SOUTH DAKOTA

An Annual Report on Cancer Incidence and Mortality Among South Dakotans

2020

Photo by Travel South Dakota

July 2024

South Dakota Cancer Registry

CANCER IN SOUTH DAKOTA 2020

SOUTH DAKOTA DEPARTMENT OF HEALTH

SDCR
SOUTH DAKOTA CANCER REGISTRY

Preface

Cancer in South Dakota, 2020 is the 28th annual report from the South Dakota Cancer Registry (SDCR) in the Office of 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 2020 cancer incidence and mortality data of South Dakota residents.

Acknowledgements

The South Dakota Cancer Registry (SDCR) acknowledges all the certified Oncology Data Specialists in the health system cancer registries who work diligently to maintain quality data. The SDCR also acknowledges the hospitals, clinics, physicians, pathology laboratories, and other providers and health entities that submit data.

Funding Source

The publication was funded by the South Dakota Cancer Registry with the grant from the Centers for Disease Control and Prevention – grant number DP22-2202.

Requests for Information

Data queries, cancer concerns, information, or requests for additional copies should be addressed to:

Kay Dosch, MA, ODS-C, SDCR Coordinator
South Dakota Cancer Registry
615 East 4th Street
Pierre, SD 57501
Phone: (605) 773-6345

or

Morgan Vedvei, SDCR Data Manager
South Dakota Cancer Registry
615 East 4th Street
Pierre, SD 57501
Phone: (605) 773-5740

Suggested Citation

Cancer in South Dakota, 2020. Department of Health, Pierre, SD. July 2024. All material in this report may be reproduced or copied without permission. However, citation as to source is appreciated.

Web Access

This report is available on the internet at the following URL:

https://www.getscreenedsd.org/sdcr

The following Department of Health personnel were the main contributors to the development of this report:

Morgan Vedvei	SDCR Data Manager
Haley Weber	Data Analyst Intern
Kay Dosch	SDCR Coordinator
Laura Gudgeon	Chronic Disease Epidemiologist
Mark Gildemaster	Office of Health Statistics Administrator
Rebecca Piroutek	Communications Coordinator
Sarah Quail	Cancer Programs Director
Tiffany Rosemond	Chronic Disease Data Analyst

Table of Contents

LIST OF TABLES

List of Figures

List of Figures (Cont.)

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 2020

- South Dakota had 4,738 reportable invasive cases of cancer diagnosed, excluding the less life-threatening cancers such as *in-situ* (in place) cancers (except *in-situ* bladder cases) and the most common skin cancers.
- Every day, 13 cases of cancer were diagnosed in residents of South Dakota; this includes cases of invasive cancer and *in-situ* bladder.
- The 5 most diagnosed cancer sites (prostate, female breast, lung, colorectal and melanoma) accounted for 54% of all cancer sites.
- Prostate cancer was the most common reportable malignancy with 702 cases, 15% of all cases and 28% of cases for males.
- Female breast cancer was the second most common reportable cancer with 613 cases, 13% of all cases and 28% of cases for females.
- Lung cancer was the third most common reportable malignancy with 574 cases, accounting for 12% of all cases.
- Colon and rectum cancer cases were the fourth most common cancer with 382 cases, 8% of all cases.
- Melanomas of the skin were the fifth most common malignancy with 277 cases, 6% of all reported cases.
- 53% of all cancers diagnosed were males and 47% were in females.
- Males had an age-adjusted incidence rate of 462.8 per 100,000, which was higher than females who had an age-adjusted rate of 405.7 per 100,000.
- Whites accounted for 91% of cancers with 4,330 cases, whereas American Indians accounted for 6% with 284 cases.
- The American Indian age-adjusted incidence rate was 547.8 per 100,000 which was higher than the White age-adjusted rate of 425.4 per 100,000.
- The South Dakota age-adjusted incidence rate in 2020 was 427.2 per 100,000, which is slightly higher than the United States (U.S. Cancer Statistics) age-adjusted incidence rate of 403.3 per 100,000.

Mortality 2020

- Overall, cancer was the second leading cause of death in South Dakota in 2020.
- In 2020, 1,728 South Dakotans died from cancer, accounting for 17.5% of resident deaths.
- Each day over 4 South Dakotans died from cancer.
- The most common cancer mortality sites (lung, prostate, female breast, colorectal, pancreas) caused half of all cancer deaths.
- Lung and bronchus cancers were the leading cause of deaths at 372 mortalities or 22% of all cancer deaths.
- Colon and rectum cancers were the second leading cause of death with 157 deaths, 9% of all cancer deaths.
- Pancreatic cancer was the third leading cause of death among cancers with 128 deaths, 7% of all cancer deaths.
- Female breast cancer was the fourth leading cause of cancer deaths with 115 mortalities, 7% of all cancer deaths and 14% of all female cancer deaths.
- Prostate cancer was the fifth leading cause of cancer deaths with 95 deaths, 5% of all cancer deaths and 10% of all male cancer deaths.
- 52% of all cancer deaths were males and 48% were females.
- Males had an age-adjusted mortality rate of 173.6 per 100,000 whereas females had an age-adjusted mortality rate of 131.3 per 100,000.
- Whites accounted for 92% of all cancer deaths in South Dakota with 1,589 deaths and American Indians made up 6% of all cancer deaths with 101 deaths in 2020.
- South Dakota's age-adjusted mortality rate for 2020 was 148.3 per 100,000 which is comparable to the United States (U.S. Cancer Statistics) age-adjusted mortality rate of 143.8.

Trends 2020

- Melanoma incidence cases have continued to increase significantly from 157 cases (17.6 age-adjusted rate) in 2009 to 277 cases (26.5 age-adjusted rate) in 2020.
- For the last decade, female breast cancer mortality rates have remained steady.
- For the last 5 years, prostate 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.
- Colorectal cancer cases and deaths have slowly been decreasing over the last 5 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 17th 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. The SDCR links incidence data with mortality files to identify persons whose death records show cancer as a cause of death, but these cancers were not reported to the central 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 analyzed by the Office of Health Statistics 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. The World Health Organization (WHO) in 2022 explained that 30-50% of cancers can be prevented by avoiding modifiable risk factors with the implementation of prevention strategies.

The best way to prevent cancer is to limit modifiable risk factors. To do this, the WHO 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 WHO 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 2020 and for the five-year period, 2016-2020.

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 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, provided that the full confidence interval is negative or positive respectively. If 0 is included within the confidence interval, then APC is considered stable and is neither increasing nor decreasing.

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.

Confidence Intervals (CI): The 95% confidence interval is used for the incidence and mortality confidence intervals. This was calculated using the formula CI=R±E, where R = age-adjusted rate/100,000 and E=1.96*(R/square root(n)). N is either the number of incidences or deaths corresponding with which rate is calculated.

Data source: All data, tables, and figures come from the South Dakota Department of Health, American Cancer Society Facts and Figures 2020 or CDC's United States Cancer Statistics (USCS) which mentions to use caution when interpreting 2020 data. The COVID-19 pandemic disrupted health services, leading to delays and reductions in cancer screening diagnosis, and reporting to some central cancer registries. This may have contributed to the decline in new cancer cases for many sites in 2020.

Disparity: Health disparities are differences in the incidence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups in the United States. These population groups can be based on age, sex, race, and location.

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 of 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 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, while relative percent change shows the change in disease relative to the baseline. The relative percent change is useful 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 less than 16 cases 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:[5]

- ***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. Advancement 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, 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. A null hypothesis states that in a given place and

period of time, all events occur randomly by chance. If this does not occur, then there is statistical significance. The confidence intervals can be 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. However, if the confidence intervals do not intersect one another, there is statistical significance. This report looks at South Dakota rates as compared to US 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 2020, cervical cancer rates were 11.6 per 100,000 American Indian women, a cervical cancer age-adjusted rate over double that of White women in South Dakota. However, the case counts were four for American Indians and 23 for Whites. Small numbers result in wider confidence intervals, thus less reliability in the data.

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).

Rural Counties: Due to small populations in many South Dakotan counties, rates can be very low and unstable. To increase stability, counties considered rural by the US Census Bureau will be grouped together.

These counties include: Aurora, Bennett, Bon Homme, Brule, Buffalo, Butte, Campbell, Charles Mix, Clark, Corson, Custer, Day, Deuel, Dewey, Douglas, Fall River, Faulk, Grant, Gregory, Haakon, Hand, Harding, Hutchinson, Hyde, Jackson, Jones, Kingsbury, Lake, Lyman, Marshall, McPherson, Mellette, Miner, Moody, Oglala Lakota, Perkins, Potter, Roberts, Sanborn, Spink, Sully, Todd, Tripp, Walworth, and Ziebach.

Health Behavior Trends that Impact Cancer within South Dakota

There are many behaviors that 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:
As of 2021, 15.3% of adults in South Dakota smoke combustible cigarettes and 6.1% of adults use e-cigarettes. 18- to 24-year-olds have the highest use of e-cigarettes among all age groups, but also have the lowest use of cigarette smoking. This compares to a national median of 14.4% adult smokers and 6.6% of adults using e-cigarettes. Tobacco use is 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 drink on occasion, and 6.7% drink 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 drink, and 6.3% drink 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% were obese. This compares to a national rate of 29.9% being at a healthy weight, 34.4% being overweight, and 33.9% being obese.

Cancer Incidence by County (Rural vs. Urban)

Table 1. Cancer Cases and Incidence Rates by County

	2020		2016-2020	
	Cases	**Rates**	**Cases**	**Rates**
South Dakota	4,738	427.2	25,520	458.0
*Rural Counties**	1,198	399.4	7,418	436.9
Minnehaha	1,089	522.9	5,318	535.9
Pennington	575	363.8	3,102	430.6
Lincoln	277	399.9	1,322	433.2
Brown	233	442.0	1,142	473.1
Codington	176	437.2	890	479.0
Yankton	149	425.8	679	438.7
Lawrence	148	329.9	728	381.1
Brookings	144	413.5	685	428.4
Davison	111	410.9	632	487.3
Meade	107	306.5	626	383.1
Hughes	101	445.4	546	490.7
Beadle	101	417.2	523	445.9
Union	100	467.5	537	528.1
Clay	60	478.8	337	554.9
Turner	43	372.1	267	451.8
McCook	35	487.4	207	558.8
Hamlin	24	334.8	167	474.8
Stanley	22	408.9	101	462.8
Edmunds	20	286.2	142	491.6
Jerauld	**	514.2	73	434.4
Hanson	**	264.9	78	465.9

Note: Rates per 100,000 age-adjusted to the 2000 US standard population and 2020 SD estimate population.

*Rural Counties include: Aurora, Bennett, Bon Homme, Brule, Buffalo, Butte, Campbell, Charles Mix, Clark, Custer, Day, Deuel, Dewey, Douglas, Fall River, Faulk, Grant, Gregory, Haakon, Harding, Hutchinson, Hyde, Jackson, Jones, Kingsbury, Lake, Lyman, Marshall, McPherson, Mellette, Miner, Moody, Oglala Lakota, Perkins, Potter, Roberts, Sanborn, Spink, Sully, Todd, Tripp, Walworth, and Ziebach

** Data suppressed for less than 16 cases, these rates are considered unstable due to few observations and should be interpreted with caution.

South Dakota collected 4,738 new reportable cancer cases in 2020. Data at the county level ranged from a low incidence rate of 264.9 in Hanson County to a high of 522.9 in Minnehaha County. There were 4 (Minnehaha, Clay, McCook, and Jerauld) counties with significantly higher incidence rates than the state rate of 427.2. There were two counties (Edmunds, Hanson) with significantly lower incidence rates than the state rate.

Table 2: Age-Adjusted Incidence Rates by County for Selected Sites, 2020

	Colorectal		Lung and Bronchus		Female Breast		Prostate		Melanoma	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
South Dakota	382	35.6	574	48.1	613	117.1	702	119.5	277	26.5
*Rural Counties**	116	40.1	147	43.7	140	96.7	186	109.6	52	17.1
Minnehaha	82	40.1	136	61.0	156	144.8	143	136.6	83	38.6
Pennington	37	25.0	84	50.5	81	104.4	84	97.6	21	13.4
Lincoln	**	23.3	29	42.6	36	109.4	33	105.9	23	32.0
Brown	19	38.9	24	46.0	29	113.8	35	130.7	19	36.6
Codington	**	28.7	24	60.7	23	134.1	32	143.4	**	19.3
Yankton	**	35.7	**	30.4	16	111.4	21	126.5	**	34.4
Lawrence	18	42.2	21	44.4	**	67.8	22	90.0	**	16.7
Brookings	**	41.5	**	23.7	20	125.5	24	140.8	**	26.9
Davison	**	28.1	**	22.8	**	120.4	22	162.9	**	40.1
Meade	**	32.5	17	45.2	**	81.3	20	115.8	**	6.4
Hughes	**	31.7	**	65.7	18	177.9	**	103.4	**	40.9
Beadle	**	24.2	**	45.4	**	96.1	23	193.2	**	39.1
Union	**	41.4	**	49.6	**	101.9	**	139.0	**	36.9
Clay	**	26.8	**	47.8	**	185.8	**	136.7	**	19.5
Turner	**	7.7	**	75.1	**	88.2	**	76.1	**	14.3
McCook	**	20.0	**	30.6	**	255.8	**	127.8	**	20.0
Hamlin	**	9.5	**	39.5	**	110.5	**	55.5	**	20.8
Stanley	**	92.2	**	50.1	**	102.3	**	182.0	**	17.8
Edmunds	**	28.0	**	32.7	**	87.1	**	70.6	**	26.4
Jerauld	**	74.0	**	27.1	**	0.0	**	50.4	**	19.4
Hanson	**	0.0	**	25.1	**	0.0	**	67.6	**	0.0

Note: Rates per 100,000 age-adjusted to the 2000 US standard population and 2020 SD estimated population.

*Rural Counties include: Aurora, Bennett, Bon Homme, Brule, Buffalo, Butte, Campbell, Charles Mix, Clark, Custer, Day, Deuel, Dewey, Douglas, Fall River, Faulk, Grant, Gregory, Haakon, Harding, Hutchinson, Hyde, Jackson, Jones, Kingsbury, Lake, Lyman, Marshall, McPherson, Mellette, Miner, Moody, Oglala Lakota, Perkins, Potter, Roberts, Sanborn, Spink, Sully, Todd, Tripp, Walworth, and Ziebach

** Data suppressed for less than 16 cases, these rates are considered unstable due to few observations and should be interpreted with caution.

Table 3: Age-adjusted Incidence Rates by Site, Gender and Race, South Dakota, 2020

	Total		Male		Female		White		American Indian	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total	4,738	427.2	2,518	462.8	2,220	405.7	4,330	425.4	284	547.8
Oral Cavity	128	12.1	88	17.0	40	7.6	116	12.3	**	16.5
Digestive System	807	72.3	451	83.6	356	62.4	727	71.3	55	111.3
Respiratory	612	51.4	322	58.1	290	46.6	563	51.0	42	95.2
Bones and Joints	**	0.8	**	0.7	**	0.9	**	0.9	**	1.0
Soft Tissue (Including Heart)	19	1.9	**	2.1	**	1.8	16	1.8	**	2.6
Skin	277	26.5	161	30.4	116	23.7	273	29.4	**	4.3
Breast	618	58.3	**	1.0	613	117.1	560	118.1	34	121.1
Female Genital System	274	51.2			274	51.2	238	50.1	25	83.1
Male Genital System	738	126.7	738	126.7			683	129.1	33	160.2
Urinary	427	37.2	302	56.7	125	21.5	395	36.8	25	44.1
Eye and Orbit	**	0.6	**	0.9	**	0.4	**	0.7	**	0.0
Brain and CNS	50	4.7	27	5.3	23	4.8	46	5.2	**	6.1
Endocrine	117	11.7	34	5.9	83	17.7	99	12.2	**	19.9
Lymphomas	216	17.4	116	23.4	100	15.7	178	16.9	**	16.7
Multiple Myeloma	77	7.1	40	8.0	37	6.6	70	6.9	**	10.1
Leukemia	170	12.2	104	20.3	66	11.2	150	15.0	**	16.7

Note: Rates per 100,000 age-adjusted to the 2000 US standard population and 2020 SD estimated population.

** Data suppressed for less than 16 cases, these rates are considered unstable due to few observations and should be interpreted with caution.

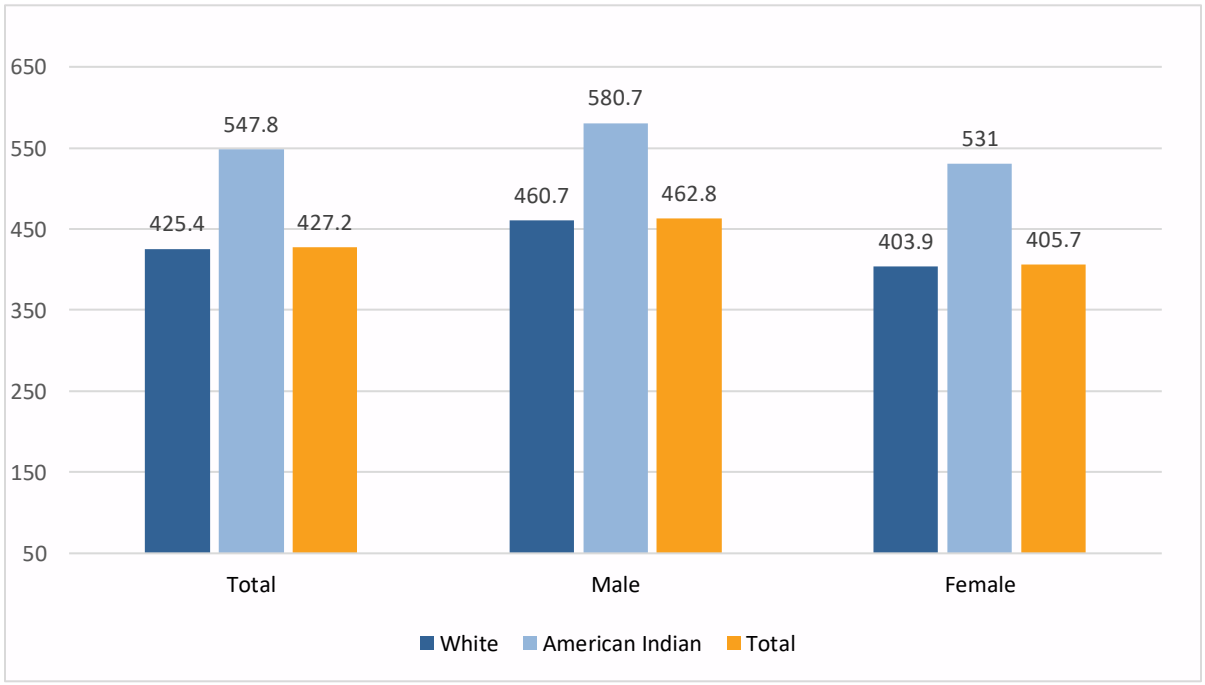
Table 4: Percentage of Selected Cancer Incidence by Age Groups in South Dakota, 2020

Ages:	*0-19*	*20-34*	*35-49*	*50-64*	*65-74*	*75-84*	*85+*
All Sites	1%	2%	8%	28%	33%	20%	8%
Bladder	0%	0%	1%	20%	32%	29%	18%
Breast, Female	0%	2%	14%	34%	29%	17%	4%
Colorectal	0%	1%	12%	24%	32%	20%	11%
Cervical	0%	19%	30%	22%	26%	3%	0%
Leukemia	13%	7%	10%	15%	21%	21%	13%
Kidney and Renal Pelvis	0%	0%	10%	30%	38%	14%	8%
Non-Hodgkin Lymphoma	1%	2%	6%	21%	35%	26%	9%
Lung and Bronchus	0%	0%	1%	23%	41%	25%	10%
Melanomas	0%	3%	14%	33%	31%	14%	5%
Pancreas	0%	0%	4%	22%	38%	28%	8%
Prostate	0%	0%	1%	31%	43%	20%	5%

In 2020, over half of all cancers were diagnosed between the ages 50-74. It is notable that 19% of cervical cancers were diagnosed between the ages 20-34 and 30% were between the ages 35-49; making up almost half of the total cervical cancers diagnosed. In 2020, 20% of the leukemia cases were diagnosed in persons under 35 years old, compared to 7% in 2019.

