis.

Percent change: The difference between two rates expressed as a percentage.

Racial misclassifications: When race is not specified in a source document and the default is to record these cases as white or unknown, the results are considered biased. Numerator error can occur because of misclassification.

Rate comparisons: When comparing age-adjusted rates and age-specific rates based on fewer than 10 cases, rate comparisons are difficult to interpret. In comparing rates among geographic areas such as counties, states and health districts, the absolute numbers and differences in demographics should be considered, as well as clinical significance of the disease. Data quality indicators for each registry should also be reviewed. Interpretations without considering these factors may be misleading. There will also be differences between mortality statistics published by various agencies and the mortality rates in this report.

Risks and associated risk factors: These were developed using the "American Cancer Society Textbook of Oncology," and the Harvard Cancer Center, Causes of Human Cancer.

Stage at time of diagnosis: Staging is the process of describing the extent or spread of disease from the origin, which is the primary site. Summary staging is the standard used for comparison nationally. SEER Summary Stages 2000 are defined as follows:

- **In situ:** Malignant cells are within the cell group from which they arose, without penetration of the basement membrane of the tissue and no stromal invasion. *In situ* is “in place”.
- **Localized:** The malignant cells are limited to the organ of origin and have spread no farther than the organ in which they started.
- **Regional:** The tumor is beyond the limits of the organ of origin by direct extension to adjacent areas with or without lymph node involvement.
- **Distant:** The primary tumor has broken away and has traveled, growing secondary tumors in other parts of the body. It has metastasized

In situ and localized stages are the **early stages** of diagnosis. Regional and distant stages are **late stage** diagnoses.

Staging: Advancement in diagnostic procedures may change in due time. Advances increase the probability that a given cancer will be diagnosed in a more advanced stage, for example with new scanning methods metastases can be detected. Therefore, if someone was previously diagnosed with a localized tumor, they may now be staged as distant. This is called stage migration and can affect the analysis of all solid tumors.

Statistical significance: This determines whether an event happens by chance alone. The null hypothesis states that in a given place and a period of time, all events occur randomly by chance. If not, then there is statistical significance. Confidence intervals are used to test statistical significance in this report. If the confidence intervals of two different rates intersect each other, then there is no statistical difference between the two rates.³ However, if the confidence intervals do not intersect one another, there is statistical significance. This report looks at the South Dakota rates as compared to the U.S. national rates using SEER data.

In South Dakota, case counts can be very low; therefore, magnitude bias is inherent with confidence intervals and z- tests. For example, in the year 2001, cervical cancer rates were 10 per 100,000 American Indian women, a cervical cancer age-adjusted rate six times higher than white women in South Dakota. However, the case counts were 2 for American Indians and 10 whites. Small numbers result in wider confidence intervals, thus less confidence in the data.

Years of life potential life lost (YPLL): The years of potential life lost is calculated for each individual who dies of a cancer of interest by determining the number of years of additional expected life if that person had lived to 75 years. The YPLL in the general population associated with a particular cancer is the sum of this expectation over all those individuals who died of that cancer in a particular year. YPLL reflects the burden of cancer on younger persons while death rates reflect the burden on older persons.

¹<http://epi.grants.cancer.gov/ResPort/HDOverview.html>

²<http://www.omni.org/docs/CMHFProceedings.pdf>

³BIOSTATISTICS *The Bare Essentials*, 2nd edition
Norman and Shreiner Page 512

Appendix B. 2000 United States Standard Million Population

Age Group	Number in Group
All ages	1,000,000
<5	69,135
5-9	72,533
10-14	73,032
15-19	72,169
20-24	66,478
25-29	64,529
30-34	71,044
35-39	80,762
40-44	81,851
45-49	72,118
50-54	62,716
55-59	48,454
60-64	38,793
65-69	34,264
70-74	31,773
75-79	26,999
80-84	17,842
85+	15,508

