SOUTH DAKOTA DEPARTMENT OF HEALTH

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SOUTH DAKOTA DEPARTMENT OF HEALTH

Cancer in South Dakota 2021

South Dakota Cancer Registry

SDCR

SOUTH DAKOTA CANCER REGISTRY

Preface

Cancer in South Dakota, 2021 is an annual report from the South Dakota Cancer Registry (SDCR) in the Office of Chronic Disease Prevention and Health Promotion in the Division of Family and Community Health within the South Dakota Department of Health (SD DOH). This report contains 2021 cancer incidence and mortality data of South Dakota residents.

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Executive Summary

This report summarizes the burden of cancer in South Dakota and provides cancer incidence and mortality data. The data enables organizations working in cancer care to identify public health problems. Organizations can then use this data to identify goals for cancer control and to inform citizens and health care professionals about the risks, early detection, and treatment of cancer.

Incidence 2021

- South Dakota had 5,172 reportable invasive cases of cancer diagnosed, excluding the less life-threatening cancers, such as *in situ* cancers (except *in situ* bladder) and the most common skin cancers.
- Every day, 14 cases of cancer were diagnosed in residents of South Dakota; this includes cases of invasive cancer and *in situ* bladder.
- The five most diagnosed cancer sites (prostate, female breast, lung, colorectal and melanoma) accounted for 56% of all cancer sites.
- Prostate cancer was the most common reportable malignancy with 761 cases, 15% of all cases, and 28% of cases among males.
- Female breast cancer was the second most common reportable cancer with 726 cases, 14% of all cases, and 29% of cases among females.
- Lung cancer was the third most common reportable malignancy with 632 cases, accounting for 12% of all cases.
- Colon and rectum cancer cases were the fourth most common cancer with 428 cases, 8% of all cases.
- Melanomas of the skin were the fifth most common malignancy with 343 cases, 7% of all reported cases.
- 52% of all cancers were diagnosed among males and 48% were among females.
- Males had an age-adjusted incidence rate of 493.5 per 100,000, which was higher than that of females who had an age-adjusted rate of 457.5 per 100,000.
- Whites accounted for 93% of cancers with 4,799 cases, whereas American Indians accounted for 5% with 284 cases.
- The age-adjusted incidence rate among American Indians was 565.8 per 100,000, which was higher than the age-adjusted rate among Whites of 483.0 per 100,000.
- The age-adjusted incidence rate in in South Dakota in 2021 was 470.6 per 100,000, which is higher than the age-adjusted incidence rate in the United States of 439.1 per 100,000.

Mortality 2021

- Cancer was the leading cause of death in 2021 for South Dakota residents. This was the first time since 2017.
- In 2021, 1,740 South Dakotans died from cancer, accounting for 18.9% of resident deaths.
- Each day over 4 South Dakotans die from cancer.
- The most common cancer mortality sites (lung, colorectal, pancreas, female breast, and prostate) caused half of all cancer deaths.
- Lung and bronchus cancers were the leading cause of cancer deaths, with 387 mortalities or 22% of all cancer deaths.
- Colon and rectum cancers were the second leading cause of cancer deaths, with 160 deaths, 9% of all cancer deaths.
- Pancreatic cancer was the third leading cause of cancer death among cancers, with 136 deaths, 8% of all cancer deaths.
- Female breast cancer was the fifth leading cause of cancer deaths with 97 mortalities, 6% of all cancer deaths and 12% of all female cancer deaths.
- Prostate cancer was the fourth leading cause of cancer deaths with 104 deaths, 6% of all cancer deaths and 11% of all male cancer deaths.
- 54% of all cancer deaths were among males and 46% were among females.
- Males had an age-adjusted mortality rate of 184.7 per 100,000, whereas females had an age-adjusted mortality rate of 132.2 per 100,000.
- Whites accounted for 93% of all cancer deaths in South Dakota, with 1,618 deaths and American Indians accounted for 5% of all cancer deaths with, 86 deaths in 2021.
- The age-adjusted mortality rate in South Dakota for 2021 was 154.8 per 100,000 which is comparable to the age-adjusted mortality rate in the United States of 144.2

Trends 2021

- Melanoma incidence cases have continued to increase significantly from 157 cases (17.6 age-adjusted rate) in 2009 to 343 cases (33.2 age-adjusted rate) in 2021.
- Within the last decade, female breast cancer mortality rates have been declining.
- Within the last 5 years, bladder cancer cases have slowly increased. Mortality rates, however, have remained steady.
- Lung cancer cases and mortality rates have remained relatively stable over the last 10 years.

Trends are displayed in the Selected Cancer Sites: Incidence and Mortality section of the report and show the incidence and mortality rates of the specific cancers above for the last 15 years.

Introduction

The South Dakota Cancer Registry (SDCR) is a statewide cancer surveillance system that was developed in 2001. Funded by the CDC, the SDCR works to reduce the cancer burden for South Dakota residents as well as provide data for researchers and increase prevention efforts throughout the state. In 2005, a state law (SDCL 1-43-14) was passed that requires any detection, diagnosis, or treatment of cancer by licensed health care providers to be reported to the SDCR. 2023 was the 18th consecutive year the SDCR has received the North American Association of Central Cancer Registries gold certification, an annual review that requires registries to produce complete, accurate, and timely data. Additionally, the SDCR has received the CDC Registry of Distinction, requiring the registry to meet two of the national data standards. These standards are the National Data Quality Standard and the United States Cancer Statistics Publication Standard.

The SDCR works only with reportable cancers which includes benign brain, benign central nervous system, and all malignant cancers except for basal and squamous cell carcinomas of the skin and *in situ* (stage 0) cervical cancers.

The SDCR performs many quality assurance procedures to ensure that the data are valid. As a way of case finding, the SDCR links data with vital statistics mortality files to identify persons whose death records show cancer as a cause of death, but these cancers are not yet in the registry. The registry then follows up on the cases and adds them to the registry. The SDCR also links incidence data with the Indian Health Service (IHS) database to identify American Indian South Dakotans who were misclassified as another race.

Every year, the registry provides data to show incidence and mortality rates of cancer, along with more specific information, such as type, stage, survival rates, and trends. The data are also broken down by location within the state, demographic disparities and where they occur, and the effects of screening efforts. Along with data collected by the SDCR, information on cancer control and prevention programs is provided by a public health survey that is coordinated by the Office of Health Data and Reporting with the SD Department of Health. Every life is touched by cancer somehow, whether one is diagnosed with the disease or has a family member or friend with the disease. Regardless of age, there are many societal, cultural, and economic impacts when a person dies from cancer. This is in part due to health care expenditures, productivity loss, and suffering for patients and their families. Cancer concerns voiced by South Dakotans are a priority for the SDCR.

As the SDCR continues to collect population-based data and as health care entities and providers continue to report cases, more questions can be answered with the data. Data collected by the SDCR is linked with information provided through the CDC to determine modifiable risk factors, such as obesity, smoking, and exercise. According to the American Cancer Society, at least 42% of newly diagnosed cancers, excluding non-melanoma of the skin, are potentially avoidable.

The best way to prevent cancer is to limit modifiable risk factors. To do this, the CDC recommends avoiding the use of tobacco products, maintaining a healthy weight and diet, doing physical activity on a regular basis, avoiding alcohol consumption, avoiding ultraviolet radiation exposure, using sun protection, avoiding air pollution, and minimizing exposure to occupational carcinogens. The CDC also suggests getting vaccinated against human papillomavirus (HPV) and hepatitis B. In addition to these guidelines, it is also recommended to get consistent screening to detect cancer in the early stages, making it more treatable.

The SDCR continuously expands data collection. This helps prevention and control programs to target at-risk populations as well as support epidemiologic studies. The end goal is to reduce the cancer burden by producing valid and accurate data reflecting the complete assessment of cancer in South Dakota, and to disseminate the information in a timely manner.

Technical Notes

Age-adjusted incidence rates: Age-adjusted incidence rates are calculated using a direct method and standardized to the age distribution of the 2000 US 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. 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 sex

Age-adjusted mortality rates: Age-adjusted mortality rates are calculated for total deaths and separately for males and females. The mortality rates are age-adjusted to the 2000 US standard population using five-year groups and are per 100,000 persons. Rates are presented for 2021 and for the five-year period, 2017-2021.

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 cancer cases could be greater than the number of persons who are diagnosed with cancer. A metastatic cancer starts at a primary site and has spread to other surrounding tissues or body organs.

Data source: All data, tables, and figures come from the South Dakota Department of Health, American Cancer Society Facts and Figures 2021 or CDC's United States Cancer Statistics (USCS), which mentions to use caution when interpreting 2021 data. The COVID-19 pandemic disrupted health services, leading to delays and reductions in cancer screening diagnosis, and reporting to some central cancer registries.

Early detection and screening: Improved early detection and screening may increase incidence and survival rates. Increases may occur as a result of the introduction of new treatments and 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 diagnoses, have led to increased survival rates and reduction in mortality.

Limitations to data interpretation and comparison: Several factors must 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 group may change for the calendar year for which the data has already been reported in a previous publication. Additional cancer cases 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.

Metastasis: When cancer spreads from the primary site to other organs or tissues of the body, it is said to metastasize. Cancer usually spreads through the blood or the lymphatic system.

Percent change: This is the difference between two rates expressed as a percentage. There is an absolute percent change as well as relative percent change. Absolute percent change measures the actual difference in the rates between the latest rate and the baseline. In contrast, relative percent change shows the change in the disease relative to the baseline. The relative percent change is beneficial when comparing magnitude changes between two periods.

Rate comparisons: Rate comparisons are difficult to interpret when comparing age-adjusted and age-specific rates based on fewer than 16 cases. Because of this, incidence and mortality counts with fewer than 3 cases at the county level will be suppressed from this report. When 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 the clinical significance of the disease. Data quality indicators for each registry should also be reviewed. Interpretations made without considering these factors may be misleading. There may also be differences between statistics published by various agencies and the cancer statistics in this report. This is in part due to differences in population datasets, as well as the timeframe in which data was pulled.

Stage at time of diagnosis: Staging is the process of describing the extent or spread of disease from the primary site. 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.
- **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 **early-stage** diagnoses. Regional and distant stages are **late-stage** diagnoses.

Staging: Stage is based on an assessment of the size of the primary tumor, whether it has spread, and, if so, how far. Because an accurate diagnosis is essential for effective treatment, physicians can use physical exams, imaging, lab tests, biopsies, an analysis of the patient's body fluids, and surgery in various combinations in the staging process. Advancements in diagnostic procedures may change over time. These advancements may increase the chance that a given cancer will be diagnosed at a more advanced stage. For example, new scanning methods can detect metastases. 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.

Population Data: Population data is from the Vintage US Census Data for the year of the report. Vintage data is the estimated population at the middle of the year (July 1st).

Health Behavior Trends that Impact Cancer within South Dakota

Many behaviors can impact the risk for developing cancer and the mortality associated with it. This includes diet, weight, physical activity, and substance use. Additionally, screening is used to detect cancer early, which can increase life expectancy. The Behavioral Risk Factor Surveillance System (BRFSS) through the Centers for Disease Control and Prevention (CDC) monitors these behaviors nationally and by state to determine health trends in populations. The main trends include tobacco use, alcohol use, physical activity, diet, weight, and screening for breast cancer, cervical cancer, colorectal cancer, and prostate cancer. Screening information is included within the section for the relevant cancer.

Tobacco Use:
In 2021, 15.3% of adults in South Dakota smoked combustible cigarettes and 6.1% of adults used e-cigarettes. 18- to 24-year-olds had the highest use of e-cigarettes among all age groups but also had the lowest use of cigarette smoking. This compared to a national median of 14.4% adult smokers and 6.6% of adults who used e-cigarettes. Tobacco use was linked to 40% of all diagnosed cancers and 30% of cancer deaths.

Alcohol Consumption:
In South Dakota, 57.2% of adults consumed alcohol, 19.6% binge drank on occasion, and 6.7% drank heavily. For each of these, males were shown to have a higher percentage than females. Nationally, 53.2% of adults consumed alcohol, 15.4% binge drank, and 6.3% drank heavily.

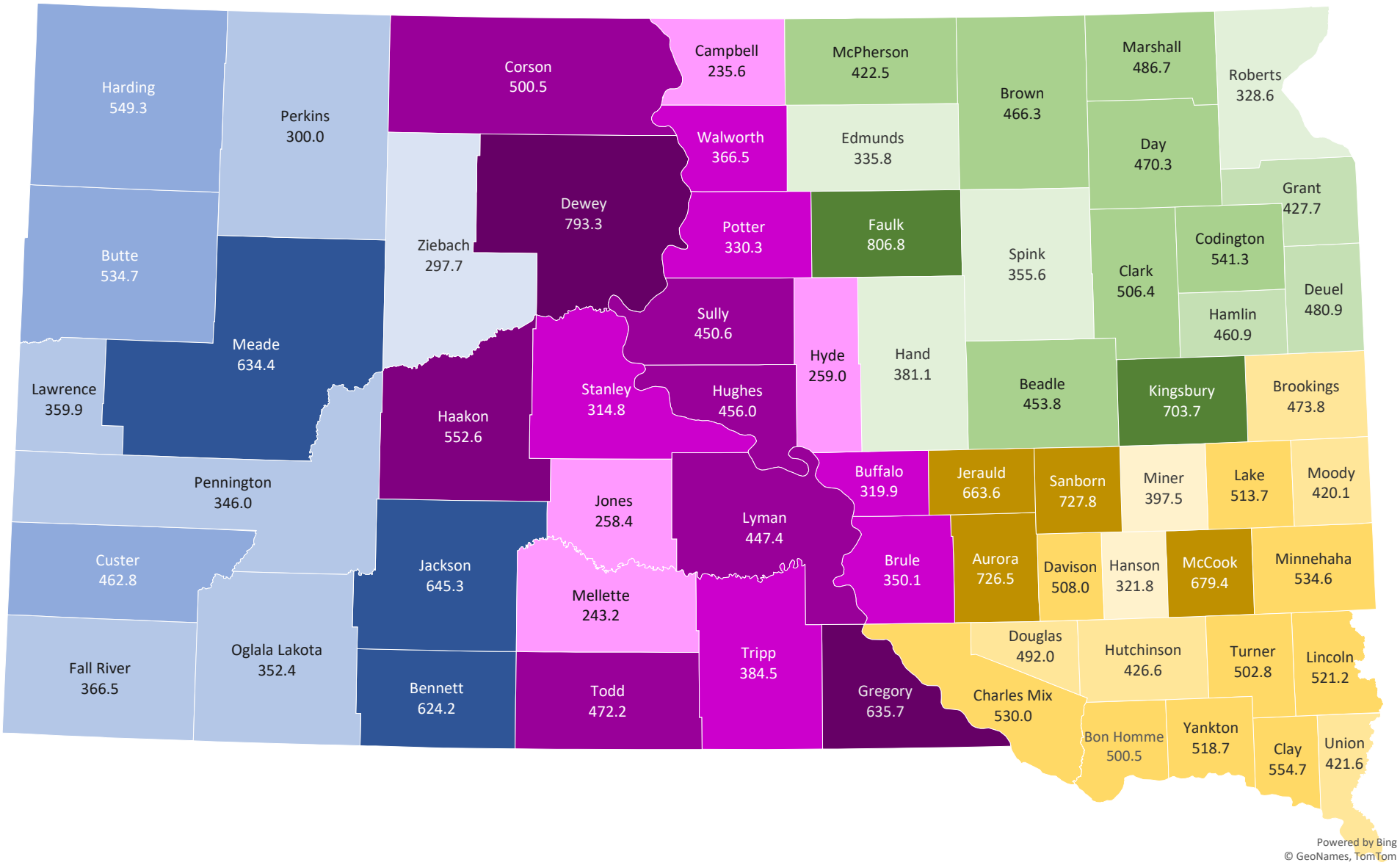
Physical Activity:
In South Dakota in 2021, 76.8% of adults had reported being physically active within the last month. Activity levels were very similar among males and females. The percentages of physical activity tended to increase with educational attainment and decrease with age. This compares to a national average of 76.3% of adults being physically active, with trends like South Dakota in terms of educational attainment and age.

Diet:
A healthy diet includes plenty of fruits and vegetables. 56.6% of South Dakotans consumed at least one piece of fruit every day, with a higher percentage of females eating fruit compared to males. Additionally, 80.8% of South Dakota adults ate at least one vegetable a day, again with a higher percentage of females eating vegetables than males. Nationally, 59.2% of adults consumed fruit daily and 80.3% consumed vegetables daily. On average it is recommended to eat 2 cups of fruit per day, which is equivalent to 1 large apple or 2 large bananas. Additionally, it is recommended to get about 3 cups of vegetables daily, equivalent two medium carrots or 1 large ear of corn. Other options for both fruits and vegetables can be found at https://www.myplate.gov.

Weight:
Maintaining a healthy weight is important for decreasing the risk of cancer. In South Dakota in 2021, 26.6% of adults were at a healthy weight, 33.7% were overweight, and 38.4% had obesity. This compares to a national rate of 29.9% being at a healthy weight, 34.4% being overweight, and 33.9% having obesity.

Cancer Incidence by County

Figure 1: Map of Age-Adjusted Incidence Rates for All Cancers by State Regions, 2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

Age-Adjusted Incidence Rates by County, All Cancers

Table 1: Age-Adjusted Incidence Rates by County for All Cancers

Region	County	Age-Adjusted Rate	Region	County	Age-Adjusted Rate
Western	Bennett	624.2	Northeastern	Beadle	453.8
	Butte	534.7		Brown	466.3
	Custer	462.8		Clark	506.4
	Fall River	366.5		Codington	541.3
	Harding	549.3		Day	470.3
	Jackson	645.3		Deuel	480.9
	Lawrence	359.9		Edmunds	335.8
	Meade	634.4		Faulk	806.8
	Oglala Lakota	352.4		Grant	427.7
	Pennington	346.0		Hamlin	460.9
	Perkins	300.0		Hand	381.1
	Ziebach	297.7		Kingsbury	703.7
Central	Brule	350.1		Marshall	486.7
	Buffalo	319.9		McPherson	422.5
	Campbell	235.6		Roberts	328.6
	Corson	500.5		Spink	355.6
	Dewey	793.3	Southeastern	Aurora	726.5
	Gregory	635.7		Bon Homme	500.5
	Haakon	552.6		Brookings	473.8
	Hughes	456.0		Charles Mix	530.0
	Hyde	259.0		Clay	554.7
	Jones	258.4		Davison	508.0
	Lyman	447.4		Douglas	492.0
	Mellette	243.2		Hanson	321.8
	Potter	330.3		Hutchinson	426.6
	Stanley	314.8		Jerauld	663.6
	Sully	450.6		Lake	513.7
	Todd	472.2		Lincoln	521.2
	Tripp	384.5		McCook	679.4
	Walworth	366.5		Miner	397.5
				Minnehaha	534.6
				Moody	420.1
				Sanborn	727.8
				Turner	502.8
				Union	421.6
				Yankton	518.7

Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

Table 2: Age-Adjusted Incidence Rates by County for Selected Sites, 2021

		Colorectal		Lung and Bronchus		Melanoma of the Skin		Female Breast		Prostate	
Region	County	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Western	Bennett	3	76.8	*	60.5	0	0.0	*	87.2	5	301.6
	Butte	6	37.2	10	64.9	*	9.8	17	238.1	9	99.2
	Custer	*	6.6	6	34.4	3	18.6	12	200.8	13	136.1
	Fall River	4	28.6	7	42.4	*	5.2	5	60.6	9	115.0
	Harding	0	0.0	0	0.0	*	37.3	*	430.4	*	272.9
	Jackson	3	103.4	*	28.1	*	72.3	*	58.8	*	77.1
	Lawrence	8	25.3	16	37.2	5	14.7	25	137.4	30	124.6
	Meade	25	74.0	28	74.7	10	32.2	33	205.6	35	185.6
	Oglala Lakota	5	41.5	5	51.8	0	0.0	6	108.6	5	82.0
	Pennington	36	24.7	68	44.1	28	21.0	69	91.7	65	76.8
	Perkins	*	32.2	0	0.0	0	0.0	*	147.2	3	94.4
	Ziebach	*	87.2	*	57.6	0	0.0	*	96.3	*	43.1
Central	Brule	*	9.5	3	36.5	0	0.0	5	95.8	5	130.4
	Buffalo	3	205.5	*	36.3	0	0.0	0	0.0	0	0.0
	Campbell	*	25.6	0	0.0	0	0.0	*	260.0	*	90.2
	Corson	*	40.5	*	51.2	0	0.0	3	170.1	*	41.8
	Dewey	3	67.4	4	109.2	*	37.6	*	64.0	0	0.0
	Gregory	*	11.9	5	78.5	3	40.3	6	197.2	7	175.8
	Haakon	*	22.1	*	21.6	0	0.0	3	163.2	*	107.1
	Hughes	5	26.2	9	40.8	11	52.8	23	181.5	11	87.2
	Hyde	*	31.1	*	44.7	0	0.0	*	90.8	*	170.0
	Jones	0	0.0	0	0.0	0	0.0	0	0.0	*	92.4
	Lyman	*	40.1	*	38.7	0	0.0	*	81.4	0	0.0
	Mellette	0	0.0	*	95.8	*	40.7	0	0.0	0	0.0
	Potter	*	14.8	0	0.0	*	83.9	5	268.5	3	135.7
	Stanley	4	81.9	*	36.8	*	39.1	0	0.0	*	19.9
	Sully	*	51.0	*	51.0	0	0.0	3	308.4	*	96.6
	Todd	6	78.9	*	17.2	3	44.4	7	228.7	5	215.2
	Tripp	5	88.9	4	46.6	*	8.8	*	38.6	8	167.7
	Walworth	*	23.2	7	66.9	*	10.5	*	30.7	5	89.9
Northeastern	Beadle	7	32.2	10	34.0	9	32.9	18	159.4	13	109.9
	Brown	21	44.0	38	80.2	20	46.1	31	126.0	18	72.5
	Clark	5	87.7	*	21.2	0	0.0	6	310.2	4	136.4
	Codington	20	52.8	31	75.7	12	31.5	37	196.3	29	142.9
	Day	4	35.0	4	57.2	4	30.7	5	85.6	8	156.6
	Deuel	7	98.0	*	16.9	*	11.7	5	144.7	5	131.1
	Edmunds	3	43.3	3	46.0	0	0.0	*	30.1	5	137.1
	Faulk	3	59.1	5	162.8	0	0.0	*	125.4	4	230.6
	Grant	8	60.4	4	31.3	*	6.0	5	86.5	14	241.4
	Hamlin	3	61.6	5	68.7	*	10.7	4	145.4	4	85.4
	Hand	*	31.5	4	83.5	3	58.5	*	39.7	4	132.7
	Kingsbury	5	82.1	7	73.2	4	39.8	8	259.9	7	194.9
	Marshall	4	55.4	4	57.8	3	52.6	5	159.1	*	43.1
	McPherson	*	31.8	*	20.4	*	11.4	3	118.6	3	216.8
	Roberts	4	28.1	7	59.9	*	15.0	3	60.2	8	92.6
	Spink	8	86.2	0	0.0	4	48.7	5	120.4	5	81.9