Figure 1 shows incidence rates for American Indians in South Dakota were higher than those for Whites in 2020. Of the 4,738 newly diagnosed cases, 284 were American Indians, 151 females and 133 males.

Figure 1: Cancer Incidence Rates by Race and Gender, All Sites, South Dakota 2020



Note: Rates per 100,000 age-adjusted to the 2000 US standard population and 2020 SD estimated population.
Source: South Dakota Dept. of Health

Cancer Cases and Deaths by Rank

Prostate cancer was the most common cancer diagnosed in 2020. The other four most diagnosed cancers were female breast, lung and bronchus, colorectal, and melanoma. These 5 cancer types accounted for 54% of the new cases diagnosed and 44% of cancer deaths. Figure 2 shows the percentage of new cancer cases and deaths by rank and gender.

Figure 2: Percentage of Cancer Cases and Deaths by Rank and Gender, South Dakota, 2020

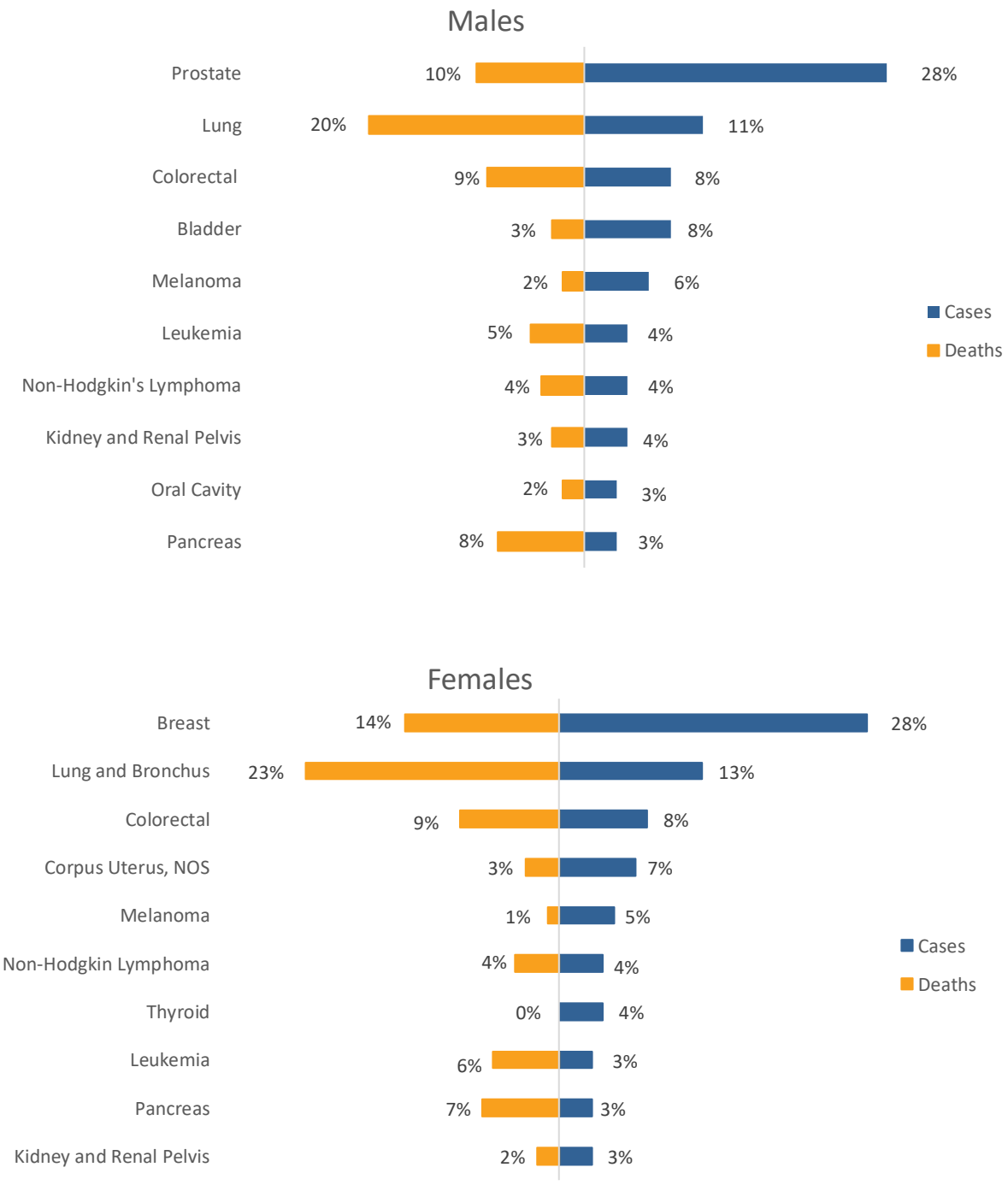
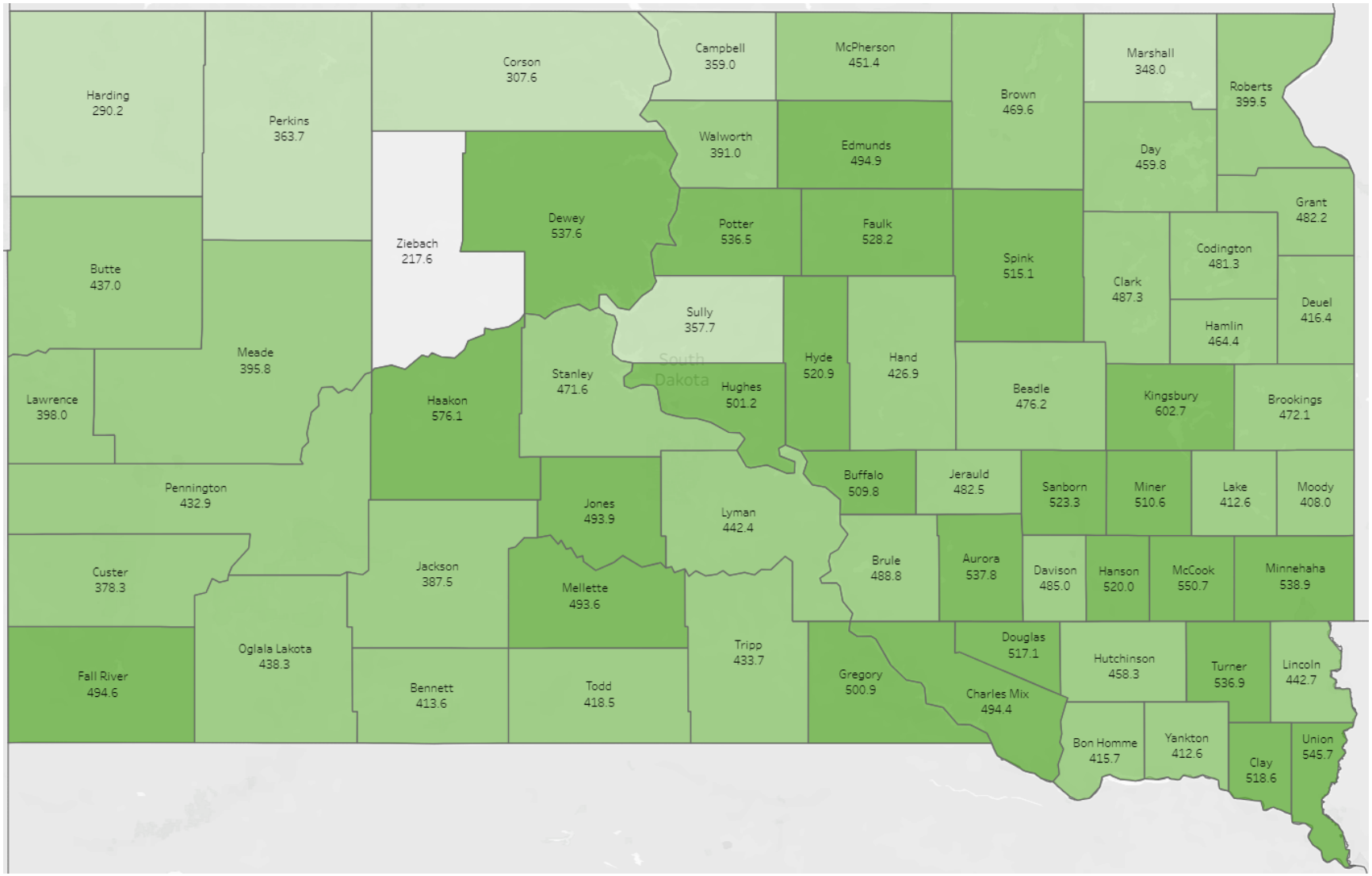
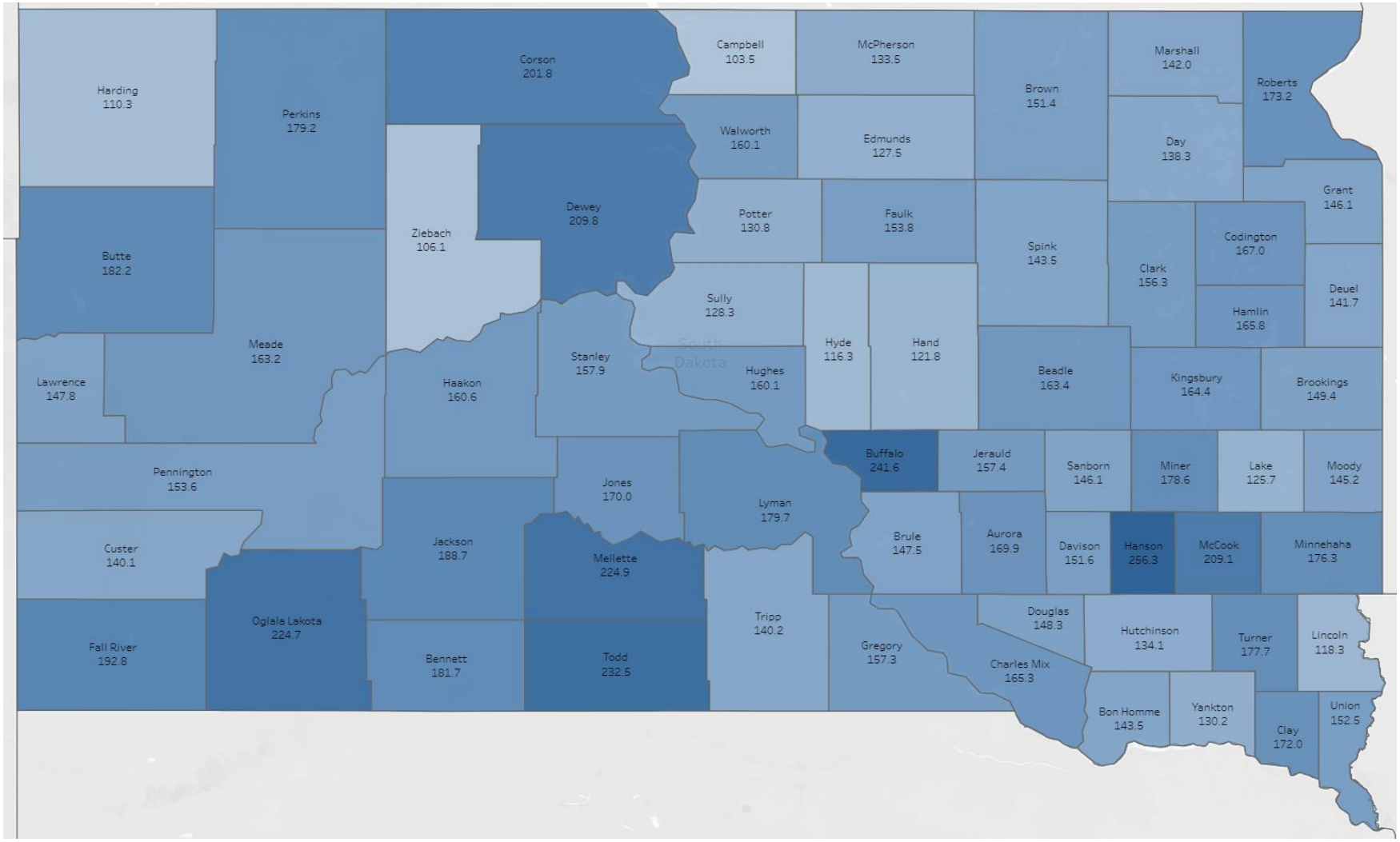


Figure 3: Cancer Incidence Rates by County, South Dakota, 2020



Source: South Dakota Cancer Registry

Figure 4: Cancer Mortality Rates by County, South Dakota, 2020



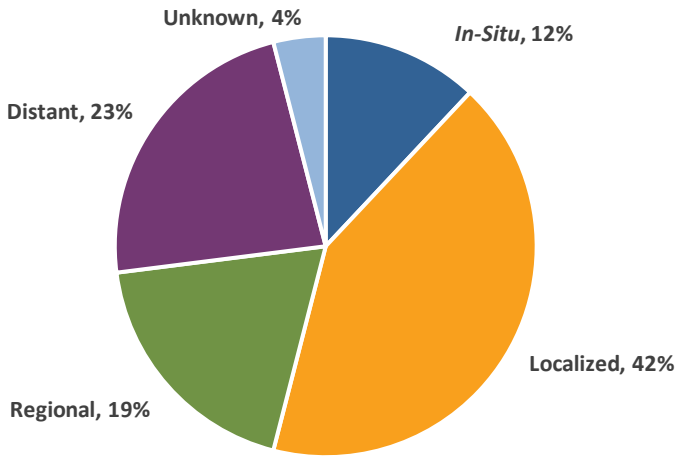
Source: South Dakota Cancer Registry

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 5: Stage at Diagnosis, All Sites, South Dakota, 2020



Source: South Dakota Cancer Registry

The figure above illustrates the percentage of cases diagnosed at each stage of disease. For 2020, there were a total of 5,159 cases reported to the South Dakota State Cancer Registry, which includes all *in-situ* cases.

Table 5: Stage at Diagnosis, All Cases, South Dakota, 2020

Stage	Number of Cases	Percent of Total
In-Situ	639	12%
Localized	2173	42%
Regional	969	19%
Distant	1180	23%
Unknown	198	4%

Figure 6: 2020 Stage at Diagnosis in South Dakota, White

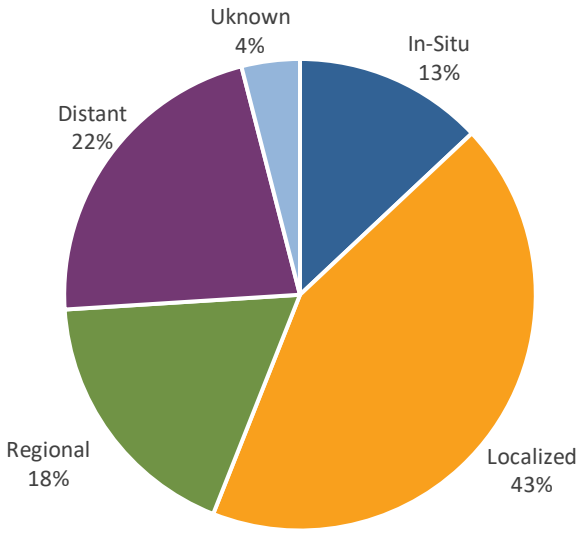
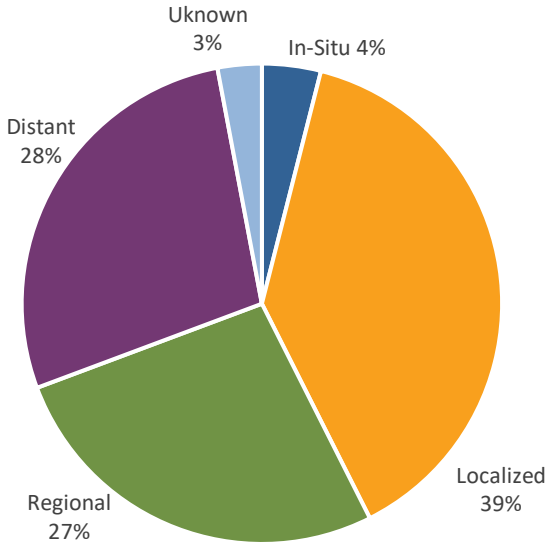


Figure 7: 2020 Stage at Diagnosis in South Dakota, American Indian



Source: South Dakota Cancer Registry

When analyzed by race, 43% of cancer cases diagnosed among Whites and 39% among American Indians were diagnosed at a localized stage. 55% of American Indians were diagnosed at the regional and distant stages combined compared to the 40% among Whites.

Cases of lymphomas, myelomas, and leukemias are usually diagnosed at distant stages and therefore can skew the proportion of all sites diagnosed at distant stages. Some differences in case counts by stage for selected sites are shown below in the Selected Cancer Sites Incidence and Mortality section.

Cancer Mortality by County (Rural vs. Urban)

Table 6: Cancer Deaths and Mortality Rates by County

	2020		2016-2020	
	Deaths	**Rates**	**Deaths**	**Rates**
South Dakota	1,728	148.3	24,520	458.0
*Rural Counties**	502	150.9	2,502	153.3
Minnehaha	362	181.1	1,695	174.4
Pennington	211	138.8	1,096	150.9
Lincoln	80	121.3	335	114.7
Brown	76	144.3	360	138.2
Codington	68	168.6	307	157.3
Yankton	42	114.4	206	118.9
Lawrence	57	128.5	255	130.4
Brookings	51	148.5	211	130.9
Davison	32	101.2	213	146.4
Meade	41	110.9	280	171.1
Hughes	43	183.7	178	155.5
Beadle	34	130.6	187	150.8
Union	36	165.1	170	163.1
Clay	24	188.4	115	179.1
Turner	20	142.6	100	154.0
McCook	**	149.8	82	204.0
Hamlin	**	210.6	72	188.7
Stanley	**	109.4	34	146.5
Edmunds	**	112.4	35	111.0
Jerauld	**	0.0	26	124.6
Hanson	**	264.9	45	302.1

Note: Rates per 100,000 age-adjusted to the 2000 US standard population and 2020 SD estimated population.