Appendix C. Race in South Dakota by County, 2000 Census

	Total		White		Black		American Indian		Asian		Hawaiian		Some Other	
South Dakota	754844		669404	89%	6201	1%	68279	9%	5760	1%	361	0%	4839	1%
Aurora	3058		2926	96%	10	0%	65	2%	8	0%	0	0%	49	2%
Beadle	17023		16501	97%	156	1%	228	1%	68	0%	9	0%	61	0%
Bennett	3574		1462	41%	11	0%	2075	58%	3	0%	10	0%	13	0%
BonHomme	7260		6934	96%	59	1%	241	3%	8	0%	1	0%	17	0%
Brookings	28220		27194	96%	119	0%	343	1%	433	2%	11	0%	120	0%
Brown	35460		33854	95%	141	0%	1165	3%	177	0%	37	0%	86	0%
Brule	5364		4823	90%	17	0%	486	9%	33	1%	2	0%	3	0%
Buffalo	2032		332	16%	2	0%	1692	83%	0	0%	0	0%	6	0%
Butte	9094		8687	96%	14	0%	247	3%	30	0%	0	0%	116	1%
Campbell	1782		1770	99%	0	0%	11	1%	1	0%	0	0%	0	0%
CharlesMix	9350		6512	70%	14	0%	2754	29%	11	0%	1	0%	58	1%
Clark	4143		4087	99%	5	0%	31	1%	8	0%	2	0%	10	0%
Clay	13537		12560	93%	173	1%	457	3%	295	2%	3	0%	49	0%
Codington	25897		25054	97%	67	0%	498	2%	107	0%	6	0%	165	1%
Corson	4181		1555	37%	4	0%	2603	62%	5	0%	0	0%	14	0%
Custer	7275		6851	94%	30	0%	325	4%	32	0%	1	0%	36	0%
Davison	18741		18034	96%	80	0%	445	2%	101	1%	10	0%	71	0%
Day	6267		5719	91%	11	0%	514	8%	5	0%	3	0%	15	0%
Deuel	4498		4431	99%	5	0%	30	1%	15	0%	6	0%	11	0%
Dewey	5972		1442	24%	3	0%	4503	75%	9	0%	3	0%	12	0%
Douglas	3458		3391	98%	6	0%	50	1%	5	0%	0	0%	6	0%
Edmunds	4367		4332	99%	6	0%	13	0%	10	0%	1	0%	5	0%
Fall River	7453		6746	91%	29	0%	606	8%	26	0%	8	0%	38	1%
Faulk	2640		2626	99%	2	0%	10	0%	1	0%	0	0%	1	0%
Grant	7847		7738	99%	2	0%	47	1%	25	0%	0	0%	35	0%
Gregory	4792		4465	93%	2	0%	298	6%	18	0%	0	0%	9	0%
Haakon	2196		2117	96%	0	0%	74	3%	4	0%	0	0%	1	0%
Hamlin	5540		5456	98%	9	0%	49	1%	17	0%	1	0%	8	0%
Hand	3741		3715	99%	2	0%	11	0%	8	0%	0	0%	5	0%
Hanson	3139		3124	99%	0	0%	5	0%	8	0%	1	0%	1	0%
Harding	1353		1321	98%	4	0%	15	1%	8	1%	0	0%	5	0%
Hughes	16481		14654	89%	38	0%	1631	10%	85	1%	4	0%	69	0%
Hutchinson	8075		7980	99%	14	0%	64	1%	9	0%	0	0%	8	0%
Hyde	1671		1522	91%	4	0%	141	8%	0	0%	2	0%	2	0%
Jackson	2930		1467	50%	1	0%	1453	50%	4	0%	1	0%	4	0%
Jerauld	2295		2272	99%	2	0%	18	1%	3	0%	0	0%	0	0%
Jones	1193		1143	96%	0	0%	47	4%	0	0%	1	0%	2	0%
Kingsbury	5815		5730	99%	8	0%	33	1%	31	1%	0	0%	13	0%
Lake	11276		11023	98%	35	0%	99	1%	67	1%	1	0%	51	0%
Lawrence	21802		20884	96%	71	0%	629	3%	104	0%	14	0%	100	0%
Lincoln	24131		23539	98%	133	1%	204	1%	156	1%	9	0%	90	0%
Lyman	3895		2522	65%	3	0%	1351	35%	14	0%	0	0%	5	0%
Marshall	5832		5766	99%	5	0%	36	1%	15	0%	0	0%	10	0%
McCook	2904		2885	99%	0	0%	12	0%	5	0%	0	0%	2	0%
McPherson	4576		4237	93%	8	0%	312	7%	5	0%	3	0%	11	0%
Meade	24253		22471	93%	444	2%	829	3%	286	1%	19	0%	204	1%
Mellette	2083		932	45%	0	0%	1143	55%	2	0%	0	0%	6	0%
Miner	2884		2848	99%	18	1%	11	0%	4	0%	0	0%	3	0%
Minnehaha	148281		137941	93%	2916	2%	3457	2%	1895	1%	93	0%	1979	1%
Moody	6595		5600	85%	28	0%	909	14%	46	1%	1	0%	11	0%
Pennington	88565		76789	87%	1028	1%	8735	10%	1080	1%	72	0%	861	1%
Perkins	3363		3250	97%	9	0%	73	2%	9	0%	0	0%	22	1%
Potter	2693		2643	98%	0	0%	33	1%	13	0%	1	0%	3	0%
Roberts	10016		6840	68%	17	0%	3121	31%	33	0%	0	0%	5	0%
Sanborn	2675		2645	99%	3	0%	10	0%	13	0%	1	0%	3	0%
Shannon	12466		562	5%	10	0%	11850	95%	4	0%	6	0%	34	0%
Spink	7454		7272	98%	20	0%	133	2%	15	0%	1	0%	13	0%
Stanley	2772		2579	93%	8	0%	172	6%	9	0%	0	0%	4	0%
Sully	1556		1522	98%	3	0%	20	1%	5	0%	0	0%	6	0%
Todd	9050		1138	13%	8	0%	7861	87%	18	0%	0	0%	25	0%
Tripp	6430		5625	87%	10	0%	782	12%	7	0%	0	0%	6	0%
Turner	8849		8748	99%	23	0%	43	0%	24	0%	0	0%	11	0%
Union	12584		12187	97%	55	0%	87	1%	191	2%	7	0%	57	0%
Walworth	5974		5172	87%	7	0%	776	13%	11	0%	2	0%	6	0%
Yankton	21652		20592	95%	289	1%	469	2%	116	1%	7	0%	179	1%
Ziebach	2519		665	26%	0	0%	1844	73%	2	0%	0	0%	8	0%