		Colorectal		Lung and Bronchus		Melanoma of the Skin		Female Breast		Prostate	
	County	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Southeastern	Aurora	*	37.4	*	57.7	0	0.0	6	394.1	*	98.5
	Bon Homme	*	13.0	5	62.2	4	43.2	6	168.4	13	257.1
	Brookings	14	48.4	15	44.9	18	57.1	22	150.8	26	146.9
	Charles Mix	5	35.5	6	45.7	3	22.3	6	159.1	13	218.8
	Clay	9	73.6	7	54.8	*	12.1	11	188.7	12	147.1
	Davison	10	45.9	19	59.9	10	41.6	16	123.6	15	106.7
	Douglas	*	35.9	4	74.3	*	82.0	*	92.3	4	182.9
	Hanson	*	39.3	*	76.5	0	0.0	3	138.0	3	107.3
	Hutchinson	4	32.8	3	18.4	4	49.8	7	146.7	13	203.7
	Jerauld	0	0.0	4	115.0	0	0.0	*	213.5	5	452.0
	Lake	4	31.3	11	73.8	9	78.2	5	99.0	11	127.2
	Lincoln	24	37.6	40	54.3	36	53.3	54	151.7	52	147.8
	McCook	4	61.3	8	105.0	*	24.4	10	282.2	10	256.7
	Miner	*	30.8	*	30.8	0	0.0	*	107.4	4	167.4
	Minnehaha	74	36.6	150	69.6	84	38.0	148	144.2	160	146.6
	Moody	5	67.1	4	46.1	0	0.0	8	204.1	4	76.9
	Sanborn	*	42.4	*	65.0	*	59.7	3	247.3	*	145.9
	Turner	3	18.9	6	39.7	4	42.0	7	105.4	4	79.3
	Union	4	21.7	11	49.6	12	68.5	13	133.4	17	133.9
	Yankton	15	51.1	17	50.0	13	45.7	20	126.2	24	142.8

Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry
* Data suppressed for less than 3 cases, these rates are considered unstable due to few observations and should be interpreted with caution

Table 3: Age-Adjusted Incidence Rates by Site, Sex, and Race, 2021 – South Dakota

	Total		Male		Female		White		American Indian	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total	5,172	470.6	2,687	493.5	2,485	457.5	4,799	483.0	284	565.8
Oral Cavity	139	12.5	110	19.7	29	5.2	128	12.8	8	12.6
Digestive System	905	82.6	467	89.6	438	76.8	818	82.3	68	132.0
Respiratory	669	57.7	339	61.4	330	55.4	618	57.5	43	98.8
Bones and Joints	7	0.8	4	1.0	3	0.7	6	0.9	0	0.0
Soft Tissue (Including Heart)	34	3.2	20	3.7	14	2.6	32	3.3	1	1.4
Skin	362	35.1	208	39.5	154	32.2	353	38.6	5	11.9
Female Breast	726	69.8			726	69.8	687	147.2	27	90.5
Female Genital System	275	48.5			275	48.5	246	48.1	21	69.8
Male Genital System	799	136.6	799	136.6			750	139.6	39	164.7
Urinary	516	47.3	373	72.3	143	24.9	473	47.4	35	69.5
Eye and Orbit	3	0.4	0	0.0	3	0.8	3	0.5	0	0.0
Brain and CNS	60	6.3	31	6.7	29	5.9	57	6.9	1	1.0
Endocrine	137	15.2	47	9.8	90	21.0	130	17.0	5	8.7
Lymphomas	308	28.0	158	28.8	150	27.4	291	29.1	3	17.3
Multiple Myeloma	71	6.3	42	7.6	29	5.0	63	6.0	5	9.9
Leukemia	178	15.8	101	18.3	77	13.6	167	16.3	8	15.7

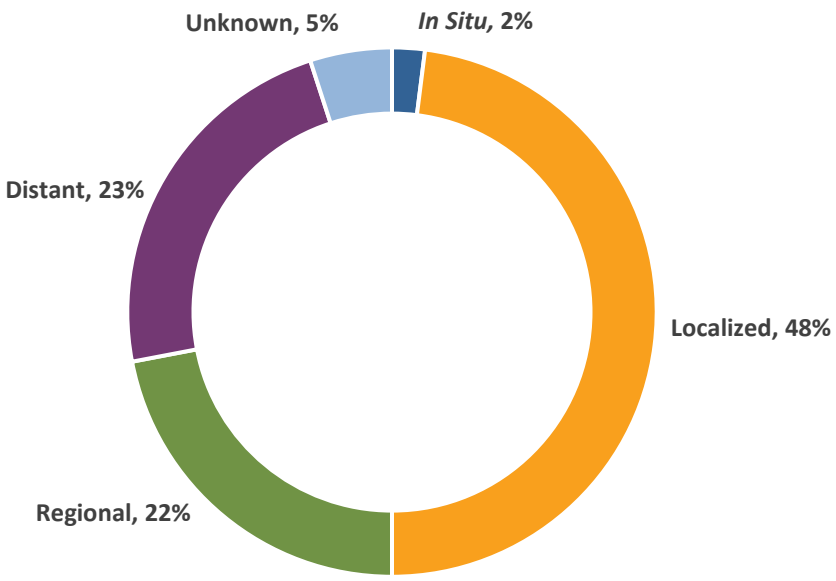
Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

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 stomal 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 tissue.
- **Distant** – The tumor cells have broken away from the primary tumor and traveled to other parts of the body.
- **Unknown** – If extension or metastatic, there is not sufficient evidence available to assign a stage.

Figure 2: Stage at Diagnosis, All Sites, 2021 – South Dakota



Source: South Dakota Cancer Registry

Table 4: Stage at Diagnosis, All Reportable Sites, 2021 – South Dakota

Stage	Number of Cases	Percent of Total
In Situ	142	2%
Localized	2,467	48%
Regional	1,121	22%
Distant	1,201	23%
Unknown	241	5%

Figure 3: 2021 Stage at Diagnosis for All Reportable Cancers, White

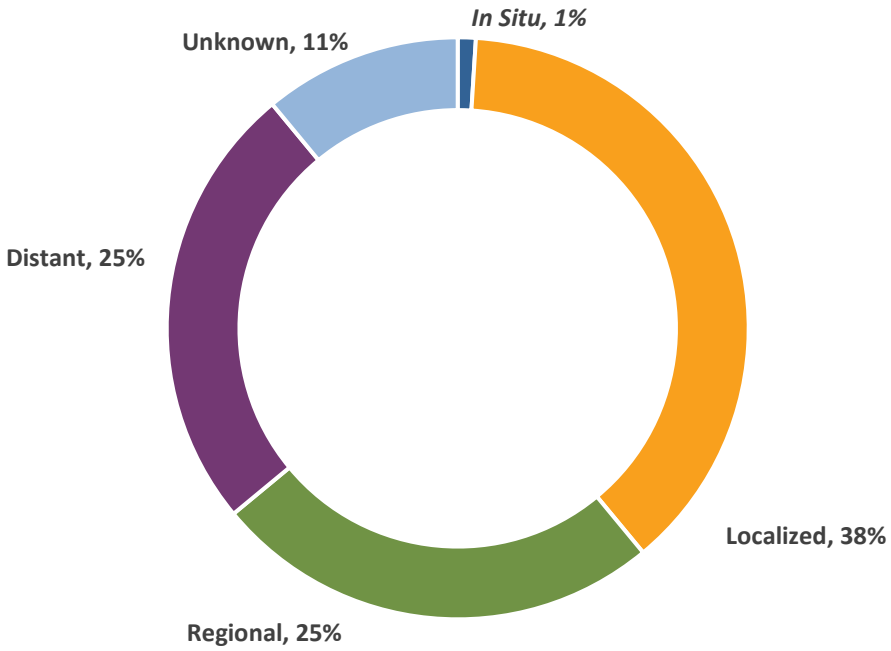
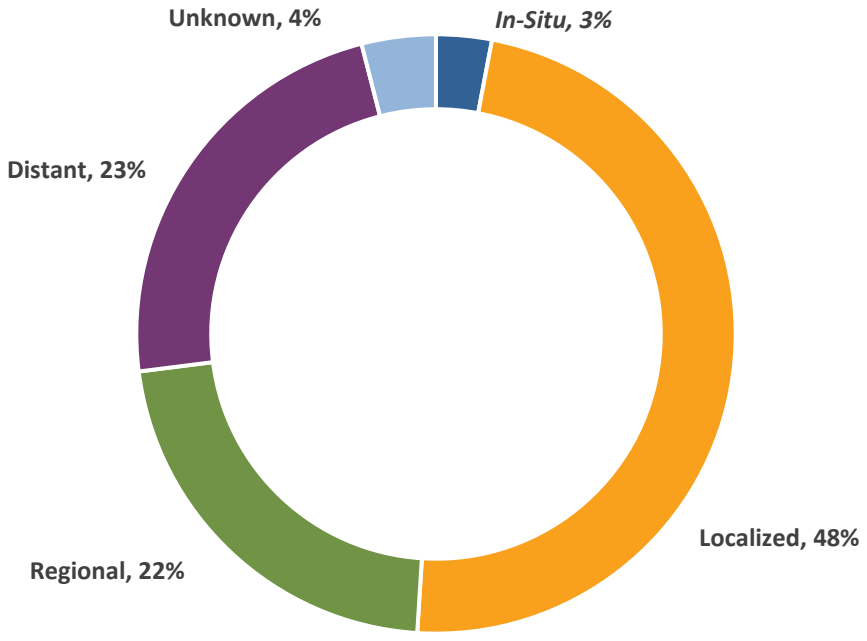
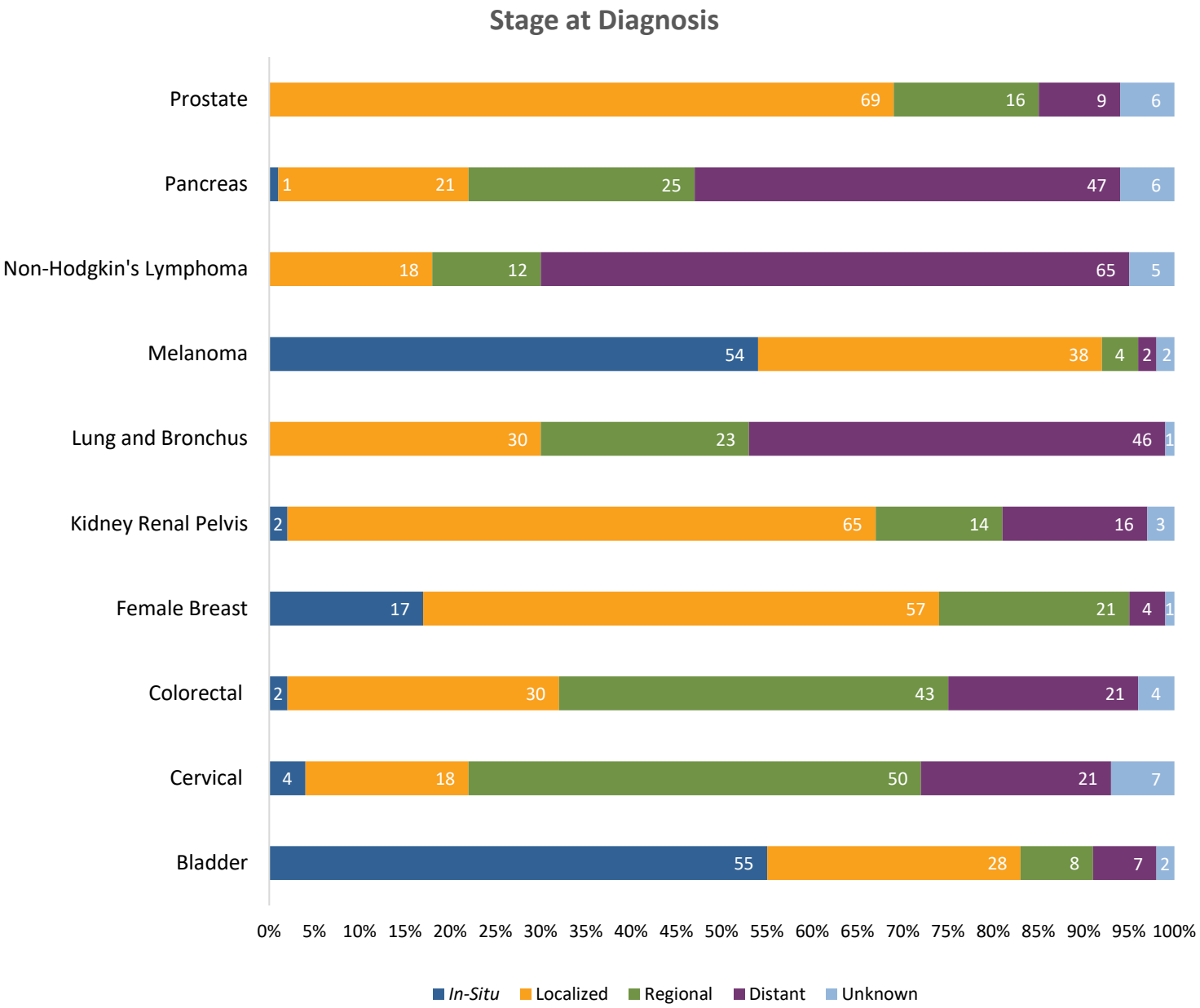


Figure 4: 2021 Stage at Diagnosis for All Reportable Cancers, American Indian



Source: South Dakota Cancer Registry

Figure 5: 2021 Stage at Diagnosis for Selected Sites

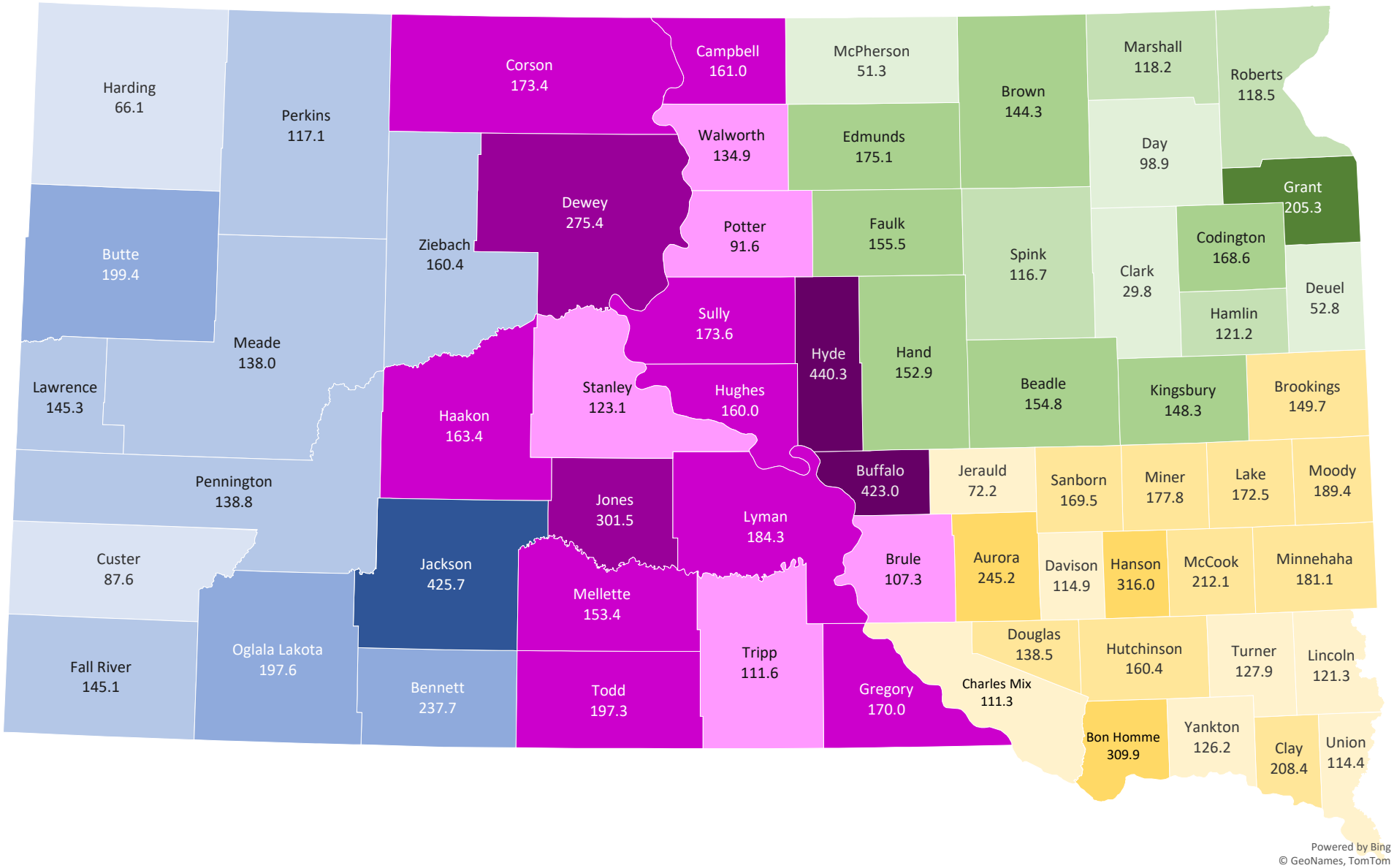


Source: South Dakota Cancer Registry

The data presented shows the selected sites that the report goes into further detail below. *In situ* cases are not considered a reportable cancer other than bladder. However, if a case is given to the registry we take note of the stage.

Cancer Mortality by County

Figure 6: Map of Age-Adjusted Mortality Rates for All Cancers by State Regions, 2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

Age-Adjusted Mortality Rates by County, All Cancers

Table 5: Age-Adjusted Mortality Rates by County for All Cancers

Region	County	Age-Adjusted Rate	Region	County	Age-Adjusted Rate
Western	Bennett	237.7	Northeastern	Beadle	154.8
	Butte	199.4		Brown	144.3
	Custer	87.6		Clark	29.8
	Fall River	145.1		Codington	168.6
	Harding	66.1		Day	98.9
	Jackson	425.7		Deuel	52.8
	Lawrence	145.3		Edmunds	175.1
	Meade	138.0		Faulk	155.5
	Oglala Lakota	197.6		Grant	205.3
	Pennington	138.8		Hamlin	121.2
	Perkins	117.1		Hand	152.9
	Ziebach	160.4		Kingsbury	148.3
Central	Brule	107.3		Marshall	118.2
	Buffalo	423.0		McPherson	51.3
	Campbell	161.0		Roberts	118.5
	Corson	173.4		Spink	116.7
	Dewey	275.4	Southeastern	Aurora	245.2
	Gregory	170.0		Bon Homme	309.9
	Haakon	163.4		Brookings	149.7
	Hughes	160.0		Charles Mix	111.3
	Hyde	440.3		Clay	208.4
	Jones	301.5		Davison	114.9
	Lyman	184.3		Douglas	138.5
	Mellette	153.4		Hanson	316.0
	Potter	91.6		Hutchinson	160.4
	Stanley	123.1		Jerauld	72.2
	Sully	173.6		Lake	172.5
	Todd	197.3		Lincoln	121.3
	Tripp	111.6		McCook	212.1
	Walworth	134.9		Miner	177.8
				Minnehaha	181.1
				Moody	189.4
				Sanborn	169.5
				Turner	127.9
				Union	114.4
				Yankton	126.2

Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

Table 6: Age-Adjusted Mortality Rates by County for Selected Sites, 2021

		Colorectal		Lung and Bronchus		Melanoma of the Skin		Female Breast		Prostate	
Region	County	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Western	Bennett	*	29.9	*	37.0	0	0.0	0	0.0	0	0.0
	Butte	*	3.5	7	43.5	0	0.0	*	7.8	0	0.0
	Custer	0	0.0	*	13.5	0	0.0	0	0.0	0	0.0
	Fall River	0	0.0	5	42.2	*	12.4	*	20.3	*	5.7
	Harding	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Jackson	*	28.1	*	92.2	*	31.1	*	75.9	0	0.0
	Lawrence	5	12.8	6	14.2	6	15.5	5	13.6	*	2.8
	Meade	6	12.7	7	20.8	*	6.6	*	4.0	0	0.0
	Oglala Lakota	*	18.9	4	63.5	*	8.2	0	0.0	0	0.0
	Pennington	10	6.8	51	35.7	17	12.8	13	8.3	6	3.6
	Perkins	0	0.0	0	0.0	0	0.0	*	23.5	*	12.3
	Ziebach	0	0.0	*	57.6	0	0.0	0	0.0	0	0.0
Central	Brule	0	0.0	*	10.3	0	0.0	0	0.0	0	0.0
	Buffalo	0	0.0	*	173.9	0	0.0	0	0.0	0	0.0
	Campbell	*	58.1	*	27.9	*	39.7	0	0.0	0	0.0
	Corson	*	39.4	0	0.0	*	28.4	0	0.0	0	0.0
	Dewey	*	43.3	4	97.8	0	0.0	0	0.0	0	0.0
	Gregory	0	0.0	4	53.9	*	24.2	*	11.9	0	0.0
	Haakon	0	0.0	*	33.7	0	0.0	0	0.0	0	0.0
	Hughes	*	11.9	6	23.7	*	12.3	*	15.1	0	0.0
	Hyde	0	0.0	*	70.7	0	0.0	0	0.0	0	0.0
	Jones	0	0.0	*	128.7	0	0.0	0	0.0	0	0.0
	Lyman	0	0.0	*	21.0	*	21.0	0	0.0	0	0.0
	Mellette	0	0.0	*	33.6	0	0.0	*	86.2	0	0.0
	Potter	0	0.0	*	18.6	0	0.0	*	14.8	0	0.0
	Stanley	*	41.1	*	44.1	0	0.0	0	0.0	0	0.0
	Sully	*	58.0	*	43.5	0	0.0	0	0.0	0	0.0
	Todd	0	0.0	*	48.6	0	0.0	*	31.4	0	0.0
	Tripp	0	0.0	*	20.4	*	9.3	*	19.5	0	0.0
	Walworth	*	10.5	4	39.8	0	0.0	*	17.7	0	0.0
Northeastern	Beadle	*	10.8	6	22.9	*	11.9	*	4.5	0	0.0
	Brown	*	3.5	18	33.1	8	17.5	*	5.3	*	1.8
	Clark	*	13.7	0	0.0	0	0.0	*	14.1	*	18.9
	Codington	5	12.0	11	28.4	*	8.3	7	18.1	*	2.3
	Day	*	6.9	*	23.0	0	0.0	*	7.7	0	0.0
	Deuel	0	0.0	0	0.0	*	12.6	0	0.0	0	0.0
	Edmunds	*	10.3	4	68.9	0	0.0	*	15.8	0	0.0
	Faulk	0	0.0	*	56.7	0	0.0	*	25.4	0	0.0
	Grant	*	14.4	8	69.2	*	14.6	*	26.1	0	0.0
	Hamlin	0	0.0	*	13.7	*	19.3	0	0.0	0	0.0
	Hand	*	14.0	*	50.2	0	0.0	*	17.4	0	0.0
	Kingsbury	0	0.0	5	50.5	0	0.0	*	22.8	0	0.0
	Marshall	*	23.0	6	66.8	0	0.0	0	0.0	*	17.4
	McPherson	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Roberts	*	7.7	6	41.3	0	0.0	*	13.4	0	0.0
	Spink	*	28.1	0	0.0	0	0.0	*	7.1	0	0.0

		Colorectal		Lung and Bronchus		Melanoma of the Skin		Female Breast		Prostate	
	County	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Southeastern	Aurora	*	18.4	*	21.5	*	18.4	0	0.0	0	0.0
	Bon Homme	4	30.0	5	58.2	*	36.5	*	13.0	*	28.3
	Brookings	5	15.0	11	33.7	0	0.0	0	0.0	5	35.2
	Charles Mix	*	18.3	4	31.9	0	0.0	0	0.0	0	0.0
	Clay	*	16.7	7	52.3	*	9.5	*	6.1	*	7.3
	Davison	*	8.1	7	21.2	*	3.3	*	9.8	0	0.0
	Douglas	*	17.5	*	62.5	0	0.0	0	0.0	0	0.0
	Hanson	0	0.0	4	129.9	0	0.0	*	62.0	0	0.0
	Hutchinson	*	8.8	0	0.0	0	0.0	5	33.6	0	0.0
	Jerauld	0	0.0	0	0.0	*	47.6	*	24.6	0	0.0
	Lake	*	14.1	11	63.4	*	3.8	*	7.2	0	0.0
	Lincoln	5	6.9	24	31.4	0	0.0	4	6.3	*	2.1
	McCook	*	13.0	0	0.0	*	14.8	*	13.0	0	0.0
	Miner	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Minnehaha	24	13.3	90	43.9	21	9.9	15	8.0	10	5.3
	Moody	*	11.5	*	19.1	*	10.9	*	13.8	0	0.0
	Sanborn	*	22.4	*	30.2	*	28.2	*	30.2	0	0.0
	Turner	0	0.0	*	18.6	*	17.2	*	6.2	0	0.0
	Union	*	8.5	6	22.7	5	26.5	*	5.2	0	0.0
	Yankton	*	9.1	10	27.0	*	2.2	0	0.0	0	0.0

Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry
* Data suppressed for less than 3 cases, these rates are considered unstable due to few observations and should be interpreted with caution

Table 7: Age-Adjusted Mortality Rates by Site, Sex, and Race, 2021 – South Dakota

	Total		Male		Female		White		American Indian	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total	1,740	154.8	946	184.7	794	132.2	1,618	154.2	86	200.1
Oral Cavity	28	2.4	20	3.4	8	1.5	27	2.5	1	2.1
Digestive System	479	42.7	274	51.9	205	34.1	444	42.6	24	58.2
Respiratory	404	35.0	233	43.7	171	28.4	377	35.1	19	32.6
Bones and Joints	4	0.4	3	0.7	1	0.1	3	0.4	1	1.1
Soft Tissue (Including Heart)	16	1.4	9	1.7	7	1.1	16	1.5	0	0.0
Skin	29	2.7	21	4.3	8	1.3	28	2.9	0	0.0
Female Breast	97	19.4			97	19.4	89	16.3	5	24.1
Female Genital System	70	6.6			70	6.6	59	5.9	11	22.3
Male Genital System	109	10.0	109	10.0			100	9.7	4	12.6
Urinary	105	9.7	68	14.3	37	6.2	96	9.4	6	12.9
Eye and Orbit	1	0.0	1	0.1	0	0.0	1	0.1	0	0.0
Brain and CNS	61	5.6	32	6.3	29	5.0	59	5.9	2	5.6
Endocrine	5	0.4	2	0.4	3	0.5	5	0.5	0	0.0
Lymphomas	63	5.7	33	5.2	30	6.2	62	5.9	1	3.8
Multiple Myeloma	30	2.6	18	3.7	12	1.8	29	2.7	0	0.0
Leukemia	83	7.3	46	9.4	37	5.7	80	7.7	1	1.1

Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

Selected Cancer Sites: Incidence and Mortality

This section covers the following cancers: bladder, cervical, colorectal, female breast, kidney and renal pelvis, leukemia, lung and bronchus, melanoma of the skin, non-Hodgkin's lymphoma, pancreas, and prostate.

These cancers were selected because of their high risk ranking in the cancer sites reported as well as the importance and impact on society.

Topics for each cancer include incidence and mortality data along with age-adjusted rates, trends, comparison with national data, risks associated factors and prevention.

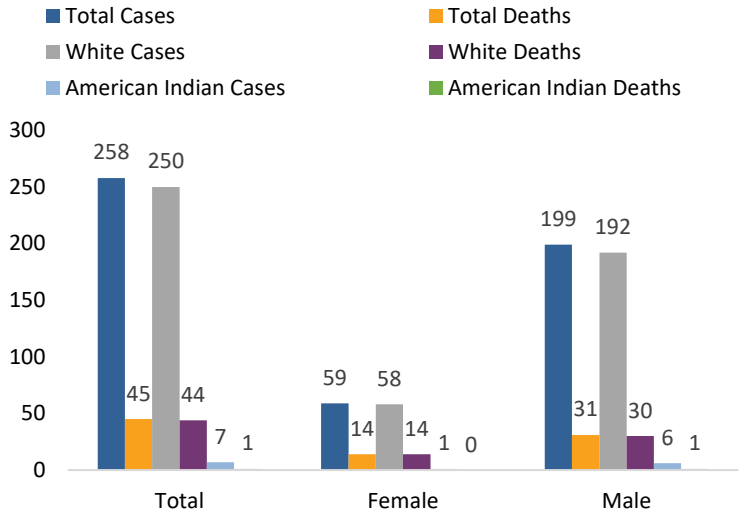
Bladder

Table 8: Bladder Cancer Incidence and Mortality Rates, 2021

Bladder Cancer Age-Adjusted Rates		Incidence			Mortality		
		Total	Female	Male	Total	Female	Male
South Dakota	**Total**	22.6	9.8	37.5	4.2	2.4	6.7
	White	23.6	10.5	38.6	4.4	2.6	7.0
	American Indian	15.5	2.6	31.6	1.6	0.0	3.7
United States	**Total**	18.1	7.8	31.2	4.1	2.0	7.0
	White	20.6	8.7	35.1	4.6	2.2	7.9
	American Indian	10.8	5.0	17.9	***	***	***

Source: South Dakota Cancer Registry and United States Cancer Statistics
*** Data not available, for more information visit the CDC United States Cancer Statistics website.

Figure 7: Bladder Cancer Case and Death Counts, 2021



Descriptive Epidemiology

Stage at Diagnosis: Bladder cancer is categorized as noninvasive and invasive. There were 142 (55%) noninvasive cancers reported, and 111 (43%) invasive cases reported in 2021. Nationally, 47.9% of the cases of urinary bladder cancer were diagnosed at the *in situ* stage. In South Dakota, 17% of the cases were not diagnosed until the disease had spread to distant sites.

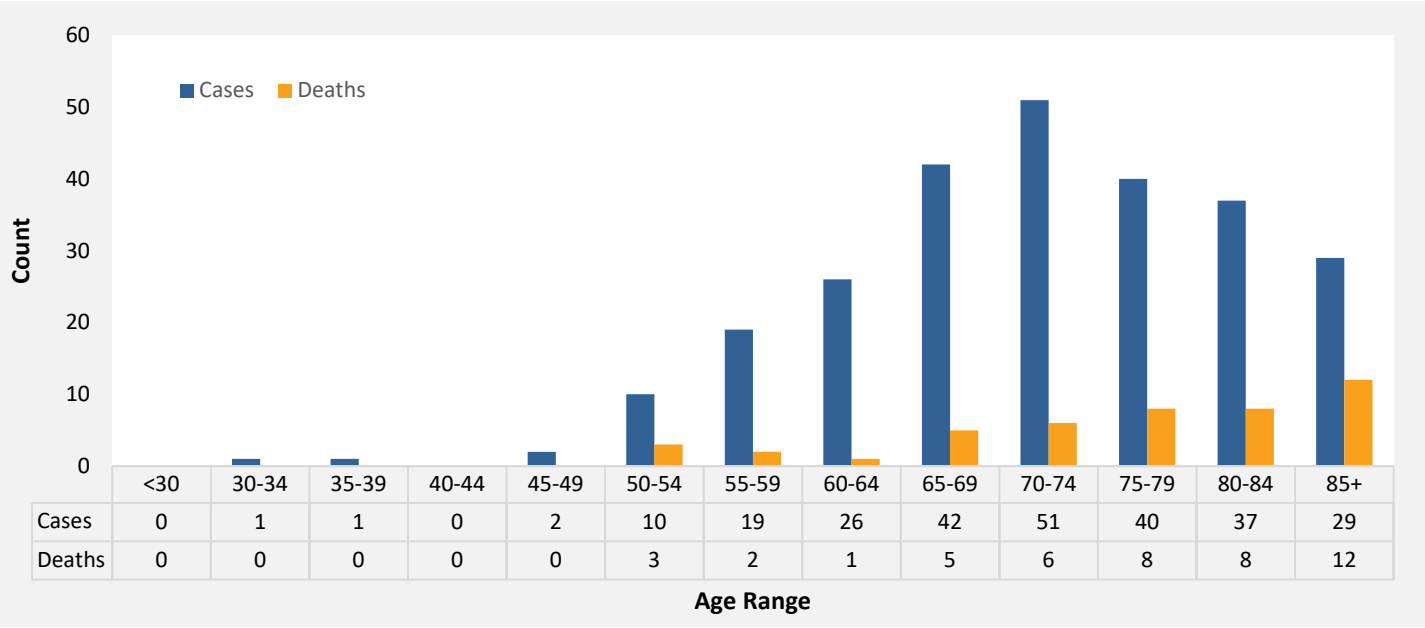
Incidence: In 2021, there were 79,510 cases of bladder would be diagnosed in the United States. There were 258 cases of bladder cancer reported in South Dakota. There were 199 males, and 59 females diagnosed in 2021. Statistically, males were diagnosed about four times as often as females. There were 7 American Indian cases diagnosed in 2021. In the United States, it was the seventh most frequent cancer. In South Dakota, it was the sixth most diagnosed cancer.

Mortality: Advances in intravesical therapy and in the treatment of advanced disease have reduced the percentage of mortality from bladder cancer. In South Dakota, those aged 85 and older have the highest mortality rate. In 2021, the South Dakota and U.S. mortality rate was 4.2 and 4.1 respectively.

Risk and Associated Factors: Tobacco use increases the risk of bladder cancer by two times that of someone who does not use tobacco. Work exposure to certain chemicals also increases the risk. Those with the highest risk are makers of rubber, leather, textiles, paint products, and printing compounds. Most risk factors do not directly cause the cancer but increase the chance of damage to DNA in the cells that can lead to bladder cancer.

Prevention and Early Detection: Using protective measures when handling chemicals and avoiding the use of tobacco are two of the most common recommendations for prevention. Getting screened for bladder cancer is also recommended for early detection.

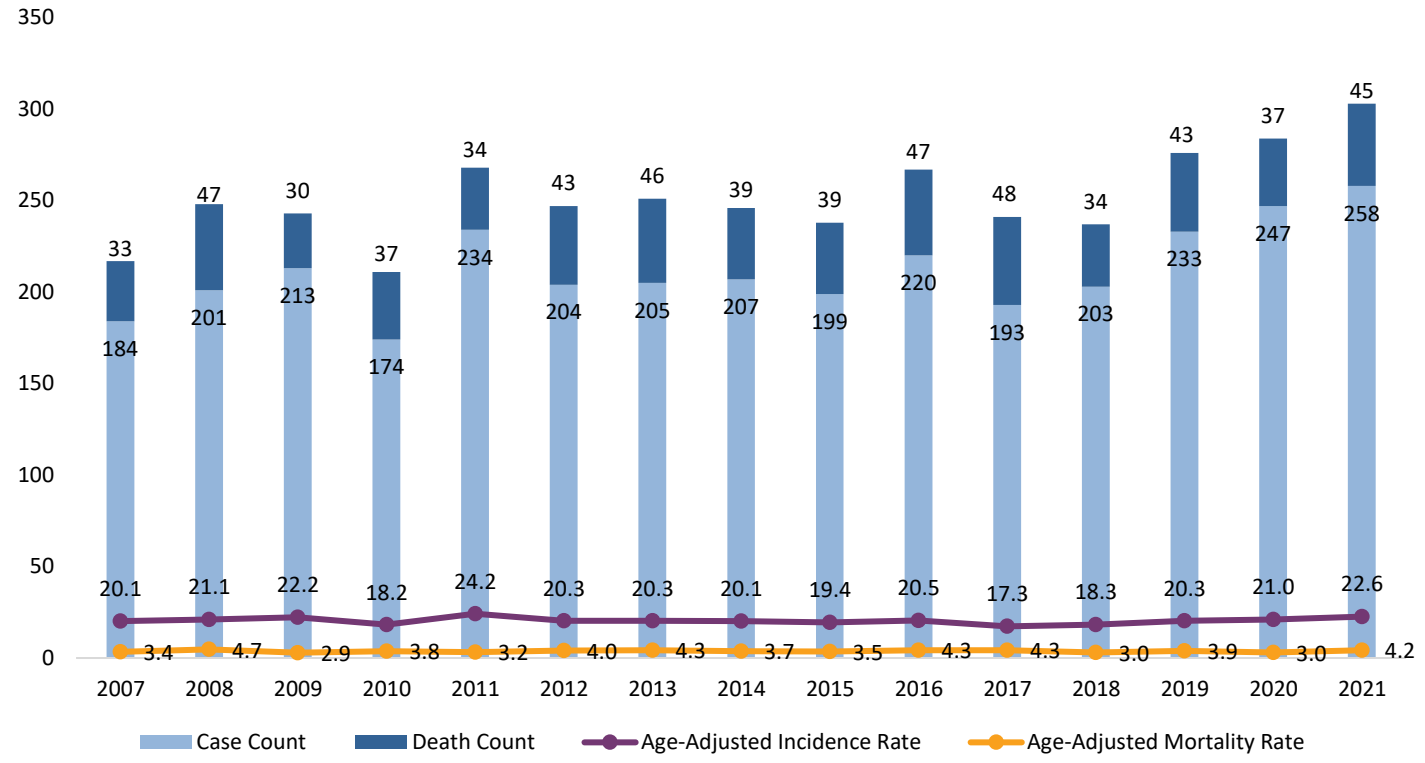
Figure 8: Bladder Cancer Number of Cases and Deaths by Age, South Dakota, 2021



	<30	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	0	1	1	0	2	10	19	26	42	51	40	37	29
Deaths	0	0	0	0	0	3	2	1	5	6	8	8	12

Source: South Dakota Cancer Registry

Figure 9: Bladder Cancer Case and Death Counts and Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

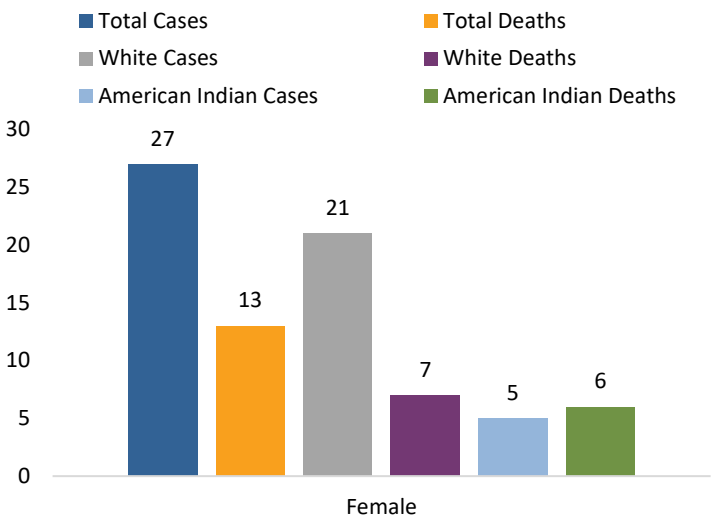
Cervical

Table 9: Cervical Cancer Incidence and Mortality Rates, 2021

Cervical Cancer Age-Adjusted Rates		Incidence	Mortality
		Female	Female
South Dakota	Total	5.8	3.1
	White	5.3	2.0
	American Indian	18.3	20.8
United States	Total	7.4	2.1
	White	6.8	2.0
	American Indian	10.9	***

Source: South Dakota Cancer Registry and United States Cancer Statistics
*** Data not available, for more information visit the CDC United States Cancer Statistics website.

Figure 10: Cervical Cancer Case and Death Counts, 2021



Descriptive Epidemiology

Stage at Diagnosis: An early stage of diagnosis provides the best opportunity for a cure. In South Dakota, 19% of the cases were diagnosed at a localized stage. The United States Cancer Statistics (USCS) reports 42.4% of cases diagnosed nationally were at localized stage, 35.8 % were regional and 15.3% were diagnosed at a distant stage.

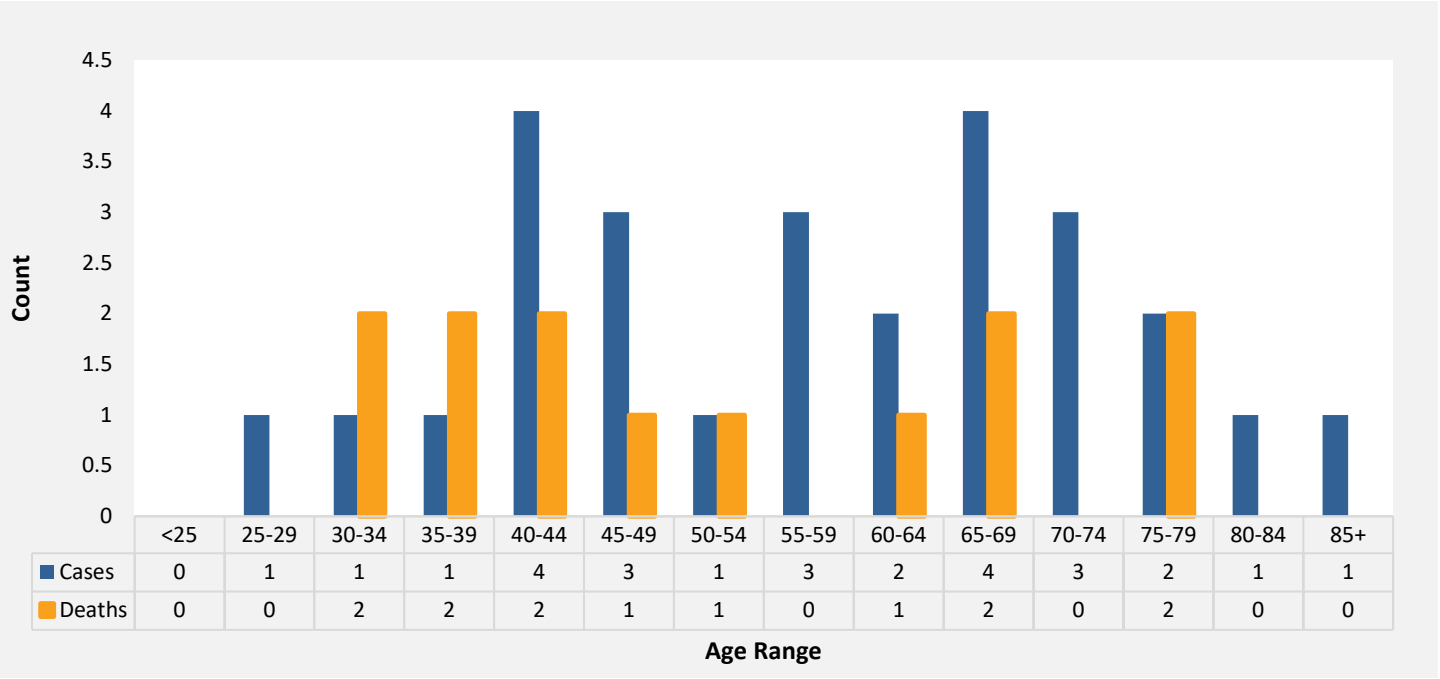
Incidence: In 2021, the incidence rate in South Dakota was 5.8 and the United States rate was 7.4. According to the USCS, there were 13,111 cases of invasive cervical cancer diagnosed in the United States in 2021. Studies have suggested that recent declines in the incidence among young women may be associated with an increase in Human Papillomavirus (HPV) vaccination.