*Rural Counties include: Aurora, Bennett, Bon Homme, Brule, Buffalo, Butte, Campbell, Charles Mix, Clark, Custer, Day, Deuel, Dewey, Douglas, Fall River, Faulk, Grant, Gregory, Haakon, Harding, Hutchinson, Hyde, Jackson, Jones, Kingsbury, Lake, Lyman, Marshall, McPherson, Mellette, Miner, Moody, Oglala Lakota, Perkins, Potter, Roberts, Sanborn, Spink, Sully, Todd, Tripp, Walworth, and Ziebach

** Data suppressed for less than 16 cases, these rates are considered unstable due to few observations and should be interpreted with caution.

Table 7: Age-Adjusted Mortality Rates by County for Selected Sites, 2020

	Colorectal		Lung and Bronchus		Female Breast		Prostate		Melanoma	
	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
South Dakota	157	13.3	372	31.2	115	19.3	95	19.6	20	1.9
*Rural Counties**	67	20.7	91	26.6	29	17.3	29	19.8	**	2.3
Minnehaha	25	13.4	92	42.3	20	19.3	16	22.7	**	2.9
Pennington	**	6.0	44	28.3	17	21.0	**	21.8	**	2.0
Lincoln	**	10.4	16	24.8	**	23.4	**	19.0	**	0.0
Brown	**	11.5	17	28.6	**	23.4	**	11.5	**	0.0
Codington	**	7.7	21	52.9	**	3.2	**	28.4	**	3.1
Yankton	**	8.0	**	14.3	**	6.5	**	6.4	**	0.0
Lawrence	**	16.9	**	27.7	**	0.0	**	16.8	**	0.0
Brookings	**	15.7	**	27.8	**	44.8	**	12.9	**	4.9
Davison	**	9.3	**	25.8	**	20.5	**	15.0	**	3.6
Meade	**	6.0	**	22.2	**	14.5	**	21.7	**	0.0
Hughes	**	22.8	**	39.0	**	20.1	**	7.6	**	8.6
Beadle	**	0.0	**	26.7	**	37.2	**	16.9	**	0.0
Union	**	5.8	**	55.2	**	0.0	**	35.2	**	0.0
Clay	**	7.0	**	20.5	**	19.7	**	85.7	**	0.0
Turner	**	5.1	**	48.5	**	47.3	**	14.4	**	0.0
McCook	**	25.4	**	14.4	**	15.4	**	0.0	**	0.0
Hamlin	**	0.0	**	45.3	**	49.1	**	19.2	**	0.0
Stanley	**	20.4	**	56.3	**	47.3	**	0.0	**	0.0
Edmunds	**	18.0	**	18.0	**	0.0	**	0.0	**	0.0
Jerauld	**	0.0	**	0.0	**	0.0	**	0.0	**	0.0
Hanson	**	0.0	**	12.6	**	96.4	**	129.2	**	0.0

Note: Rates per 100,000 age-adjusted to the 2000 US standard population and 2020 SD estimated population.

*Rural Counties include: Aurora, Bennett, Bon Homme, Brule, Buffalo, Butte, Campbell, Charles Mix, Clark, Custer, Day, Deuel, Dewey, Douglas, Fall River, Faulk, Grant, Gregory, Haakon, Harding, Hutchinson, Hyde, Jackson, Jones, Kingsbury, Lake, Lyman, Marshall, McPherson, Mellette, Miner, Moody, Oglala Lakota, Perkins, Potter, Roberts, Sanborn, Spink, Sully, Todd, Tripp, Walworth, and Ziebach

** Data suppressed for less than 16 cases, these rates are considered unstable due to few observations and should be interpreted with caution.

Table 8: Age-adjusted Mortality Rates by Site, Gender and Race, South Dakota, 2020

	Total		Male		Female		White		American Indian	
	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
Total	1,728	148.3	907	173.6	821	131.3	1,589	146.3	101	223.2
Oral Cavity	29	2.5	22	3.8	**	1.4	23	2.2	**	9.7
Digestive System	471	39.6	280	51.2	191	29.5	418	37.8	42	94.2
Respiratory	388	32.5	196	36.0	192	30.4	361	32.5	18	36.3
Bones and Joints	**	0.2	**	0.3	**	0.1	**	0.2	**	0.0
Soft Tissue (Including Heart)	**	0.9	**	1.6	**	0.2	**	0.9	**	1.5
Melanoma	20	1.9	**	2.7	**	1.2	20	2.2	**	0.0
Breast	116	10.3	**	0.2	115	19.3	106	10.2	**	16.8
Female genital system	83	13.6			83	13.6	76	13.4	**	17.3
Male genital system	95	19.6	95	19.6			94	20.2	**	3.9
Urinary	84	6.9	57	10.9	27	4.1	80	7.0	**	5.8
Eye and Orbit	**	0.1	**	0.0	**	0.2	**	0.1	**	0.0
Brain and CNS	51	4.7	31	6.2	20	3.6	50	5.1	**	1.4
Endocrine	**	0.7	**	0.5	**	0.9	**	0.7	**	1.5
Lymphomas	67	6.1	33	7.3	34	5.0	62	5.9	**	3.7
Multiple Myeloma	44	3.8	29	5.7	**	2.1	41	3.8	**	7.1
Leukemia	90	8.0	44	8.8	46	7.5	82	7.7	**	7.7

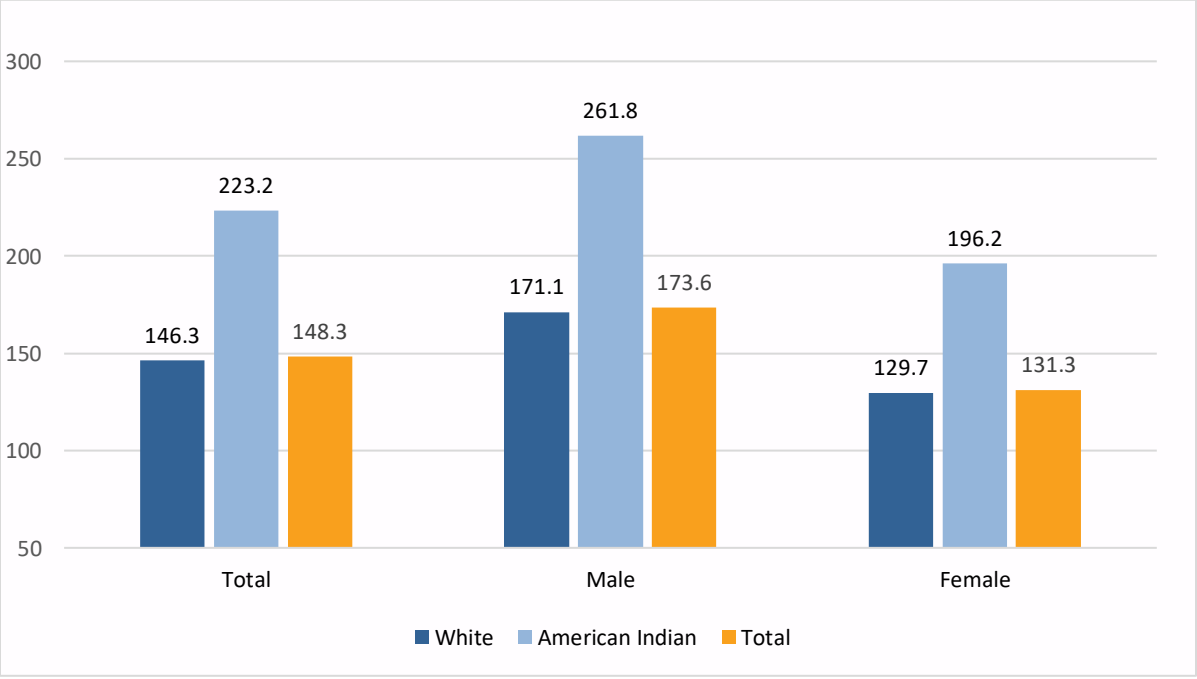
Note: Rates per 100,000 age-adjusted to the 2000 US standard population and 2020 SD estimated population.

** Data suppressed for less than 16 cases, these rates are considered unstable due to few observations and should be interpreted with caution.

Table 9: Percentage of Selected Cancers Deaths by Age Groups in South Dakota, 2020

Ages:	*0-19*	*20-34*	*35-49*	*50-64*	*65-74*	*75-84*	*85+*
All Sites	0%	0%	3%	20%	28%	27%	22%
Bladder	0%	0%	0%	8%	16%	30%	46%
Breast, Female	0%	0%	7%	20%	30%	24%	19%
Colorectal	0%	1%	2%	14%	33%	25%	25%
Cervical	0%	8%	17%	8%	33%	17%	17%
Leukemia	2%	0%	2%	11%	19%	37%	29%
Kidney and Renal Pelvis	0%	0%	0%	21%	34%	24%	21%
Non-Hodgkin Lymphoma	0%	0%	2%	17%	11%	39%	31%
Lung and Bronchus	0%	0%	1%	24%	31%	28%	16%
Melanomas	0%	0%	20%	10%	30%	30%	10%
Pancreas	0%	0%	2%	20%	37%	24%	17%
Prostate	0%	0%	0%	7%	15%	28%	50%

Figure 8: Cancer Mortality Rates by Race and Gender, All Sites, South Dakota, 2020



Note: Rates per 100,000 age-adjusted to the 2000 US standard population and 2020 SD estimated population.
Source: South Dakota Dept. of Health

This page is intentionally left blank.

Selected Cancer Sites: Incidence and Mortality

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

These cancers were selected because of their high 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.

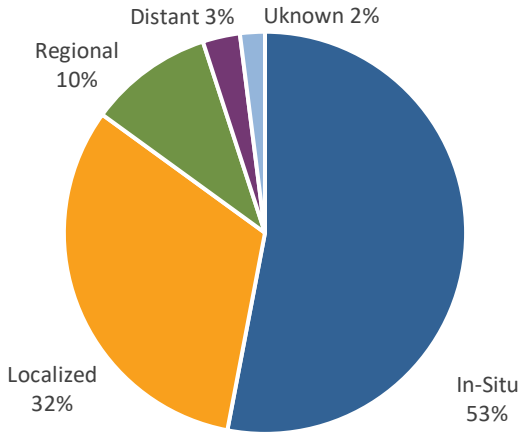
Bladder

Table 10: Bladder Cancer Incidence and Mortality Summary, 2020

Bladder Cancer			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# cases/deaths	**247**	190	57	37	29	**
		age-adjusted rate	**21.0**	36.0	9.1	3.0	5.8	1.1
	White	# cases/deaths	**238**	182	56	35	28	**
		age-adjusted rate	**21.7**	36.7	9.7	3.0	5.8	1.0
	American Indian	# cases/deaths	**	**	**	**	**	**
		age-adjusted rate	**8.6**	20.2	0.0	3.6	8.8	0.0
United States	**Total**	Age-Adjusted Rate	**17.1**	29.6	7.2	4.0	6.8	1.9
	White	Age-Adjusted Rate	**19.5**	33.5	8.1	4.5	7.7	2.1
	American Indian	Age-Adjusted Rate	**9.6**	17.1	3.7	2.4	3.9	1.4

**Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

Figure 9: Bladder Cancer Stage at Diagnosis
South Dakota, 2020



Source: South Dakota Cancer Registry

Descriptive Epidemiology

Stage at Diagnosis: Bladder cancer is categorized as noninvasive and invasive. There were 131 (53%) noninvasive cancers reported in 2020 and 116 (45%) invasive cases reported. Nationally, 48.5% of the cases of urinary bladder cancer were diagnosed at the *in-situ* stage. In South Dakota, 3% of the cases were not diagnosed until the disease had spread to distant sites.

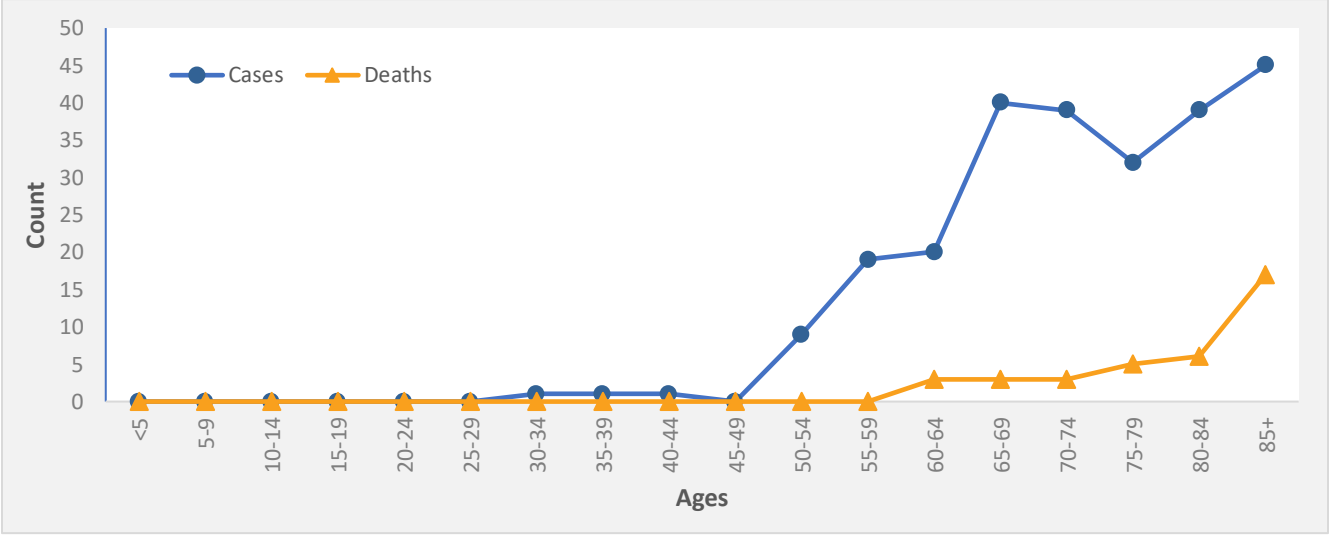
Incidence: In 2020, it was estimated that 81,400 cases of bladder would be diagnosed in the United States. There were 247 cases of bladder cancer reported in South Dakota. There were 190 males and 57 females diagnosed in 2020. Statistically, males were diagnosed about four times as often as females. There were five American Indian cases diagnosed in 2020. In the United States, it was the sixth most frequent cancer. In South Dakota, it was the seventh 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 2020, The South Dakota and U.S. mortality rate was 3.0 and 4.0 respectively.

Risk and Associated Factors: Tobacco use increases the risk of bladder cancer by two times of 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 10: Bladder Cancer Number of Cases and Deaths by Age, South Dakota, 2020



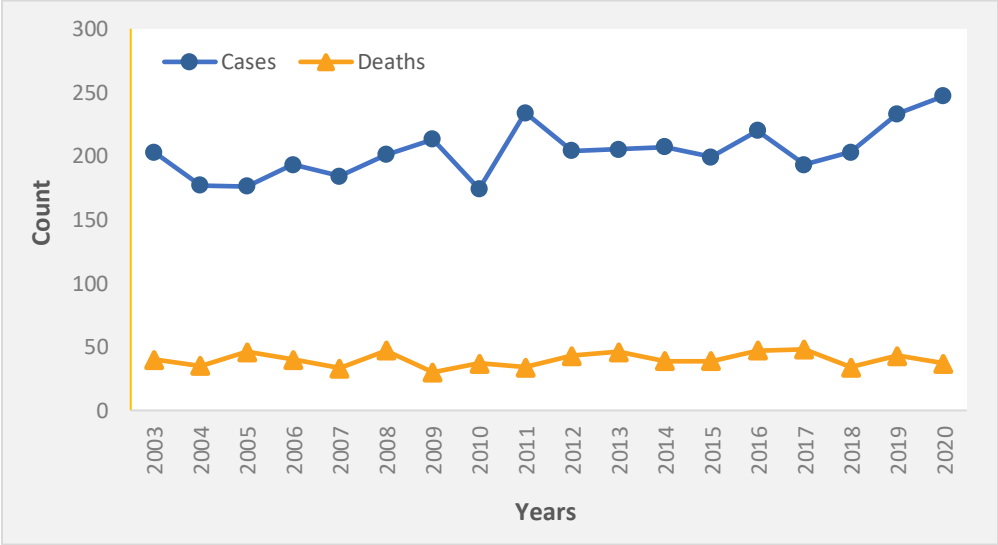


Figure 11: Bladder Cancer Cases and Deaths by Year, South Dakota, 2003-2020

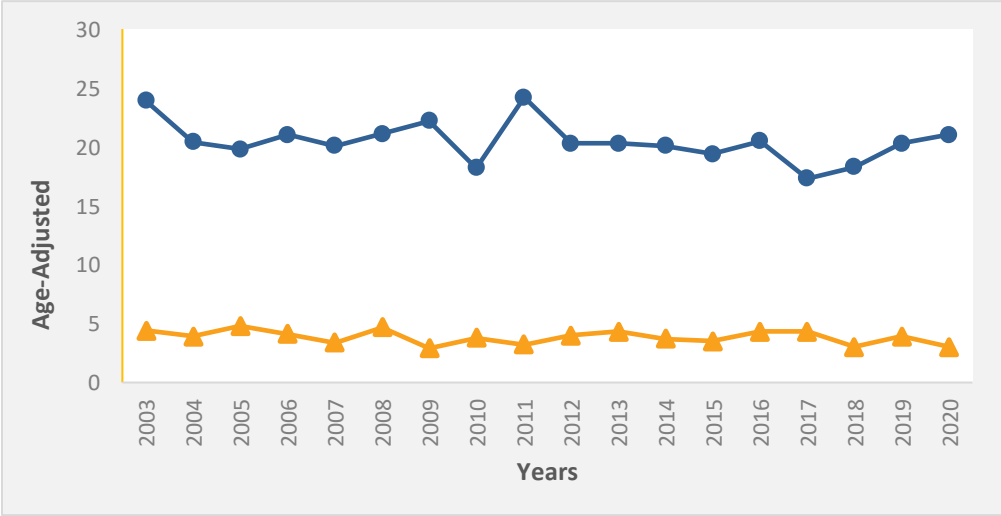


Figure 12: Bladder Cancer Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations.
Source: South Dakota Cancer Registry

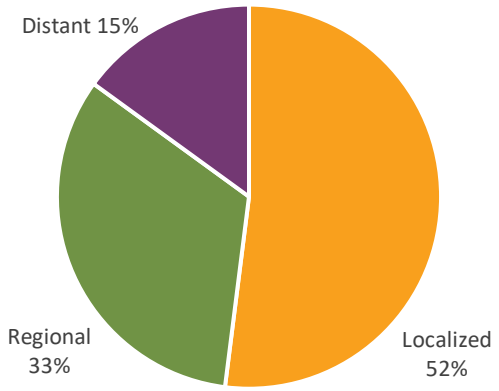
Cervical

Table 11: Cervical Cancer Incidence and Mortality Summary, 2020

Cervical Cancer			Incidence		Mortality	
			Total	Female	Total	Female
South Dakota	**Total**	# cases/deaths	**27**	27	**	**
		age-adjusted rate	**5.9**	5.9	2.2	2.2
	White	# cases/deaths	**23**	23	**	**
		age-adjusted rate	**5.8**	5.8	2.2	2.2
	American Indian	# cases/deaths	**	**	**	**
		age-adjusted rate	**11.6**	11.6	8.0	8.0
United States	**Total**	Age-Adjusted Rate	**6.8**	6.8	2.2	2.2
	White	Age-Adjusted Rate	**6.5**	6.5	2.1	2.1
	American Indian	Age-Adjusted Rate	**8.4**	8.4	1.9	1.9

**Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

Figure 13: Cervical Cancer Stage at Diagnosis South Dakota, 2020



Source: South Dakota Cancer Registry

Descriptive Epidemiology

Stage at Diagnosis: An early stage of diagnosis provides the best opportunity for a cure. In South Dakota, 52% of the cases were diagnosed at a localized stage. The United States Cancer Statistics reports that 43.7% of the cases diagnosed nationally were at a localized stage, 34.7% were regional and 15% were diagnosed at a distant stage.