U.S. Census Bureau 2000

Appendix D. SEER Incidence Site Analysis Categories

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	Recode
Oral Cavity and Pharynx			
Lip	C000-C009	excluding 9590-9989, and sometimes 9050-9055, 9140+	20010
Tongue	C019-C029		20020
Salivary Gland	C079-C089		20030
Floor of Mouth	C040-C049		20040
Gum and Other Mouth	C030-C039, C050-C059, C060-C069		20050
Nasopharynx	C110-C119		20060
Tonsil	C090-C099		20080
Oropharynx	C100-C109		20080
Hypopharynx	C129, C130-C139		20090
Other Oral Cavity and Pharynx	C140, C142-C148		20100
Digestive System			
Esophagus	C150-C159	excluding 9590-9989, and sometimes 9050-9055, 9140+	21010
Stomach	C160-C169		21020
Small Intestine	C170-C179		21030
Colon and Rectum			
Colon excluding Rectum			
Cecum	C180	excluding 9590-9989, and sometimes 9050-9055, 9140+	21041
Appendix	C181		21042
Ascending Colon	C182		21043
Hepatic Flexure	C183		21044
Transverse Colon	C184		21045
Splenic Flexure	C185		21046
Descending Colon	C186		21047
Sigmoid Colon	C187		21048
Large Intestine, NOS	C188-C189, C260		21049
Rectum and Rectosigmoid Junction			
Rectosigmoid Junction	C199	excluding 9590-9989, and sometimes 9050-9055, 9140+	21051
Rectum	C209		21052
Anus, Anal Canal and Anorectum	C210-C212, C218		21060
Liver and Intrahepatic Bile Duct			
Liver	C220	excluding 9590-9989, and sometimes 9050-9055, 9140+	21071
Intrahepatic Bile Duct	C221		21072
Gallbladder	C239		21080
Other Biliary	C240-C249		21090
Pancreas	C250-C259		21100
Retroperitoneum	C480		21110
Peritoneum, Omentum and Mesentery	C481-C482		21120
Other Digestive Organs	C268-C269, C488		21130
Respiratory System			
Nose, Nasal Cavity and Middle Ear	C300-C301, C310-C319	excluding 9590-9989, and sometimes 9050-9055, 9140+	22010
Larynx	C320-C329		22020
Lung and Bronchus	C340-C349		22030
Pleura	C384		22050
Trachea, Mediastinum and Other Respiratory Organs	C339, C381-C383, C388, C390, C398, C399		22060