Mortality: In 2021, the mortality rate in South Dakota was 3.1 for cancer of the cervix uteri. The United States rate was 2.1. Cases diagnosed at a localized stage had a 90.4% five-year survival rate according to the United States Cancer Statistics. Nationally, when diagnosed at a distant stage, the percentage of survival drops to 20.3% at five years.

Risk and Associated Factors: Almost all cervical cancers are caused by HPV. Most people will get HPV at some point in their lives. Additionally, having a weakened immune system, smoking, or inhaling secondhand smoke can increase the risk of cervix uteri cancer.

Prevention and Early Detection: It is recommended that females ages 21-65 are screened regularly through HPV and Pap tests to allow for early detection. Additionally, receiving the HPV vaccination and wearing condoms when sexually active can decrease the chances of HPV transmission. The HPV vaccine protects against the types of HPV that most often cause cervical, vaginal, and vulvar cancers. Vaccination is recommended for boys and girls ages 11 to 12 years but can be given at age 9 through 26. In 2022, 72.8% of females ages 21-65 in South Dakota had a cervical cancer screening test within the last 1-5 years. A cervical cancer screening test is a Pap test and/or an HPV test.

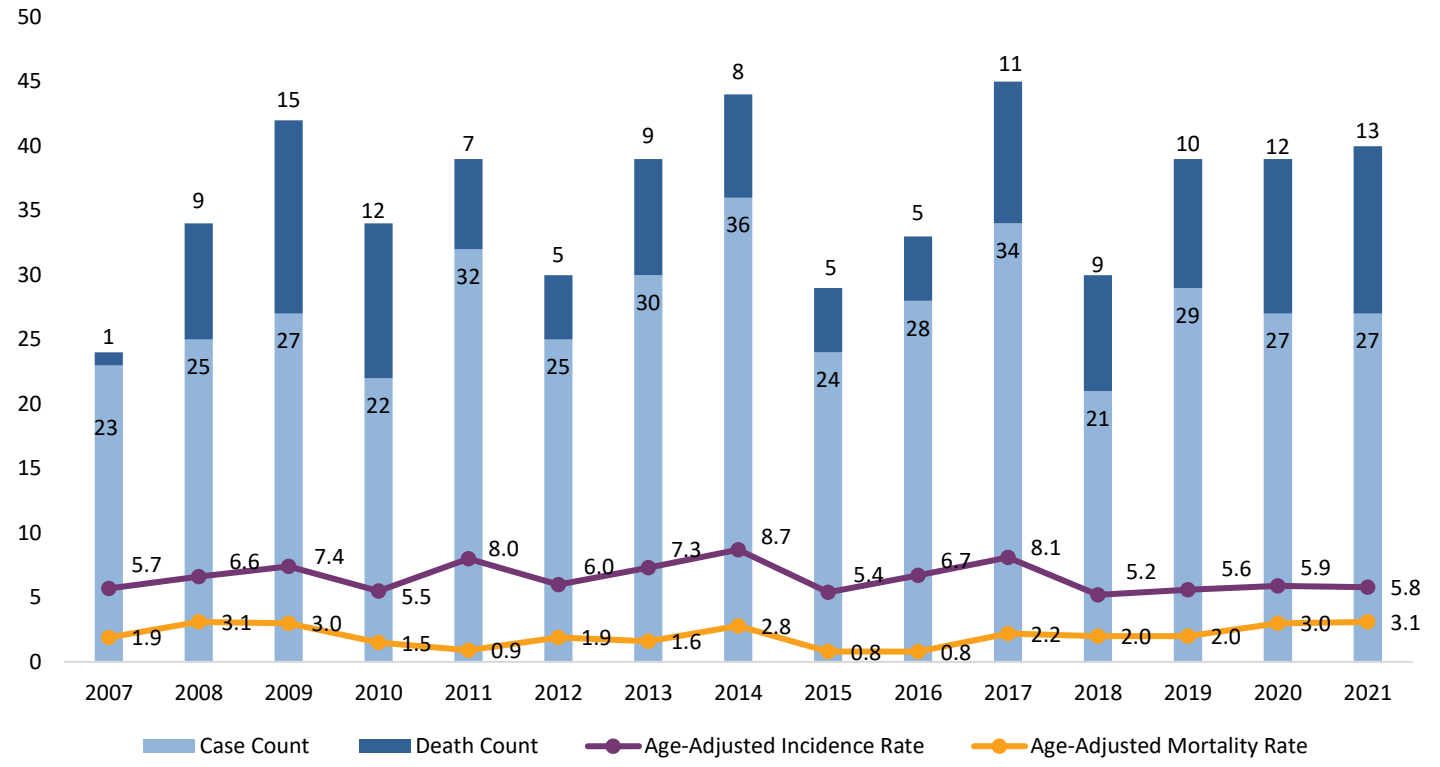
Figure 11: Cervical Cancer Number of Cases and Deaths by Age, South Dakota, 2021



	<25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	0	1	1	1	4	3	1	3	2	4	3	2	1	1
Deaths	0	0	2	2	2	1	1	0	1	2	0	2	0	0

Source: South Dakota Cancer Registry

Figure 12: Cervical Cancer Case and Death Counts and Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

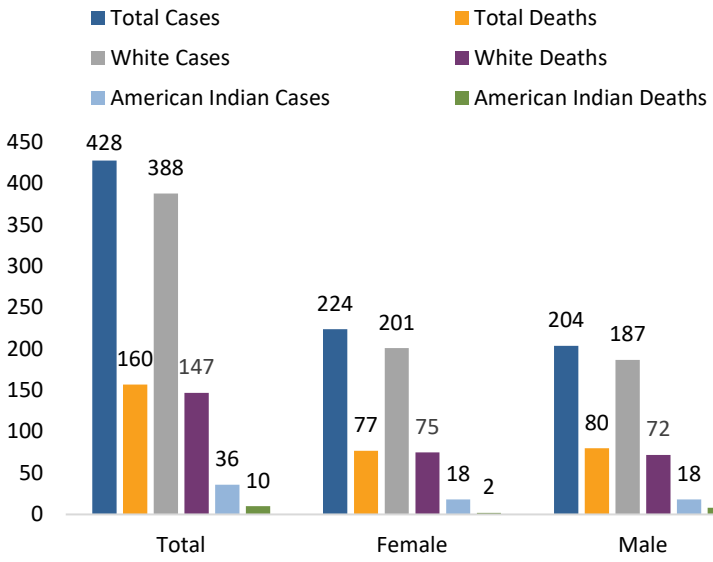
Colorectal

Table 10: Colorectal Incidence and Mortality Summary, 2021

Colorectal Cancer Age-Adjusted Rates		Incidence			Mortality		
		Total	Female	Male	Total	Female	Male
South Dakota	**Total**	40.6	40.2	40.9	14.1	12.7	15.3
	White	41.0	40.3	41.7	14.3	13.4	14.4
	American Indian	65.9	59.6	71.4	16.9	6.5	28.7
United States	**Total**	36.0	32.0	40.7	12.6	10.6	15.0
	White	36.0	32.0	40.5	12.8	10.8	15.1
	American Indian	43.3	39.1	47.8	12.8	10.9	14.8

Source: South Dakota Cancer Registry and United States Cancer Statistics

Figure 13: Colorectal Cancer Case and Death Counts, 2021



Descriptive Epidemiology

Stage at Diagnosis: The prognosis of a patient is greatly influenced by the stage of disease at diagnosis. In 2021, 31% of the cases of colorectal cancer were diagnosed at a localized stage. The remaining 279 cases were diagnosed after the disease had spread beyond the colon. From 2017-2021, the five-year survival rate for those diagnosed at a distant stage was 17.7%.

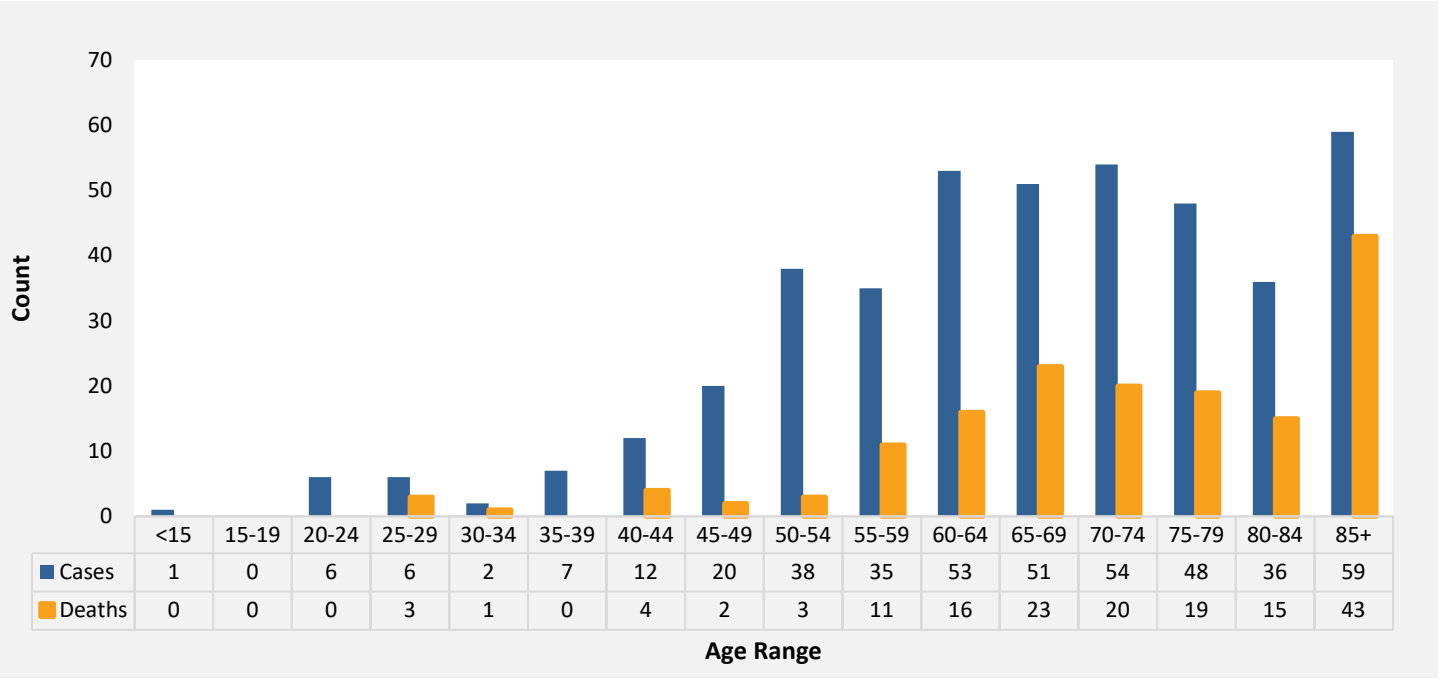
Incidence: Colorectal cancer accounted for 8% of all cases reported in South Dakota in 2021. The median age at diagnosis was 68. There were 204 males, and 224 females diagnosed with colorectal cancer in 2021. Overall, colorectal cancer was the fourth most diagnosed cancer. When reviewed by sex, it was the third most diagnosed cancer for both sexes with 48% of cases for males and 52% cases for females.

Mortality: The overall five-year survival rate from 2017-2021 was 63% for males and 66% for females in the United States. In 2021, there were a total of 160 deaths that attributed to colorectal cancer in South Dakota; 82 males and 78 females. Of that number, 150 were White and 10 were American Indian. The median age of death was 74.

Risk and Associated Factors: The risk of colorectal cancer increases with age. Over 87% of cases occur in people who are 50 years or older. There has been a recent trend showing an increase in development at younger ages, primarily in 20-to 40-year-olds. Risk factors for colorectal cancer include a family history of the disease, lack of regular physical activity, a poor diet, being overweight and obesity, alcohol consumption, and tobacco use.

Prevention and Early Detection: The U.S. Preventative Services Task Force (USPSTF) recommends screening for colorectal cancer starting at age 45 and continuing until age 75. In 2022, 65.5% of South Dakotans ages 45-75 were up to date with the recommended colorectal cancer screening guidelines set by the USPSTF. These guidelines became effective in 2021, and included either a colonoscopy every 10 years, a CT colonography every 5 years, a sigmoidoscopy every 5 years, a sigmoidoscopy every 10 years with an annual FIT, or a FIT or other stool-based test every 1-3 years.

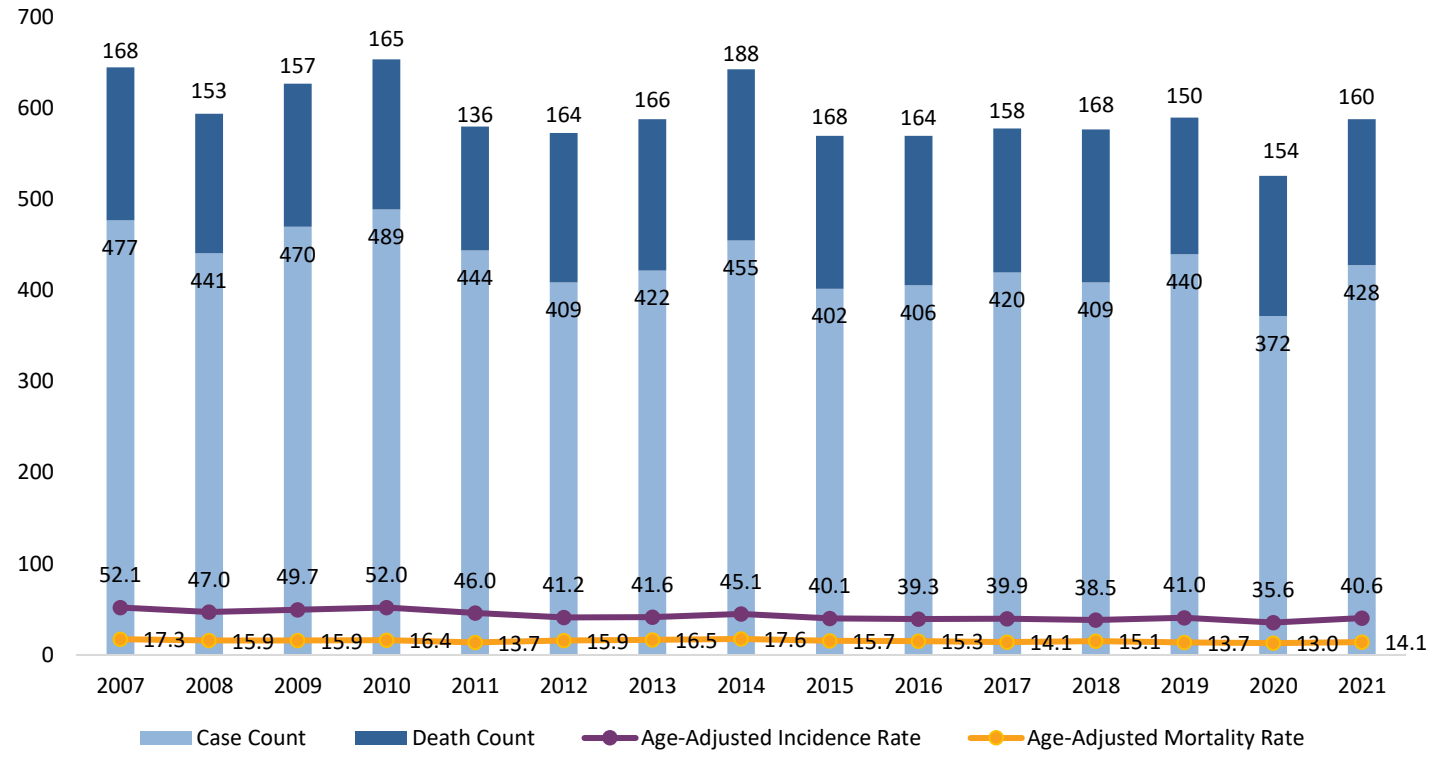
Figure 14: Colorectal Cancer Number of Cases and Deaths by Age, South Dakota, 2021



	<15	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	1	0	6	6	2	7	12	20	38	35	53	51	54	48	36	59
Deaths	0	0	0	3	1	0	4	2	3	11	16	23	20	19	15	43

Source: South Dakota Cancer Registry

Figure 15: Colorectal Cancer Case and Death Counts by Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

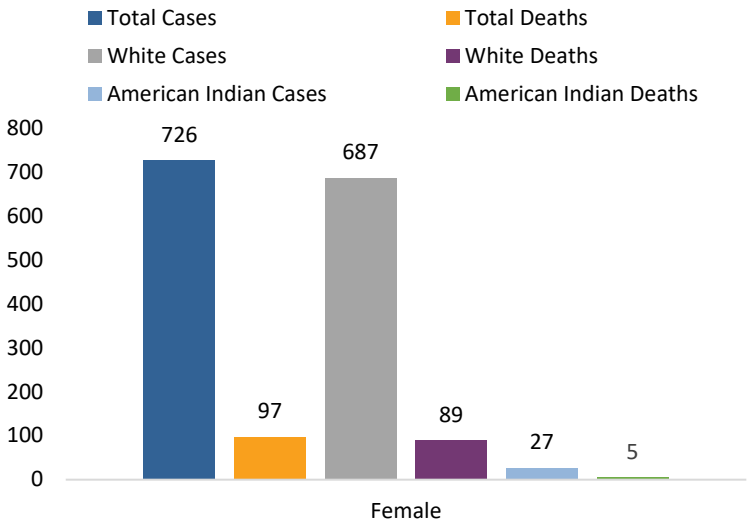
Female Breast

Table 11: Female Breast Cancer Incidence and Mortality summary, 2021

Female Breast Cancer Age-Adjusted Rates		Incidence	Mortality
		Female	Female
South Dakota	Total	69.8	16.6
	White	74.0	16.3
	American Indian	48.8	24.1
United States	Total	133.8	7.4
	White	139.2	6.8
	American Indian	117.2	10.9

Source: South Dakota Cancer Registry and United States Cancer Statistics

Figure 16: Female Breast Cancer Case and Death Counts, 2021



Descriptive Epidemiology

Stage at Diagnosis: Including *in situ* female breast cancer cases there were 862 cases diagnosed in 2021, of which 498 cases were diagnosed at a localized stage. This represents 58% of all reported breast cancer cases. *In situ* breast cancers were excluded from the incidence rates. There were 228 cases that metastasized beyond the breast. Advanced-stage breast cancers often metastasized typically to the bones, liver, and lung.

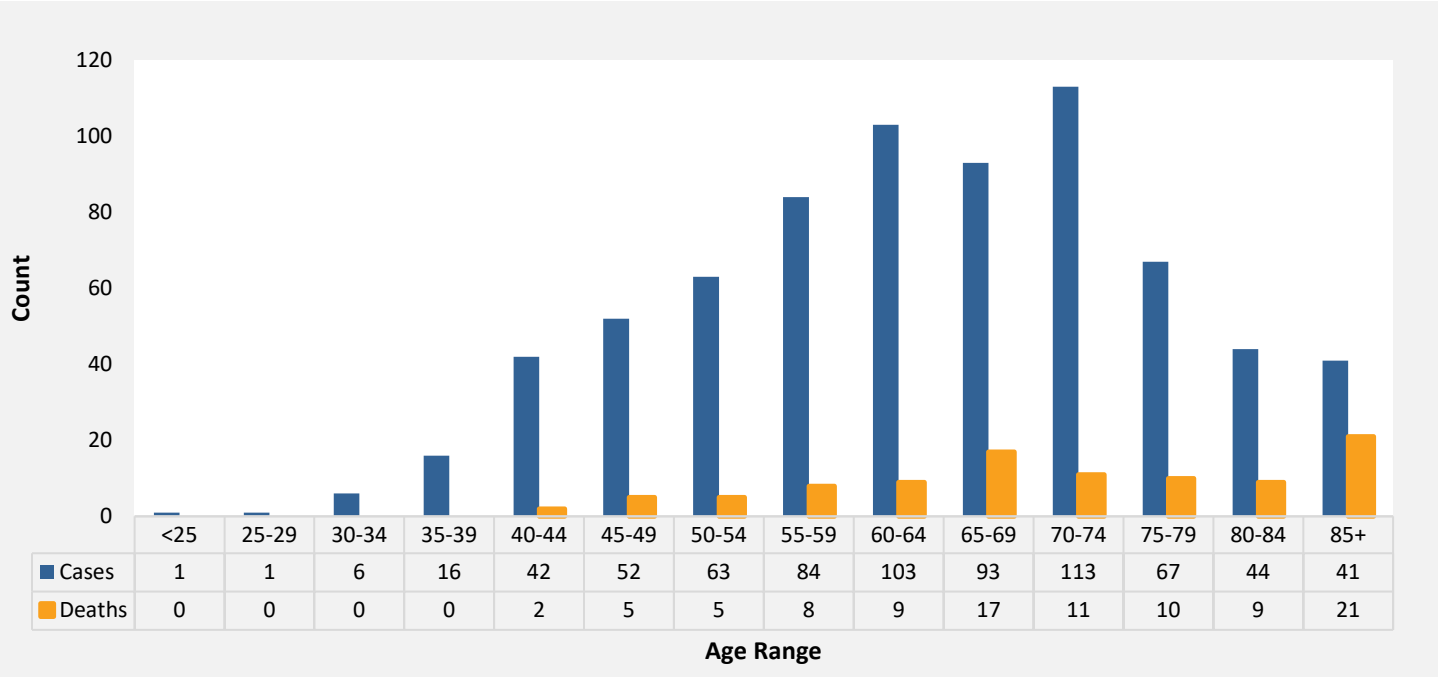
Incidence: Nationally, breast cancer is the most common malignant tumor among females. South Dakota had 726 invasive female breast cancers reported in 2021. These cases represented 29% of all cancer cases in women reported in 2021 versus 31% nationally.

Mortality: Breast cancer is the fifth leading cause of death attributed to cancer in South Dakota. Nationwide, breast cancer mortality peaked in 1999 and has been decreasing since. In cancers only of females, it is the second leading cause of cancer deaths in South Dakota. Although mortality has increased among females older than 55 years, it has decreased among those who are younger. In 2021, there were 97 deaths. Of those deaths, 89 were White and 5 were American Indian.