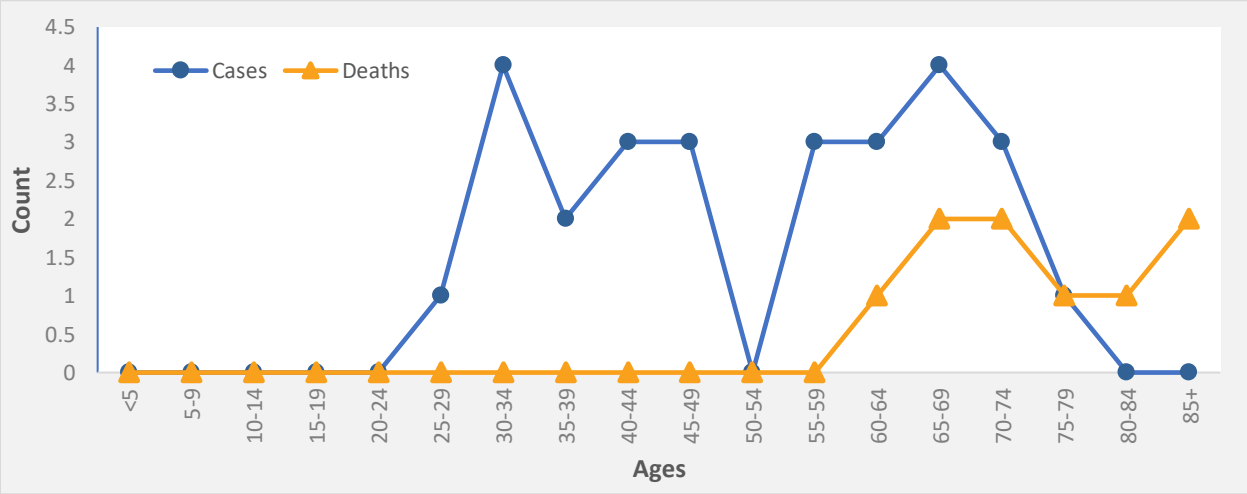
Incidence: In 2020, the incidence rate in South Dakota was 5.9 and the United States rate was 6.8. The American Cancer Society estimated that 13,800 cases of invasive cervical cancer would be diagnosed in the United States in 2020. Studies have suggested that recent declines in the incidence among young women may be associated with an increase in HPV vaccination.

Mortality: In 2020, the mortality rate in South Dakota was 2.2 for cancer of the cervix uteri. The United States rate was 2.2. Cases diagnosed at a localized stage had a 91.2% survival rate according to the United States Cancer Statistics. Nationally, when diagnosed at a distant stage, the percentage of survival drops to 18.9% at five years.

Risk and Associated Factors: Almost all cervical cancers are caused by the Human Papillomavirus (HPV). Most people will get HPV at some point in their lives. Additionally, having a weakened immune system, smoking, or breathing 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 though HPV test and Pap test 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 South Dakota in 2020, 80.2% of females between the ages 21 and 65 reported receiving a Pap test within the last 3 years. This is better than the national average of 77.7% of females.

Figure 14: Cervical Cancer Number of Cases and Deaths by Age, South Dakota, 2020



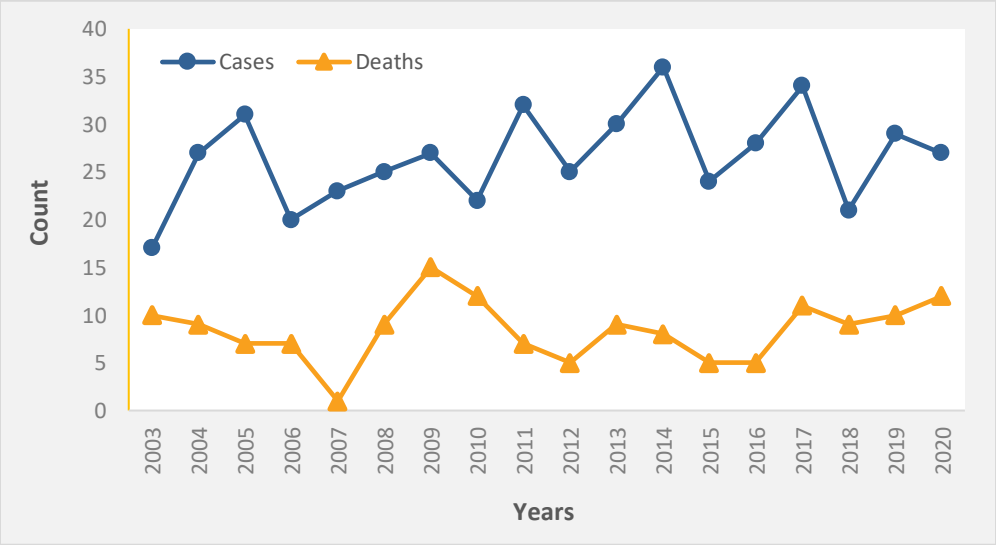


Figure 15: Cervical Cancer Cases and Death by Year, South Dakota, 2003-2020

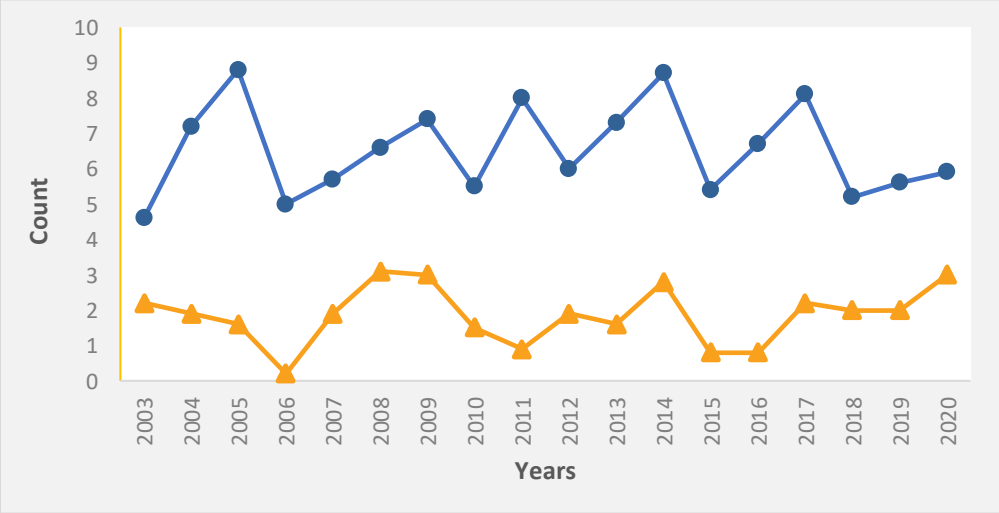


Figure 16: Cervical Cancer Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations.
Source: South Dakota Cancer Registry

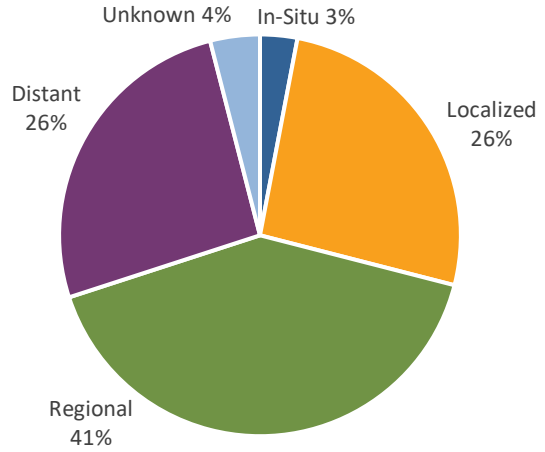
Colon and Rectum

Table 12: Colorectal Incidence and Mortality Summary, 2020

Colorectal Cancer			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# cases/deaths	**382**	202	180	157	81	76
		age-adjusted rate	**35.6**	38.8	32.6	13.3	15.1	11.6
	White	# cases/deaths	**341**	181	160	131	68	63
		age-adjusted rate	**34.5**	37.5	31.9	11.7	13.4	10.7
	American Indian	# cases/deaths	**31**	**	17	20	**	**
		age-adjusted rate	**64.7**	68.2	61.7	50.9	71.7	38.2
United States	**Total**	Age-Adjusted Rate	**32.5**	37.1	28.6	12.6	15.1	10.5
	White	Age-Adjusted Rate	**32.9**	37.2	29.1	12.6	14.9	10.5
	American Indian	Age-Adjusted Rate	**34.3**	39.8	29.6	13.1	16.1	10.6

** Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

Figure 17: Colorectal Cancer Stage at Diagnosis, South Dakota, 2020



Source: South Dakota Cancer Registry

Descriptive Epidemiology

Stage at Diagnosis: The prognosis of a patient is greatly influenced by the stage of disease at diagnosis. In 2020, 26% of the cases of colorectal cancer were diagnosed at a localized stage. The remaining 225 cases were diagnosed after the disease had spread beyond the colon. From 2016-2020, the five-year survival rate for those diagnosed at a distant stage was 15.8%.

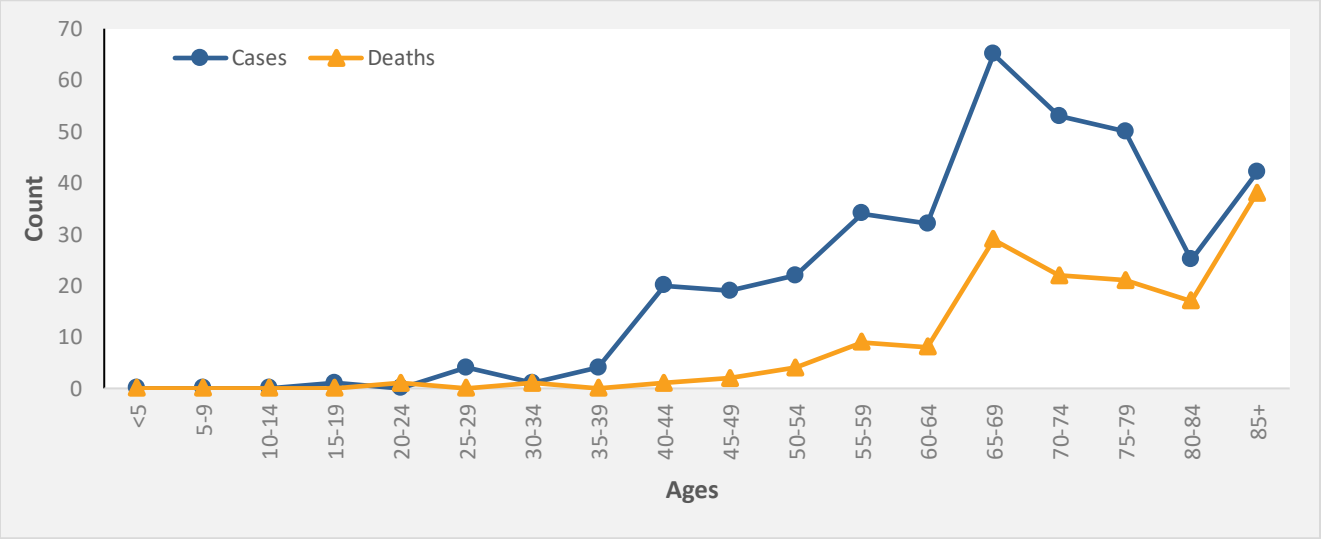
Incidence: Colorectal cancer accounted for 382 of all cases reported in South Dakota in 2020. The median age at diagnosis was 67. There were 202 males and 180 females diagnosed with colorectal cancer in 2020. in South Dakota. Overall, colorectal cancer was the fourth most diagnosed cancer. When reviewed by sex, it was the third most diagnosed cancer for both sexes with 8% of cases for males and 8.1% of cases for females.

Mortality: The overall five-year survival rate from 2016-2020 was 67% for males and females in the United States. In 2020, there were a total of 157 deaths that attributed to colorectal cancer in South Dakota; 81 males and 76 females. Of that number, 131 were White and 20 were American Indian. The median age at death was 74.

Risk and Associated Factors: The risk of colorectal cancer increases with age. Over 90% 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 20–40-year-olds. Risk factors for colorectal cancer include a family history of the disease, a lack of regular physical activity, a poor diet, 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. Recommended screening methods include high-sensitivity fecal occult blood test (FOBT), fecal immunochemical test (FIT), FIT-DNA, colonoscopy, CT colonography, & flexible sigmoidoscopy. In 2020, only 2 out of 3 South Dakotans aged 50-75 had received a colonoscopy within the last 10 years.

Figure 18: Colorectal Cancer Number of Cases and Deaths by Age, South Dakota, 2020



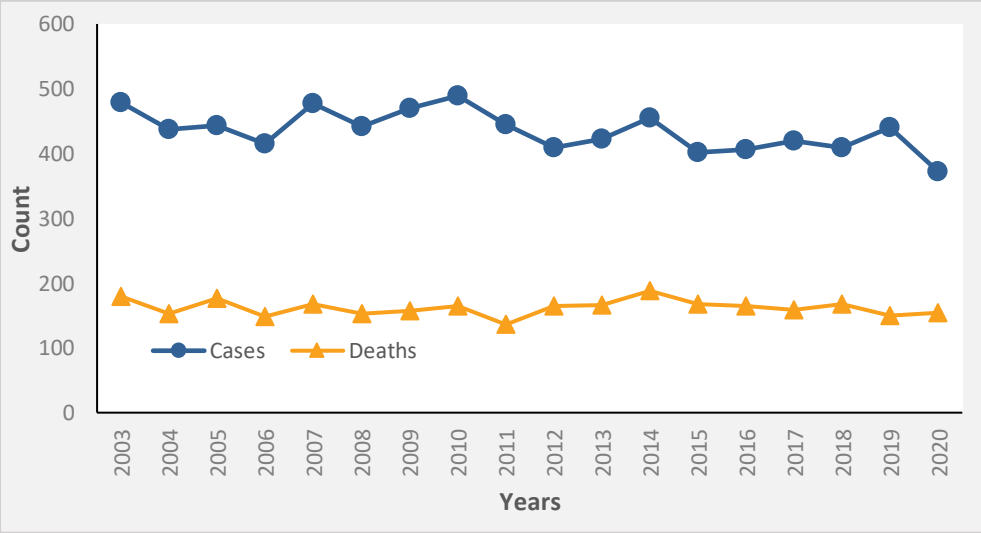


Figure 19: Colorectal Cancer Cases and Deaths by Year, South Dakota, 2003-2020

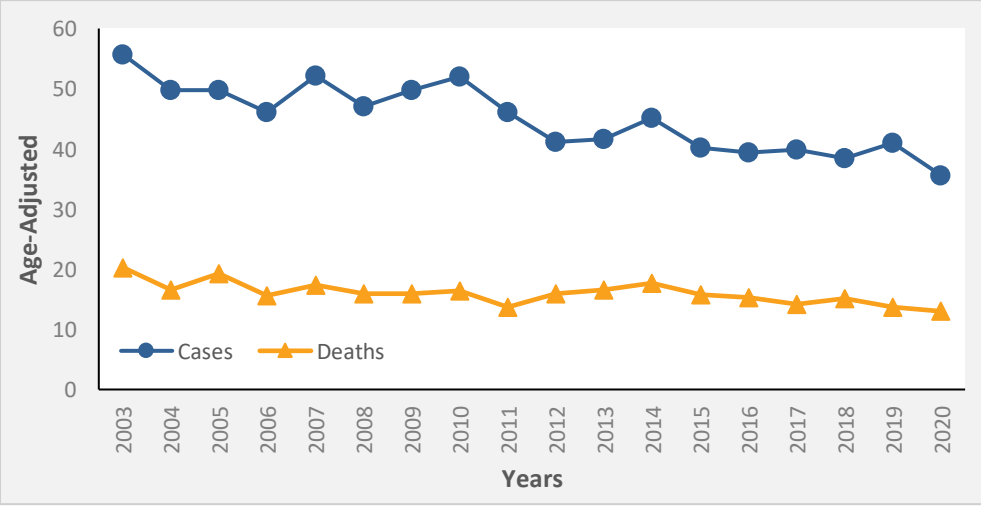


Figure 20: Colorectal Cancer Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations.
Source: South Dakota Cancer Registry

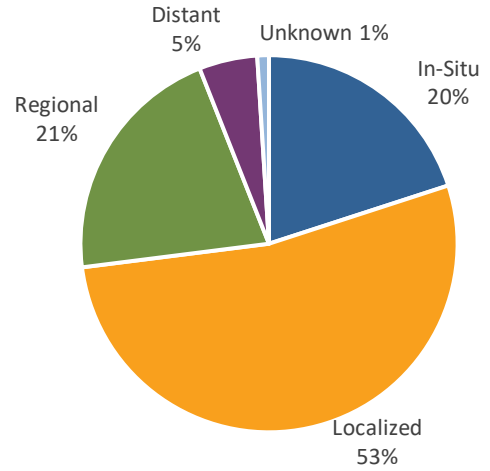
Female Breast

Table 13: Female Breast Cancer Incidence and Mortality Summary, 2020

Breast Cancer			Incidence	Mortality
			Total	Total
South Dakota	**Total**	# cases/deaths age-adjusted rate	**613** **117.1**	115 19.3
	White	# cases/deaths age-adjusted rate	**560** **118.1**	106 19.3
	American Indian	# cases/deaths age-adjusted rate	**34** **121.1**	** 24.8
United States	**Total**	Age-Adjusted Rate	**119.2**	19.1
	White	Age-Adjusted Rate	**125.3**	19.3
	American Indian	Age-Adjusted Rate	**91.6**	13.5

**Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

Figure 21: Female Breast Cancer Stage at Diagnosis, South Dakota, 2020



Source: South Dakota Cancer Registry

Descriptive Epidemiology

Stage at Diagnosis: Including *in-situ* female breast cancer cases there were 753 cases diagnosed in 2020, of which 404 cases were diagnosed at a localized stage. This represents 53% of all reported breast cancer cases. There were 192 cases that metastasized beyond the breast. Advanced-stage breast cancers often metastasize, typically to the bones, liver, and lung. *In-situ* breast cancers were excluded from the incidence rates.