Bones and Joints	C400-C419	excluding 9590-9989, and sometimes 9050-9055, 9140+	23000
Soft Tissue including Heart	C380, C470-C479, C490-C499	excluding 9590-9989, and sometimes 9050-9055, 9140+	24000
Skin excluding Basal and Squamous			
Melanoma of the Skin	C440-C449	8720-8790	25010
Other Non-Epithelial Skin	C440-C449	excluding 8000-8005, 8010-8045, 8050-8084, 8090-8110, 8720-8790, 9590-9989, and sometimes 9050-9055, 9140+	25020
Breast	C500-C509	excluding 9590-9989, and sometimes 9050-9055, 9140+	26000
Female Genital System			
Cervix Uteri	C530-C539	excluding 9590-9989, and sometimes 9050-9055, 9140+	27010
Corpus and Uterus, NOS			
Corpus Uteri	C540-C549	excluding 9590-9989, and sometimes 9050-9055, 9140+	27020
Uterus, NOS	C559		27030
Ovary	C569		27040
Vagina	C529		27050
Vulva	C510-C519		27060
Other Female Genital Organs	C570-C589		27070
Male Genital System			
Prostate	C619	excluding 9590-9989, and sometimes 9050-9055, 9140+	28010
Testis	C620-C629		28020
Penis	C600-C609		28030
Other Male Genital Organs	C630-C639		28040
Urinary System			
Urinary Bladder	C670-C679	excluding 9590-9989, and sometimes 9050-9055, 9140+	29010
Kidney and Renal Pelvis	C649, C659		29020
Ureter	C669		29030
Other Urinary Organs	C680-C689		29040
Eye and Orbit	C690-C699	excluding 9590-9989, and sometimes 9050-9055, 9140+	30000
Brain and Other Nervous System			
Brain	C710-C719	excluding 9530-9539, 9590-9989, and sometimes 9050-9055, 9140+	31010
Cranial Nerves Other Nervous System	C710-C719	9530-9539	31040
	C700-C709, C720-C729	excluding 9590-9989, and sometimes 9050-9055, 9140+	
Endocrine System			
Thyroid	C739	excluding 9590-9989, and sometimes 9050-9055, 9140+	32010
Other Endocrine including Thymus	C379, C740-C749, C750-C759		32020

Lymphoma			
Hodgkin's Lymphoma			
Hodgkin's - Nodal	C024, C098-C099, C111, C142, C379, C422, C770-C779	9650-9667	33011
Hodgkin's - Extranodal	All other sites		33012
Non-Hodgkin's Lymphoma			
NHL - Nodal	C024, C098, C099, C111, C142, C379, C422, C770-C779	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727-9729, 9823, 9827	33041
NHL - Extranodal	All sites except C024, C098-C099, C111, C142, C379, C422, C770-C779	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727-9729	33042
	All sites except C024, C098-C099, C111, C142, C379, C420-C422, C424, C770-C779	9823, 9827	
Myeloma		9731-9732, 9734	34000
Leukemia			
Lymphocytic Leukemia			
Acute Lymphocytic Leukemia		9826, 9835-9837	35011
Chronic Lymphocytic Leukemia	C420, C421, C424	9823	35012
Other Lymphocytic Leukemia		9820, 9832-9834, 9940	35013
Myeloid and Monocytic Leukemia			
Acute Myeloid Leukemia		9840, 9861, 9866, 9867, 9871-9874, 9895-9897, 9910, 9920	35021
Acute Monocytic Leukemia		9891	35031
Chronic Myeloid Leukemia		9863, 9875, 9876, 9945, 9946	35022
Other Myeloid/Monocytic Leukemia		9860, 9930	35023
Other Leukemia			
Other Acute Leukemia		9801, 9805, 9931	35041
Aleukemic, subleukemic and NOS		9733, 9742, 9800, 9831, 9870, 9948, 9963, 9964	35043
	C420, C421, C424	9827	
Mesothelioma +		9050-9055	36010
Kaposi Sarcoma +		9140	36020
Miscellaneous		9740-9741, 9750-9758, 9760-9769, 9950, 9960-9962, 9970, 9975, 9980, 9982-9987, 9989	37000
	C760-C768, C809		
	C420-C424	excluding 9590-9989, and sometimes 9050-9055, 9140+	
	C770-C779		
Invalid	Site or histology code not within valid range or site code not found in this table.		99999