Risk and Associated Factors: Studies have shown that the risk of breast cancer is due to a combination of factors. Most breast cancers are found in females who are 50 years or older. Unchangeable risk factors include age, mutations of the BRCA1 and BRCA2 genes, a family history of breast or ovarian cancer. Risk factors that can be changed include lack of physical activity, alcohol consumption, obesity, and taking hormone replacement therapies or birth control pills.

Prevention and Early Detection: Prevention and early detection are key to the survival of breast cancer. Breast cancers found during mammograms are more likely to be smaller and still confined to the breast. It is recommended that females aged 40-75 get a mammogram every 2 years. In 2022, 72.8% of South Dakotan females between the ages 50-74 were up to date with the recommended breast cancer screening guidelines set by the USPSTF. Implemented in 2009 and affirmed in 2016, these guidelines included a biennial mammogram for females ages 50-74.

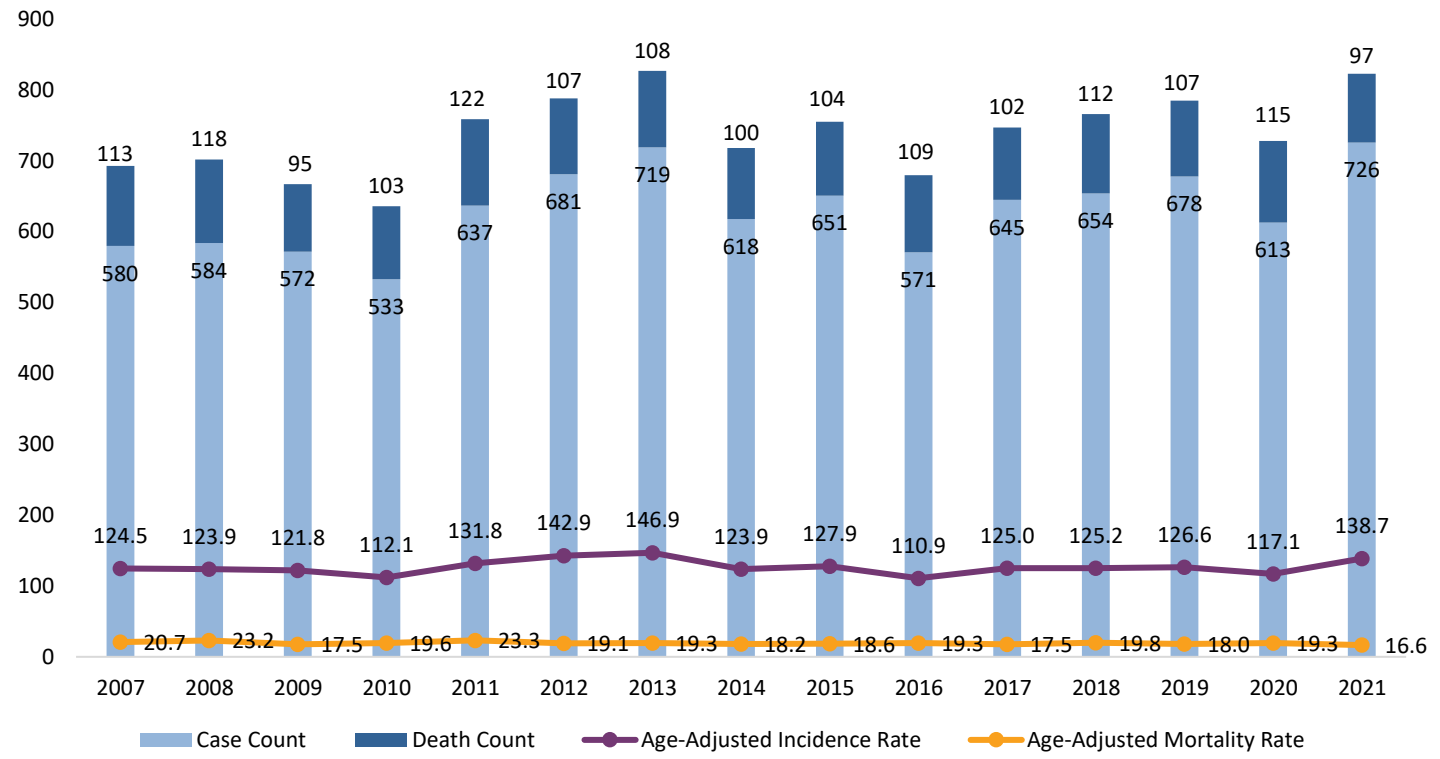
Figure 17: Female Breast Cancer Number of Cases and Deaths by Age, South Dakota, 2021



	<25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	1	1	6	16	42	52	63	84	103	93	113	67	44	41
Deaths	0	0	0	0	2	5	5	8	9	17	11	10	9	21

Source: South Dakota Cancer Registry

Figure 18: Female Breast Cancer Case and Death Counts by Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

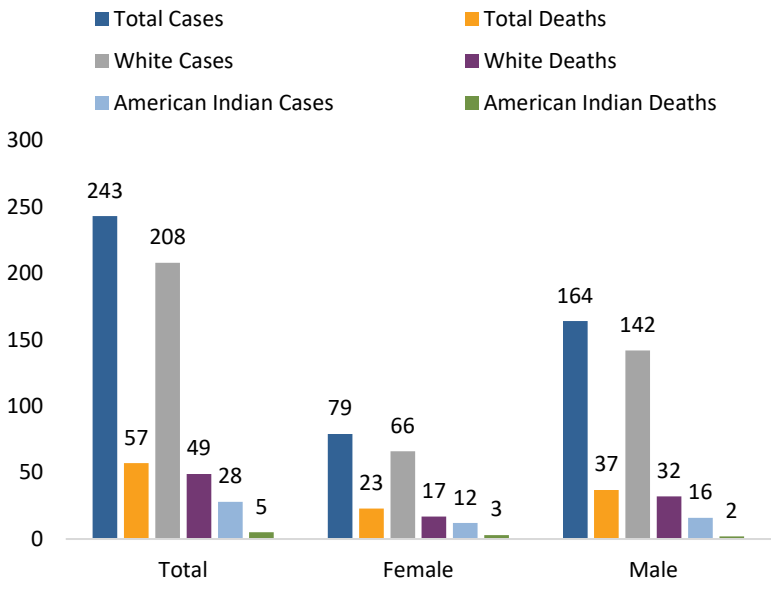
Kidney and Renal Pelvis

Table 12: Kidney Cancer Incidence and Mortality Summary, 2021

Kidney and Renal Pelvis Cancer Age-Adjusted Rates		Incidence			Mortality		
		Total	Female	Male	Total	Female	Male
South Dakota	**Total**	23.2	14.0	32.7	5.3	3.8	7.6
	White	22.0	13.1	31.0	4.7	3.0	6.7
	American Indian	54.0	36.6	81.8	11.2	11.0	11.5
United States	**Total**	17.0	11.8	22.9	3.4	2.1	5.0
	White	17.2	11.8	23.3	3.5	2.2	5.2
	American Indian	26.4	18.6	35.5	4.7	**	6.8

Source: South Dakota Cancer Registry and United States Cancer Statistics
** Data not available, for more information visit the CDC United States Cancer Statistics website.

Figure 19: Kidney and Renal Pelvis Cancer Case and Death Counts, 2021



Descriptive Epidemiology

Stage at Diagnosis: As with all malignancies, early diagnosis is the key to a better prognosis and possible cure. In 2021, 66% of all cases were diagnosed at a localized stage, another 16% stage was diagnosed at a distant stage. As with other cancers, renal cancers can spread through the bloodstream and/or lymphatic system.

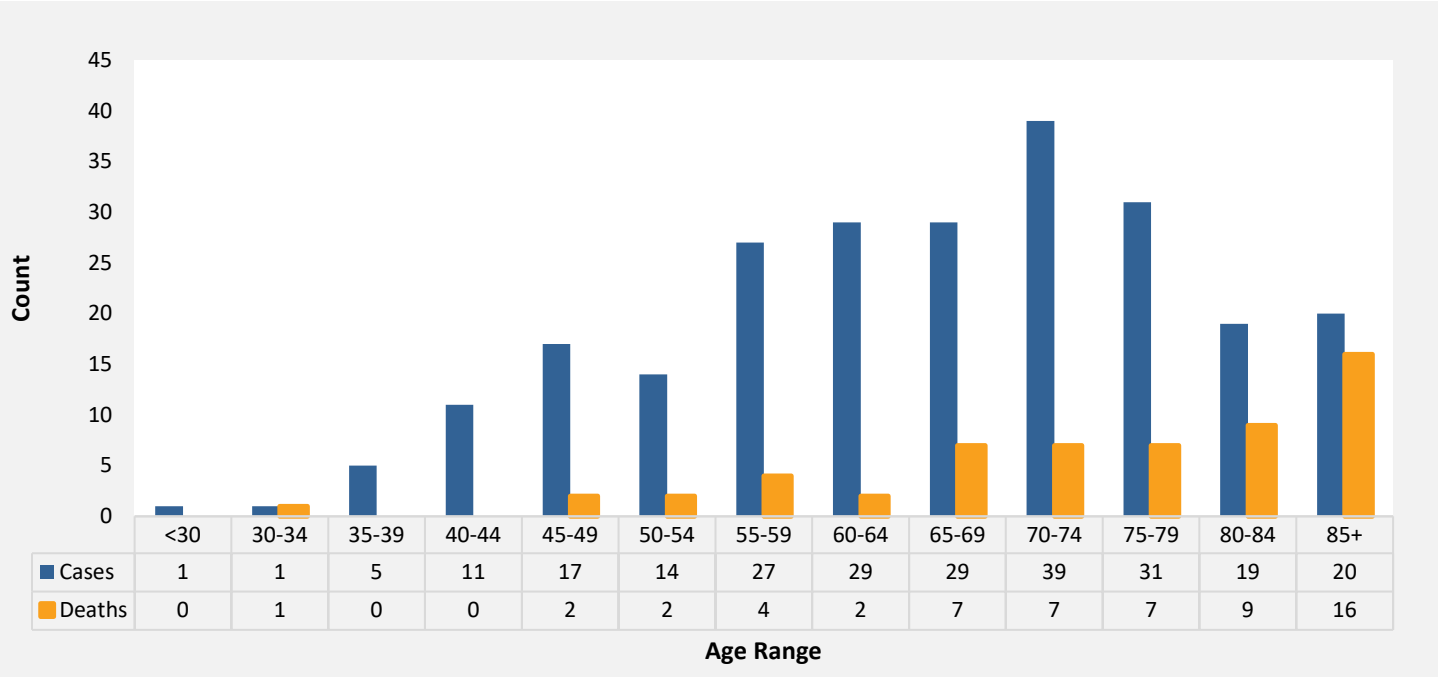
Incidence: In 2021, there were 72,402 new cases of kidney cancer in the United States according to the USCS. This accounts for 4% of all reported malignancies in the United States. In South Dakota, there were 243 cases of kidney cancer in 2021. This represents 5% of all cancer cases with an age-adjusted rate of 23.2 per 100,000 persons in South Dakota. The median age at diagnosis was 67.

Mortality: Kidney cancer was the tenth leading cause of cancer death in South Dakota in 2021. The South Dakota median age of death was 78. Survival rates associated with kidney cancer depend on how far the disease has progressed and the size of the tumor. The 2017-2021 five-year survival rate for localized stage kidney cancer is 91.2% and 18.4% for distant stage.

Risk and Associated Factors: The use of tobacco increases the risk of developing kidney cancer, with a higher risk associated with greater use. Additionally, being overweight or obese, taking pain medication for extended periods of time, chronic Hepatitis C infection, or being exposed to chemicals increases the risk.

Prevention and Early Detection: To prevent kidney cancer, avoid tobacco use, maintain a healthy weight and diet, exercise, and take precautions when using chemicals, especially those who work with metal. It is difficult to diagnose kidney cancer until it becomes symptomatic. Symptoms include blood in the urine, a lump or swelling in the kidney area, fatigue, an increase in appetite, weight loss without known cause, and lower back pain or side pain that doesn't go away.

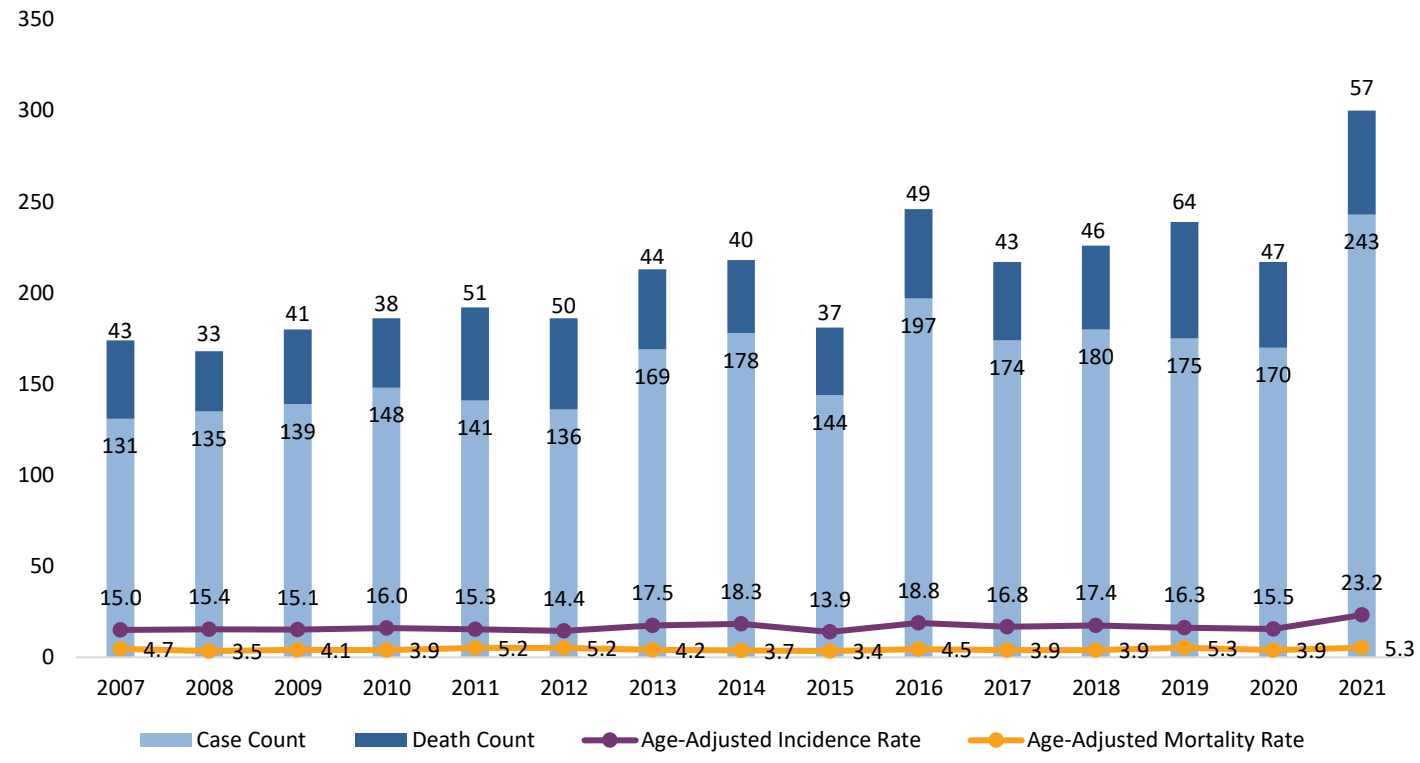
Figure 20: Kidney and Renal Pelvis Cancer Number of Cases and Deaths by Age, South Dakota, 2021



	<30	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	1	1	5	11	17	14	27	29	29	39	31	19	20
Deaths	0	1	0	0	2	2	4	2	7	7	7	9	16

Source: South Dakota Cancer Registry

Figure 21: Kidney and Renal Pelvis Cancer Case and Death Counts by Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

Leukemia

Table 13: Leukemia Incidence and Mortality Summary, 2021

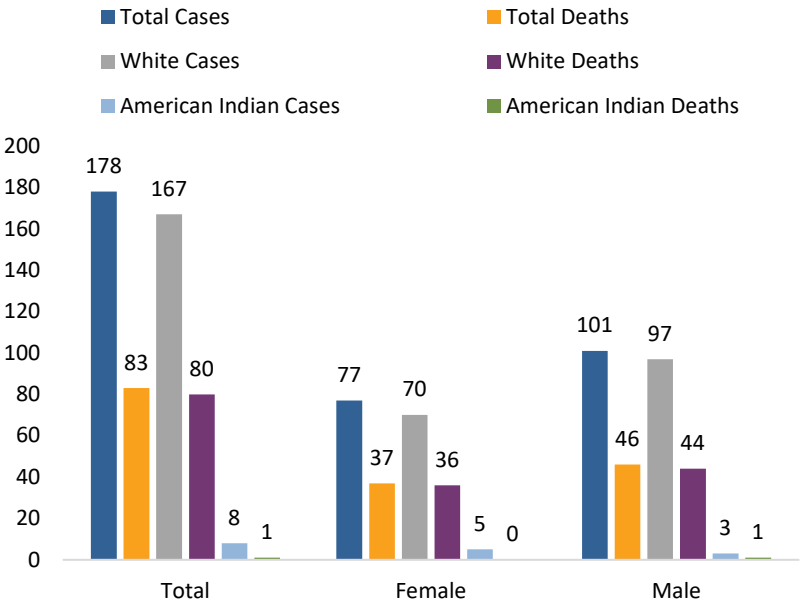
Leukemia Cancer Age-Adjusted Rates		Incidence			Mortality		
		Total	Female	Male	Total	Female	Male
South Dakota	**Total**	15.8	13.6	18.3	7.3	5.7	9.4
	White	16.3	14.0	19.1	7.7	6.1	9.6
	American Indian	15.7	18.3	11.2	1.1	0.0	2.2
United States	**Total**	13.6	10.7	17.1	5.7	4.3	7.5
	White	14.4	11.2	18.2	6.1	4.6	8.1
	American Indian	11.1	9.3	13.5	**	**	**

Source: South Dakota Cancer Registry and United States Cancer Statistics

** Data not available, for more information visit the CDC United States Cancer Statistics website.

Figure 22: Leukemia Cancer Case and Death Counts, 2021

Descriptive Epidemiology



Stage at Diagnosis: Leukemia is a type of cancer of the blood. Leukemias are not staged because they may involve bone marrow throughout the body. Physicians classify them by type and subtype to determine the prognosis and recommended level of treatment. It is defined by how quickly the disease progresses. Leukemia is either chronic (disease progresses slowly) or acute (progresses quickly).

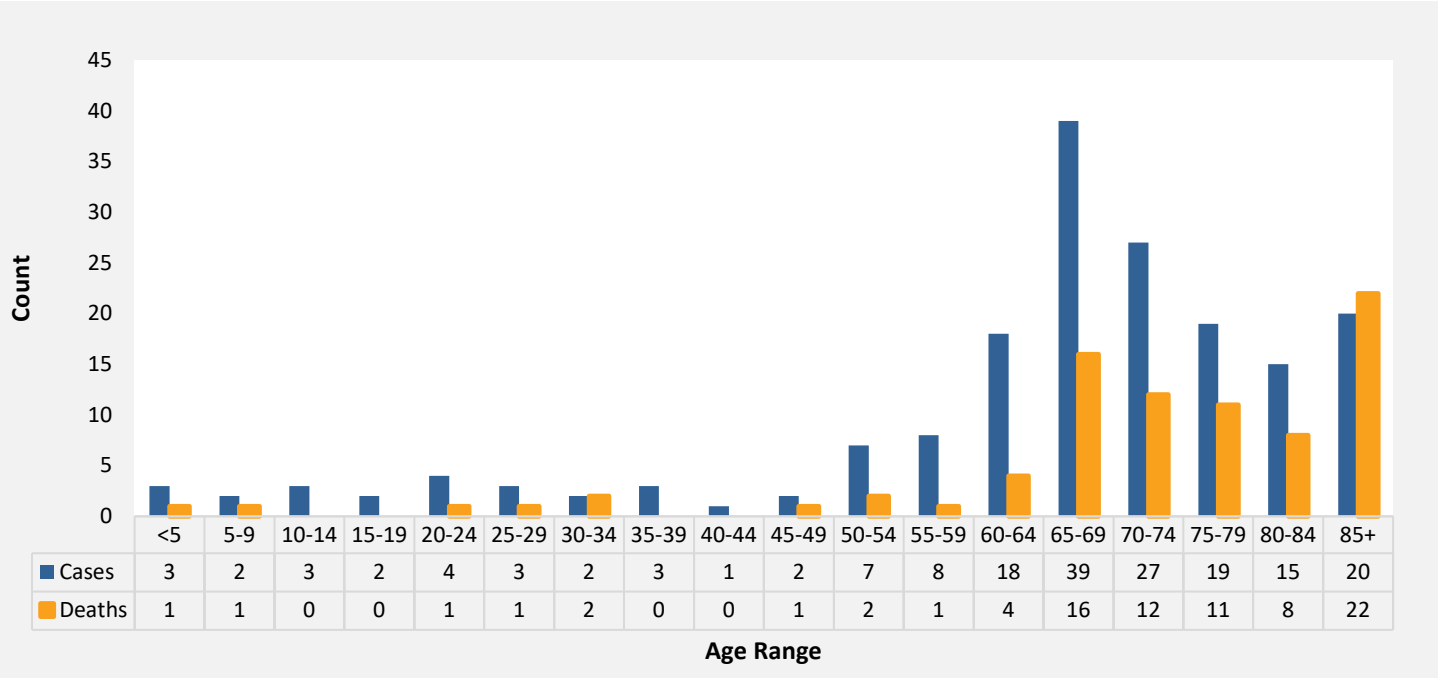
Incidence: Leukemias are a diverse group of cancers and are subtyped by tissue structure. Subtypes have different causes, treatment, and prognosis. Leukemias accounted for 3% of cancers reported in 2021 in South Dakota. According to the USCS, there were 56,789 leukemia cases nationwide.

Mortality: Leukemia accounted for 8% of all cancer deaths in South Dakota in 2021. Acute myeloid leukemia was the most frequent cause of leukemia deaths. About 83% of the deaths associated with leukemia occurred at ages 65 or older.