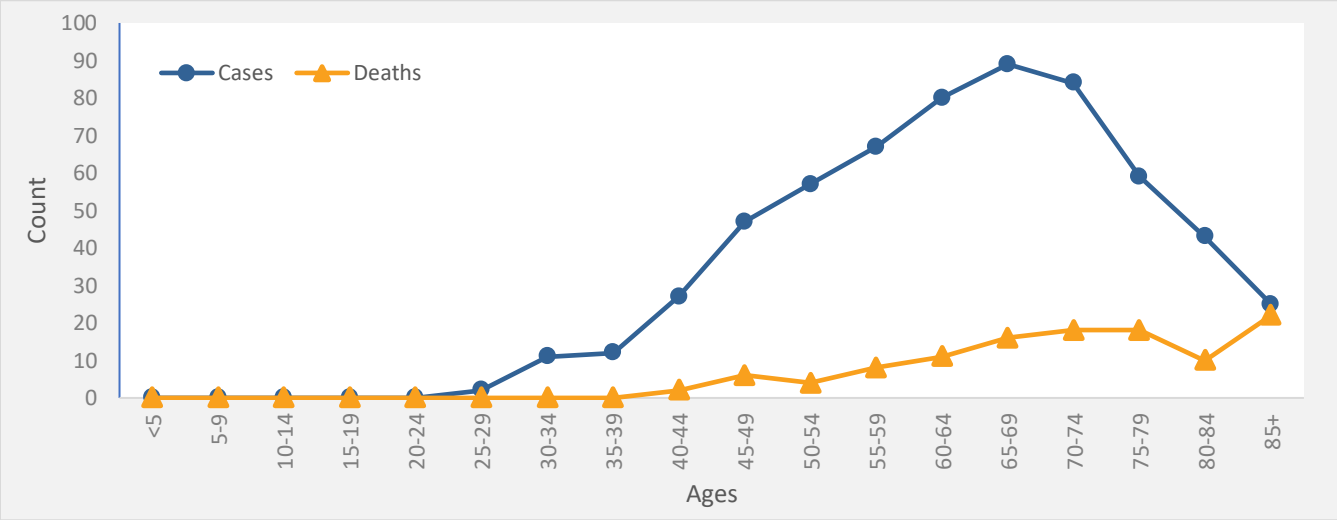
Incidence: Nationally, breast cancer is the most common malignant tumor among females. South Dakota had 613 invasive female breast cancers reported in 2020. These cases represented 13% of all invasive cancer cases reported in 2020 versus 15% nationally. In South Dakota, breast cancer represented 27.6% of the cancer cases for females diagnosed in 2020.

Mortality: Breast cancer is the fourth leading cause of death attributed to cancer in South Dakota. Nationwide, breast cancer mortality peaked in 1989 and has been decreasing since. In cancers only of females, it is the 2nd leading cause of cancer deaths. Although mortality has increased among females older than 55 years, it has decreased among those who are younger. In 2020, there were 115 deaths. Of those deaths, 106 were white.

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 50-74 get a mammogram every 2 years. In 2020, 80.1% of South Dakotan females between the ages 50-74 reported having met the mammogram screening guidelines This is slightly better than the nationwide average of 78.3%.

Figure 22: Female Breast Cancer Number of Cases and Death by Age, South Dakota, 2020



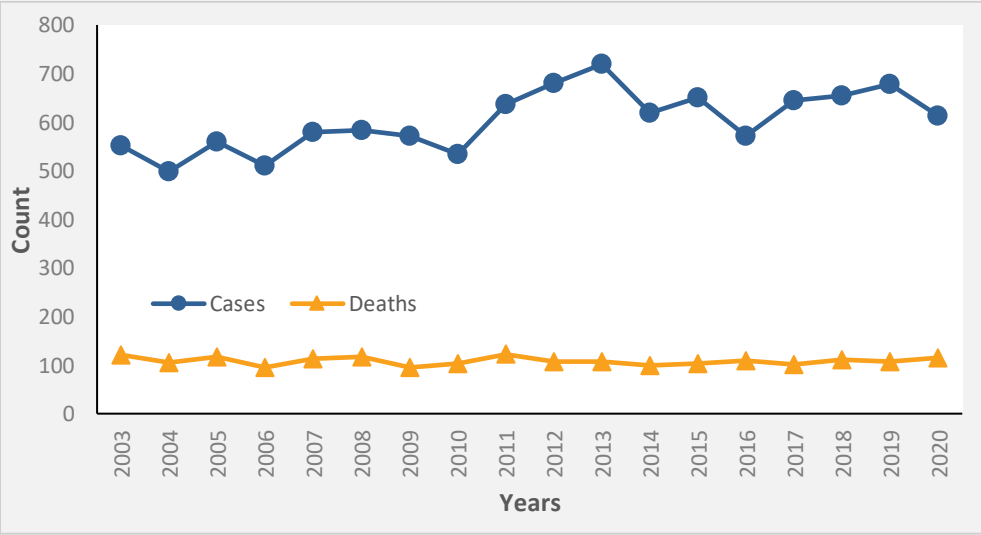


Figure 23: Female Breast Cancer Cases and Deaths by Year, South Dakota, 2003-2020

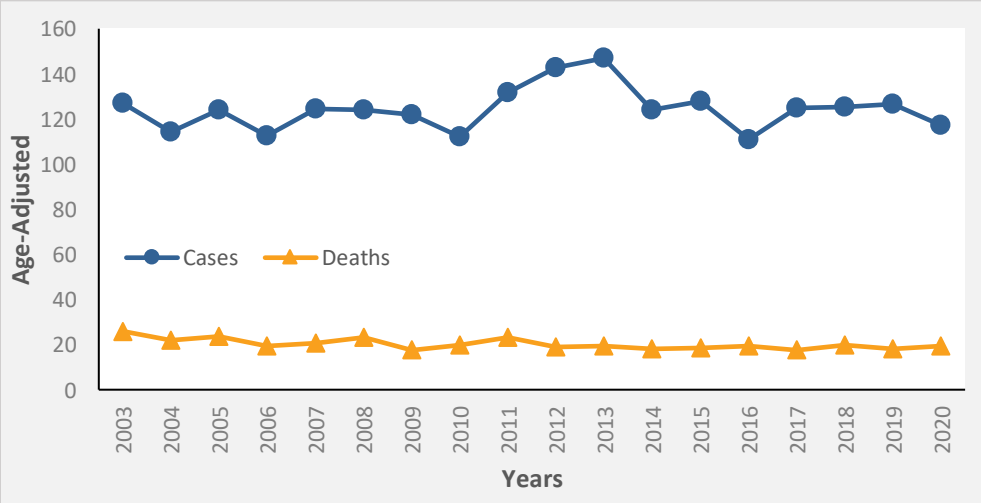


Figure 24: Female Breast Cancer Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations
Source: South Dakota Cancer Registry

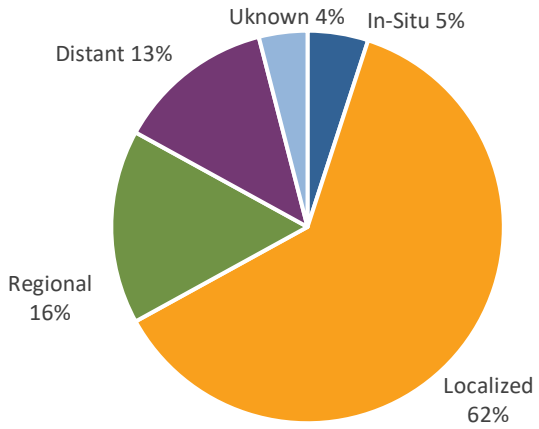
Kidney

Table 14: Kidney Cancer Incidence and Mortality Summary, 2020

Kidney Cancer			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# cases/deaths	**170**	103	67	47	28	19
		age-adjusted rate	**15.5**	19.1	12.5	3.9	5.2	3.0
	White	# cases/deaths	**148**	92	56	45	27	18
		age-adjusted rate	**14.3**	17.9	11.3	4.0	5.3	3.0
	American Indian	# cases/deaths	**20**	**	**	**	**	**
		age-adjusted rate	**33.9**	38.5	32.9	2.2	0.0	3.7
United States	**Total**	Age-Adjusted Rate	**15.8**	21.8	10.6	3.4	5.1	2.1
	White	Age-Adjusted Rate	**16.2**	22.3	10.7	3.6	5.3	2.2
	American Indian	Age-Adjusted Rate	**22.9**	30.5	16.1	4.7	6.5	3.2

**Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

Figure 25: Kidney Cancer Stage at Diagnosis South Dakota, 2020



Source: South Dakota Cancer Registry

Descriptive Epidemiology

Stage at Diagnosis: As with all malignancies, early diagnosis is the key to a better prognosis and possible cure. In 2020, 62% of all cases were diagnosed at a localized stage; another 13% were diagnosed at a distant stage. As with other cancers, renal cancer can spread through the bloodstream and/or lymphatic system.

Incidence: In 2020, the American Cancer Society estimated there would be 73,750 new cases of kidney cancer in the United States. This accounts for 4% of all reported malignancies in the United States.

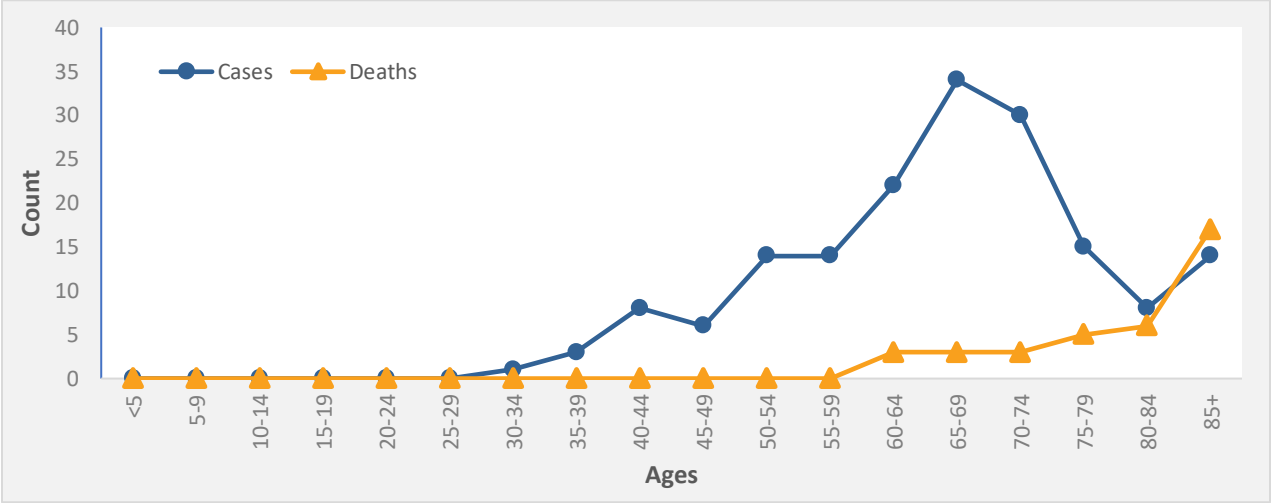
In South Dakota, there were 170 cases of kidney cancer in 2020. This represents 3.6% of all cancer cancers with an age-adjusted rate of 15.5 per 100,000 persons in South Dakota. The median age at diagnosis was 66 in South Dakota.

Mortality: Kidney cancer was the 11th leading cause of cancer death in South Dakota in 2020. The South Dakota median age of death was 73. Survival rates associated with kidney cancer depend on how far the disease has progressed, the size of the tumor, and whether it has metastasized. The 2016-2020 five-year survival rate for localized stage kidney cancer is 90.9% and 17.2% for distant stage.

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

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 26: Kidney Cancer Number of Cases and Death by Age, South Dakota, 2020



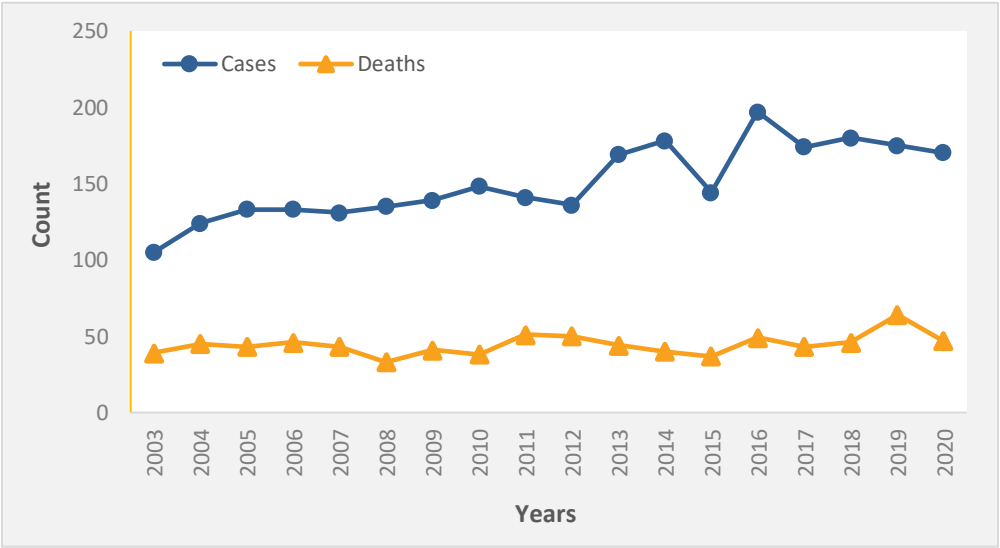


Figure 27: Kidney Cancer Cases and Deaths by Year, South Dakota 2003-2020

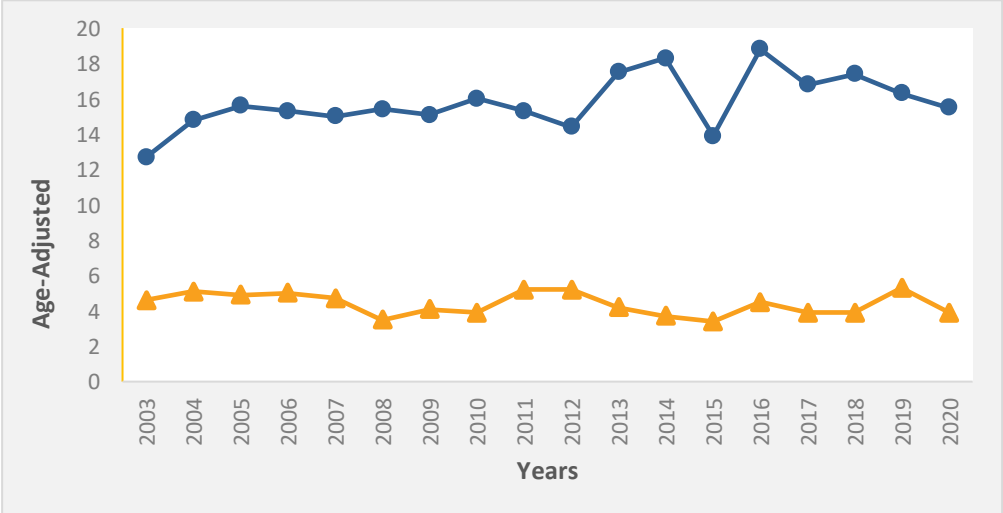


Figure 28: Kidney Cancer Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations.
Source: South Dakota Cancer Registry

Leukemia

Table 15: Leukemia Incidence and Mortality Summary, 2020

Leukemia			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# cases/deaths age-adjusted rate	**170** **15.6**	104 20.3	66 11.2	88 8.0	44 8.8	44 7.5
	White	# cases/deaths age-adjusted rate	**150** **15.0**	93 20.1	57 10.3	82 7.7	39 7.9	43 7.6
	American Indian	# cases/deaths age-adjusted rate	****** **16.7**	** 15.5	** 16.7	** 7.7	** 10.6	** 5.7
United States	**Total**	Age-Adjusted Rate	**12.7**	16.0	10.1	5.8	7.7	4.3
	White	Age-Adjusted Rate	**13.5**	17.0	10.5	6.2	8.3	4.6
	American Indian	Age-Adjusted Rate	**10.3**	11.7	9.1	3.5	**	**

**Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

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).

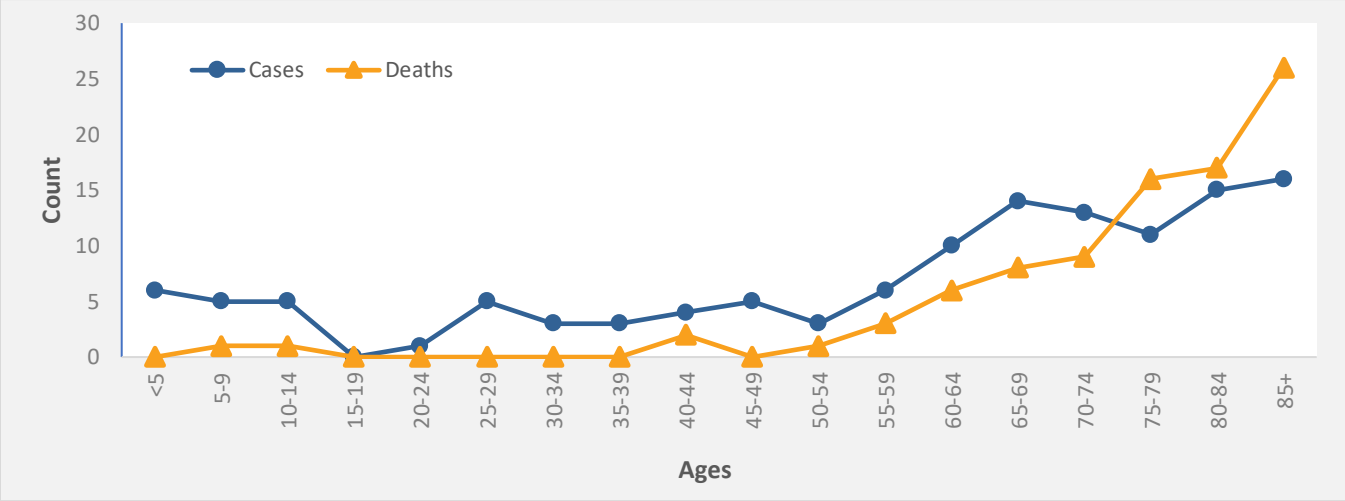
Incidence: Leukemias are a diverse group of cancers and are subtyped by tissue structure. Subtypes have different causes, treatment, and prognoses. Leukemias accounted for 3.6% of cancers reported in 2020 in South Dakota. The American Cancer Society estimated that there would be 230 new cases of leukemia in South Dakota during 2020 and 60,530 cases nationwide.