Source: <http://seer.cancer.gov/siterecode>

Appendix E. SEER Cancer Cause of Death Analysis Categories

Cancer Causes of Death	ICD-b0
All Malignant Cancers	C00-C97
Oral Cavity and Pharynx	
Lip	C00
Tongue	C01-C02
Salivary Gland	C07-C08
Floor of Mouth	C04
Gum and Other Mouth	C03, C05-C06
Nasopharynx	C11
Tonsil	C09
Oropharynx	C10
Hypopharynx	C12-C13
Other Oral Cavity and Pharynx	C14
Digestive System	
Esophagus	C15
Stomach	C16
Small Intestine	C17
Colon and Rectum	
Colon excluding Rectum	C18, C26.0
Rectum and Rectosigmoid Junction	C19-C20
Anus, Anal Canal and Anorectum	C21
Liver and Intrahepatic Bile Duct	
Liver	C22.0, C22.2-C22.4, C22.7, C22.9
Intrahepatic Bile Duct	C22.1
Gallbladder	C23
Other Biliary	C24
Pancreas	C25
Retroperitoneum	C48.0
Peritoneum, Omentum and Mesentery	C45.1+, C48.1-C48.2
Other Digestive Organs	C26.8-C26.9, C48.8
Respiratory System	
Nose, Nasal Cavity and Middle Ear	C30-C31
Larynx	C32
Lung and Bronchus	C34
Pleura	C38.4, C45.0+
Trachea, Mediastinum and Other Respiratory Organs	C33, C38.1-C38.3, C38.8, C39
Bones and Joints	C40-C41
Soft Tissue including Heart	C47, C49, C38.0, C45.2+
Skin excluding Basal and Squamous	
Melanoma of the Skin	C43
Other Non-Epithelial Skin	C44, C46+
Breast	C50
Female Genital System	
Cervix Uteri	C53
Corpus and Uterus, NOS	
Corpus Uteri	C54
Uterus, NOS	C55
Ovary	C56
Vagina	C52
Vulva	C51
Other Female Genital Organs	C57-C58

Male Genital System	
Prostate	C61
Testis	C62
Penis	C60
Other Male Genital Organs	C63
Urinary System	
Bladder	C67
Kidney and Renal Pelvis	C64-C65
Ureter	C66
Other Urinary Organs	C68
Eye and Orbit	C69
Brain and Other Nervous System	C70, C71, C72
Endocrine System	
Thyroid	C73
Other Endocrine including Thymus	C37, C74-C75
Lymphoma	
Hodgkin's Lymphoma	C81
Non-Hodgkin's Lymphoma	C82-C85, C96.3
Myeloma	C90.0, C90.2
Leukemia	
Lymphocytic Leukemia	
Acute Lymphocytic Leukemia	C91.0
Chronic Lymphocytic Leukemia	C91.1
Other Lymphocytic Leukemia	C91.2-C91.4, C91.7, C91.9
Myeloid and Monocytic Leukemia	
Acute Myeloid	C92.0, C92.4-C92.5, C94.0, C94.2
Acute Monocytic Leukemia	C93.0
Chronic Myeloid Leukemia	C92.1
Other Myeloid/Monocytic Leukemia	C92.2-C92.3, C92.7, C92.9, C93.1-C93.2, C93.7, C93.9
Other Acute Leukemia	C94.4, C94.5, C95.0
Aleukemic, Subleukemic and NOS	C90.1, C91.5, C94.1, C94.3, C94.7, C95.1, C95.2, C95.7,
Mesothelioma (ICD-10 only)+	C45+
Kaposi Sarcoma (ICD-10 only)+	C46+
Miscellaneous Malignant Cancer	C26.1, C45.7+, C45.9+, C76-C80, C88, C96.0-C96.2, C96.7, C96.9, C97

Source: <http://seer.cancer.gov/coderecode>

Appendix F. BRFSS Methods

Participating Agencies

The South Dakota Behavioral Risk Factor Surveillance System is a combined effort between the South Dakota Department of Health (DOH) and the Centers for Disease Control and Prevention (CDC). The DOH contracts with Personal Group, Inc. to collect the data through telephone interviews. However, the DOH continues to supervise the survey process, as well as design and distribute the report. The CDC provides financial and technical assistance, develops the questionnaire, designs the methodology, and processes the data.