Risk and Associated Factors: Risk factors for chronic leukemia include high levels of radiation exposure, exposure to chemicals, especially benzene (found in cigarette smoke, cleaning products, and paint strippers), having genetic syndromes such as Down Syndrome. Chronic leukemia is also more commonly found in those over the age of 50. The risk factors for acute leukemia match that of chronic leukemia.

Prevention and Early Detection: There are very few ways to prevent or detect leukemia in the early stages, however, taking caution when interacting with chemicals as well as avoiding tobacco use can help decrease the risk factors.

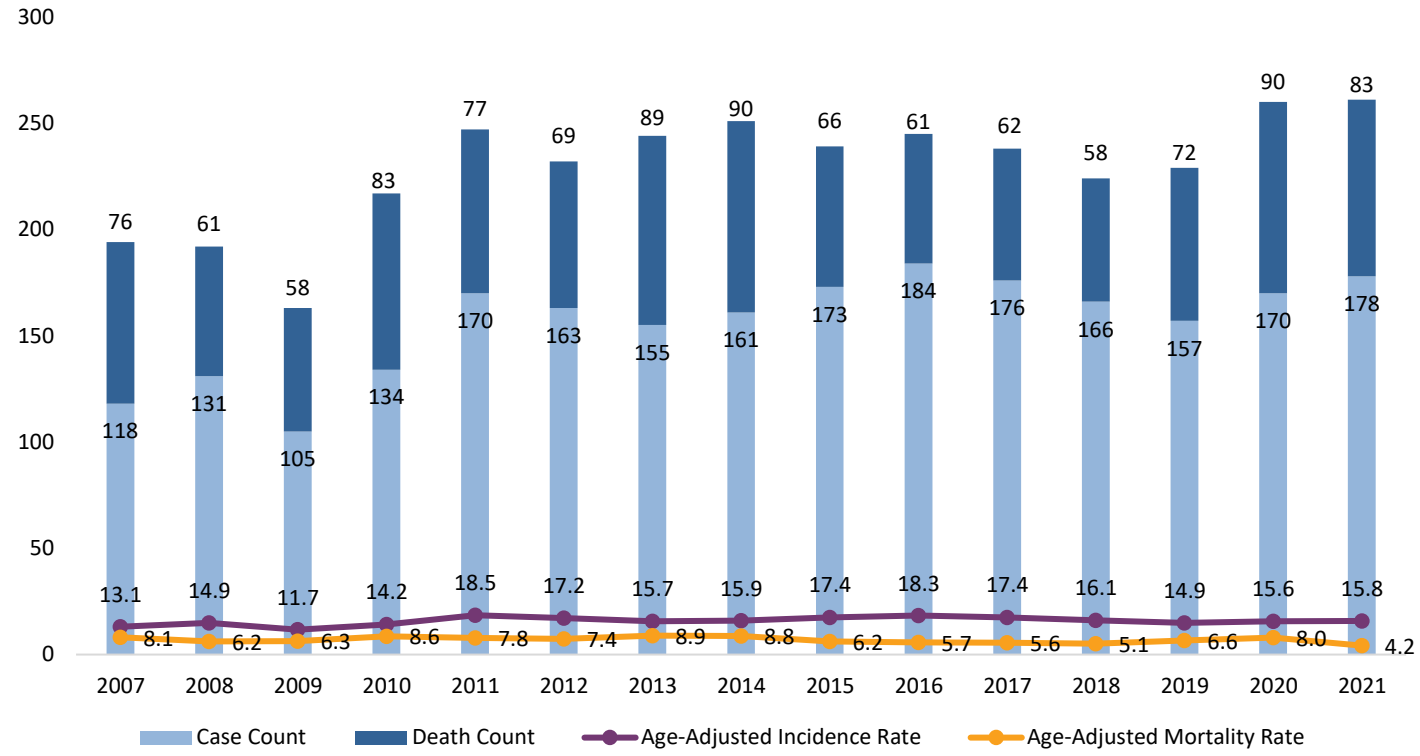
Figure 23: Leukemia Number of Cases and Deaths by Age, South Dakota, 2021



	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	3	2	3	2	4	3	2	3	1	2	7	8	18	39	27	19	15	20
Deaths	1	1	0	0	1	1	2	0	0	1	2	1	4	16	12	11	8	22

Source: South Dakota Cancer Registry

Figure 24: Leukemia Cancer Case and Death Counts by Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

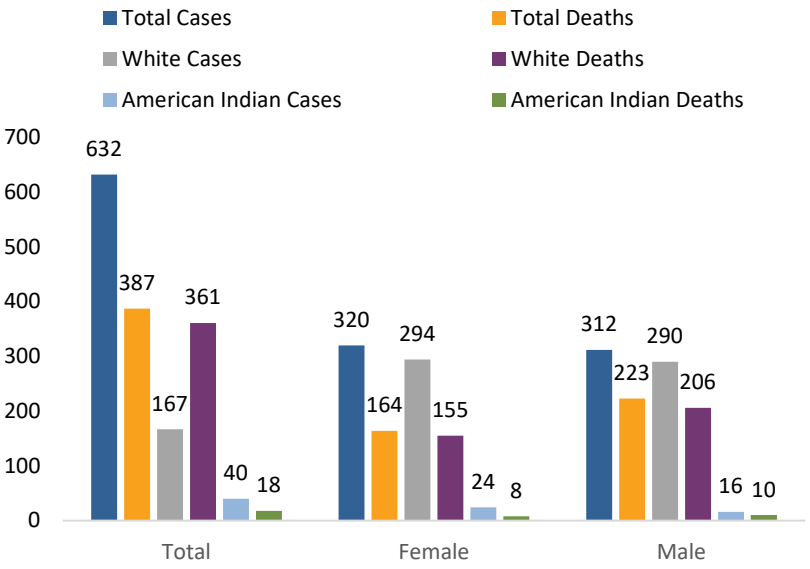
Lung and Bronchus

Table 14: Lung Incidence and Mortality Summary, 2021

Lung and Bronchus Cancer Age-Adjusted Rates		Incidence			Mortality		
		Total	Female	Male	Total	Female	Male
South Dakota	**Total**	54.5	53.5	56.6	33.7	27.4	42.0
	White	54.3	53.1	56.8	33.7	27.8	41.7
	American Indian	93.0	99.7	86.5	41.0	36.7	43.9
United States	**Total**	49.1	45.5	54.1	29.9	25.9	35.2
	White	53.2	50.4	57.0	32.9	29.2	37.2
	American Indian	51.8	52.4	51.5	24.6	25.2	24.0

Source: South Dakota Cancer Registry and United States Cancer Statistics

Figure 25: Lung Cancer Case and Death Counts, 2021



Descriptive Epidemiology

Stage at Diagnosis: In 2021, 30% of lung cancer patients were diagnosed at localized stage. The more advanced stage, the poorer the prognosis. In 2021, 435 cases were diagnosed when the disease had progressed beyond the lung and metastasized to a distant location. Approximately, 69% of cases were diagnosed after the disease had progressed beyond the lung to lymph nodes, regional areas, or distant sites such as the brain or bone.

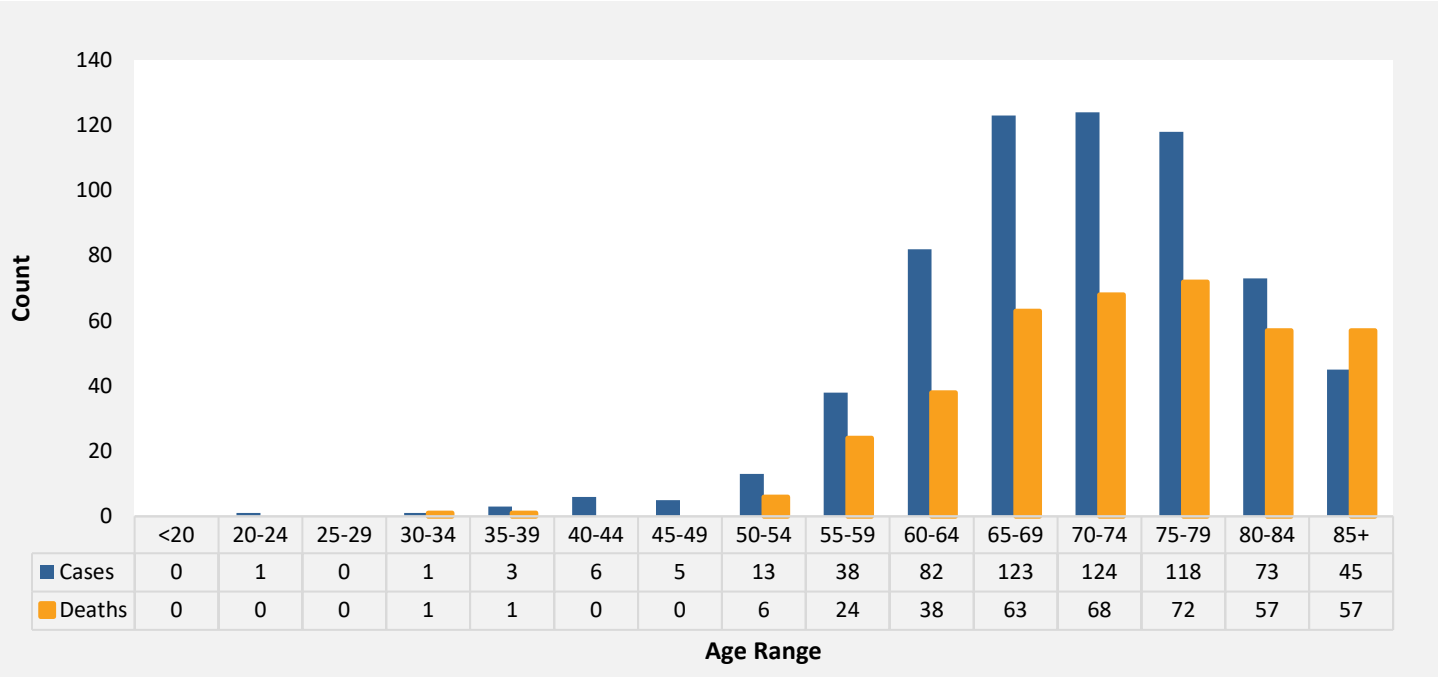
Incidence: Lung cancer is a major public health concern, with 220,847 new cases in the United States in 2021. It is the 2nd most diagnosed cancer in both men and women in South Dakota and the United States.

Mortality: There were 387 lung cancer deaths in South Dakota in 2021. Lung cancer is the most common cause of cancer deaths in both South Dakota and the United States. 46% of lung cancer cases are diagnosed at a distant stage, often making it fatal. However, over the past two decades advances in the understanding of tumor biology and development of targeted treatment, along with the introduction of screening, have led to improvements in survival.

Risk and Associated Factors: Cigarettes smoking is still the number one factor for lung cancer and accounts for approximately 80% of lung cancer deaths. Other factors include secondhand smoke, radon, asbestos, air pollution, arsenic in drinking water, and a personal or family history of lung disease or cancer.

Prevention and Early Detection: The U.S. Preventative Services Taskforce (USPSTF) recommends annual screening for high-risk individuals (ages 50-80 years with at least a 20 pack-year smoking history) for lung cancer with low-dose computed tomography. There were approximately 8.5 million adults eligible in the United States for lung cancer screening in 2021.

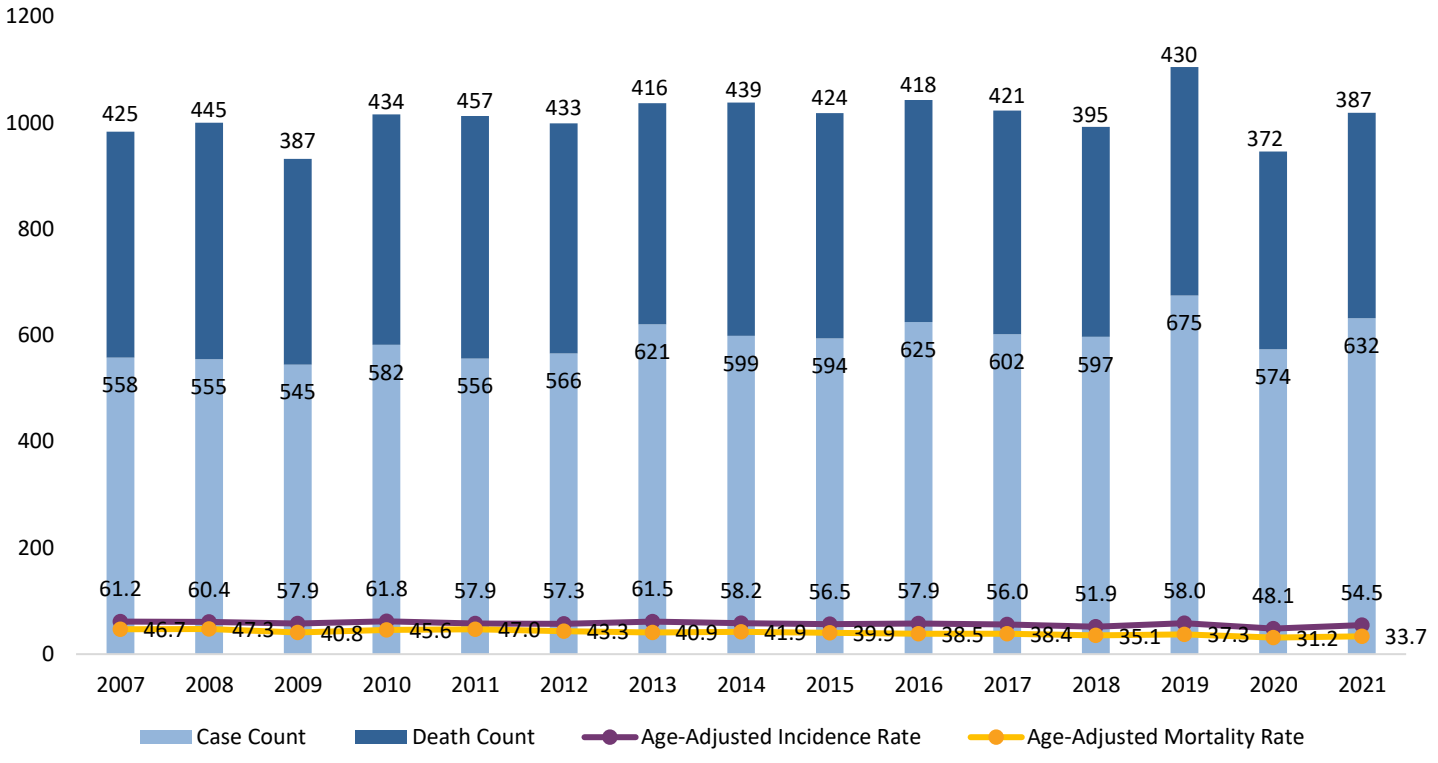
Figure 26: Lung and Bronchus Number of Cases and Deaths by Age, South Dakota, 2021



	<20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	0	1	0	1	3	6	5	13	38	82	123	124	118	73	45
Deaths	0	0	0	1	1	0	0	6	24	38	63	68	72	57	57

Source: South Dakota Cancer Registry

Figure 27: Lung and Bronchus Cancer Case and Death Counts by Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

Melanoma of the Skin

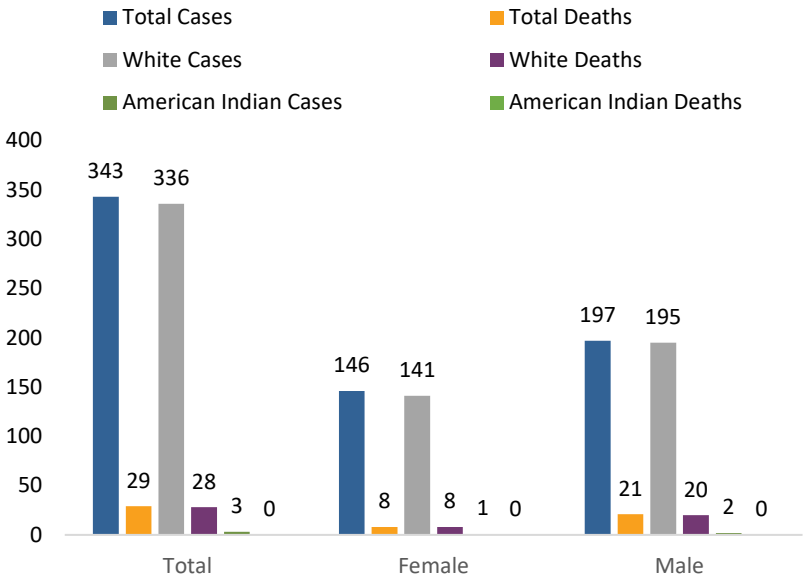
Table 15: Melanoma of the Skin Incidence and Mortality Summary, 2021

Melanoma of the Skin Cancer Age-Adjusted Rates		Incidence			Mortality		
		Total	Female	Male	Total	Female	Male
South Dakota	**Total**	33.2	30.8	37.3	2.7	1.3	4.3
	White	36.8	34.2	41.2	2.9	1.5	4.5
	American Indian	8.0	10.4	3.7	0.0	0.0	0.0
United States	**Total**	23.0	18.9	28.6	2.0	1.3	2.9
	White	30.2	25.7	36.4	2.6	1.7	3.7
	American Indian	8.8	6.4	11.8	**	**	**

Source: South Dakota Cancer Registry and United States Cancer Statistics

** Data not available, for more information visit the CDC United States Cancer Rates website.

Figure 28: Melanoma of the Skin Case and Death Counts, 2021



Descriptive Epidemiology

Stage at Diagnosis: Melanoma is staged by the depth of invasion and the extension of the lesion. In 2021, 57% of the melanoma of the skin cases reported in South Dakota were localized. Another 32% were staged as in situ disease. The survival rate for localized melanoma is 84% and for distant disease it is 3.7%.

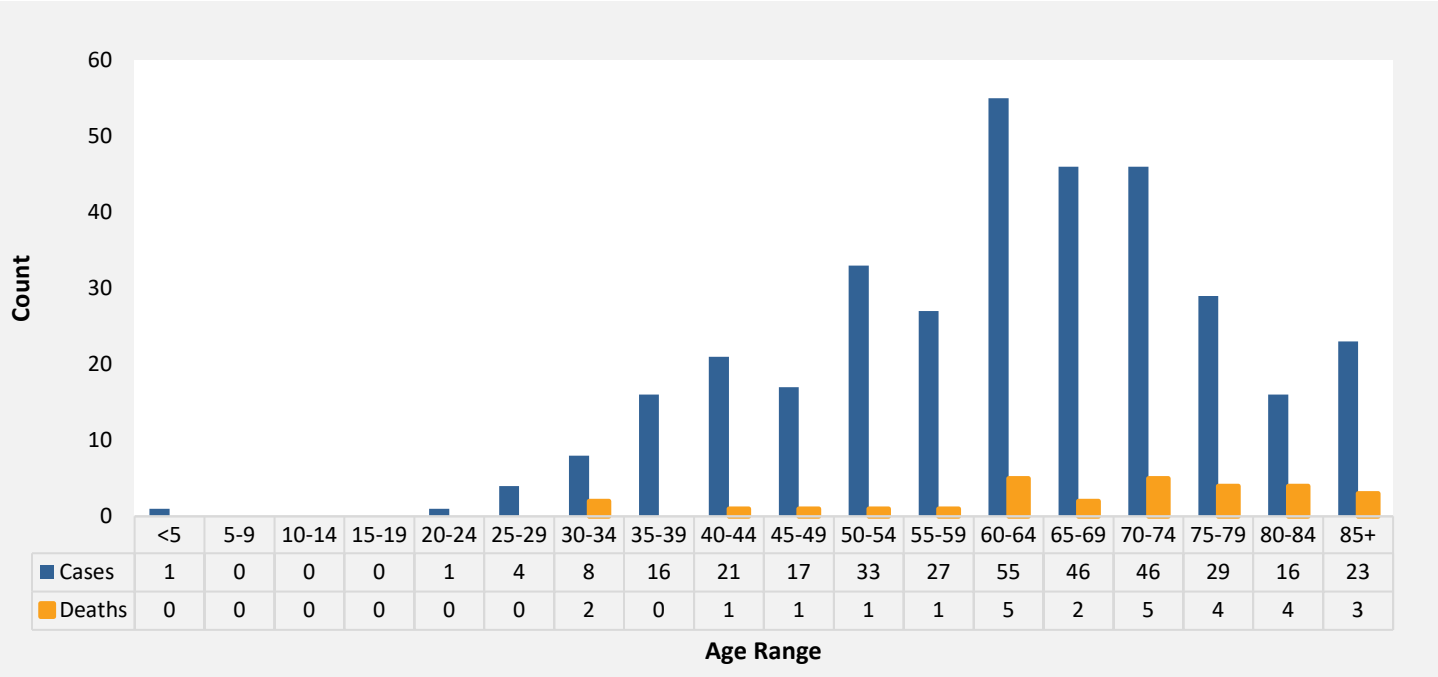
Incidence: In the United States in 2021, there were 94,614 new cases of melanoma of the skin according to the USCS. The three most common types of skin cancer are basal cell, squamous cell, and melanoma. Melanoma has the poorest prognosis without treatment out of these skin cancers. In 2021, South Dakota's incidence rate of melanoma was 33.2 and 23.0 in the United States.

Mortality: There were 29 deaths attributed to melanoma of the skin in South Dakota in 2021 with a mortality rate of 2.7 while the United States mortality rate was 2.0. The median age of death in South Dakota was 70 for melanoma of the skin.

Risk and Associated Factors: Risk factors associated with melanoma of the skin include having a lighter natural skin color, skin that burns, freckles, or reddens easily, having blue or green eyes or blond or red hair, or having a large number of moles. Further, a family history of skin cancer, older age, or exposure to the sun and UV rays can increase the risk for developing melanoma of the skin.

Prevention and Early Detection: The best way to prevent skin cancer is to protect your skin from exposure to the sun. This can be done by staying in the shade, wearing clothing to cover arms and legs, wearing a wide brimmed hat, using sunglasses, and using sunscreen with an SPF of 15 or higher. Additionally, avoiding indoor tanning beds, booths, or sunlamps can help prevent skin cancer.