Mortality: Leukemia accounted for 5.2% of all cancer deaths in South Dakota in 2020. Acute myeloid leukemia was the most frequent cause of leukemia deaths. About 84.1% of the deaths associated with leukemia occurred at ages 65 years 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 29: Leukemia Number of Cases and Deaths by Age, South Dakota, 2020



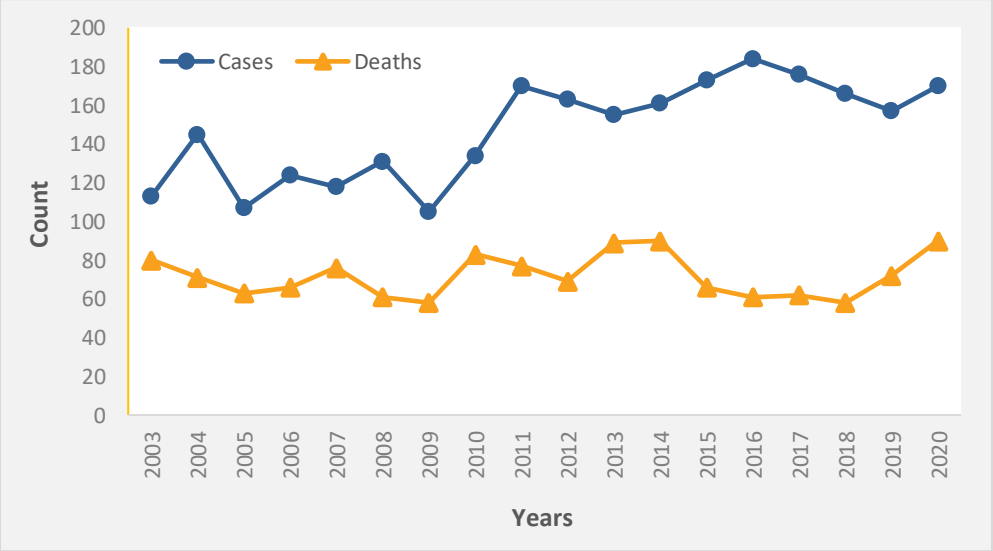


Figure 30: Leukemia Cases and Deaths by Year, South Dakota, 2003-2020

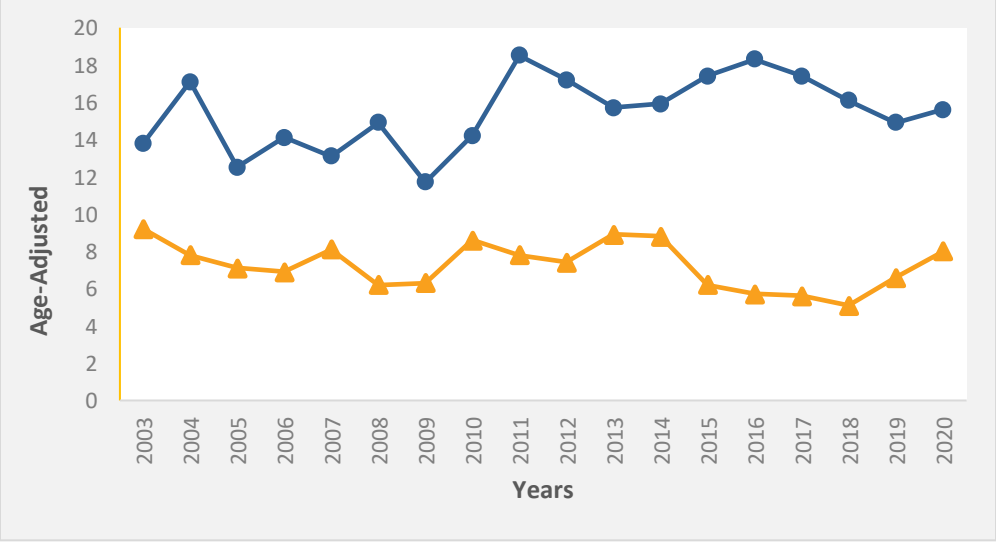


Figure 31: Leukemia Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations.
Source: South Dakota Cancer Registry

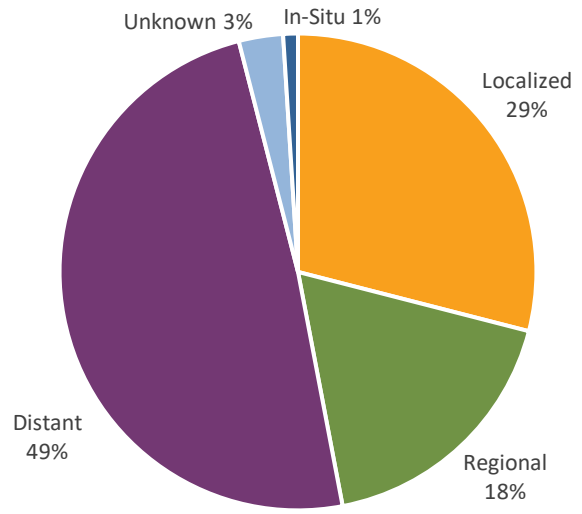
Lung and Bronchus

Table 16: Lung Incidence and Mortality Summary, 2020

Lung Cancer			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# cases/deaths	**574**	289	285	372	183	189
		age-adjusted rate	**48.1**	52.1	45.6	31.2	33.7	30.0
	White	# cases/deaths	**518**	260	258	346	171	175
		age-adjusted rate	**46.3**	49.6	44.6	31.1	33.6	29.7
	American Indian	# cases/deaths	**43**	21	22	18	**	**
		age-adjusted rate	**93.1**	103.2	84.2	36.3	39.2	35.3
United States	**Total**	Age-Adjusted Rate	**47.1**	52.9	42.7	31.8	38.0	26.8
	White	Age-Adjusted Rate	**51.4**	56.3	47.6	34.8	40.5	30.1
	American Indian	Age-Adjusted Rate	**45.2**	51.1	40.7	26.8	30.6	23.7

** Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

Figure 32: Lung Cancer Stage at Diagnosis South Dakota, 2020



Source: South Dakota Cancer Registry

Descriptive Epidemiology

Stage at Diagnosis: In 2020, 29% of lung cancer patients were diagnosed at localized stage. The more advanced the stage, the poorer the prognosis. In 2020, 284 (49%) cases were diagnosed when the disease had progressed beyond the lung and metastasized to a distant location. Approximately, 67% 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.

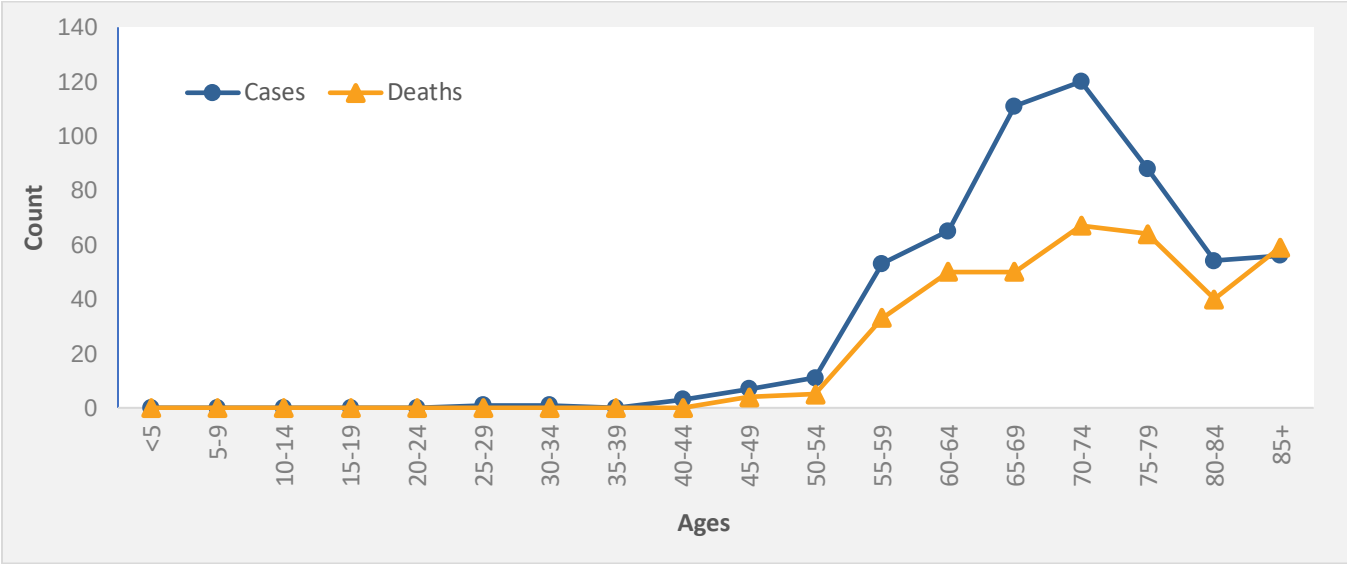
Incidence: Lung cancer is a major public health concern, with an estimated 197,453 new cases in the United States in 2020. It is the second most commonly diagnosed cancer in both men and women in South Dakota and the United States.

Mortality: There were 372 lung cancer deaths in South Dakota in 2020. Lung cancer is the most common cause of cancer death in both South Dakota and the United States. Because many cases are diagnosed at a late stage, lung cancer is often 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: Cigarette smoking is still the number one factor for lung cancer and accounts for 80% of cases and 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 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 2020.

Figure 33: Lung and Bronchus Cancer Number of Cases and Deaths by Age, South Dakota,2020



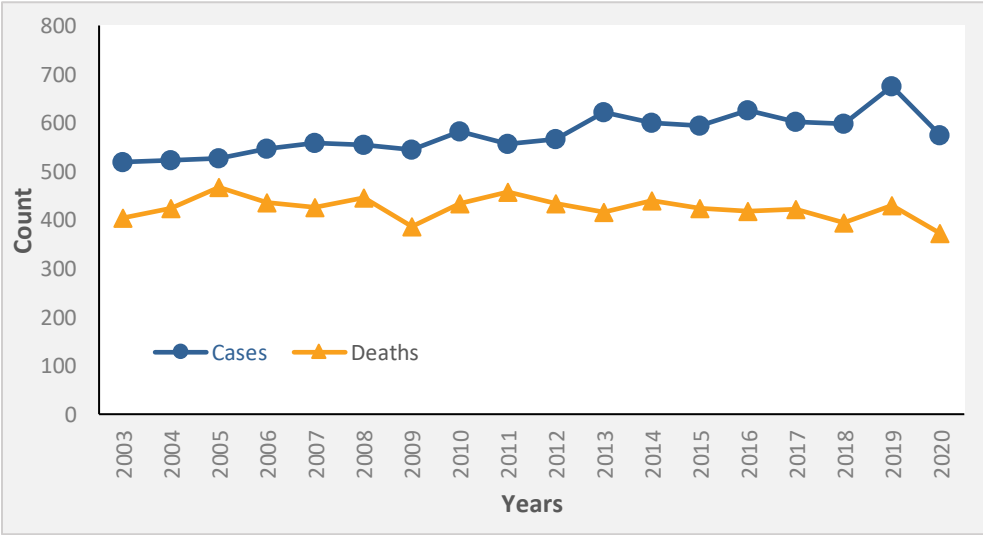


Figure 34: Lung and Bronchus Cancer Cases and Deaths by Year, South Dakota, 2003-2020

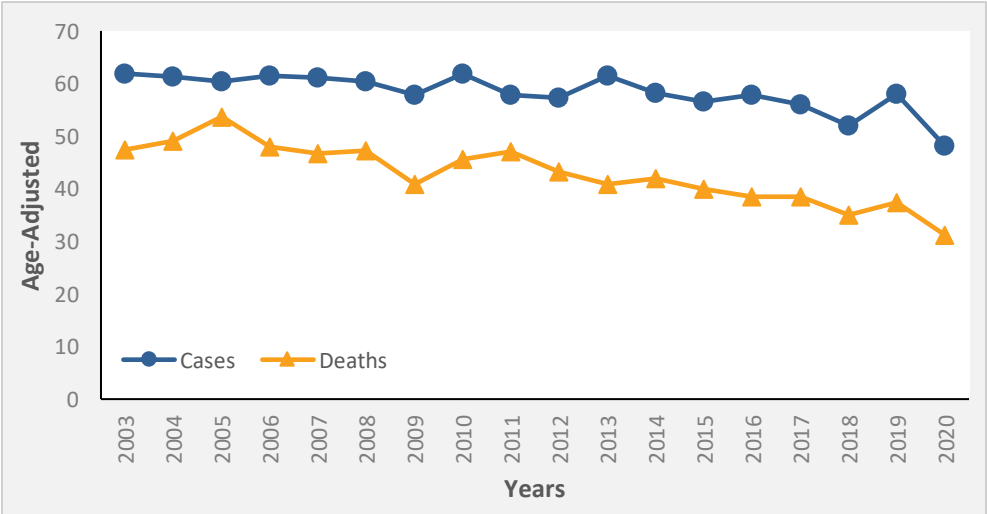


Figure 35: Lung and Bronchus Cancer Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations.
Source: South Dakota Cancer Registry

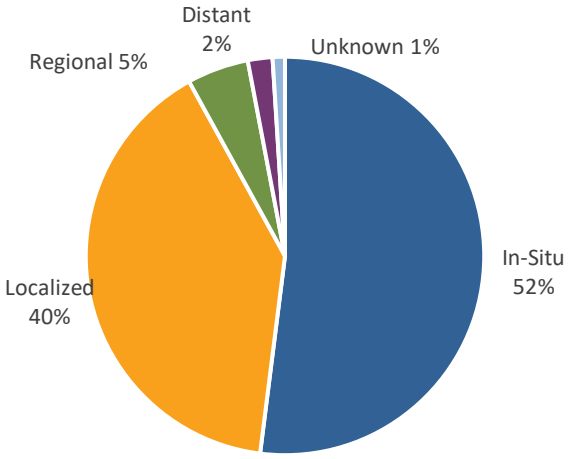
Melanoma of the Skin

Table 17: Melanoma of the Skin Incidence and Mortality Summary, 2020

Melanoma of the Skin			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# cases/deaths	**277**	161	116	20	**	**
		age-adjusted rate	**26.5**	30.4	23.7	1.9	2.7	1.2
	White	# cases/deaths	**273**	158	115	20	**	**
		age-adjusted rate	**29.4**	32.8	27.0	2.0	2.9	1.4
	American Indian	# cases/deaths	**	**	**	**	**	**
		age-adjusted rate	**4.3**	6.2	2.8	0.0	0.0	0.0
United States	**Total**	Age-Adjusted Rate	**20.0**	25.0	16.3	2.0	3.0	1.3
	White	Age-Adjusted Rate	**26.1**	31.7	21.9	2.6	3.8	1.7
	American Indian	Age-Adjusted Rate	**7.3**	9.0	6.0	0.8	**	**

** Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

Figure 36: Melanoma of the Skin Stage at Diagnosis South Dakota, 2020



Source: South Dakota Cancer Registry

Descriptive Epidemiology

Stage at Diagnosis: Melanoma is staged by the depth of invasion and the extension of the lesion. In 2020, 40% of the melanoma of the skin cases reported in South Dakota were localized. Another 52% were staged as in-situ disease. The survival rate for localized melanoma is 98.4% and for distant disease it is 34.6%.

Incidence: In the United States in 2020, the American Cancer Society estimated that there would be 100,350 new cases of melanoma of the skin.

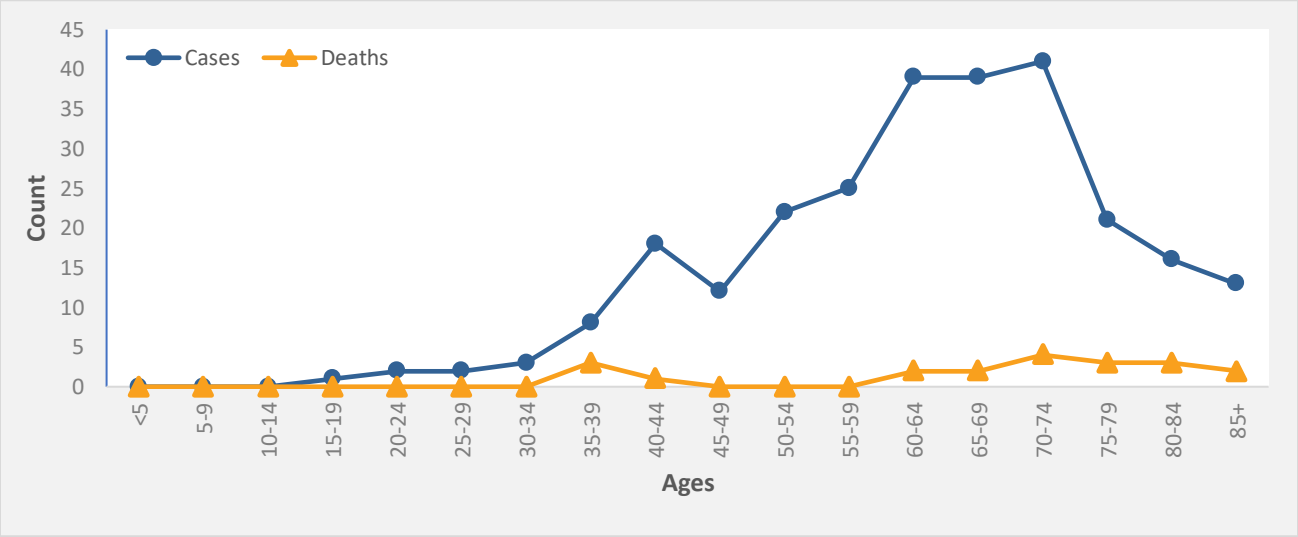
There are three forms of skin cancer: basal cell, squamous cell, and melanoma. Melanoma is by far the most dangerous form of skin cancer. In 2020, South Dakota's incidence rate of melanoma was 26.5 and 20.0 in the United States.