Method of Surveillance

This study uses a telephone survey rather than other survey methods because of its low cost, ease of administration in reaching respondents, and reliability. Telephone surveys are less representative of areas where a significant portion of the population does not have telephones. However, according to a Federal Communications Commission report, 97.8 percent of the households in South Dakota had telephone service in 2008. Please note that households with only a cell phone are not eligible for this survey.

Questionnaire Development

The BRFSS is designed to collect information on the health behaviors of adults over time. For the 2008 survey (Appendix B), standard demographic questions were included along with sections on general health status, health insurance, sleep, physical activity, diabetes, oral health, cardiovascular disease, asthma, tobacco use, alcohol use, immunization, falls, seat belt use, women's health, prostate cancer, colorectal cancer, and HIV/AIDS. South Dakota also added several state-specific questions to the end of the core questionnaire including the *Healthy South Dakota* program, women's health, smokeless tobacco, secondhand smoke, signs and symptoms of a stroke, disaster preparedness, children's health insurance, children's flu shot immunizations, childhood diabetes, sexual violence, oral health, and special health conditions in children.

Accuracy and Confidence Intervals

It is important to remember that this survey data are **self-reported**. Therefore, people may tend to report a more favorable lifestyle than actually practiced. The accuracy of self-reported data may also vary according to risk factors, i.e., self-reported smoking status is thought to be more accurate than self-reported eating habits. These limitations do not negate the survey's ability to identify high-risk groups and monitor long-term trends.

The standard error (SE) of a percentage is used in health statistics when studying or comparing percentages. The SE defines a percentage's variability and can be used to calculate a confidence interval (CI) to determine the actual variance of a percentage 95 percent of the time. Percentages for two different populations are significantly different when their confidence intervals do not overlap.

The DOH has calculated the standard error and confidence intervals differently for the complex sample designs used in BRFSS than simple random sample designs. Therefore, please note that the confidence intervals in this report were calculated using software specifically designed to handle these types of data. Given all of this, it could be stated with 95 percent certainty, that the actual data for South Dakota is represented within the given confidence intervals.

Eligible Respondent Selection

Eligible respondents for the survey were individuals 18 years of age or over who resided a majority of the time at the household contacted. In households with more than one eligible respondent, a random selection was made to determine the actual respondent. Data included in the children's sections of this report were estimated based on responses from the adult respondent regarding a randomly selected child in the household. Automated prescreening was done to eliminate business phones and non-working numbers. "No Answers" and "Busy Signals" were re-dialed a minimum of three times on five different days at different times before they were removed.

Data Collection Process

There were 6,981 interviews completed between January 1, 2008 and December 31, 2008, at an average of 582 interviews per month.

Data Processing

The DOH sent the data electronically to the CDC. The CDC then supplied a final data file with applicable data weights and several calculated variables included. The DOH used this file to calculate all the data presented in this report.

Weighting

Collecting data via telephone survey often produces an over-representation of certain demographic groups in the sample population. Therefore, the sample population may not be representative of the actual population. To account for this, the DOH has applied a weighting factor to each respondent/household.

Sample Description

Survey interviewers collected demographic variables including age, gender, and race. Those interested can find a summary of the demographic results in a table displayed in Appendix A: Demographics in a report "The Health Behaviors of South Dakotans 2008" (<http://doh.sd.gov/statistics/2008BRFSS/default.aspx>). Appendix A also summarizes the region, household income, education, employment status, marital status, presence of children in the household, and pregnancy status of female respondents ages 18-44 years old.

Completion Rate

Table 3 of the report "The Health Behaviors of South Dakotans 2008" (<http://doh.sd.gov/statistics/2008BRFSS/default.aspx>) shows the outcome of all telephone calls. The 6,981 completed interviews represented a completion rate of 12.7 percent. The refusal rate was 9.3 percent.