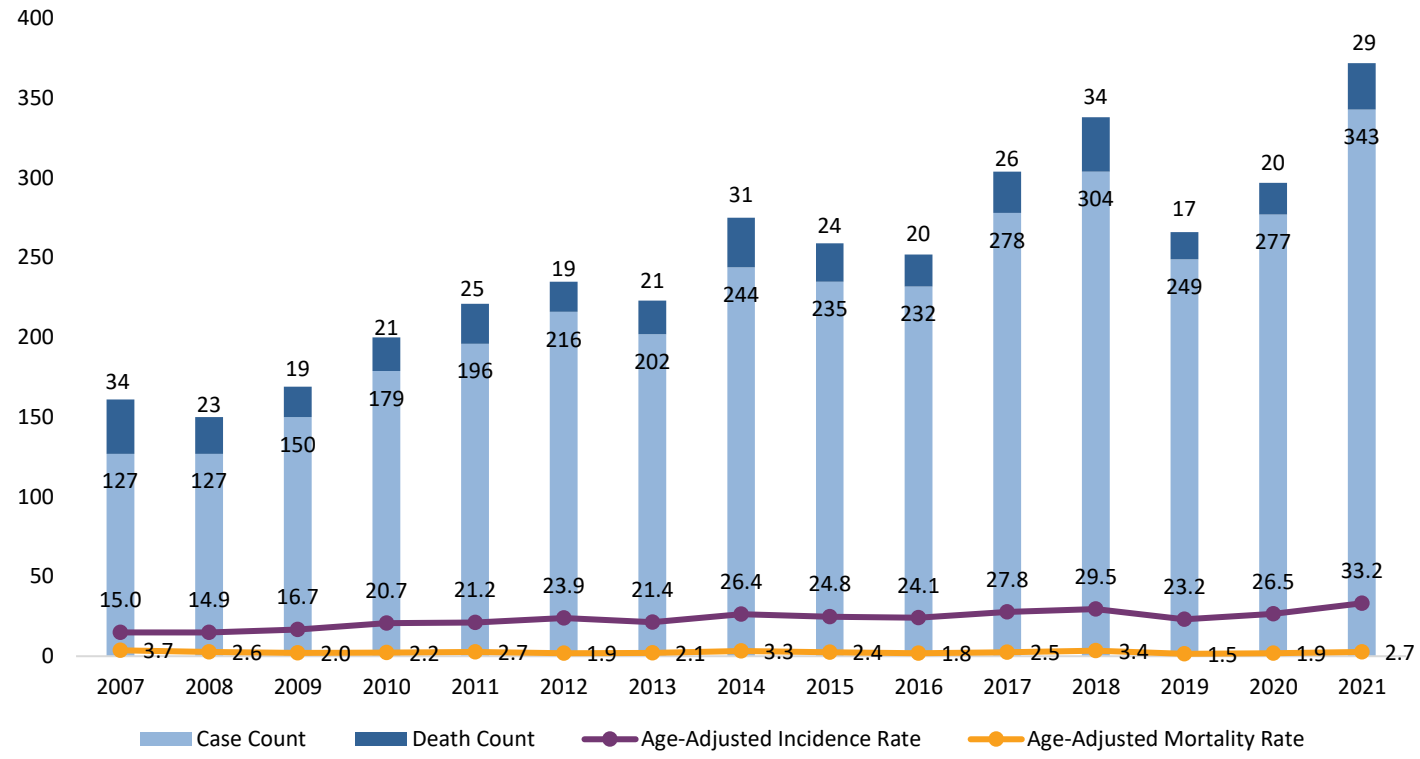
Figure 29: Melanoma of the Skin Number of Cases and Deaths by Age, South Dakota, 2021



	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	1	0	0	0	1	4	8	16	21	17	33	27	55	46	46	29	16	23
Deaths	0	0	0	0	0	0	2	0	1	1	1	1	5	2	5	4	4	3

Source: South Dakota Cancer Registry

Figure 30: Melanoma of the Skin Case and Death Counts by Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

Non-Hodgkin's Lymphoma

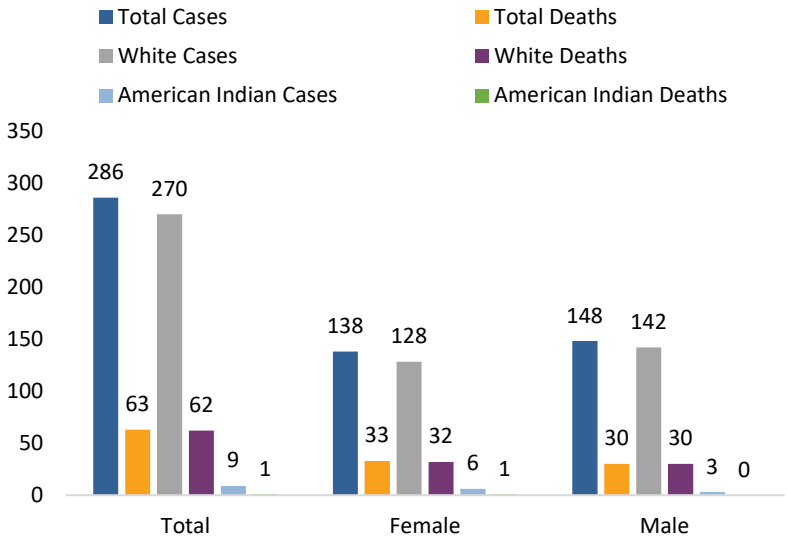
Table 16: Non-Hodgkin's Lymphoma Incidence and Mortality Summary, 2021

Non-Hodgkin's Lymphoma Cancer Age-Adjusted Rates		Incidence			Mortality		
		Total	Female	Male	Total	Female	Male
South Dakota	**Total**	25.6	24.9	26.5	5.7	5.2	6.2
	White	26.4	25.5	27.6	5.9	5.3	6.6
	American Indian	16.3	21.7	9.4	3.8	6.7	0.0
United States	**Total**	17.8	14.8	21.5	4.7	3.6	6.1
	White	18.5	15.2	22.5	5.0	3.8	6.5
	American Indian	12.3	11.1	13.8	**	**	**

Source: South Dakota Cancer Registry and United States Cancer Statistics

** Data not available, for more information visit the CDC United States Cancer Rates website.

Figure 31: Non-Hodgkin's Lymphoma Case and Death Counts, 2021



Descriptive Epidemiology

Stage at Diagnosis: The stage is based on where lymphoma cells are found (in the lymph or other organs or tissues). The stage also depends on how many areas are involved. Localized stage only involves a single lymph node region. When two or more lymph node regions are involved and the regions are on both sides of the diaphragm, the cancer is staged as distant. In 2021, 79% of the cases were diagnosed at a distant stage.

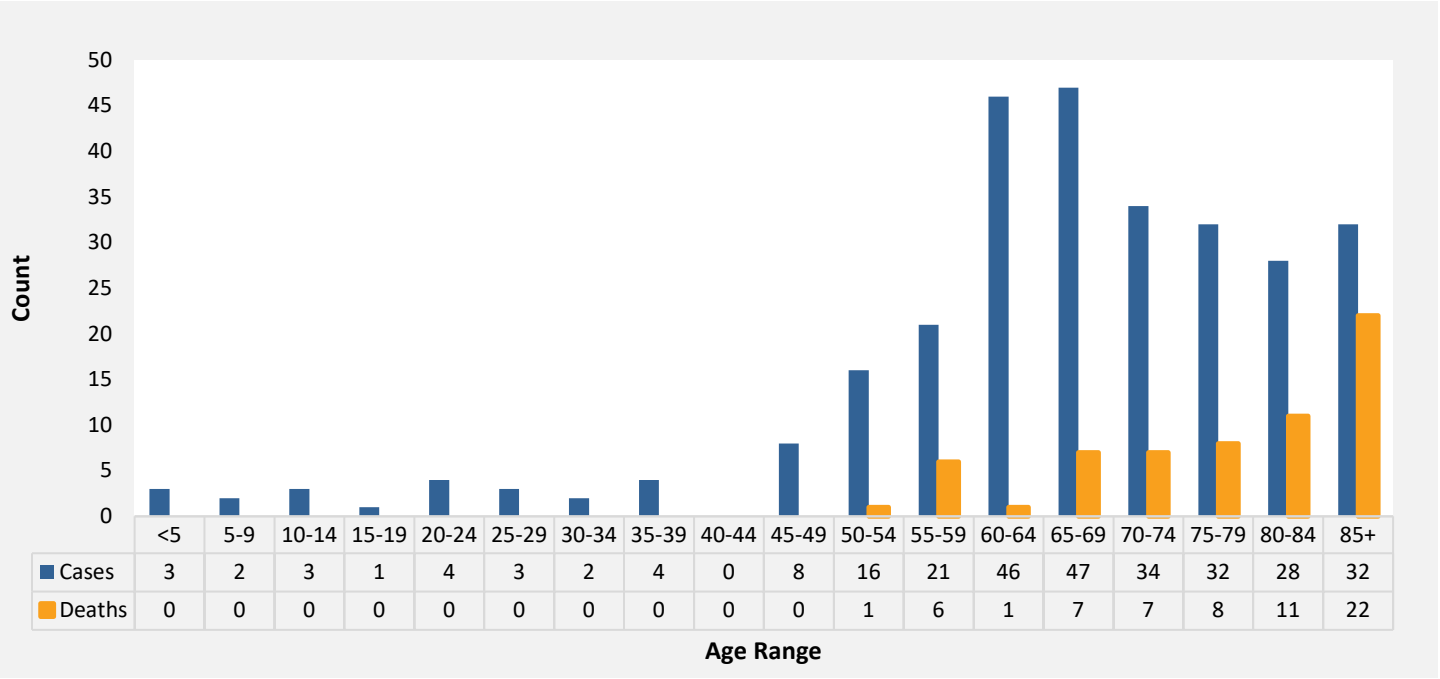
Incidence: Non-Hodgkin's lymphoma is a cancer that originates in the lymphatic system. It develops in lymphocytes, a type of white blood cell. Non-Hodgkin's lymphoma is more than five times as common as Hodgkin's disease. The median age at diagnosis in South Dakota was 68.

Mortality: There were 63 deaths reported in South Dakota that were attributed to non-Hodgkin's lymphoma. The median age at death for those cases was 80 in 2021. Nationally, the five-year survival rate was 73% for non-Hodgkin's lymphoma cases.

Risk and Associated Factors: Age is a strong risk factor for this disease, with most cases occurring at age 60 years or older. Exposure to chemicals such as benzene and certain herbicides and insecticides may be linked to an increased risk. Some chemotherapy used to treat other cancers can increase the risk as well as patients having been treated with radiation. Certain infections increase the risk, such as HIV, Epstein-Barr virus, H. pylori bacteria, and the hepatitis C virus. Additionally, having a family history of non-Hodgkin's lymphoma can increase the risk.

Prevention and Early Detection: There is no absolute way to prevent non-Hodgkin's lymphoma, however, maintaining a healthy immune system can prevent against infections that lead to the disease. Non-Hodgkin's lymphoma may present with various symptoms. Symptoms can include enlarged lymph nodes, chills or fever, unexplained weight loss, fatigue, chest pain, severe or frequent infections, and swelling in the abdomen.

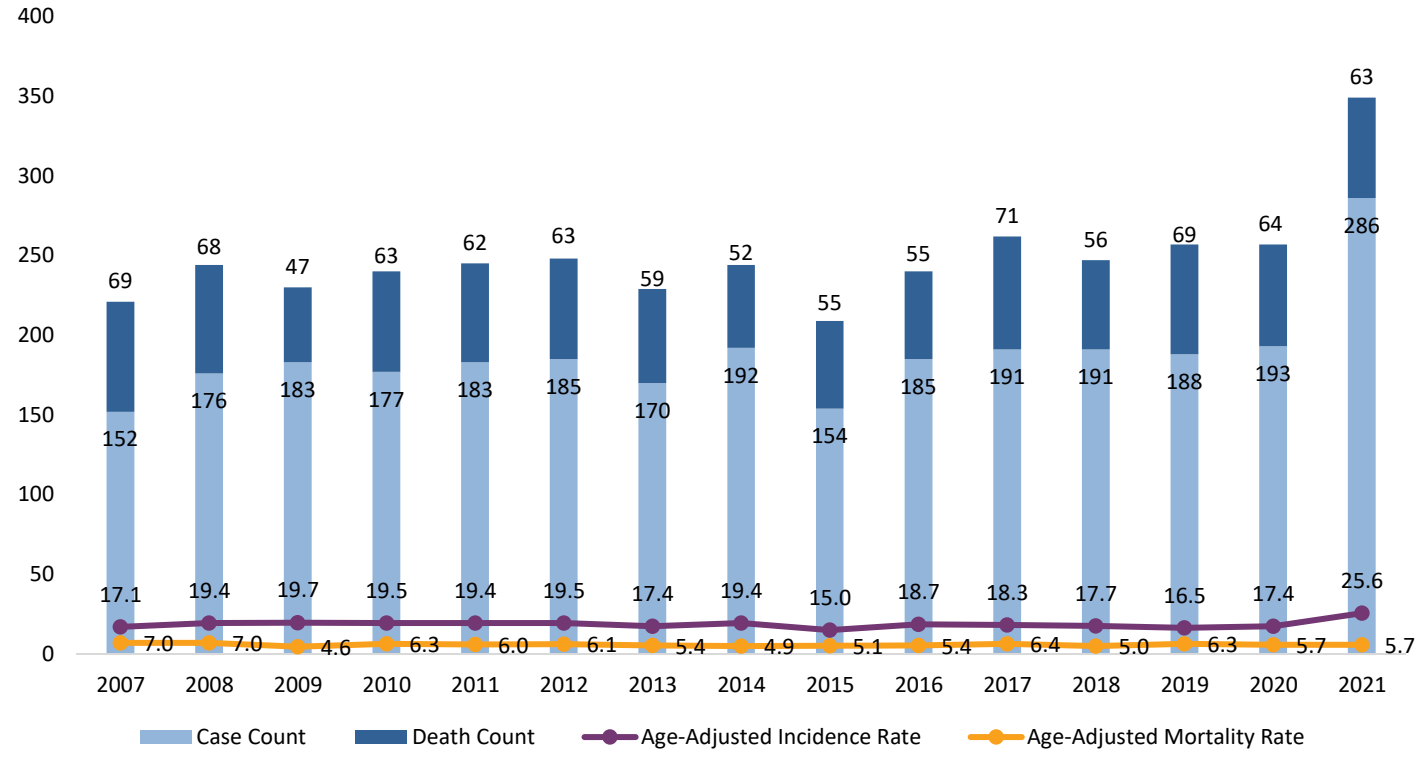
Figure 32: Non-Hodgkin's Lymphoma Number of Cases and Deaths by Age, South Dakota, 2021



	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	3	2	3	1	4	3	2	4	0	8	16	21	46	47	34	32	28	32
Deaths	0	0	0	0	0	0	0	0	0	0	1	6	1	7	7	8	11	22

Source: South Dakota Cancer Registry

Figure 33: Non-Hodgkin's Lymphoma Case and Death Counts by Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

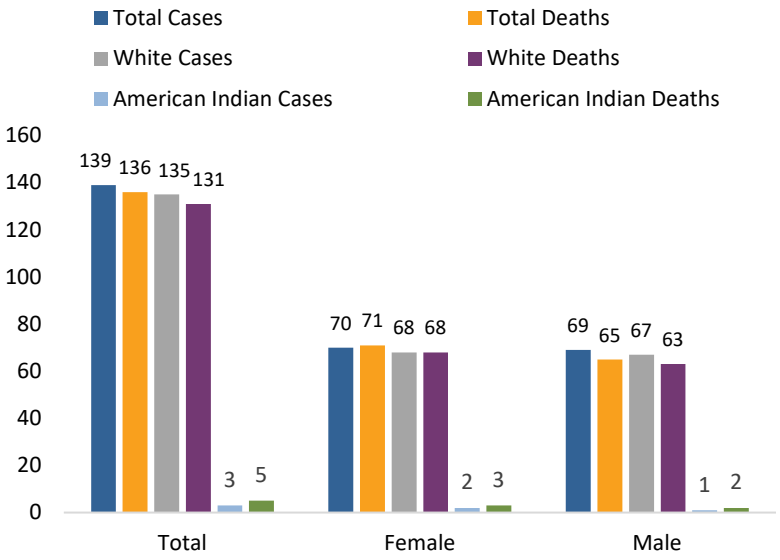
Pancreas

Table 17: Pancreatic Cancer Incidence and Mortality Summary, 2021

Pancreatic Cancer Age-Adjusted Rates		Incidence			Mortality		
		Total	Female	Male	Total	Female	Male
South Dakota	**Total**	12.2	11.3	13.5	12.1	11.4	12.8
	White	12.8	12.1	14.0	12.5	11.7	13.4
	American Indian	11.9	13.1	8.9	15.8	19.8	8.8
United States	**Total**	13.4	11.8	15.2	11.1	9.7	12.9
	White	13.4	11.6	15.5	11.4	9.8	13.4
	American Indian	12.2	11.2	13.4	9.0	9.4	8.4

Source: South Dakota Cancer Registry and United States Cancer Statistics

Figure 34: Pancreatic Cancer Stage at Diagnosis, South Dakota, 2021



Descriptive Epidemiology

Stage at Diagnosis: Pancreatic cancer is often diagnosed late in the disease process. In South Dakota, 72% of new cases were diagnosed at a late stage (regional and distant) in 2021.

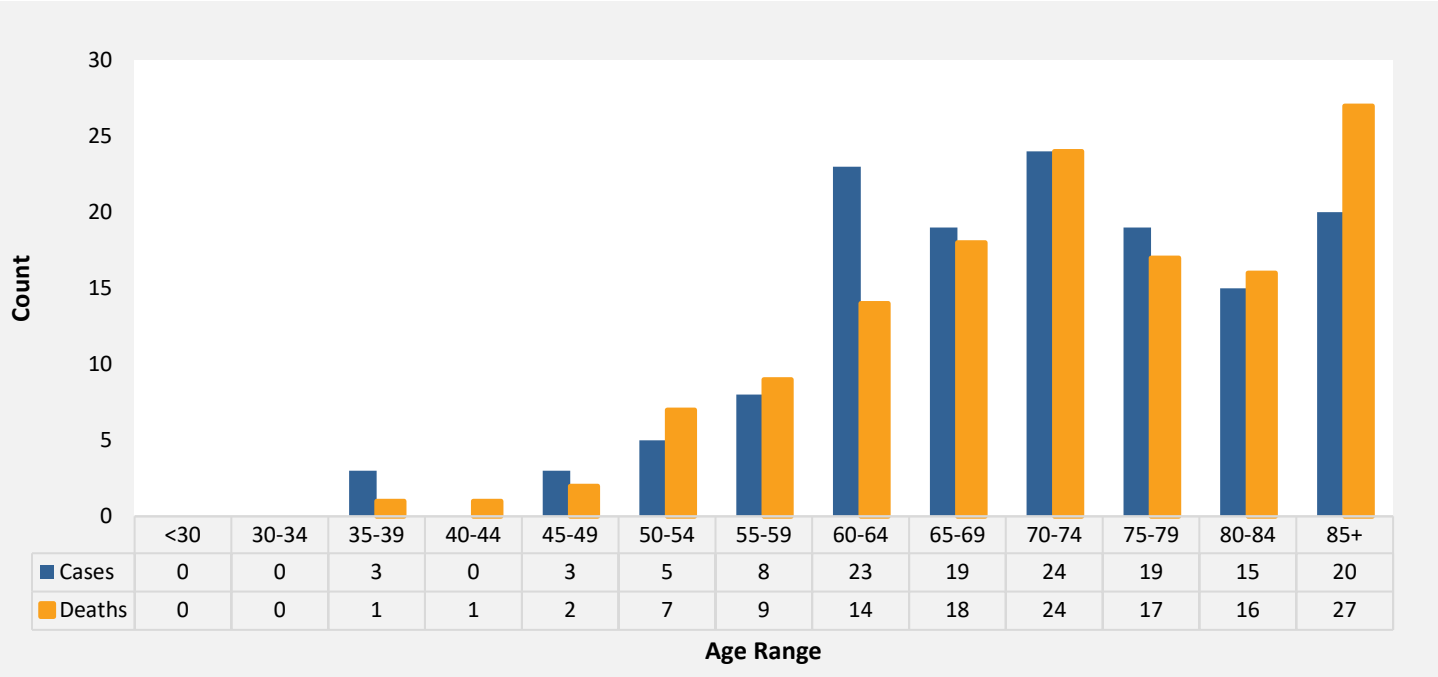
Incidence: The incidence of pancreas cancer increases steadily with age. There were 58,486 new cases of pancreatic cancer diagnosed in 2021 in the United States. The majority of cases occurred in South Dakotans 65 years or older. 97 (70%) were diagnosed in 2021 in that age group. 69 males and 70 females were diagnosed with pancreatic cancer in 2021. Nationally, there was a higher incidence rate in Blacks of both genders. The median age at diagnosis was 71 years in South Dakota.

Mortality: The overall survival for cancer of the pancreas is poor. Studies reveal that for 2017-2021 five-year survival rate was approximately 13%. In 2021, there were 136 deaths with the median age at death at 73 in South Dakota.

Risk and Associated Factors: Pancreatic cancer has many different risk factors that can increase the likelihood of development. Tobacco use doubles the chance of developing pancreatic cancer than those who do not use tobacco. Additionally, being overweight, aging, having diabetes or chronic pancreatitis, exposure to workplace chemicals (specifically in the dry cleaning and metal working industries), having a family history of pancreatic cancer, and inheriting genetic syndromes (Lynch syndrome, hereditary breast and ovarian cancers, and Peutz-Jeghers syndrome).

Prevention and Early Detection: There is currently no recommended routine screening for pancreatic cancer, however there are newer tests that are being used for detection, including endoscopic ultrasounds or MRIs. These tests are currently only offered to those with a strong family history of pancreatic cancer or genetic syndromes that increases the risk. There is no true way to fully prevent pancreatic cancer, however, risk can be reduced by avoiding tobacco use, maintaining a healthy diet and weight, avoiding alcohol use, staying physically active, and limiting exposure to carcinogenic chemicals.