Mortality: There were 20 deaths attributed to melanoma of the skin in South Dakota in 2020 with a mortality rate of 1.9 while the United States mortality rate was 2.0. The median age of death in South Dakota was 71.5 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 blonde 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 37: Melanoma of the Skin Number of Cases and Deaths by Age, South Dakota, 2020



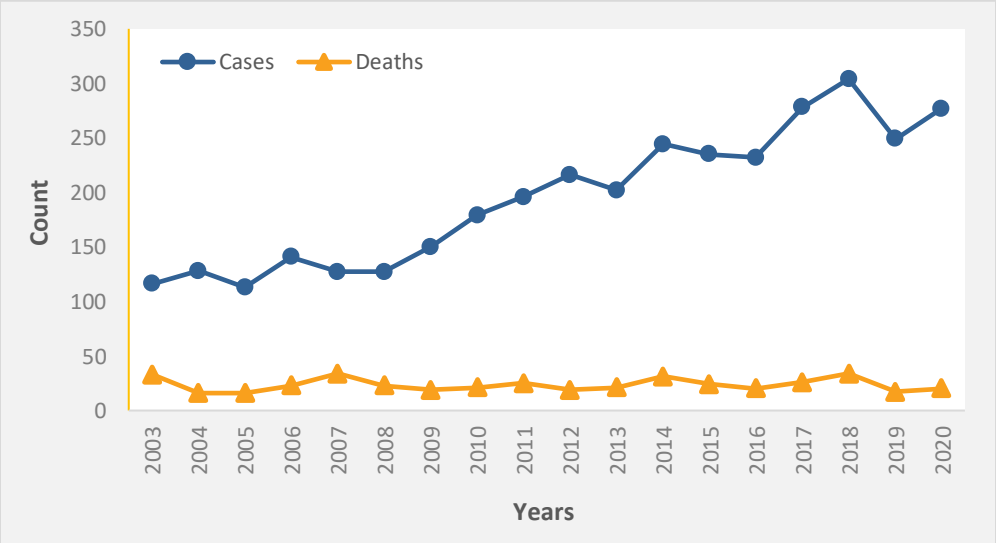


Figure 38: Melanoma of the Skin Cases and Deaths by Year, South Dakota 2003-2020

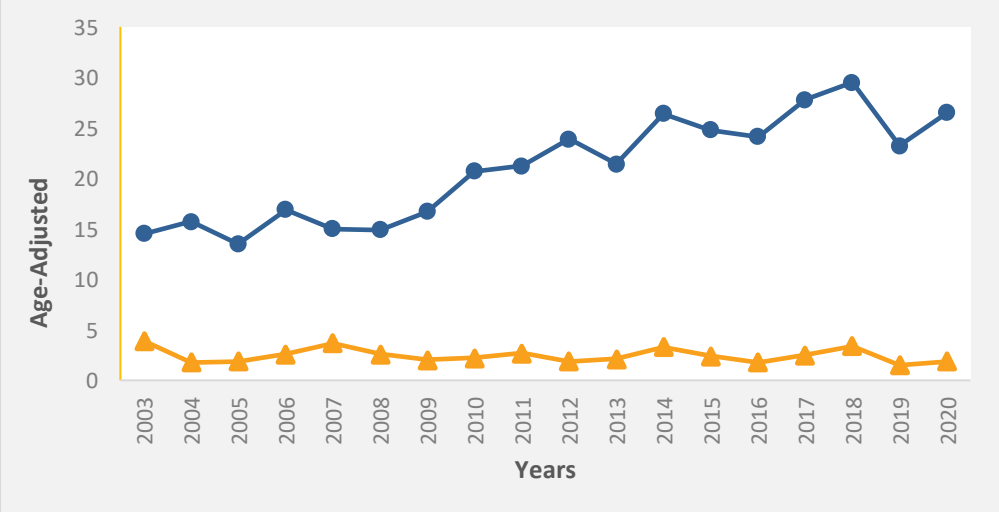


Figure 39: Melanoma of the Skin Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations.
Source: South Dakota Cancer Registry

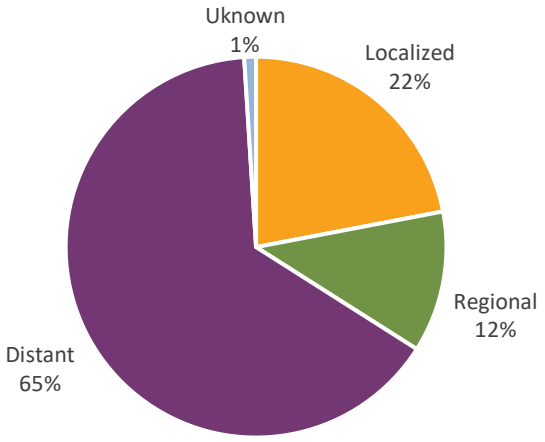
Non-Hodgkin's Lymphoma

Table 18: Non-Hodgkin's Lymphoma Incidence and Mortality Summary, 2020

Non-Hodgkin's Lymphoma			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# cases/deaths	**193**	104	89	64	30	34
		age-adjusted rate	**17.4**	20.0	15.3	5.7	6.6	5.0
	White	# cases/deaths	**177**	94	83	60	30	30
		age-adjusted rate	**16.9**	19.3	14.9	5.7	7.0	4.6
	American Indian	# cases/deaths	**	**	**	**	**	**
		age-adjusted rate	**13.7**	18.2	8.8	3.7	0.0	6.5
United States	**Total**	Age-Adjusted Rate	**17.0**	20.6	13.9	4.9	6.4	3.7
	White	Age-Adjusted Rate	**17.9**	21.8	14.5	5.2	6.8	3.9
	American Indian	Age-Adjusted Rate	**12.9**	15.0	9.9	3.7	5.1	2.5

**Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

Figure 40: Non-Hodgkin's Lymphoma Stage at Diagnosis South Dakota, 2020



Source: South Dakota Cancer Registry

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 2020, 65% of the cases were diagnosed at a distant stage.

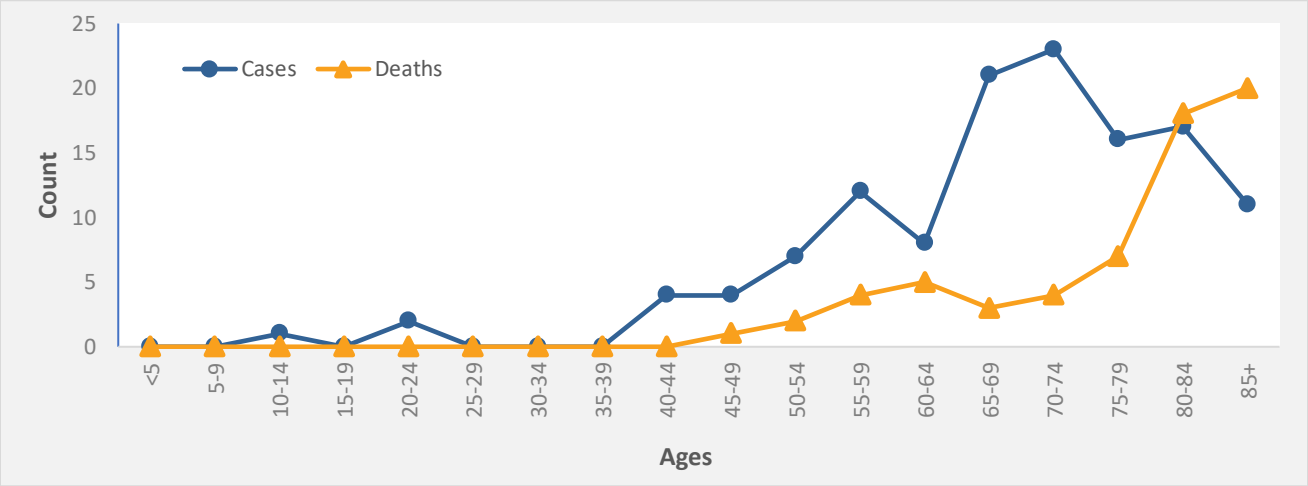
Incidence: Non-Hodgkin's lymphoma is a cancer that originates in the lymphatic system. It develops in lymphocytes, a type of white blood cell. Non-Hodgkin's lymphoma is more than 5 times as common as Hodgkin's disease. Incidence rates of non-Hodgkin's lymphoma have been decreasing since 2016. The median age at diagnosis in South Dakota was 68.

Mortality: There were 64 deaths reported in South Dakota that were attributed to Non-Hodgkin's Lymphoma. The median age at death for those cases was 81 in 2020. Nationally, the five-year survival rate was 72% 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 and 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 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 41: Non-Hodgkin's Lymphoma Number of Cases and Deaths by Age, South Dakota 2020



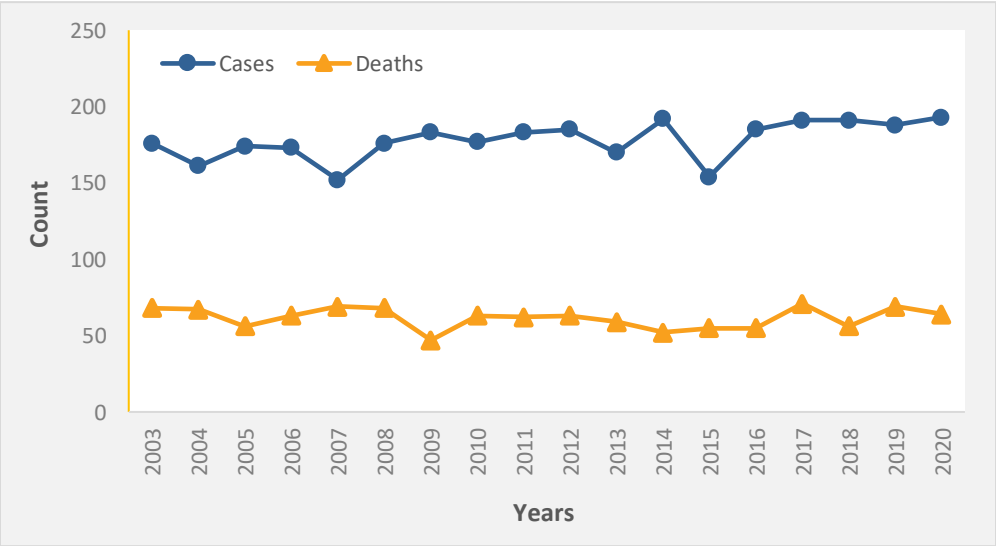


Figure 42: Non-Hodgkin's Lymphoma Cases and Death by Year, South Dakota 2003-2020

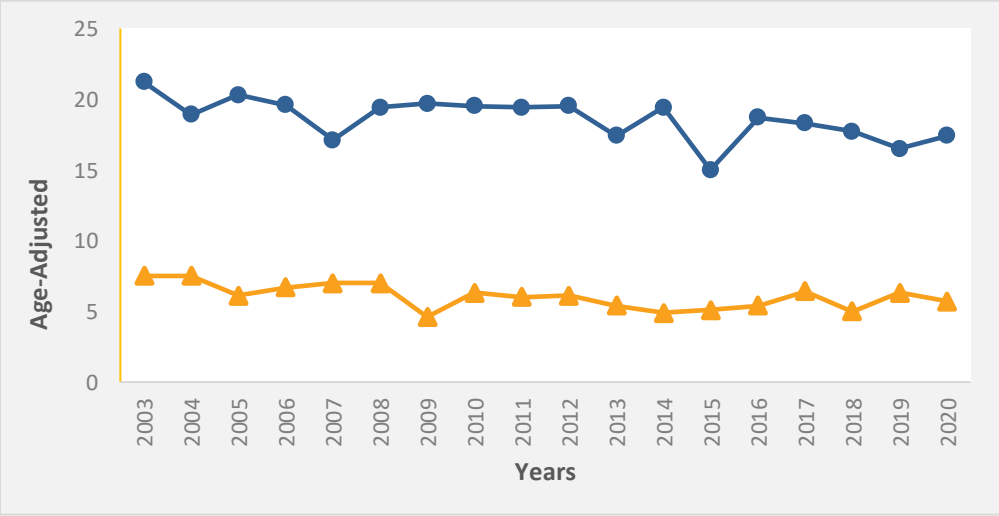


Figure 43: Non-Hodgkin's Lymphoma Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations.
Source: South Dakota Cancer Registry

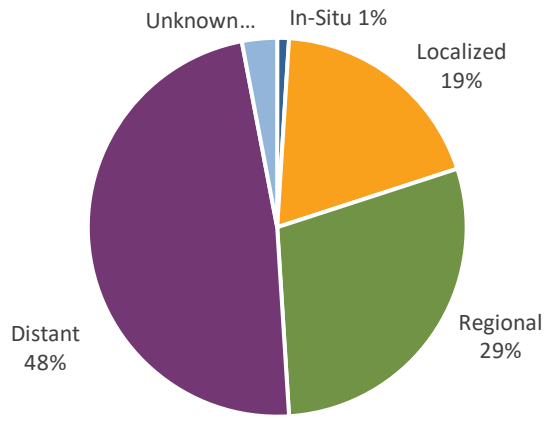
Pancreas

Table 19: Pancreatic Cancer Incidence and Mortality Summary, 2020

Pancreatic Cancer			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# cases/deaths age-adjusted rate	**151** **132.2**	80 14.7	71 11.7	128 10.9	74 13.5	54 8.1
	White	# cases/deaths age-adjusted rate	**141** **13.2**	75 14.9	66 11.4	116 10.7	69 13.9	47 7.5
	American Indian	# cases/deaths age-adjusted rate	****** **8.2**	** 15.2	** 2.6	** 19.4	** 17.0	** 20.4
United States	**Total**	Age-Adjusted Rate	**12.9**	14.7	11.3	11.0	12.7	9.6
	White	Age-Adjusted Rate	**12.9**	14.9	11.1	11.3	13.1	9.6
	American Indian	Age-Adjusted Rate	**12.1**	13.9	10.5	8.8	9.9	7.9

**Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

Figure 25: Pancreatic Cancer Stage at Diagnosis, South Dakota, 2020



Source: South Dakota Cancer Registry

Descriptive Epidemiology

Stage at Diagnosis: Pancreatic cancer is often diagnosed late in the disease process. In South Dakota, 77% of new cases were diagnosed at a late state (regional and distant) in 2020.

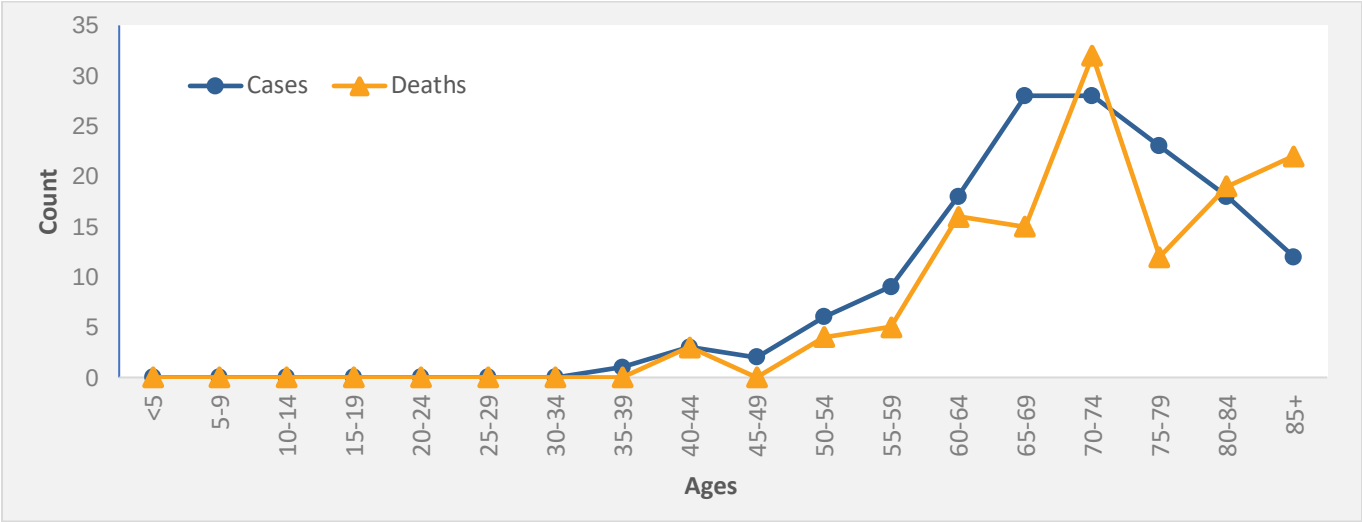
Incidence: The incidence of pancreatic cancer increases steadily with age. An estimated 57,600 new cases of pancreatic cases were expected to be diagnosed in 2020 in the United States. The majority of cases occurred in South Dakotans 65 years or older. One hundred and nine (73%) were diagnosed in 2020 in that age group. Pancreatic cancer is slightly more common in males than in females and in 2020, 75 males and 66 females were diagnosed. Nationally, there was a higher incidence rate in Blacks of both genders. The median age at diagnosis was 70 years in South Dakota and

Mortality: The overall survival for cancer of the pancreas is poor. Studies reveal that the 2016-2020 five-year survival rate was approximately 13%. In 2020, there were 128 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 nonsmokers. 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 to search, 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 45: Pancreatic Cancer Number of Cases and Deaths by Age, South Dakota 2020



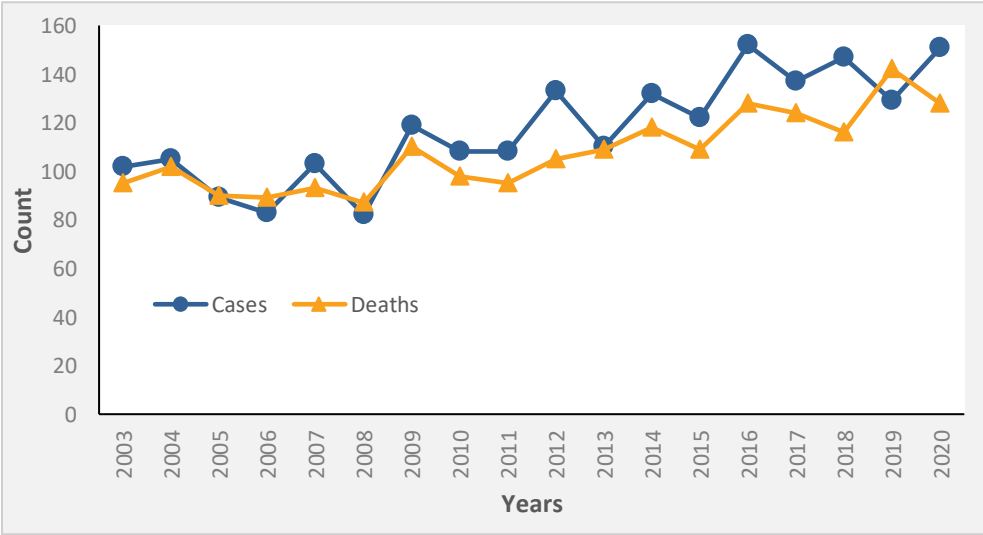


Figure 46: Pancreatic Cancer Cases and Deaths by Year, South Dakota, 2003-2020

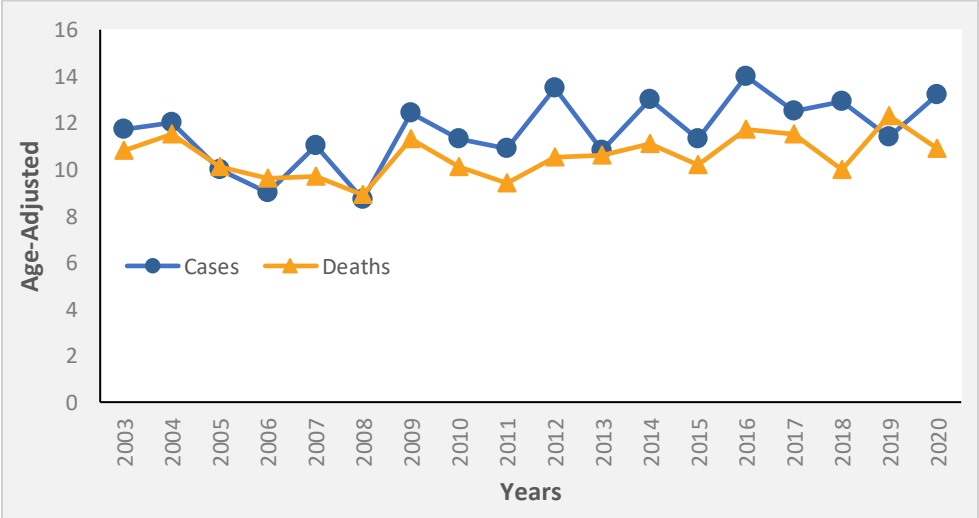


Figure 47: Pancreatic Cancer Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations.
Source: South Dakota Cancer Registry

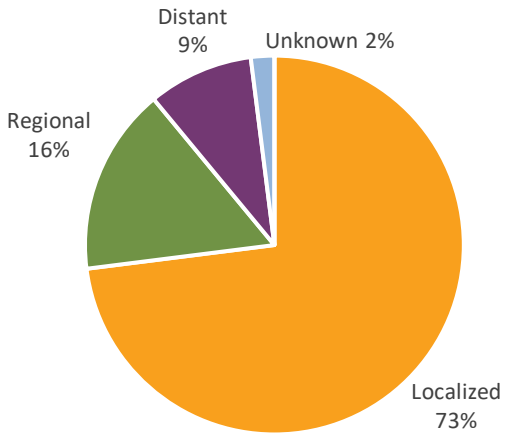
Prostate

Table 20: Prostate Incidence and Mortality Summary, 2020

Prostate Cancer			Incidence		Mortality	
			Total	Male	Total	Male
South Dakota	**Total**	# cases/deaths	**702**	702	95	95
		age-adjusted rate	**119.5**	119.5	19.6	19.6
	White	# cases/deaths	**652**	652	94	94
		age-adjusted rate	**119.2**	119.2	20.2	20.2
	American Indian	# cases/deaths	**31**	31	**	**
		age-adjusted rate	**148.2**	148.2	1.9	3.9
United States	**Total**	Age-Adjusted Rate	**100.0**	100.0	18.5	18.5
	White	Age-Adjusted Rate	**95.4**	95.4	17.7	17.7
	American Indian	Age-Adjusted Rate	**65.0**	65.0	12.9	12.9

**Data suppressed for less than 16 cases, rates are considered unstable due to few observations and should be interpreted with caution.