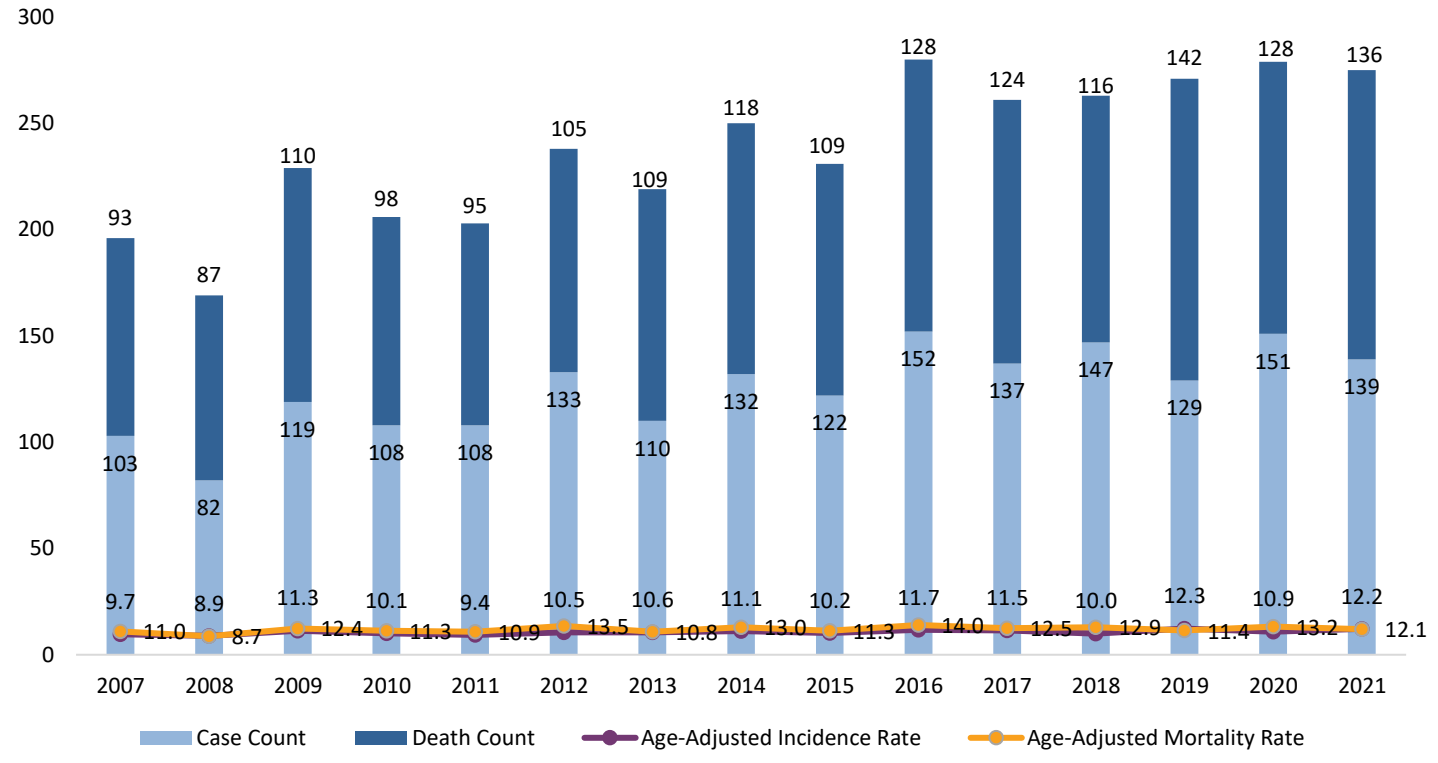
Figure 35: Pancreatic Cancer Number of Cases and Deaths by Age, South Dakota, 2021



	<30	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	0	0	3	0	3	5	8	23	19	24	19	15	20
Deaths	0	0	1	1	2	7	9	14	18	24	17	16	27

Source: South Dakota Cancer Registry

Figure 36: Pancreatic Cancer Case and Death Counts by Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

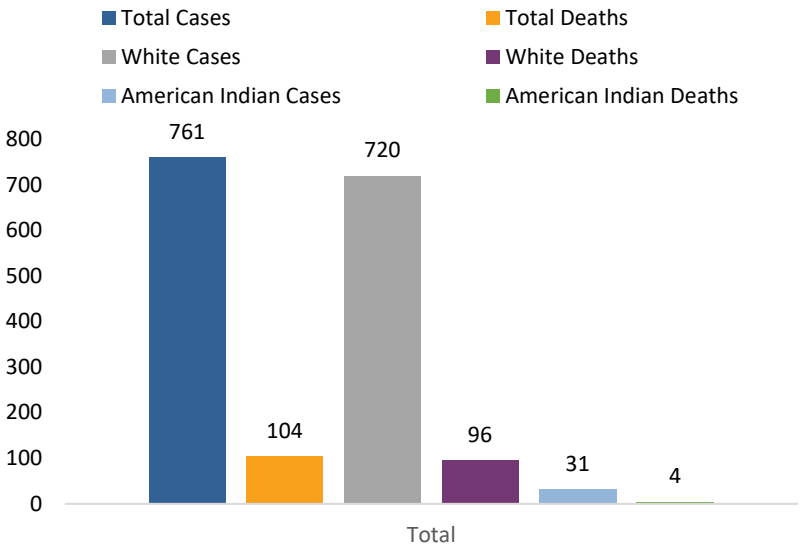
Prostate

Table 18: Prostate Incidence and Mortality Summary, 2021

Prostate Cancer Age-Adjusted Rates		Incidence	Mortality
		Male	Total Male
South Dakota	Total	127.6	22.6
	White	130.9	22.1
	American Indian	132.3	33.6
United States	Total	114.7	18.7
	White	108.0	17.9
	American Indian	80.4	12.1

Source: South Dakota Cancer Registry and United States Cancer Statistics

Figure 37: Prostate Cancer Stage at Diagnosis, South Dakota, 2021



Descriptive Epidemiology

Stage at Diagnosis: The greatest number of prostate cases were diagnosed at an early stage. In 2021, 69% of the cases were diagnosed as localized (not extending outside the prostate). Frequently, older patients may simply be monitored (watchful waiting) by their physician; others may be given hormonal therapy.

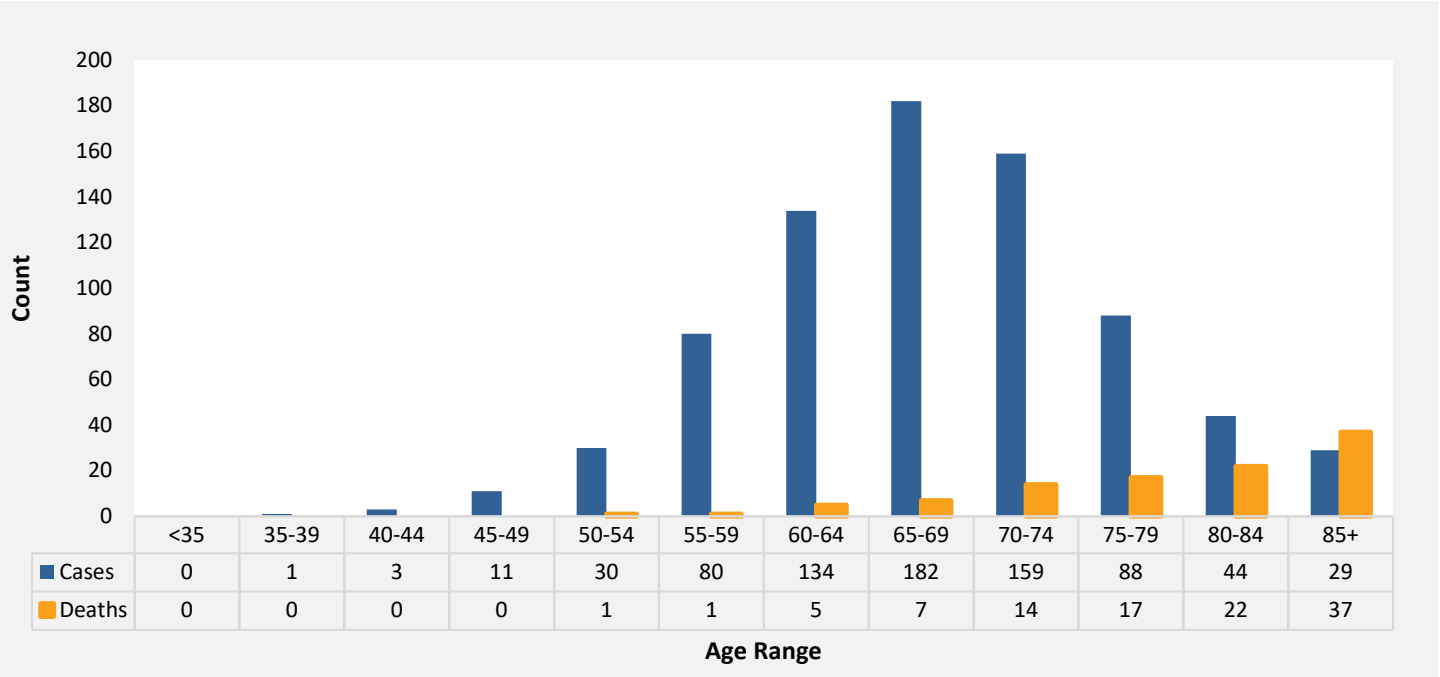
Incidence: Carcinoma of the prostate is predominately a tumor of older males. The median age at diagnosis in South Dakota is 68. Also, in South Dakota the incidence of prostate cancer begins to increase in the 60's age group.

Mortality: Prostate cancer was the second leading cancer death in males in South Dakota in 2021. Prostate cancer can be a slow progressing disease and can be cured or at least controlled in the early stages. The median age of death in South Dakota in 2021 was 80 years old. Many patients have co-morbid conditions and will die of other causes rather than prostate cancer.

Risk and Associated Factors: Prostate cancer has many risk factors including aging, a family history of prostate cancer, and genetic changes. Additionally, prostate cancer develops more commonly in African American males than in males of other races. Risk has also been shown to increase in males who consume a lot of dairy products as well as males who tend to be obese, use tobacco, or are exposed to chemicals.

Prevention and Early Detection: While there is no way to fully prevent prostate cancer, the risk can be lowered by maintaining a healthy weight, keeping physically active, and following a healthy eating pattern. Early detection for prostate cancer can occur through testing for prostate-specific antigen (PSA) levels, as well as through a digital rectal exam (DRE). While these tests can help detect prostate cancer, there is a possibility of over diagnosis and over treatment.

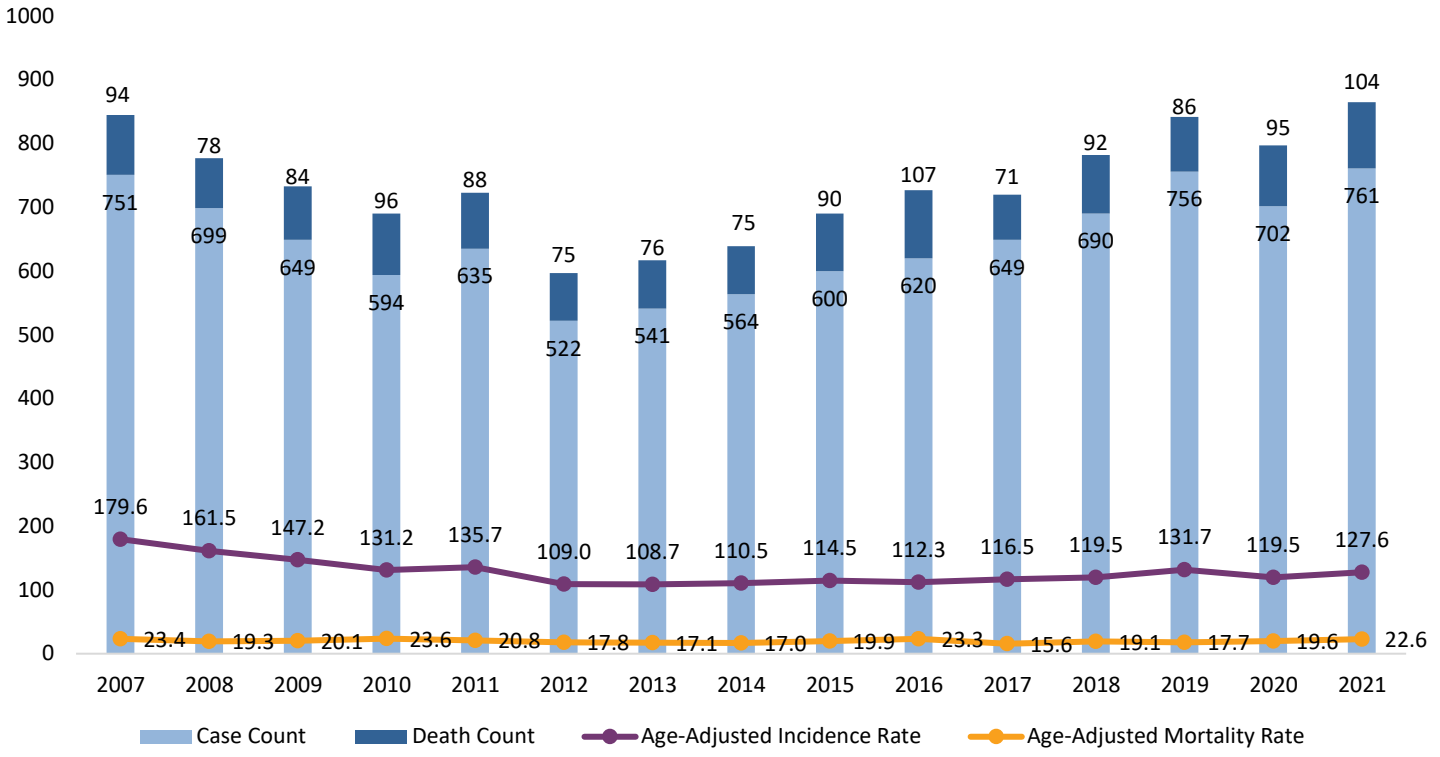
Figure 38: Prostate Cancer Number of Cases and Deaths by Age, South Dakota, 2021



	<35	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
Cases	0	1	3	11	30	80	134	182	159	88	44	29
Deaths	0	0	0	0	1	1	5	7	14	17	22	37

Source: South Dakota Cancer Registry

Figure 39: Prostate Cancer Case and Death Counts by Age-Adjusted Incidence and Mortality Rates by Year, South Dakota, 2007-2021



Note: Rates per 100,000 age-adjusted to the 2000 US Standard Population using 2021 SD Population Estimates.
Source: South Dakota Cancer Registry

Appendices

Appendix A: 2000 United States Standard Million Population

Age Group	Number in Group
Total	**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 B: 2017-2021 South Dakota Estimated Population

Year	2017	2018	2019	2020	2021
Total	869,666	882,235	884,659	892,717	895,376
<5	61,759	62,132	61,167	60,464	58,668
5-9	60,372	60,762	60,934	61,387	61,519
10-14	59,303	60,882	60,732	61,285	63,228
15-19	56,675	57,674	57,734	58,826	60,932
20-24	59,550	59,585	58,930	59,560	59,304
25-29	57,257	58,754	57,986	57,884	56,249
30-34	56,348	57,341	57,078	57,225	56,922
35-39	54,536	56,007	56,899	57,060	57,957
40-44	46,458	47,902	48,965	51,248	53,690
45-49	47,425	47,241	46,641	46,133	46,213
50-54	52,109	49,840	48,224	47,567	48,279
55-59	59,476	59,311	58,789	57,078	55,524
60-64	56,774	57,950	58,709	59,823	60,473
65-69	48,277	50,160	52,022	54,035	55,178
70-74	32,952	34,890	37,194	40,006	42,511
75-79	22,463	23,666	24,442	25,136	24,540
80-84	17,151	17,147	17,228	17,144	16,023
85+	20,781	20,991	20,985	20,856	18,166

Appendix C: 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 9050-9055, 9140, 9590-9992	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		20070
Oropharynx	C100-C109		20080
Hypopharynx	C129, C130-C139		20090
Other Oral Cavity and Pharynx	C140, C142, C148		20100
Digestive System			
Esophagus	C150-C159	excluding 9050-9055, 9140, 9590-9992	21010
Stomach	C160-C169		21020
Small Intestine	C170-C179		21030
Colon and Rectum			
Colon excluding Rectum			
Cecum	C180	excluding 9050-9055, 9140, 9590-9992	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 9050-9055, 9140, 9590-9992	21051
Rectum	C209		21052
Anus, Anal Canal and Anorectum	C210-C212, C218		21060
Liver and Intrahepatic Bile Duct			
Liver	C220	excluding 9050-9055, 9140, 9590-9992	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

Appendix C: SEER Incidence Site Analysis Categories (Continued)

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	Recode
Respiratory System			
Nose, Nasal Cavity, and Middle Ear	C300-C301, C310-C319	Excluding 9050-9055, 9140, 9590-9992	**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 9050-9055, 9140, 9590-9992**	**23000**
Soft Tissue including Heart	**C380, C470-C479, C490-C499**	**excluding 9050-9055, 9140, 9590-9992**	**24000**
Skin excluding Basal and Squamous			
Melanoma of the Skin	C000-006, C008-069, C090-C148, C300-C329, C440-C500, C510-C512, C518-C519, C600-C602, C608-C609, C632, C690, C693, C694	8720-8790	25010
Other Non-Epithelial Skin	C445-C449	8000-8040, 8042-8180, 8191-8246, 8248-8700, 8940, 8982	25020
Breast	**C500-C509**	**excluding 9050-9055, 9140, 9590-9992**	**26000**
Female Genital System			
Cervix Uteri	C530-C539	excluding 9050-9055, 9140, 9590-9992	27010
Corpus and Uterus, NOS			
Corpus Uteri	C540-C549	excluding 9050-9055, 9140, 9590-9992	27020
Uterus, NOS	C559		27030
Ovary	C569		27040
Vagina	C529		27050
Vulva	C510-C519		27060
Other Female Genital Organs	C570-C579, C589		27070
Male Genital System			
Prostate	C619	excluding 9050-9055, 9140, 9590-9992	28010
Testis	C620-C629		28020
Penis	C600-C609		28030
Other Male Genital Organs	C630-C639		28040
Urinary System			
Urinary Bladder	C670-C679	excluding 9050-9055, 9140, 9590-9992	29010
Kidney and Renal Pelvis	C649, C659		29020
Ureter	C669		29030
Other Urinary Organs	C680-C689		29040
Eye and Orbit	**C690-C699**	**excluding 9050-9055, 9140, 9590-9992**	**30000**

Appendix C: SEER Incidence Site Analysis Categories (Continued)

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	Recode
Brain and Other Nervous System			
Brain	C710-C719	excluding 9050-9055, 9140, 9530-9539, 9590-9992	31010
Cranial Nerves Other Nervous System	C710-719	9530-9539	31040
	C700-C709, C720-C729	Excluding 9050-9055, 9140, 9590-9992	
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	9590-9597, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687-9691, 9695, 9698-9702, 9705, 9708-9709, 9712.	33041
NHL - Extranodal	All sites except C024, C098-C099, C111, C142, C379, C422, C770-C779	9590-9597, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9688, 9689-9691, 9695, 9698-9702,9705,	33042
	All sites except C024, C098-C099, C111, C142, C379, C420-C422, C424, C770-C779	9811-9818, 9823, 9827, 9837	
Myeloma		**9731-9732, 9734**	**34000**
Leukemia			
Lymphocytic Leukemia			
Acute Lymphocytic Leukemia		9826, 9835-9836	35011
	C420, C421, C424	9811-9818, 9837	
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, 9865-9867, 9869, 9871-9874, 9895-9897, 9898, 9910-9911, 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, 9805-9809, 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, 9750-9769, 9950, 9960-9962, 9965-9967, 9970-9971, 9975, 9980, 9982-9987, 9989, 9991-9992**	**37000**

Invalid	**C760-C768, C809**	**Excluding 9050-9055, 9140, 9590-9992**	
	C420-C424		
	C770-C779		
	Site or histology code not within valid range or site code not found in this table.		**99999**

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American Cancer Society. Cancer Facts & Figures 2021. Atlanta: American Cancer Society; 2021.

The surgery codes are based on the American College of Surgeons Commission on Cancer's Standards for Oncology Registry Entry, American College of Surgeons, Chicago, IL, 60611-321 (STORE), Revised for 2022, Appendix B: Site-specific Surgery Codes. The surgery codes in this document are identical to the STORE manual; only formatting and annotations may vary. The SEER Notes that appear in the Surgery Code sections contain information or instructions not found in STORE or that are different from STORE

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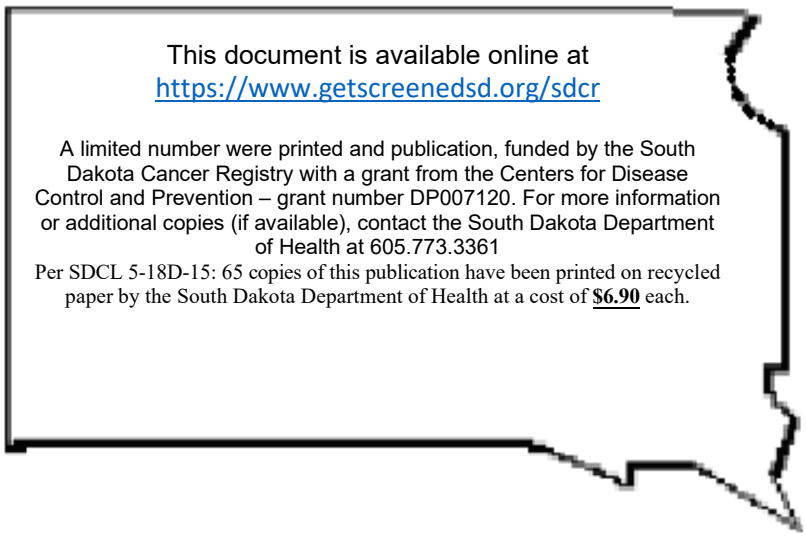

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