Figure 48: Prostate Cancer Stage at Diagnosis, South Dakota, 2020



Source: South Dakota Cancer Registry

Descriptive Epidemiology

Stage at Diagnosis: The greatest number of prostate cases were diagnosed at an early stage. In 2020, 73% 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 69. Also, in South Dakota the incidence of prostate cancer begins to increase in the 60s age group.

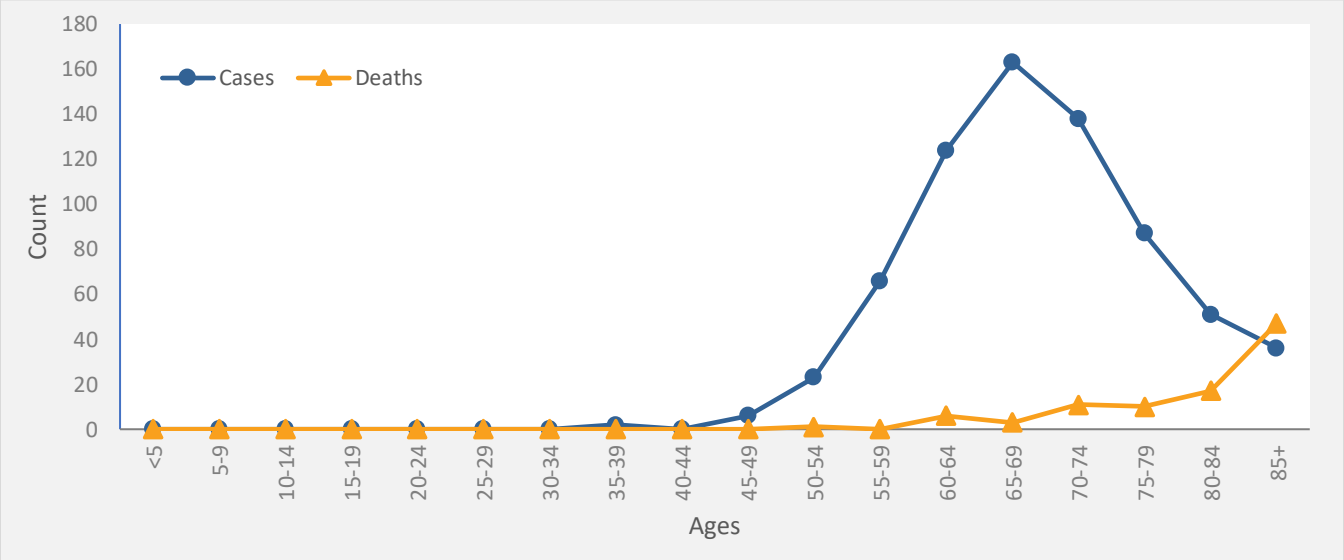
Mortality: Prostate cancer was the second leading cancer death in males in South Dakota in 2020. Prostate cancer can be a slow progressing disease and can be cured or at least controlled in the early stages. The median age of death in South Dakota in 2020 was 89 years old. Many patients have co-morbid 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 can occur through testing for prostate-specific antigen (PSA) levels, as well as through a digital rectal exam (DRE). While these tests can help to detect prostate cancer, there is a possibility of over diagnosis and over treatment.

In 2020, 39.2% of males aged 40 or older had received a PSA test within the last two years. This gives South Dakota the highest testing rate of any state within the nation. The national average PSA testing rate is 31.8%

Figure 49: Prostate Cancer Number of Cases and Deaths by Age, South Dakota, 2020



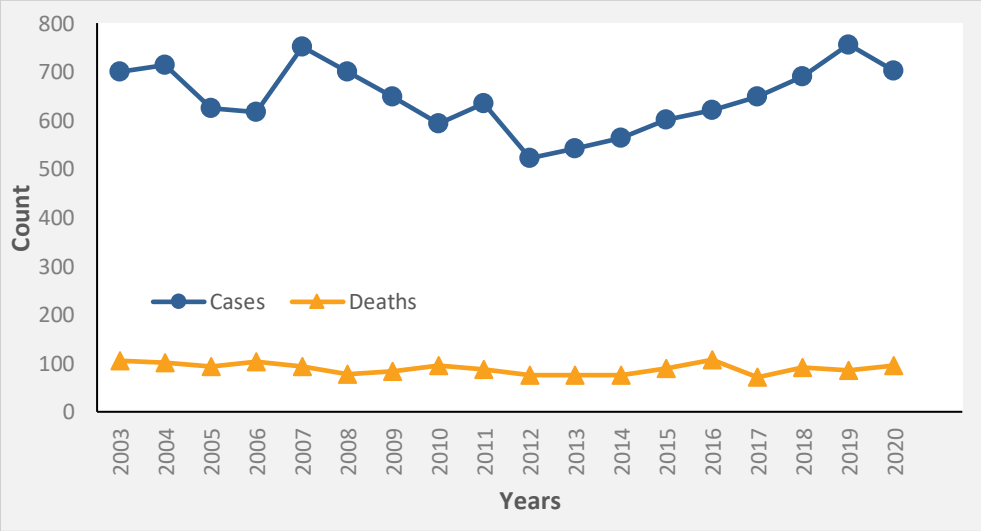


Figure 50: Prostate Cancer Cases and Deaths by Year, South Dakota 2003-2020

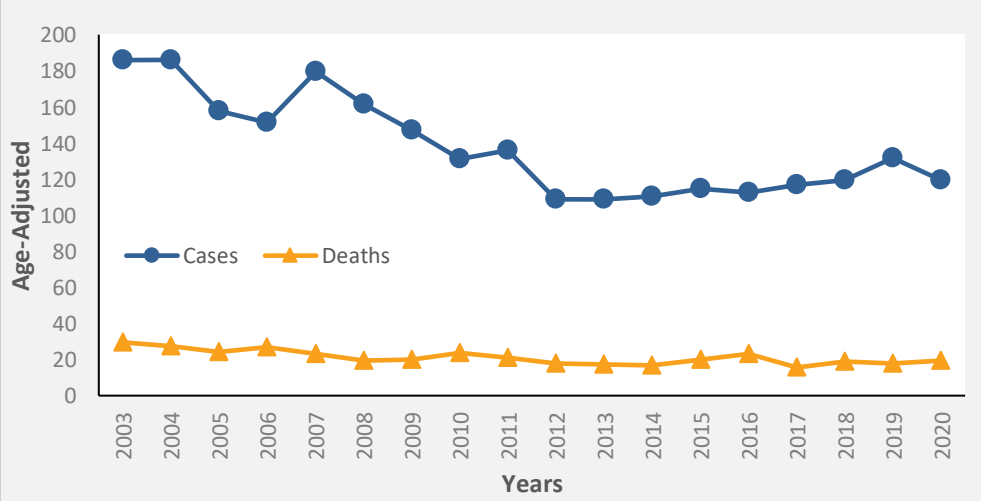


Figure 51: Prostate Cancer Age-Adjusted Incidence and Mortality Rates by Year, South Dakota 2003-2020

Rates per 100,000 age-adjusted to 2000 US standard population and SD estimated populations.
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: 2016-2020 South Dakota Estimated Population

Year	2016	2017	2018	2019	2020
Total	865,454	869,666	882,235	884,659	892,717
<5	61,369	61,759	62,132	61,167	60,464
5-9	60,477	60,372	60,762	60,934	61,387
10-14	57,842	59,303	60,882	60,732	61,285
15-19	56,838	56,675	57,674	57,734	58,826
20-24	61,366	59,550	59,585	58,930	59,560
25-29	55,852	57,257	58,754	57,986	57,884
30-34	56,414	56,348	57,341	57,078	57,225
35-39	52,857	54,536	56,007	56,899	57,060
40-44	45,735	46,458	47,902	48,965	51,248
45-49	47,699	47,425	47,241	46,641	46,133
50-54	54,496	52,109	49,840	48,224	47,567
55-59	59,850	59,476	59,311	58,789	57,078
60-64	55,854	56,774	57,950	58,709	59,823
65-69	46,846	48,277	50,160	52,022	54,035
70-74	30,618	32,952	34,890	37,194	40,006
75-79	22,243	22,463	23,666	24,442	25,136
80-84	17,582	17,151	17,147	17,228	17,144
85+	21,516	20,781	20,991	20,985	20,856

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	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	C440-C449	8720-8790	25010
Other Non-Epithelial Skin	C440-C449	excluding 8000-8005, 8010-8046, 8050-8084, 8090-8110, 8720-8790, 9050-9055, 9140, 9590-9992	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**
Brain and Other Nervous System			
Brain	C710-C719	excluding 9050-9055,9140,9530-9539, 9590-	31010
Cranial Nerves Other Nervous System	C710-C719	9530-9539	31040
	C700-C709, C720-C729	excluding 9050-9055, 9140, 9590-9992	
Endocrine System			
Thyroid	C739	excluding 9050-9055, 9140, 9590-9992	32010
Other Endocrine including Thymus	C379, C740-C749, C750-C759		32020

Source:https://seer.cancer.gov/siterecode/icdo3_dwhoheme/index.html

References

American Cancer Society, “Can Pancreatic Cancer Be Found Early?,” February 11, 2019. https://www.cancer.org/cancer/types/pancreatic-cancer/detection-diagnosis-staging/detection.html. Accessed June 22, 2023.

American Cancer Society, “Can Pancreatic Cancer Be Prevented?,” June 9, 2020. https://www.cancer.org/cancer/types/pancreatic-cancer/causes-risks-prevention/prevention.html. Accessed June 22, 2023.

American Cancer Society, “Can Prostate Cancer Be Found Early?,” August 1, 2019. https://www.cancer.org/cancer/types/prostate-cancer/detection-diagnosis-staging/detection.html. Accessed June 22, 2023.

American Cancer Society, “Can Prostate Cancer Be Prevented?,” June 9, 2020. https://www.cancer.org/cancer/types/prostate-cancer/causes-risks-prevention/prevention.html. Accessed June 22, 2023.

American Cancer Society, “Key Statistics for Non-Hodgkin Lymphoma,” January 12, 2023. https://www.cancer.org/cancer/types/non-hodgkin-lymphoma/about/key-statistics.html. Accessed June 22, 2023.

American Cancer Society, “Leukemia,” 2023. https://www.cancer.org/cancer/types/leukemia.htm. Accessed June 22, 2023.

American Cancer Society, “Non-Hodgkin Lymphoma Risk Factors,” September 19, 2022. https://www.cancer.org/types/non-hodgkin-lymphoma/causes-risks-prevention/risk-factors.html. Accessed June 22, 2023.

American Cancer Society, “Pancreatic Cancer Risk Factors,” June 9, 2020. https://www.cancer.org/cancer/types/pancreatic-cancer/causes-risks-prevention/risk-factors.html. Accessed June 22, 2023.

American Cancer Society, “Prostate Cancer Risk Factors,” June 9, 2020. https://www.cancer.org/cancer/types/prostate-cancer/causes-risks-prevention/risk-factors.html. Accessed June 22, 2023.

American Cancer Society, “Signs and Symptoms of Non-Hodgkin Lymphoma,” August 1, 2018. https://www.cancer.org/cancer/types/non-hodgkin-lymphoma/detection-diagnosis-staging/sings-symptoms.html. Accessed June 22, 2023.

American Cancer Society, “Treatment of Stage IV (Metastatic) Breast Cancer,” January 31, 2023. https://www.cancer.org/cancer/types/breast-cancer/treatment/treatment-of-breast-cancer-by-stage/treatment-of-stage-iv-advanced-breast-cancer.html. Accessed July 25, 2023.

Cancer Facts and Figures, 2020. Atlanta. American Cancer Society. 2020, https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2020/cancer-facts-and-figures-2020.pdf

Centers for Disease Control and Prevention, “Bladder Cancer,” July 6, 2022. https://www.cdc.gov/cancer/bladder/index.htm. Accessed June 22, 2023.

Centers for Disease Control and Prevention, “BRFSS Prevalence & Trends Data: Home,” Accessed July 6, 2023. https://www.cdc.gov/brfss/brfssprevalence/index.html. Accessed June 22, 2023.

Centers for Disease Control and Prevention, “Cancer and Tobacco Use,” August 27, 2019. https://www.cdc.gov/vitalsigns/cancerandtobacco/index.html#:~:text=Tobacco%20use%20causes%20at%20least,10%20of%20all%20cancer%20deaths. Accessed June 22, 2023.

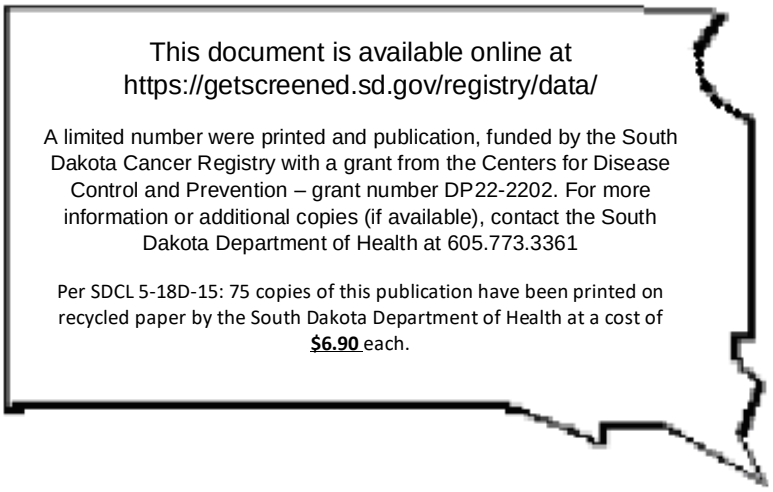
Centers for Disease Control and Prevention, “Colorectal Cancer Screening Tests,” February 23, 2023. https://www.cdc.gov/cancer/colorectal/basic_info/screening/tests.htm. Accessed June 22, 2023.

Centers for Disease Control and Prevention, “Kidney Cancer,” July 6, 2022. https://www.cdc.gov/cancer/kidney/index.htm. Accessed June 22, 2023.

Centers for Disease Control and Prevention, “What are the Risk Factors for Breast Cancer?,” September 26, 2022. https://www.cdc.gov/cancer/breast/basic_info/risk_factors.htm. Accessed June 22, 2023.
Centers for Disease Control and Prevention, “What are the Risk Factors for Colorectal Cancer?,” February 23, 2023. https://www.cdc.gov/cancer/colorectal/basic_info/risk_factors.htm. Accessed June 22, 2023.
Centers for Disease Control and Prevention, “What are the Risk Factors for Lung Cancer?,” October 25, 2022. https://www.cdc.gov/cancer/lung/basic_info/risk_factors.htm. Accessed June 22, 2023.
Centers for Disease Control and Prevention, “What are the Risk Factors for Skin Cancer?,” April 18, 2023. https://www.cdc.gov/cancer/skin/basic_info/risk_factors.htm. Accessed June 22, 2023.
Centers for Disease Control and Prevention, “What Can I Do to Reduce My Risk of Colorectal Cancer?,” February 23, 2023. https://www.cdc.gov/cancer/colorectal/basic_info/prevention.htm. Accessed June 22, 2023.
Centers for Disease Control and Prevention, “What Can I Do to Reduce My Risk of Lung Cancer?,” October 25, 2022. https://www.cdc.gov/cancer/lung/basic_info/prevention.htm. Accessed June 22, 2023.
Centers for Disease Control and Prevention, “What Can I Do to Reduce My Risk of Skin Cancer?,” April 18, 2023. https://www.cdc.gov/cancer/skin/basic_info/prevention.htm. Accessed June 22, 2023.
Centers for Disease Control and Prevention, “What is Breast Cancer Screening?,” September 26, 2022. https://www.cdc.gov/cancer/breast/basic_info/screening.htm. Accessed June 22, 2023.
Centers for Disease Control and Prevention, “Who Should Be Screened for Lung Cancer?,” October 25, 2022. https://www.cdc.gov/cancer/lung/basic_info/screening.htm. Accessed June 22, 2023.
MyPlate, “Fruits,” December 2020, https://www.myplate.gov/eat-healthy/fruits. Accessed July 20, 2023.
MyPlate, “Vegetables,” December 2020, https://www.myplate.gov/eat-healthy/vegetables. Accessed July 20, 2023.
National Cancer Institute, “Bladder Cancer Causes and Risk Factors,” April 27, 2023. https://www.cancer.gov/types/bladder/causes-risk-factors. Accessed June 22, 2023.
National Cancer Institute, “Cancer Stat Facts: Cervical Cancer,” 2023, https://seer.cancer.gov/statfacts/html/cervix.html. Accessed June 22, 2023.
National Cancer Institute, “Cancer Stat Facts: Lung and Bronchus Cancer,” (n.d.), https://seer.cancer.gov/statfacts/html/lungb.html. Accessed July 25, 2023.
National Cancer Institute, “Cervical Cancer Causes, Risk Factors, and Prevention,” February 24, 2023. https://www.cancer.gov/types/cervical/causes-risk-prevention. Accessed June 22, 2023.
National Cancer Institute, “Summary Staging,” (n.d.), https://training.seer.cancer.gov/staging/systems/summary/. Accessed July 25, 2023.
National Cancer Institute, “Why is Colorectal Cancer Rising Rapidly among Young Adults?” November 5, 2020. https://www.cancer.gov/news-events/cancer-currents-blog/2020/colorectal-cancer-rising-younger-adults. Accessed July 25, 2023.
National Heart Lung and Blood Institute, “Health Disparities.” April 2017. https://www.nhlbi.nih.gov/health/educational/healthdisp/index.htm#source1. Accessed June 22, 2023.
Norman, Geoffrey R., and David L. Streiner. *Biostatistics: The Bare Essentials*. 2nd ed. Shelton, CT: People’s Medical Publishing House-USA, 2014.
Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute, Cancer Query Systems, http://seer.cancer.gov/canques/
US Census Bureau, “South Dakota: 2020 Core Based Statistical Areas and Counties,” March 2020, https://www2.census.gov/programs-surveys/metro-micro/reference-maps/2020/state-maps/46_SouthDakota_2020.pdf. Accessed October 29, 2023.

World Health Organization, “Cancer.” February 3, 2022. https://www.who.int/news-room/fact-sheets/detail/cancer. Accessed June 22, 2023.

Yabroff, K. Robin, Jennifer Lund, Deanna Kepka, and Angela Mariotto. “Economic Burden of Cancer in the United States: Estimates, Projections, and Future Research.” *Cancer Epidemiology, Biomarkers & Prevention* 20, no. 10 (October 1, 2011): 2006–14. https://doi.org/10.1158/1055-9965.epi-11-0650.



This document is available online at
https://getscreened.sd.gov/registry/data/

A limited number were printed and publication, funded by the South Dakota Cancer Registry with a grant from the Centers for Disease Control and Prevention – grant number DP22-2202. For more information or additional copies (if available), contact the South Dakota Department of Health at 605.773.3361

Per SDCL 5-18D-15: 75 copies of this publication have been printed on recycled paper by the South Dakota Department of Health at a cost of **$6.90** each.